

A REVIEW OF THE TREATMENT OF GENERAL PARALYSIS.

In an attempt to estimate the value of treatment in General Paralysis a series of fifty-eight cases has been taken. Those were not specially selected but were taken from the numbers residing in the Hospital and from those who were admitted in whom the signs and symptoms of General Paralysis were in evidence. Not all of them received the same treatment, - but were divided into four groups, each of which was subjected to a certain line of treatment. It has been my practice to treat General Paralysis (a) by Tryparsamide and Bismuth Metal and (b) by Malaria.

Before proceeding to describe the various groups with the results of treatment it is necessary to consider the agents involved and their methods of administration.

- (1) TRYPARSAMIDE is the sodium salt of N-phenylglycineamide-p-
arsonic acid, a pentavalent compound containing from
25.1 to 25.5 per cent of arsenic. It was first synthesised
by Jacobs and Heildelberger at the Rockefeller Institute
for Medical Research in 1915, and was tested by them. It
has a low toxicity for animals e.g. the minimal lethal dose
for mice on intravenous injection was over 2 gm. per kilo,
which is about 1/20 the toxicity of Salvarsan.

The claims which have been made for this drug may be briefly summarised as follows:-

- (a) The drug has a marked affinity for the tissues of the central nervous system.
- (b) There is no known substance with an equal degree of spirochaetocidal action which possesses the same degree of penetrability.
- (c)/

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(c) Its value does not depend upon parasitocidal action, but its great value in certain cases of neuro-syphilis depends on its power of developing spirochaetocidal action in hitherto inaccessible foci and in stimulating the natural powers of resistance.

ADMINISTRATION.

Tryparsamide is a white, amorphous, crystalline salt, freely soluble in water. It may be given:-

- (a) Intravenously.
- (b) Intramuscularly.
- (c) Subcutaneously.

In all my cases I have employed the intravenous method. The dose is from 1 - 3 gms. and the course of injections extends over a period of from eight to nine weeks. The solutions of the drug are freshly prepared as required with cool sterile distilled water and with the use of sterile vessels. The solution must be clear. Turbidity indicates the presence of calcium in the water used, or on the glass ware, or of chemical decomposition, and such solutions should not be used. A course is usually begun with an initial dose of 2 gms., after which a dose of 3 gms. is given every week for eight weeks, i.e. 26 gms. of tryparsamide are administered in a course of nine weeks. Cases for treatment should be carefully examined before treatment.

CONTRAINDICATIONS.

Treatment should not be undertaken in the following circumstances.

- (a) Extensive disease of the circulatory system.
- (b) Gross wasting and debilitating disease.
- (c) Optic neuritis or atrophy.
- (d) Albumen and bile in the urine.

There is one serious drawback to the use of this drug, /

drug, this being the risk of its toxic action on the optic nerves, therefore the occurrence of amblyopia indicates that treatment must be at once stopped. The appearance of jaundice also precludes further treatment.

- (2) BISMUTH. - Metallic Bismuth is the preparation of choice among Bismuth preparations. It is put up in ^{steriles} containing 0.2 Gm. in 1c.c. of 5% Glucose solution. The dose is 0.5 to 1c.c. intramuscularly into the buttocks. It is non-toxic, absorption rate is uniform and its action is steady. The only danger to avoid is ~~not~~ to inject the drug into the blood stream, as it causes paralysis and death within two hours. Fortunately this eventuality is not likely to arise if ordinary precautions are observed in its administration and, in the cases treated, no such accident occurred. Metallic Bismuth has been used by me only in combination with Tryparsamide. After the course of the latter had been completed, Bismuth Metal was given intramuscularly in 1c.c. doses for a period of twelve weeks after which the blood and cerebrospinal fluid were again examined serologically and the advisability or not of a further course of treatment considered. If conditions ~~were~~ suitable and no untoward results had occurred as a result of a first course, a second was given after a period of rest varying from six weeks to three months.
- (3) MALARIA. - Wagner Jauregg of Vienna was the first person to introduce this method of treatment when in 1917 he inoculated nine cases with benign tertian malaria. Six of those cases showed favourable results. In 1919 after further experience, the treatment was introduced into his clinic as a routine procedure.

Although malarial inoculation undoubtedly stimulates/

stimulates processes in the organism which bring about remissions, the nature of these processes is not definitely known. The fact that malaria is not a specific remedy is evidenced by similar results having been obtained from accidental infections and from the injection of tuberculin. In some cases good results have been obtained from inoculation with relapsing fever as Sagel in his "Zur Behandlung der Dementia Paralytica mit Recurrens Duttoni", describes seventy-two cases of general paralysis treated by intravenous injections of relapsing fever.

Furthermore Pilez ("Wagner's New Treatment of General Paralysis". Lancet, 1923) emphasises the favourable influence of fever upon the paralytic process. In the investigation of the cases of about 5,000 soldiers who had acquired syphilis in 1880 - 90, Mattauschek and he found 5 per cent of paralytics. Patients who had suffered from erysipelas, malaria or other feverish diseases after their infection did not develop general paralysis and patients who later became paralytic had not suffered from such feverish disease. From those observations it would appear that the rationale of this method of treatment is the reinforcing of the body's defence mechanism.

Inoculation of a patient may be effected as follows:-

1. By the bite of an infected mosquito.
2. By the injection of blood obtained from a patient suffering from malaria.

The method I have employed is by the injection of blood from a patient suffering from the disease.

By means of a serum syringe two to five cubic/

cubic centimetres of the blood is withdrawn under strict aseptic precautions from an arm vein of a patient during the febrile stage. This is immediately re-injected into the patient to be treated either intramuscularly or intravenously. When using the intramuscular method larger doses have been given - from five to eight cubic centimetres.

Symptoms of malaria develop within seven days after intravenous, and within thirty-one days after intramuscular injection. Eight rigors are allowed as a rule before the fever is terminated but where the patient is bearing it well, ten or twelve may be permitted. The bouts of pyrexia reach 104° F and even higher, some of the cases treated having had a temperature of over 106° F. The usual procedure for the termination of the treatment is by the administration of quinine. The preparation of the drug which I generally employ is the sulphate - 5 grs. being given three times a day for the first two or three days and half that amount up to the end of a week. In cases where it was deemed advisable to hasten the termination of the fever quinine bisulphate was injected hypodermically twice a day for three days and then once a day for fourteen days. Throughout the period of fever each patient received Ferri et Ammon. Cit. grs.X and Tr. Digitalis m.VII three times a day in order to counteract the anaemia which supervenes and as a cardiac tonic. Where improvement in the paralytic symptoms occurs, it does so almost immediately, or even after the lapse of some months. The mental and physical symptoms usually improve together.

The cases under review were treated by the above described agents, tryparsamide, bismuth and malaria/

malaria. As already mentioned four groups are under consideration:-

- (a) Those treated with Tryparsamide.
- (b) Those treated with Tryparsamide + Bismuth.
- (c) Those treated with Malaria.
- (d) Those treated with Malaria + Tryparsamide + Bismuth.

In all cases the cerebrospinal fluid and blood were examined serologically both before and after treatment.

(a) CASES TREATED WITH TRYPARSAMIDE.

Reference to Table No.1 will afford an insight into the general results of the use of Tryparsamide alone. It will be seen that twenty-three cases were treated and of those, six were discharged as recovered, three were improved but not sufficiently so as to warrant their discharge, six showed no improvement and eight died - several of the latter dying before the expiration of their treatment and of intercurrent affections.

Patients treated by this method show:-

Recovered ...	...	26%.
Relieved....	...	13%.
Not Improved.	...	26%.
Died.	...	34%.

The average^{age} of those who recovered was 36, of those who were relieved and not improved 43 and of those who died 49.

From the table it will be seen that there was little or no change in the Wassermann Reaction of the blood or cerebrospinal fluid except in a small number of the cases. A short survey of each case will serve to show further the condition of those patients on admission and their progress under treatment.

TABLE No. 1.

CASES TREATED WITH TRYPARSAMIDE.

CASES TREATED WITH INFUSIONS.					
CASE.	AGE.	TYPE.	WASSERMANN.		RESULT.
			Before Treatment.	After Treatment.	
Patients still in Institution.					
1.G.B.	33.	Depressed.	Blood + - ++ C.S.F. +	— +	Not Improved
2.T.C.	33.	Expansive	Blood. + C.S.F. —	— —	Not Improved
3.J.C.	45.	Depressed.	Blood. +++ C.S.F. +++	++ - +++ ++ +	Relieved.
4.J.McK.	66.	Depressed.	Blood. +++ C.S.F. +	++ +	Relieved.
5.W.K.	38.	Expansive.	Blood. +/— C.S.F. +	+/ +	Not Improved
6.G.K.	59.	Expansive.	Blood. +++ C.S.F. +++	++ - +++ +++.	Relieved.
7.H.H.M.	38.	Depressed.	Blood. +++ C.S.F. +++	++ - +++ ++	Not Improved
8.C.R.	30.	Depressed.	Blood. + - ++ C.S.F. —	— —	Not Improved
9.R.W.	43.	Expansive.	Blood. +++ C.S.F. +++	++ +++	Not Improved
Patients Discharged.					
10.T.McD.	50.	Depressed.	Blood. + C.S.F. +	— —	Recovered.
11.J.F.	48.	Depressed.	Blood. + C.S.F. +	— +	Recovered.
12.K.McK.	36.	Expansive.	Blood. ++ C.S.F. —	— —	Recovered.
13.J.M.	26.	Expansive.	Blood. +++ C.S.F. —	+++ —	Recovered.
14.A.P.	21.	Depressed.	Blood. +++ C.S.F. +++	++ ++ - +++	Recovered.
15.W.P.	40.	Expansive.	Blood. — C.S.F. +/—	— +/ —	Recovered.
Deaths.					
16.G.A.	45.	Expansive.	Blood. ++ C.S.F. +++	++ +++	Died.
17.D.C.	45.	Expansive.	Blood. + C.S.F. +	+ +	Died.
18.W.P.D.	60.	Demented.	Blood. — C.S.F. +	— +	Died.
19.J.F.	37.	Depressed.	Blood. — C.S.F. ++	— ++	Died.
20.W.H.G.	63.	Demented.	Blood. +++ C.S.F. +	? ?	Died.
21.J.M.G.	45.	Demented.	Blood. + C.S.F. +	? ?	Died.
22.A.H.I.	60.	Depressed.	Blood. +++ C.S.F. +++	? ?	Died.
23.J.McP.	39.	Demented.	Blood. +++ C.S.F. ?	? ?	Died.

Case No.1. (G.B.).Type - Depressed.

On admission this patient was morbidly depressed and was the subject of delusions of suspicion and persecution. He imagined that people were following him and accusing him of various sins. This had worried him so much that he had given up work entirely some time before admission.

His physical condition was fairly good but fibrillary twitchings of the tongue were present and fine tremors of the fingers. His pupils were unequal in size but reacted to light and accommodated.

Treatment and Progress. An examination of the blood showed that the Wassermann Reaction was positive to double positive and on examining the cerebrospinal fluid it was found that the reaction there was positive. He was given a course of Tryparsamide but no improvement resulted. At the end of the course the blood Wassermann was negative but no change was found in the cerebrospinal fluid. His mental symptoms showed no change and his physical condition began to deteriorate. His speech became slurring and his gait unsteady. His present condition is one of progressive mental and physical deterioration.

Case No.2. (T.C.)Type - Expansive.

This patient was the subject of exaltation of mind, and entertained exaggerated ideas as to his importance in the world, his well-being and his capabilities. His elation was accompanied by excitement which varied in intensity from time to time. When severe he talked incessantly in a rambling and incoherent manner his utterance being accompanied by profuse gesticulation. Along with his exaltation and excitement there were delusions of persecution and of identity. He failed to/

to recognise his mother when she visited him and asserted that she was a total stranger. He had also hallucinations of hearing and, when they were present his excitement was intensified, he became noisy and irritable and was occasionally impulsive and destructive.

Physically his condition was indifferent, tubercular lesions being present in both lungs. The knee jerks were exaggerated. The Wassermann Reaction was positive in the blood but negative in the cerebrospinal fluid.

Treatment and Progress. He received one course of Tryparsamide and at the end of his treatment showed no improvement mentally. The blood Wassermann was now negative. Shortly afterwards he became subject to cerebral seizures which have since occurred from time to time.

Present State. He is now dementing rapidly and his physical state continues to deteriorate. Seizures continue to occur at more frequent intervals.

Case No.3. (J.C.)

Type - Expansive.

On admission this patient was morbidly depressed and was the subject of delusions of sin and of persecution. At times he was acutely excited, truculent and abusive. His physical condition was weak and marked anaemia was present. Pupils were unequal and fixed. There was muscular tremor of the lips, tongue and extended fingers. Speech was slurring and the tendon reflexes were morbidly exaggerated. Romberg's sign was present and the gait was reeling and ataxic in character. The blood Wassermann was triple positive.

The/

The cerebrospinal fluid examination revealed the following:-

Wassermann	-	+++
Colloidal Gold	-	244,443,110,00.
Pandy's Test	-	+++
Total Protein	-	64 mgm. per 100 c.c.
Cell Count	-	97 per cmm.
Gold Sol. Curve.	-	Paretic Type.

Treatment and Progress. Patient had one course of Tryparsamide at the conclusion of which he suffered from a mild degree of jaundice which, however, rapidly improved when treatment was suspended. The blood Wassermann was double to triple positive but the cerebrospinal fluid showed no change. The depression which was present became less marked but a considerable degree of mental enfeeblement is now present. He is a useful worker, has parole of the hospital grounds but is not fit for discharge from institutional care.

Case No.4. (J.McK.)

Type - Depressed.

Age - 66.

Married. Occupation - Carter.

History - About four weeks before admission patient had Influenza and had not been back to work. A few days before admission he became very depressed about himself and "rambled on" about not being able to work again and thought his wife, son and daughter were conspiring against him. A few years ago a doctor attended him for "tightening of the arteries in the head" and at this time his memory "became a complete blank in the course of conversation". His wife thought he had again been troubled with this same feeling.

State on Admission.

Mental/

Mental - He was morbidly depressed, confused and at times incoherent. Delusions of suspicion and persecution were expressed in that he stated that everyone was against him especially his wife and family. His memory was considerably impaired both for recent and past events and his powers of comprehension were definitely poor. Auditory and visual hallucinations were present and there was considerable restlessness and agitation.

Physical - His general condition was weak and arterio-sclerosis was present. Pupils were irregular and contracted but reacted to light and accommodated. The tendon reflexes were exaggerated. On examination the blood Wassermann was found to be triple positive and that of the cerebrospinal fluid strongly positive.

Treatment and Progress - One course of Tryparsamide was administered during which patient's depression became, to some extent, less marked and hallucinations were not much in evidence. At the end of the course the blood Wassermann was double positive the cerebrospinal fluid unchanged. A second course of treatment was contemplated but abandoned owing to the fact that he suspected the treatment was an attempt to poison him. After this his mental state improved somewhat. His depression and suspicions became less marked and he began to take some interest in his environment.

Present Condition - He suffers at times from mild depression, is irritable, suspicious and truculent if his whims are not at once gratified. His general health is satisfactory and he is able to do some little work in the Ward.

Case/

Case No.5. (W.K.)Type - Expansive.Age - 38.Married.Occupation - Marine
Fireman.History - No history was obtained in this case.State on Admission.Mental - His intellectual state was clouded and enfeebled.

Memory was very poor, his powers of comprehension were dulled and his reasoning powers were defective. Some incoherence and confusion were present. He expressed delusions of suspicion, persecution and grandeur and auditory hallucinations were elicited as a result of which he was impulsive and resistive. He said that the Medical Officer had stolen his cigarette case and demanded to know why Sir W.K. was kept a prisoner. He said that the Prince of Wales came into the Ward to see him and was a great friend of his.

Physical - General physical state was indifferent. No system showed any gross defects except that there was some degree of arteriosclerosis and the pupils were irregular, unequal and reacted but sluggishly to light. There were tremors of the extended fingers and fibrillary twitchings of the tongue. The blood Wassermann was negative or doubtful positive and the cerebrospinal fluid positive.

Treatment and Progress - One course of Tryparsamide was administered at the end of which no change was observable in either the blood or cerebrospinal fluid reactions. His mental state showed no improvement even of the slightest.

Present State - Patient is dementing rapidly and his physical condition is deteriorating.

Case No.6. (G.K.).Type - Expanside.

Age/

Age - 59.Married.Occupation - Labourer.

History - This man had been apparently well until a few days before admission when he was found wandering laughing, singing and talking to himself.

State on Admission -

Mental - Intellectually he was enfeebled and facile.

His memory was completely disorganised and he was incoherent and confused. In general he was mildly exalted, laughed happily and talked volubly and incoherently to himself and those around. He was completely disorientated for time and place.

Physical - His general physical state was weak.

Argyll-Robertson pupils were present, knee jerks were diminished, his gait was ataxic and there was marked Rombergism and loss of muscular co-ordination.

The following was the blood and cerebrospinal fluid reports.

Report on Blood.

Wassermann	-	+++
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Report on C.S.F.

Wassermann	-	+++
Colloidal Gold	-	555,554,421,00.
Pandy's Test	-	++
Total Protein	-	58 mgms. per 100 c.c.
Cell Count	-	72 per cmm.

Treatment and Progress. - A course of Tryparsamide was given at the end of which a further examination of the blood and cerebrospinal fluid was made.

Report on Blood.

Wassermann	-	+++
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Report on C.S.F.

Wassermann	-	+++
Gold Sol.	-	322,210,000,000.

Cells show a moderate number of lymphocytes.

A second course of Tryparsamide was given when it was found that the blood Wassermann was now double to triple positive. Considerable improvement - mental and physical ensued. He became quiet, well-behaved and rational in his conduct. With his mental improvement his physical state also improved. His gait became more steady and general improvement of muscular co-ordination supervened.

Present State - He shows a considerable degree of mental enfeeblement but works well at routine duties and a possibility of his being discharged has been considered.

Case No.7. (H.H.M.)

Type - Depressed.

Age - 38.

Married.

Occupation - Labourer.

State on Admission.

Mental - He was enfeebled, facile and showed much impairment of memory and powers of comprehension. Some degree of confusion was present and he was depressed with occasional emotional outbursts. Delusions of persecution were expressed. He stated that all his troubles had been brought about by one woman and that his child aged five months knew who she was. He had violent outbursts of weeping after which he smiled and laughed readily.

Physical - His general condition was weak. There was marked tremor of the lips, tongue and extended fingers. There was marked muscular incoordination present, with slurring speech and ataxic gait. Rombergism was present. There was paresis of right arm and leg. Babinski's sign was present on the right side.

The blood and cerebrospinal fluid reports were as follows.

Report/

Report on Blood

Wassermann	-	+++
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Report on C.S.F.

Wassermann	-	+++
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Colloidal Gold	-	555,555,482,10.
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Pandy's Test.	-	++
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Total Protein	-	58 mgm. per 100 c.c.
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Cell Count	-	53 per cmm.
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Treatment and Progress - A course of Tryparsamide was given but at its termination no improvement was noted. He was still dull and depressed, expressing many fantastic hypochondriacal delusions; he stated that his bowels were blocked, that his mouth was full of abscesses, that he was weak and paralysed. His state varied a great deal, depression being more marked at one time than another. A further course of treatment was commenced but his condition showed, physically, rapid deterioration therefore this was discontinued.

The blood Wassermann was now double to triple positive while the cerebrospinal fluid Wassermann was now double positive.

Present State - He suffers from dementia and is physically deteriorating rapidly.

Case No.8. (C.R.)

Type - Depressed.

Age - 30.

Single.

Occupation - Labourer.

State on Admission.

Mental - A marked degree of mental enfeeblement was present and his behaviour was foolish and uncertain.

Memory and powers of comprehension were much impaired and delusions of wrong-doing and unworthiness were present.

Vivid auditory hallucinations were present - voices told him to injure himself and other people. He was mildly depressed/

depressed, excitable and emotional. In spite of his depression, however, he laughed happily and foolishly when questioned about his condition.

Physical - The superficial and deep reflexes were exaggerated. Pupils were medium in size and equal. The power of accommodation was unimpaired but the light reflex was much diminished.

The following were the reports on examination of the blood and cerebrospinal fluid.

Blood Report.

Wassermann. - + to ++

C.S.F. Report.

Wassermann. - —

Treatment and Progress.- A course of Tryparsamide was given at the conclusion of which the Wassermann Reaction of the blood was negative and of the cerebrospinal fluid negative. There was no improvement in his mental state. He was much more resistive and difficult to manage, being very abusive and using much foul language. His depression and auditory hallucinations persisted. His physical condition was improved.

Present State - No mental improvement is apparent. Auditory hallucinations trouble him frequently, his behaviour is foolish and he requires constant supervision. His physical health continues to be satisfactory.

Case No.9. (R.W.)

Type - Expansive.

Age - 43,

Single.

Occupation - Ship Yard
Labourer.

History - The relatives of this patient reported that, at times in the past few years, he had been very "light-headed" and "queer". On one occasion he dropped down in what was said to be a fit and which was followed later by/

by two similar attacks. He was sent to Leith Hospital where he remained unconscious for thirty-six hours when he became very noisy and unmanageable and was admitted to the Mental Observation Ward of the Royal Infirmary, Edinburgh. There it was found necessary to administer at first, Bromides and Chloral Hydrate, later, Morphia and Hyoscine to control his struggling and excitement. Eventually it was found necessary to have him certified when he was duly admitted here.

State on Admission.

Mental - He was foolish and facile in behaviour and was irrelevant in response to questions. Acute excitement and a high degree of exaltation were present. He stated that he "felt fine" and had never been happier or better at any time in his whole life. After having talked lengthily on his happy state he would burst into peals of foolish laughter and would attempt to leap from his bed in order, he said, to give an exhibition of his dancing prowess. At other times he said his bed was a boat which was carrying him across the sea to a land where he would reign supreme as King. If efforts were made to restrain him he became violently excited and attempted to attack those around him. It was frequently necessary to administer hypodermic injections of Morphia and Hyoscine to control him during those attacks.

Physical - Cardio-vascular System:- Arteries were thickened and palpable.

Nervous System - Articulation was impaired and somewhat slurred. There were no tremors or paresis but pupils were variable in size, the right being larger than the left. Both were regular and reacted to light and accommodation. Knee jerks were equal but excursion was poor. The following blood and cerebrospinal fluid reports were received.

Blood/

Blood Report.

Wassermann - + + +

C.S.F. Report.

Wassermann - + + +

Colloidal Gold - 555,554,220,00.

Pandy's Test - + + +

Total Protein - 110 mgms. per 100 c.c.

Cell Count - 37 per c.mm.

Treatment and Progress. A course of Tryparsamide was given at the end of which the blood Wassermann was double positive, that of the cerebrospinal fluid triple positive. His mental condition was not improved. His elation continued to be well marked and he was vividly hallucinated for hearing - he was continually receiving wireless messages - and at times he was impulsive and dangerous to others. Later he became less acutely excited but continued to express his grandiose delusions.

Present State - There is no mental improvement but now he is quiet, pleasant and easily supervised. His delusions of grandeur are still expressed and he is much troubled by auditory hallucinations. His physical health shows no improvement.

The cases above described are at present in the Institution, and it will be seen that in some no improvement has taken place while in others, although unfit for discharge, some improvement has taken place in that they are now able to do some useful work and to attend to their needs with very little supervision. The following six cases have been treated in a similar fashion as the foregoing and as a result have been discharged from Hospital as recovered.

Case/

Case No.10. (T.McD.)Type - Depressed.Age - 50.Widower.Occupation - Garage Att.

History - This man had always been quiet and reserved, a conscientious worker and had been a very keen reader devouring all literature he could lay his hands on. He was addicted to alcohol but never to excess. About a year before admission patient had begun to behave rather peculiarly. On one occasion he made his way across the Forth Bridge to Dunfermline to visit friends and on his return to Edinburgh that evening he was very agitated and confused in conduct. His employer took charge of him so that he could not get into trouble. Since then he had not been the same. His manner became furtive and he performed actions on one occasion no "sane man would do". He went across a broken gangway and hung on to a roof gutter from which he reached a skylight window in the garage and so made his entrance into it. This incident was occasioned by his forgetting his keys. He had also been very ~~very~~ restless and nervous but did his work satisfactorily except that his memory which was inclined to be poor began to become worse. He had to write down everything he was told. About six weeks before admission he complained of pains at the back of the head which lasted about a couple of days. He had not been troubled with headaches at any time before. A fortnight before admission he left his home to go to his work and on his way he went to a Mr Wightman's home, rapped at the door and assaulted him with a tyre lever which he was carrying. He said he saw smoke coming through the window of Mr Wightman's house. He was arrested and sent to jail. Patient's friends stated that he was not aware of his actions at the time of the assault and could not call it to mind and could give no reason for it as he had no grudge against Mr Wightman.

State/

State on Admission.

Mental - His intelligence was average for his age and class. He was mildly depressed, but answered questions readily and correctly for events at a distance but was confused with regard to recent events. He stated that he felt "fed up" and had done so for some six or seven weeks, but could give no reason for his depression. No delusions nor hallucinations were in evidence. He stated that he felt tired and disinclined for any kind of effort.

Physical - General physical state was weak.

Nervous System - There was some flattening and muscular weakness of the right side of face. The tongue was tremulous and deviated to the right side on protrusion. The pupillary light reflexes were brisk and the tendon reflexes were increased on the right side. Romberg's sign was markedly present, the gait was unsteady and showed impairment of muscular coordination.

Circulatory System - The pulse was regular and of fair volume. The arteries were thickened. The cardiac sounds were closed but soft and muffled in quality. The following were the blood and cerebrospinal fluid reports.

Blood Report.

Wassermann	-	+
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C.S.F. Report.

Wassermann	-	+
Colloidal Gold	-	122,110,000,00.
Pandy's Test	-	+
Total Protein	-	30 mgm. per 100 c.c.
Cell Count	-	7 per c.mm.

Treatment and Progress - One course of Tryparsamide was given at the end of which there was a definite improvement in his mental and physical condition. He was/

was much more cheerful and began to take an interest in what was going on around him. At the same time he spent a lot of his time in reading. His general physical condition was much improved. A second course of treatment was embarked upon at the termination of which he had an attack of jaundice which passed off in about one month's time. Otherwise his improvement was maintained. He was free from depression and confusion and his memory was improved considerably. The facial paresis was not now so evident and the knee jerks were now within normal limits. His gait was more steady and Rombergism was very much less marked.

The condition of the blood and cerebrospinal fluid was now as follows:-

Blood Report.

Wassermann - _____

C.S.F. Report.

Wassermann - _____

Colloidal Gold - 122,211,000,00.

Pandy's Test - +

Total Protein - 26 mgm. per 100 c.c.

Cell Count - 1 per cmm.

State on Discharge. Mental condition was now completely recovered from except that some defect of memory was present. Depression, confusion and agitation were now absent and his physical health was now much improved. He was discharged recovered.

Case No. 11 (J.F.)

Type - Depressed.

Age - 48.

Single.

Occupation - Joiner.

History - For several months patient had been strange in his behaviour. He was subject to fits of weeping and said that everyone was against him, then began to stay indoors because, he said, he was ashamed to go out/

out. He became depressed and suspicious and believed that all his friends were against him in consequence of which he commenced writing them threatening letters.

State on Admission,

Mental - He was mildly depressed and expressed delusions of suspicion and persecution. He admitted having written two threatening letters to his brother, whom, he declared, had defrauded him out of a sum of money amounting to £33. He said that he had contracted syphilis in America and had had treatment for a chancre. At the time of being certified, he stated, he had £164 in his possession which had been taken from him by the relieving officer. His condition, unless when engaged in conversation, was one of dejection and apathy.

Physical - His general bodily condition was indifferent.

Nervous System - The pupils were contracted and Argyll Robertson reaction was present. The superficial reflexes were absent and the tendon reflexes were exaggerated.

There was muscular tremor present in the lips, hands and tongue.

The following were the reports on the blood and cerebro-spinal fluid.

Blood Report.

Wassermann - +

C.S.F. Report.

Wassermann - +

Treatment and Progress - Patient received a course of Tryparsamide at the conclusion of which the Wassermann reaction of the blood was negative and that of the cerebro-spinal fluid still positive. During the course some improvement of physical signs was observed and the facial and labial tremor became less apparent than formerly. Mental improvement was slow at first. He was apathetic and took little interest in his surroundings but later became/

became interested in reading and manifested a desire to work. Employment was obtained for him in the nature of hand-loom weaving in which he became extremely interested. From this time he became contented, happy and delusions and depression were no longer in evidence.

State on Discharge - His mental outlook had entirely changed from one of reserve and suspicion to one of happiness and delight at again being able to do some useful work. This condition persisted and he was eventually discharged recovered.

Case No.12. (K.McK.)

Type - Expansive.

Age - 36.

Single.

Occupation - Hotel Porter.

State on Admission.

Mental - He was rather enfeebled and irrelevant in his answers to questions. His memory was fair but his powers of comprehension were much impaired and he expressed well-marked delusions of grandeur. He said that he was someone special, that he was glorified by God and in fact was God. He was the man responsible for the winning of the Great War and was in possession of a secret which had been his since the age of 13. This secret he had now to reveal and had already communicated it to Lloyd George by electricity. He was very exalted, excited and noisy at nights.

Physical. His general physical condition was average.

Nervous System - Knee jerks were exaggerated.

The following were the blood and cerebrospinal fluid reports:

Blood Report -

Wassermann	-	++
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C.S.F. Report -

Wassermann	-	—
Colloidal Gold	-	221,100,000,00.
Pandy's Test	-	+
Cell Count	-	27 per cmm.

Treatment/

Treatment and Progress - He received a course of Tryparsamide at the conclusion of which the blood and cerebrospinal fluid reports were as follows:-

Blood Report.

Wassermann - _____

C.S.F. Report.

Wassermann - _____

Colloidal Gold - 221,111,000,00.

Pandy's Test - ++

Total Protein - 32 mgm. per 100 c.c.

Cell Count - 10 per cmm.

At first there was no improvement in his condition. He continued to be excited, exalted and noisy, often struggling and fighting with the nurses so that it was necessary to administer Morphim. and Hyoscin. hypodermically. Hallucinations of sight and hearing were present and at times he exposed himself saying he had to do it for secret reasons.

However in about two month's time he began to show some improvement. The excitement gradually subsided and he began to converse quietly and rationally. His delusions were no longer expressed and hallucinations could no longer be elicited. He was put to work out-doors and a rapid mental and physical improvement resulted. Until he left several months afterwards no return of mental disturbance occurred.

State on Discharge - He had no evidence of mental symptoms and his physical health was very much improved by his outdoor work.

Case No.13.(J.M.)

Type - Expansive.

Age - 26.

Widower.

Occupation - Labourer.

State on Admission.

Mental - He was exalted and euphoric, expressing delusions of/

of grandeur and power and was hallucinated for hearing. He stated that he was one of the Chief Officers in the C.I.D. and that he had many detectives working under his orders. He heard voices telling him to go out and trap all motorists but he was going to give them all a fair sporting chance to get away. At times he was rather aggressive and difficult to control.

Physical - There was no feature of special note in the various systems.

The following were the blood and cerebrospinal fluid reports.

Blood Report.

Wassermann - + + +

C.S.F. Report.

Wassermann - —

Treatment and Progress. Patient received a course of Tryparsamide medication at the termination of which the blood and cerebrospinal fluid states were as follows.

Blood Report.

Wassermann - + + +

C.S.F. Report.

Wassermann - —

Another course was contemplated but patient developed a fairly severe generalised jaundice with marked itching of skin, staining of sclerotics and bradycardia. He was kept in bed on light diet and given Sod.Bicarb. and Calomel. The condition cleared up completely in about ten days from the onset.

Mental improvement soon began to manifest itself. At first there continued to be a great deal of mental and motor excitement with much restlessness. He continued to be exalted with exaggerated ideas of his own importance and well-being. Those symptoms, however, soon began to disappear and he became quiet, rational in his conversation and well-behaved. His delusions of grandeur and power were/

were absent and hallucinations no longer disturbed him.
State on Discharge - All symptoms and signs of mental disease were gone and his physical health was improved.

Case No.14.(A.P.).

Type - Depressed.

Age - 21.

Single.

Occupation - Miner.

History. - His father stated that he had always been a dull, listless boy, sluggish in his habits but had always been a good worker. Educational attainments, according to his school reports had been poor. He left school at the age of ten years. After leaving school he worked as a grocer's boy up to the age of sixteen when he went into the coal pits and was engaged in driving a small motor engine and afterwards in driving a water pump. On one occasion, after working the pump for fifteen months, he was found asleep in the dark and when he was wakened he chased the men with stones and sticks. On returning home he refused to speak to anyone for over a week but came to himself gradually and appeared to be quite his "normal" again. He left his work and lived with an aunt in Fife for six months during which period he worked as a miner's labourer. He returned home and was in Craiglockhart Poorhouse, Edinburgh, for a few months as a "destitute case". When he left Craiglockhart his father got him into the "Blind Asylum" where he was engaged learning the trade of mattress making. He had always enjoyed good health but had suffered from defective vision from early life. About two weeks before admission he had some teeth extracted and, next day, at 4a.m. he got up and upset his people by wandering about the house in a partially conscious state. The next evening he became excited and began to weep without ceasing. He was put to bed and kept there for a week during which he remained in an excited, emotional state, did not take his meals/

meals and had to be fed but slept well at nights. He recognised those about him but talked a lot of nonsense at times.

Family History - The father was alive and well but his mother died at the age of 43 in the Royal Infirmary, Edinburgh. Her cause of death was unknown to the father. The patient was the second eldest living of a family of six, four males and two females. The mother had had several miscarriages and still births before the eldest was born. The latter died at the age of 23 in the Royal Edinburgh Asylum. His brothers and sisters alive were said to be in good health and there was no history of insanity or allied affection amongst them. The father stated that he had always been healthy but the mother had always been in poor health and had suffered from severe ulceration of the legs which had never healed properly. Her sister had a son, aged 19, who suffered from "blindness" which began in early life. The third son in the family suffered from some affection of one eye and one ear and, as a child, had been subject to boils. The father said that he had been informed by the School Doctor that this son suffered from "venereal trouble". He himself denied ever having had venereal disease.

State on Admission.

Mental - Intellectually he was markedly enfeebled and showed defective development. Memory was impaired, incoherence was present and his powers of comprehension were very poor. A considerable degree of confusion was present. No delusions were present but he suffered from auditory and visual hallucinations. He was completely disorientated for time and place. He was restless and resistive, was quite unable to answer the simplest question and at times required to be fed.

Physical/

Physical - General bodily health and condition were weak. He was a very thin, poorly nourished youth and possessed stigmata of congenital syphilis - the face was asymmetrical, the nose was saddle-shaped, speech was slurring and hearing was defective.

Nervous System - The pupils were irregular and unequal. They were insensitive to light but the power of accommodation was present. Optic atrophy was present in both discs. The abdominal reflexes were present, the plantar reflex was flexor and the knee jerks were active. The following were the blood and cerebrospinal fluid reports.

Blood Report.

Wassermann - +++

C.S.F. Report.

Wassermann - +++.

Colloidal Gold - 455,553,321,00.

Pandy's Test - ++

Total Protein - 64 mgm. per 100 c.c.

Cell Count - 18 per 100 c.c.

Treatment and Progress - A course of Tryparsamide injections were given and after a period of rest of four weeks a second course of treatment was given. The blood and cerebrospinal fluid were again examined and the Wassermann Reaction of the blood was now found to be double positive, that of the cerebrospinal fluid double to triple positive. For three months after admission there was no change in this patient mentally, in fact, for some time, he was actually worse. He showed much motor and mental restlessness and excitement. He talked and sang incessantly and incoherently. His habits were untidy and dirty, he was destructive to bedding and furniture and at times was impulsive in his behaviour to the danger of others.

This condition persisted for several months when there/

there ensued a rapid and almost dramatic improvement in his condition. The excitement subsided, he became rational in his conversation and behaviour and tidy in his habits. He talked readily and pleasantly and became interested in his surroundings. Physically corresponding improvement was noted; he had gained weight and was very much stronger. Eventually he was sent to work in the upholsterer's shop where he was occupied for about two months before his discharge.

State on Discharge - Beyond some enfeeblement of mind and some impairment of memory his mental state was free from symptoms. Physically he was strong and healthy. He himself was very anxious to be allowed out in order to get back to work.

Case No.15 (W.P.)

Type - Expansive.

Age - 40.

Single.

Occupation - Labourer.

History - This patient's brother stated that his behaviour was first known to be abnormal about seven years before admission. At that time he arrived in Edinburgh from Glasgow, looked ill, and stated that he had escaped from a Mental Hospital. He had also been undergoing treatment for Venereal Disease in the Western Infirmary, Glasgow, and in the Royal Infirmary, Edinburgh. About a fortnight previous to admission his relatives noted that his behaviour was becoming strange. He walked about the streets and was quite unable to settle down to work. On the day before admission he went out and gave away money to the amount of £20 to anyone he met in the street after which he returned home and became acutely excited and noisy.

Family History - He was the youngest son of a family of ten, most of whom were dead and others of whom were described as being "eccentric". His paternal uncle died in the Royal/

Royal Edinburgh Asylum.State on Admission.

Mental - On admission he was acutely excited, exalted and expressed grandiose delusions. He talked and sang incessantly and displayed great distractibility. His memory was poor and his powers of comprehension were dulled. He stated that he was able to go anywhere or to do anything; he owned a fortune and was able to get as much money as he wanted at any time; many girls were in love with him and desired to marry him. At times he was aggressive and irritable, threatening the other patients near him and attempting to get out of bed. He struggled with the nurses when restrained and had to be given sedative - Pot.Brom. and Chloral.

Physical - General physical condition was weak.

Nervous System - Muscular tremors of the lips, tongue and extended fingers were present. There was muscular incoordination of the extremities, the gait was ataxic and Romberg's sign was present. Pupils were unequal in size and irregular. The response to light stimulation was absent but accommodation was present. The abdominal reflexes were brisk, the plantar was flexor, the knee jerks were active - the excursion of the right being greater than that of the left.

The blood and cerebrospinal fluid reports were as follows:-

Blood Report.

Wassermann -

C.S.F. Report.

Wassermann -

Colloidal Gold -

Pandy's Test -

Total Protein -

Cell Count -

111,000,000,000.

31 mgms. per 100 c.c.

13 per cmm.

Treatment/

Treatment and Progress - A course of Tryparsamide injections was given at the termination of which the reactions of the blood and cerebrospinal fluid were unaltered. A period of rest of one month was allowed when a further course of treatment was instituted.

In about three months from admission improvement became noticeable. He was free from excitement and became quiet and well-behaved. He became happy and contented, talked cheerfully and rationally and expressed a desire to have his zither harp and concertina which he played well and to the appreciation of many of the other patients. Physically he became stronger and began to gain weight. This improvement continued till his discharge some months later.

State on Discharge - He was quiet, well-behaved and rational in his behaviour and conversation and was a useful and willing worker in the Ward. His general health was also much improved.

The following eight cases to be described died, either during treatment or after the course had been completed. It must be noted, however, that some of those were in a very advanced stage of their disease before an opportunity for treatment had been possible and that others died of some intercurrent disease. Such being the case, it follows that the death rate in those treated with tryparsamide is somewhat higher than it would otherwise have been had those conditions not obtained.

Case No.16 (G.A.)

Type - Expansive.

Age - 45.

Married.

Occupation - Miller.

State on Admission.

Mental - Intellectually he was enfeebled and rather facile/

facile. His memory was much impaired and his powers of comprehension were very poor. He was excited and exalted, expressing delusions of grandeur and power. Partial disorientation for time and place was present. He talked incessantly, stating that he was a great runner and boxer, and was continually getting out of bed and dancing about the floor. At times he became violent and impulsive so that sedative administration was necessary.

Physical - General physical condition was weak.

Respiratory System - There was impaired percussion and resonance over the apices of both lungs, with distinctly tubular respiratory murmur.

Nervous System - Some tremor of the lips and extended fingers was present and there was fibrillary twitching of the tongue. Speech was slurring, the gait was wide based and ataxic and Romberg's sign was present. There was some general blunting of sensation which was most marked in the lower extremities. The knee jerks were diminished. The pupils were unequal, the left being the larger and the Argyll-Robertson reaction was present.

The blood and cerebrospinal fluid reports were as follows.

Blood Report

Wassermann	- ++
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C.S.F. Report.

Wassermann	- +++
Colloidal Gold	- 555,555,543,11.
Pandy's Test	- +++
Cell Count	- 32 per cmm.

Treatment and Progress - A course of Tryparsamide was administered without alteration of the reactions of the blood or cerebrospinal fluid. No improvement resulted in patient's condition. He continued to be excited and/

and irritable, at times impulsive in his behaviour. Physically there was no improvement in his condition and his weight continued to become less. This condition persisted until he developed bronchopneumonia which resulted in his death.

Causes of Death - (a) General Paralysis. (b) Bronchopneumonia. In this case the prime factor in causing death was undoubtedly the bronchopneumonia which was of a severe nature.

Case No.17 (D.C.)

Type - Expansive.

Age - 45.

Married.

Occupation - Marine Fireman.

State on Admission.

Mental - Memory was much impaired, there was no incoherence and powers of comprehension were fairly good. A moderate degree of confusion was present and he expressed delusions of grandeur and power. Apprehension of his surroundings was poor. He thought he was in the Royal Infirmary, Edinburgh, but had no idea why he should be in a hospital. He was very exalted and happy, laughing continuously and saying he was in the best of health and in the possession of heaps of money to spend. In consequence of his wealth, he said that, when he returned home, he would present every Nurse with diamond necklaces, pearls, watches and rings. Occasionally he became very troublesome and noisy, disturbed the other patients and had to be given hypodermics of morphin. and hyoscin.

Physical - General physical condition was fair.

Nervous System - Pupils were irregular and reacted very slightly and sluggishly to light. The speech was very slightly slurring. The gait was slightly ataxic.

Respiratory System - Chest was emphysematous and patient suffered from a cough but there were no adventitious sounds/

sounds in the chest.

The following were the blood and cerebrospinal fluid reports.

Blood Report.

Wassermann - +

C.S.F. Report.

Wassermann - +

Treatment and Progress - Patient was given a course of Tryparsamide with no change in either the blood or cerebrospinal fluid. His mental condition did not improve but, on the contrary, continued to become much worse. He became more noisy and was very untidy in his habits. A state of dementia supervened and he lay helpless in bed with incontinence of urine and faeces. This progressive deterioration, mental and physical, continued up to his death about a year later.

Causes of Death - (a) General Paralysis. (b) Chronic Interstitial Myocarditis.

Case No. 18. (W.P.D.)

Type - Demented.

Age - 60.

Married.

Occupation - Labourer.

State on Admission.

Mental - He displayed profound enfeeblement of mind, was dull, listless and apathetic. He was restless in bed, tossed the clothing about and was quite unable to do anything for himself. At times he talked incoherently to himself. No delusions were expressed and no hallucinations were elicited.

Physical - General physical condition was weak.

Nervous System - Some muscular tremors of the upper extremities were present. Speech was slurring. Pupils were unequal and irregular. The Argyll-Robertson reaction/

reaction was present. Organic reflexes were absent.

Circulatory System - He suffered from arteriosclerosis and the heart was enlarged. The blood and cerebrospinal fluid reports were as follows.

Blood Report.

Wassermann - —

C.S.F. Report.

Wassermann - +

Treatment and Progress - A course of Tryparsamide was administered at the conclusion of which there was no change in the reactions of the cerebrospinal fluid and blood. No mental improvement resulted but his dementia increased to a profound degree. His physical health deteriorated steadily until his death which occurred a year later.

Causes of Death - (a) General Paralysis. (b) Myocardial Degeneration. (c) Hypostatic Pneumonia.

Case No.19. (J.F.)

Type - Depressed.

Age - 37.

Married.

Occupation - Motor Mechanic.

History - His wife stated that he had always been of a bright and cheerful disposition and had been temperate in the use of alcohol and tobacco. About six months before admission he had been feeling unwell. He felt weak and tired but tried to work it off. Then he had an attack of influenza and was off work for a fortnight. He returned to work and worked for three weeks but gradually became more and more depressed. At last he had a quarrel with the foreman and lost his job. This seemed to make him worse, he lost his appetite and began to sleep badly. At the same time he began to worry a great deal about his home. He was admitted to the Royal Infirmary, Edinburgh, /

Edinburgh, but was discharged from there unimproved.

State on Admission.

Mental. - His general state was one of depression and irritability and he was the subject of delusions of persecution and unworthiness and suffered from hallucinations of hearing. At times he was very emotional. He stated that he heard voices accusing him and blaming him for not working for his family, that he had been given injections in the Royal Infirmary, Edinburgh, and that these had taken all the power out of his muscles and had been given him to keep him from becoming well again. He stated that he had contracted syphilis in 1914 and since that time had never been like other men but had always been depressed and irritable. In general he was quiet, amenable to examination and well behaved.

Physical - General physical condition was indifferent.

Nervous System - The pupils were contracted and failed to respond to light. The knee jerks were very sluggish. The following were the blood and cerebrospinal fluid reports.

Blood Report.

Wassermann - - -

C.S.F. Report.

Wassermann - + +

Treatment and Progress - A course of Tryparsamide was given at the conclusion of which there was no change to note in the blood or cerebrospinal fluid. While undergoing treatment no improvement occurred in his mental condition. He continued to be acutely depressed and expressed many delusions. He stated that he was going to be killed and that he did not care, as he had no further use for life. The Doctors, he said, could not cure him therefore there was no use in torturing him further.

After a period of rest of one month a second course of/

of injections was instituted but had to be suspended owing to the sudden change which took place in the patient. One day he suddenly became excited, restless and noisy and was vividly hallucinated for sight and hearing. He got out of bed and assaulted another patient by striking him violently on the face. This state of excitement continued but after the Tryparsamide treatment was withdrawn he gradually became quiet and depressed again. His condition gradually became worse - a condition of stupor supervened and for months he lay in bed in this state. He was dirty and untidy in his habits and required very careful nursing. His physical state deteriorated steadily, then he began to have very severe cerebral seizures. Those persisted till eventually death in a comatose condition resulted.

Causes of Death - (a) General Paralysis. (b) Fatty Degeneration of Heart.

Case No.20. (W.M.G.)

Type - Demented.

Age - 63.

Married.

Occupation - Dock Labourer.

History - Daughter said that her father had apparently been quite "normal" until a few weeks before admission, when he became dull and depressed. He took no interest in himself and became untidy and dirty in his personal habits. He muttered incoherently and wandered about in a semi-dressed condition demanding food. He complained of the other people in the house making a dreadful noise and desired to have them all removed from it to an institution.

State on Admission.

Mental - There was a considerable degree of enfeeblement present in this patient. His memory was impaired, he was incoherent at times and his powers of comprehension were slow and defective. Reasoning power was absent and there was some confusion present. He expressed no delusions and no hallucinations could be elicited but he was very dull, apathetic/

apathetic and indifferent. Patient could not be made to cooperate in his examination and showed much retardation in commencing any voluntary action. He was very suspicious and refused all medicines but took his meals fairly well.

Physical - General physical state was fair.

Cardio-vascular System - He suffered from arteriosclerosis and a moderate degree of cardiac hypertrophy. The veins of the legs were varicose.

Nervous System - The speech was indistinct; a coarse tremor of the tongue and hands was present; the pupils were unequal and irregular, the abdominal skin reflexes were absent and the knee jerks were exaggerated.

The blood and cerebrospinal fluid reports were as follows:-

Blood Report.

Wassermann - + + +

C.S.F. Report.

Wassermann - +

Treatment and Progress - Patient was given a course of Tryparsamide injections but towards the end of the course became very excitable, resistive and hallucinated for sight and hearing. A progressive deterioration - mental and physical - followed. He became more restless, dirty and, at times, noisy and violent. He refused all food and had to be tube-fed. His strength gradually became much weaker and in a few weeks time he became comatose and eventually died.

Causes of Death - (a) General Paralysis. (b) Cardiac Dilatation.

Case No. 21. (J.M.P.G.)

Type - Demented.

Age - 45.

Married.

Occupation - Coal Porter.

State on Admission -

Mental - Considerable mental enfeeblement was present, memory/

memory was fair, there was no incoherence but powers of comprehension were poor. He expressed no delusions but appeared to be hallucinated for sight. Mild depression was present but at times he said he was very happy and laughed foolishly to himself.

Physical - General physical state was poor.

Nervous System - Pupils were irregular and unequal in size. The power of accommodation was present but the light reflex was lost. The abdominal reflexes were present, the plantar was flexor and the knee jerks were absent.

Blood Report.

Wassermann - +

C.S.F. Report.

Wassermann - +

Gold Test. - 344,221,000,000.

Pandy's Test. - +

Treatment and Progress. A course of Tryparsamide injections was given and shortly after the course had been completed patient developed a severe generalised dermatitis. This cleared up with treatment and the suspension of further injections but his state became one of dementia which steadily progressed until his death a few months later. At no time during his treatment did he ever display one sign of improvement.

Causes of Death. - (a) General Paralysis.

Case No. 22. (A.H.I.)

Type - Depressed.

Age - 60.

Married.

Occupation - Cabinet Maker.

State on Admission.

Mental - He was mentally enfeebled and facile, was confused and expressed delusions of unworthiness and sin. Hallucinations of hearing and of organic sensation were present/

present. Morbid depression was present but his moods changed rapidly, at one time he wept bitterly, at another he laughed foolishly. He stated that he heard voices accusing him of having committed unnatural sexual crimes and that he felt poisonous gases being blown into his body by his accusers.

Physical - General physical state was weak.

Nervous System - The lips, tongue and hands were tremulous; speech was slurring; the pupils were unequal, irregular and reacted sluggishly to light. The tendon reflexes were exaggerated, the gait was reeling and ataxic and Romberg's sign was present.

Blood Report.

Wassermann	-	+++
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C.S.F. Report.

Wassermann	-	+++
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Colloidal Gold	-	455,544,211,10.
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Pandy's Test	-	++
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Total Protein	-	58 mgm. per 100 c.c.
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Cell Count	-	63 per cmm.
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Treatment and Progress - A course of Tryparsamide was administered but no improvement resulted. He deteriorated rapidly mentally and physically; his delusions of suspicion and various organic hallucinations were still present but were less vivid and real than formerly. Physically he lost strength and weight rapidly and began to have frequent congestive seizures. Those continued, his strength became gradually exhausted and for a few days before death he was in a state of coma.

Causes of Death - (a) General Paralysis.

Case No.23. (J.McP.)

Type - Demented.

Age - 39.

Married.

Occupation - Labourer.

State on Admission -

Mental/-

Mental - Patient showed much mental enfeeblement, incoherence and confusion. There was blunting of consciousness and he was completely disorientated for time and place. His expression was dull and stupid and he smiled foolishly when any question was put to him. At times he talked incoherently but not in reply to questions. He was dull, apathetic, displayed no interest in his surroundings and could not cooperate in his examination. He expressed no delusions and no hallucinations were elicited.

Physical - General physical state was weak.

Nervous System - There was well marked slurring of speech and his gait was ataxic. Pupils were small and equal in size. Accommodation was present but the light reflex was absent. The abdominal reflexes were present, the plantar was flexor and the knee jerks were present.

Blood Report.

Wassermann - + + +

C.S.F. Report.

No conclusive results were obtained owing to contamination of the fluid and it was impossible to obtain a specimen again owing to his rapid physical deterioration.

Treatment and Progress - A course of Tryparsamide was given but no benefit accrued. Mental enfeeblement became more marked, he became more confused and agitated and his physical health became progressively more weak. He was very restless, untidy and dirty in his habits. At times he was very noisy and required the administration of paraldehyde. For some months this state persisted; then he began to have seizures which gradually sapped his strength and hastened his death a few weeks later.

Causes of Death - (a) General Paralysis.

Tryparsamide Therapy - Conclusions.

(a)/

- (a) Recovery may be looked for in a certain proportion of cases. As has already been demonstrated twenty-six per cent of the cases treated recovered and were discharged from the Institution.
- (b) Improvement occurs in a smaller number of cases. Of those treated thirteen per cent were relieved in that the disease has been to some extent arrested.
- (c) No Improvement may be expected in certain cases. As will be observed, in this particular series of cases twenty-six per cent of those treated showed no improvement and the disease continued to pursue its ordinary course.
- (d) Death in a few cases may be hastened by the administration of tryparsamide. In two of the cases treated acute excitement was produced and in one a generalised dermatitis resulted. Those cases died but, of the remaining five deaths, none were apparently hastened by the drug and one of them was due to a superadded bronchopneumonia.
- (e) Age - It would appear that the younger patient may be more likely to be improved by tryparsamide. As has been shown the average age of those who recovered was 36, of those who were relieved and not improved 43 and of those who died 49. The prospects of recovery become progressively less as the age of the patient advances.
- (f) Type - The expansive type, as may be seen from Table No.1, tends to preponderate in the recoveries and improvements, while the depressed and demented types tend to preponderate amongst those not improved and amongst the deaths. It would appear that the Expansive Type is more amenable to treatment than the other/

other types.

(g) Blood and Cerebrospinal Fluid - The Wassermann

Reactions of the blood and cerebrospinal fluid are not influenced by tryparsamide in many cases. (See Table No.1.) In six cases the blood Wassermann was changed from positive to negative and in one case the cerebrospinal fluid Wassermann became negative.

(h) Complications may result from treatment.

(1) Jaundice developed in three cases but was amenable to treatment.

(2) Symptoms may be intensified. In two cases acute excitement developed after treatment.

(3) Dermatitis may be produced. One case treated developed a generalised exfoliative dermatitis which recovered under treatment.

Finally, from the results obtained it would appear that tryparsamide had a definite value in the treatment of General Paralysis and may be expected to produce about twenty-six per cent recoveries, or, at least, remissions.

(b) CASES TREATED WITH TRYPARSAMIDE AND BISMUTH.

Table No.2 shows at a glance the general results of the use of Tryparsamide combined with Bismuth Metal. It will be seen that nine cases were treated and that of those, four were discharged as recovered, one was improved but not sufficiently so as to warrant his discharge, two showed no improvement and two died.

Patients treated by this method show:-

Recovered	-	44%
Relieved	-	11%
Not Improved	-	22%
Died	-	22%

The average age of those who recovered was 34, of those who were relieved and not improved 44, and of those who died 50.

From this table it will also be seen that there was little or no change in the Wassermann Reaction of the blood or cerebrospinal fluid except in one or two of the cases. A short description of each case will further serve to show the condition of those patients on admission and their progress under treatment.

TABLE/

TABLE NO. 2.

CASES TREATED WITH TRYPARSAMIDE + BISMUTH.

CASE.	AGE.	TYPE.	WASSERMANN.		RESULT.
			Before Treatment.	After Treatment.	
<u>Patients still in Institution.</u>					
24.H.M.C.	55.	Depressed.	Blood.	+ - ++	Not Improved.
			C.S.F.	+	
			Blood.	+++	
25.T.McL.	44.	Depressed.	C.S.F.	+	Not Improved.
			Blood.	+ / -	
			C.S.F.	-	
26.E.H.P.	32.	Depressed.	C.S.F.	-	Relieved.
<u>Patients Discharged.</u>					
27.J.B.	30.	Depressed.	Blood.	+++	Recovered.
			C.S.F.	+++	
			Blood.	+ - ++	
28.W.J.McD23.		Expansive	C.S.F.	+	Recovered.
			Blood.	+++	
			C.S.F.	++	
29.G.G.	42.	Expansive	Blood.	+++	Recovered.
			C.S.F.	++	
			Blood.	+++	
30.F.M.	40.	Expansive	C.S.F.	+++	Recovered.
<u>Deaths.</u>					
31.W.A.B.	35.	Demented	Blood.	+++	Died.
			C.S.F.	+++	
			Blood.	+++	
32.J.R.	65.	Depressed.	C.S.F.	-	Died.

Case No.24 (H.M.C.)

Type - Depressed.

Age - 55.

Single.

Occupation - Shoe-maker.

State on Admission.

Mental - Considerable enfeeblement was present and there was slight confusion present on admission. He suffered from delusions of suspicion and persecution and auditory hallucinations were present. He was quiet, dull and morbidly depressed on account of what he considered was persecution on the part of his neighbours. They followed him about, he said, and tried to do him harm. He was rather suspicious of everyone around him.

Physical - General physical condition was fair.

Nervous System - Fine tremors of the extended fingers were present and the tongue displayed fibrillary twitchings. The pupils were unequal in size and reacted sluggishly/

sluggishly to light. Accommodation was unimpaired.

Blood Report.

Wassermann - + to ++

C.S.F. Report.

Wassermann - +

Treatment and Progress - An intravenous course of Tryparsamide was given and was followed by a course of Metallic Bismuth. The blood and cerebrospinal fluid Wassermann Reactions were unchanged. His mental state showed no appreciable change. He continued to be suspicious and to his auditory hallucinations were added visual hallucinations, the latter taking the form of writing on the clouds and sky which conveyed messages and orders to him. At times he was truculent and dangerous as, on several occasions, he made attacks upon other patients and members of the staff. His physical health improved somewhat.

Present State - He is not improved mentally but his physical health is very good. As an outdoor worker he is very useful and is employed with a working party but requires to be continuously under supervision.

Case No. 25. (T. McL.)

Type - Depressed.

Age - 44.

Single.

Occupation - Miner.

State on Admission.

Mental - Considerable mental enfeeblement was present and he was somewhat confused and incoherent. Memory was very much impaired, both for recent and past events and his powers of comprehension were very poor. He was deeply depressed and took no interest in himself or his surroundings. He expressed no delusions and no hallucinations were elicited.

Physical/

Physical - General physical state was weak.

Nervous System - Gait was slightly ataxic and Romberg's sign was present. Pain and touch sensation were absent in areas on the right arm, right leg and foot. Pupils were slightly unequal and irregular. The pupillary light reflex was present and accommodation was unimpaired.

Blood Report.

Wassermann - +++

C.S.F. Report.

Wassermann - +

Treatment and Progress - A course of Tryparsamide was administered and a course of Metallic Bismuth given immediately thereafter. At the termination of the course no change was present in the Wassermann Reactions of the blood or cerebrospinal fluid and no mental change was evident. About this time he complained of pain in the throat and, on examination, it was observed that there was marked oedema of the uvula and anterior pillar of the fauces. The tonsils appeared healthy but were embedded in markedly oedematous tissue. Repeated probing revealed no pus but the underlying swelling was extremely hard. The Ear, Throat and Nose Specialist who examined him was of the opinion that it was syphilitic in nature and recommended the pushing of the anti-syphilitic treatment.

The condition gradually subsided and his physical state in general improved. His mental state now showed some little improvement in that he became less depressed but became talkative and cheerful with a tendency to express grandiose delusions. A second course of Tryparsamide was given and a subsequent series of Metallic Bismuth injections afterwards. Examination of the blood and cerebrospinal fluid showed no change at the termination/

termination of the treatment. His mental state showed no further improvement but he became rather irritable and truculent at times with delusions of suspicion much in evidence. On several occasions he made attacks upon members of the staff who, he said, were seriously endangering his life.

Present State - There is no change mentally. He continues to be irritable and noisy at times but it has been found that when occupied in outdoor work, he tends to remain quiet and well-behaved. His physical health is very good.

Case No. 26 (E.H.P.)

Type - Depressed.

Age - 32.

Married.

Occupation - Dock Labourer^r

History - Wife stated that, about a year before admission, he became depressed and left his work for no reason. He worked occasionally after this as a day labourer and during this time he had occasional bad attacks of depression, when he would be off work one day and back again the next. The week before admission he was very depressed and far away in thought, took a long time to answer questions, was moody and took no interest in anything. He imagined his fellow workers were up against him, that people were speaking about him. Then he became sleepless, lying awake and answering voices all night. One night he went to bed with a poker, imagining that there were electric batteries at the foot of his bed. During the War, he was in the Royal Field Artillery and since then he had never appeared to be quite normal.

State on Admission.

Mental - His intellectual state was apparently average in accordance with his class and work. Memory was good, there/

there was no incoherence and his powers of comprehension were fairly good. Confusion was absent and his reasoning power was fair. Delusions of wrong doing and persecution were expressed and he was hallucinated for sight and hearing. He was acutely depressed, emotional and excitable and at times was very restless, tossing himself about in bed. Several times he got out of bed and rushed to the windows and had to be given Paraldehyde which enabled him to go to sleep. Sometimes he complained of receiving electric shocks, hearing voices and seeing visions. He stated that he had had a talk with God on Derby Day and that since then people had been up against him.

Physical - General physical condition was fair.

Nervous System - The pupils were unequal, the right being the larger and the pupillary light reflex was diminished. The tendon jerks were brisk, amplitude being greater on the right side. The gait was somewhat ataxic.

Blood Report.

Wassermann - + / -

C.S.F. Report.

Wassermann - -

Colloidal Gold - 012,232,100,00.

Pandy's Test - -

Treatment and Progress - A course of Tryparsamide followed by one of Bismuth Metal was given when the blood and cerebrospinal fluid were again examined.

Blood Report.

Wassermann - -

C.S.F. Report.

Wassermann - -

Colloidal Gold - 111,222,100,00.

Pandy's Test - + +

Total/

Total Protein - 52 mgm. per 100 c.c.

Cell Count - 24 per cmm.

Under treatment patient became quiet and terrifying hallucinations were less in evidence. He continued to express his delusions as before but did not seem to be depressed on account of them. Considerable enfeeblement of mind became marked but he was able to be allowed out to work and seemed to enjoy the employment of wheeling a barrow. His physical health was definitely improved. Present State - Mental enfeeblement is now pronounced but he is a willing and useful worker who requires little or no supervision.

The following four cases were treated in a similar fashion and were so improved as to be able to be discharged to follow their former work and resume their normal life.

Case No.27. (J.B.)

Type - Depressed.

Age - 30.

Married.

Occupation - Labourer.

State on Admission.

Mental - All mental processes were definitely retarded, memory was impaired and powers of comprehension were weak. Vague delusions of suspicion were present and he suffered from hallucinations of hearing. Consciousness was to some extent blunted and he was partially disorientated for time and place. The delusions of persecution were incoherently expressed and were to the effect that he was subjected by his neighbours to some influence, with the nature of which he was unacquainted. The auditory hallucinations took the form of bells which were rung, he said, immediately behind him and from which he found it quite impossible to escape. Within a few hours of admission his suspicions were extended to/
to/

to the Staff and it was difficult to reassure him that no attempt to harm him was being made.

Physical - General physical condition was weak.

Nervous System - Some muscular spasticity and weakness was present. Pupils were regular but slightly unequal. The reaction to light was sluggish. The abdominal reflexes were present and the plantar was flexor. Knee jerks were brisk and the excursion of the left was greater than that of the right.

Blood Report.

Wassermann - + + +

C.S.F. Report.

Wassermann - + + +

Treatment and Progress - A course of intravenous Tryparsamide injections, followed by a course of intramuscular injections of Bismuth Metal, was given. At the end of two months from commencing treatment considerable improvement of all symptoms and signs was noted. No delusions were expressed, hallucinations were absent, he was bright and cheerful, responding readily to questions. This state of affairs continued. He behaved and conversed rationally and was usefully employed as a worker in the Ward. Examination of the blood and cerebrospinal fluid revealed that the Wassermann Reaction of the former was now double positive but continued to be triple positive in the cerebrospinal fluid. During the following three months patient continued to remain well and was duly discharged.

State on Discharge - He was rational in behaviour and conversation, presented no signs or symptoms of mental disorder and was a willing and good worker. His physical state was much improved.

Case No. 28. (W.J. McD.)

Type - Expansive.

Age - 23.

Married.

Occupation - Soldier.

History -/

History - He was received from the Military Hospital at Edinburgh Castle with a history of having suddenly become acutely excited and noisy. He was put to bed and was so violent in his struggles that it required six men to restrain him. He told them that his relatives were extremely wealthy and that he must be discharged from the Army at once in order to help in the disposal of this money most of which was really his own.

State on Admission.

Mental - His intellectual state was somewhat enfeebled, his memory was fairly good but his powers of comprehension were impaired. There was no disorientation for time or place. His affective state was one of exaltation and excitement and there was much motor restlessness.

Delusions of grandeur and persecution were expressed and hallucinations of hearing were present. He stated that he was a champion professional boxer and that, by being detained, hundreds of people who had travelled up from England to see him had been disappointed. A large sum of money, he said, was lying to his account at the General Post Office. He said that, while lying in bed, he heard his father talking to him.

Physical - General physical condition was indifferent.

Nervous System - Tremors of the extended fingers were present. Pupils were contracted and unequal. Accommodation was present but the light reflex was sluggish.

Blood Report.

Wassermann - + to ++

C.S.F. Report.

Wassermann - +

Treatment and Progress - A course of Tryparsamide, followed by Bismuth Metal, was administered and the blood and cerebrospinal fluid reactions done again with the following results. Blood Wassermann was unchanged as was/

was also the cerebrospinal fluid Wassermann.

A decided change resulted in his symptoms however. His exaltation gradually waned and delusions and hallucinations slowly disappeared. In about three months he was quite free from mental symptoms, was bright, cheerful and happy and was eventually discharged recovered.

State on Discharge - He displayed no evidence of mental disturbance and his physical health was also considerably improved.

Case No.29. (G.G.)

Type - Expansive.

Age - 42.

Single.

Occupation - Labourer.

State on Admission.

Mental - This patient was a Russian who said that he had been, at one time, a Medical Student. No proof of that was obtained and, when admitted, he had apparently been employed at casual labour. He showed much exaltation and euphoria and expressed delusions of grandeur and suspicion. He was very happy and well pleased with himself and his surroundings and said he had been engaged in work of international importance and had liberated two hundred girls from the White Slave Trade at a cost of several hundred thousand pounds and was going to liberate 30,000 more from all parts of the world. He had huge sums of money in the bank at his disposal. Unfortunately he had been followed by secret police who had upset his plans and had had him arrested.

Physical - General physical condition was weak.

Nervous System - Some muscular tremors of the lips, tongue and extended fingers were present. There was some muscular incoordination with slight Rombergism. Pupils were irregular and slightly unequal. The light reflex and power of accommodation were present. The abdominal reflexes were present, the plantar was flexor and the knee jerks were exaggerated, the left being greater than the/

the right in excursion.

Blood Report.

Wassermann - +++

C.S.F. Report.

Wassermann - ++

Treatment and Progress. - Courses of Tryparsamide and Bismuth Metal were given. For a month or two no appreciable change was noticed then it was observed that he did not exhibit so many of his grandiose ideas though they continued to be present. A considerable improvement in his physical condition was, however, observable. Later he began to converse in a rational fashion and no longer expressed any of his grandiose ideas at all. He was employed in the Ward and was a very useful and trustworthy worker up to his discharge. No change occurred in the Wassermann Reaction of the cerebrospinal fluid but the blood Wassermann changed from triple positive to double to triple positive.

State on Discharge - All delusions of suspicion and grandeur were absent, his conversation and behaviour were rational and his bodily health was much improved.

Case No. 30. (F.M.)

Type - Expansive.

Age - 40.

Single.

Occupation - Engine Driver.

State on Admission -

Mental - Patient was slightly incoherent and showed considerable impairment of memory and powers of comprehension. There was some blunting of consciousness and he was disorientated for time and place. He was very exalted, noisy at intervals and expressed delusions of grandeur and power with hallucinations of hearing. He stated that he was the possessor of several thousands of pounds/

pounds, that he was the driver of the Flying Scotsman and that he had several motor cars. At intervals he became vividly hallucinated for hearing and became excited under their influence and occasionally shouted back replies to the voices.

Physical - General bodily health and condition was weak.

Nervous System - The pupils were irregularly contracted and did not react to light although accommodation was present. The abdominal reflexes were present, the plantar was flexor and the knee jerks were exaggerated. There was much muscular incoordination present and the gait was ataxic. The speech was slurring.

Blood Report.

Wassermann - + + +

C.S.F. Report.

Wassermann - + + +

Gold Curve - Paretic Type.

Treatment and Progress - Patient had a course of Tryparsamide and Bismuth Metal medication. There was no change in the cerebrospinal fluid reactions but the blood Wassermann was now negative. As the treatment progressed there was a gradual improvement in the mental symptoms and physical signs. His behaviour and conversation became rational and his delusions and hallucinations slowly disappeared. The physical signs also showed marked improvement.

State on Discharge - He was free from mental symptoms and the slurring speech and muscular incoordination were absent.

The following two cases died one of them being the subject of Pulmonary Tuberculosis which was instrumental in hastening his demise.

Case No. 31. (W.A.B.)

Age/

Type - Demented.

Age - 35.Married.Occupation - Mason.State on Admission.

Mental - Considerable enfeeblement was present, his memory was impaired and his powers of comprehension were dulled. There was some blunting of consciousness and some degree of confusion was present. He was dull and apathetic, took no interest in himself or his surroundings and replied irrelevantly to questions.

Physical - General physical condition was weak. Signs of Pulmonary Tuberculosis were present.

Nervous - There were tremors of the lips, tongue and extended fingers. Speech was slurring and there was some muscular incoordination.

Blood Report.

Wassermann	-	+++
------------	---	-----

C.S.F. Report.

Wassermann	-	+++
------------	---	-----

Pandy's Test	-	+
--------------	---	---

Gold Curve	-	Paretic Type.
------------	---	---------------

Treatment and Progress - A course of Tryparsamide and a course of Bismuth Metal were administered and after a period of rest both courses were repeated. The blood was examined when it was found that the Wassermann Reaction was still triple positive. A specimen of cerebrospinal fluid was obtained but owing to contamination by blood no conclusive results could be obtained. There was no improvement mentally - on the other hand, the mental enfeeblement continued to become more marked.

In a few months time his physical health became much more impaired and he was put back to bed on account of general weakness and loss of weight. Temperature was swinging in character with a marked evening rise and a troublesome cough was present with abundant purulent sputum. Examination of the latter demonstrated the presence/

presence of numerous tubercle bacilli. Physical examination of the chest showed consolidation and cavity formation over the right upper lobe and left apex. At the same time he began to suffer from severe congestive seizures with the result that his deterioration became rapidly hastened, culminating in death.

Causes of Death - (a) General Paralysis. (b) Pulmonary Tuberculosis.

Case No.32. (J.R.)

Type - Depressed.

Age - 65.

Married.

Occupation - Joiner.

State on Admission -

Mental - There was some confusion and incoherence present and he expressed vague delusions of suspicion and persecution. His continuous complaint was that he would like to know what was to be done to him. At times he was emotional and agitated to a considerable extent. He was partially disorientated for time and place.

Physical - General physical condition was indifferent.

Nervous System - Some muscular incoordination was present and tremors of the lips, tongue and extended fingers were in evidence. Pupils were medium in size and unequal. They reacted sluggishly to light but accommodation was unimpaired.

Blood Report.

Wassermann

- + + +

C.S.F. Report.

Wassermann

- —

Treatment and Progress - A course of Tryparsamide followed by Bismuth Metal was given at the conclusion of which there was no improvement but, on the contrary, definite increase in confusion and agitation. It appeared as though the injections had acted as a stimulant to the progress of the disease for all symptoms became intensified while/

while, at the same time, his physical health deteriorated, terminating finally in hypostatic pneumonia and death.

Causes of Death - (a) General Paralysis. (b) Hypostatic Pneumonia.

Tryparsamide and Bismuth Therapy -

Conclusions.

- (a) Recovery may be expected in a rather higher percentage of cases than in treatment with Tryparsamide alone. In this case, of those treated, fortyfour per cent recovered from their clinical symptoms and signs and were discharged as recovered.
- (b) Improvement takes place in a certain number of cases, which, however, do not become sufficiently well for discharge. In this case eleven per cent were so improved.
- (c) No Improvement occurs in a certain number of those treated. In this series twenty-two per cent of those treated were not improved and the disease is pursuing an uninterrupted course.
- (d) Death, in one case, was hastened by the treatment. The confusion and agitation present in this case (No.32) became markedly increased and rapid physical deterioration occurred at the same time.
- (e) Age, in this case, is also an important factor in successful treatment. The average age of those who recovered was 34, of those relieved and not improved 44, and of those who died 50. The prospects of benefit are greater the younger the patient is.
- (f) Type - The expansive type derives most benefit from treatment. Of the four cases who were discharged recovered, three were of the expansive form with mental excitement, exaltation, and delusions of grandeur.
- (g) Blood and Cerebrospinal Fluid. - Change in the Wassermann Reactions of the blood and cerebrospinal fluid is not to be expected in many cases. In one case/

case the blood Wassermann was changed from doubtful positive or negative to negative and in another from triple positive to negative. The cerebrospinal fluid was unchanged in any of the cases. (See Table No.2.)

- (h) Complications - In this series there were no complications except in one case where death resulted (Case No.32). To conclude it would appear that Tryparsamide, in combination with Bismuth Metal, produces a greater proportion of recoveries than where it is used alone. Where Tryparsamide alone was used in the first series of cases, twenty-six per cent of the cases treated recovered, while, in the second series, treated by tryparsamide and bismuth, there were forty-four per cent of recoveries.

(c) CASES TREATED WITH MALARIA.

The results of treatment with Malaria alone are shown generally in Table No.3. It will be seen that fourteen cases were treated and that, of those, four were discharged as recovered, five were improved but not sufficiently so as to be able to take their place in the outer world again, two showed no improvement and three died.

Patients treated by this method show:-

Recovered	...	...	29%.
Relieved	...	...	36%.
Not Improved	...	...	14%.
Died.	...	...	21%.

TABLE/

TABLE NO. 3.

CASES TREATED WITH MALARIA.

CASE.	AGE.	TYPE.	WASSERMANN.		RESULT.
			Before Treatment.	After Treatment.	
<u>Still in Institution.</u>					
33.R.J.S.	37.	Expansive.	Blood. ++	++	Relieved.
			C.S.F. ++	++	
34.J.S.C.	37.	Expansive.	Blood. +	+	Relieved.
			C.S.F. +	+	
35.J.L.	41.	Expansive.	Blood. +	+/-	Relieved.
			C.S.F. +	+	
36.A.M.	30.	Expansive.	Blood. +++	+++	Not Improved.
			C.S.F. +++	+++	
37.T.M.	30.	Demented.	Blood. +++	+++	Relieved.
			C.S.F. +++	+++	
38.D.S.	40.	Depressed.	Blood. ++	+	Not Improved.
			C.S.F. +	+	
39.J.W.W.	30.	Expansive.	Blood. +	-	Relieved.
			C.S.F. ++	+/-	
<u>Discharged.</u>					
40.J.C.	42.	Expansive.	Blood. +	+	Recovered.
			C.S.F. +	+	
41.J.A.C.	48.	Expansive.	Blood. ++	++	Recovered.
			C.S.F. +	+	
42.A.M.	52.	Demented.	Blood. ++	++	Recovered.
			C.S.F. ++	++	
43.T.M.S.	40.	Expansive.	Blood. +	+	Recovered.
			C.S.F. +	+	
<u>Deaths.</u>					
44.J.C.	43.	Demented.	Blood. +	+	Died.
			C.S.F. +	+	
45.J.R.	33.	Demented.	Blood. +++	?	Died.
			C.S.F. +++	?	
46.D.V.	39.	Demented.	Blood. +++	?	Died.
			C.S.F. ++	!	

The average age of those who recovered was 45, of those who were relieved and not improved 35, and of those who died 38.

From the table it will also be seen that no change occurred in the blood and cerebrospinal fluid except in two cases. Cases with complete remission of symptoms had still a positive Wassermann.

A short summary of each case will now show the general condition of the patients in this series before and after treatment.

Case No.33. (R.J.S.)Type - Expansive.Age - 37.Married.Occupation - Engineer .State on Admission.

Mental - He was rather enfeebled and facile, showed some impairment of memory and his powers of comprehension were weak. There was disorientation for time and place. He was exalted and euphoric and expressed delusions of grandeur and power. At the same time he was noisy and talkative. He stated that he would give away fortunes to the nurses and aeroplanes capable of two thousand miles per hour to the doctors. In his possession, he said, were a thousand cart loads of gold, jewellery in abundance. At times he was rather untidy and dirty in his habits.

Physical - General physical condition was weak.

Nervous System - Speech was slurring and tremors of extended fingers and of tongue were present. Pupils were unequal in size and the reaction to light was sluggish. Knee jerks were much diminished.

Blood Report.

Wassermann - + +

C.S.F.Report.

Wassermann - + +

Treatment and Progress - 5 c.c. of malarial blood were injected intramuscularly and after thirty-two days typical malarial rigors developed. He stood those well in spite of the fact that they were quotidian. At the ninth rigor the malaria was terminated by the administration of quinine. The temperature ranged from 102°F to 104°F. (See Chart.)

As a result of treatment some improvement resulted in that the acute mental symptoms subsided but considerable enfeeblement remained. The physical signs were much improved/

NAME & ADDRESS

Case No. 33. (R. J. S.)

AGE 34

OCCUPATION

CASE BOOK N°

PAGE

DISEASE

RESULT

DAY OF MONTH	1.	2.	3.	4.	5.	6.	7.	8.	9.	10.	11.	12.	13.	14.	15.	16.	17.	18.	19.	20.	21.	22.	23.	24.	25.	26.	27.	28.	29.	30.	31.	DAY OF MONTH	
DAY OF DISEASE																																	DAY OF DISEASE
TIME	M	E	M	E	M	E	M	E	M	E	M	E	M	E	M	E	M	E	M	E	M	E	M	E	M	E	M	E	M	E	TIME		
106																																41	
8																																8	
6																																6	
4																																4	
2																																2	
105																																40	
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6																																6	
4																																4	
2																																2	
96																																36	
M																																M	
PULSE																																PULSE	
E																																E	
M																																M	
RESP.																																RESP.	
E																																E	
MOTIONS																																MOTIONS	
Fl. Oz.																																Fl. Oz.	
Sp. Gr.																																Sp. Gr.	
Reaction																																Reaction	
Abnorm.																																Abnorm.	
alities																																alities.	

REMARKS

Inj. Malarial Blood 5 cc. 20

Case No. 32 (R.T.S.)

AGE **34** OCCUPATION

RESULT *Q. 442* 1928.

DAY OF MONTH	
DAY OF DISEASE	

CENTIGRADE SCALE.

M
PULSE
F

M
RESP.
E

MOTIONS

Fl. Oz.

Sp. Gr. 20

Reaction 2

Abnorm-
alities

REMARKS

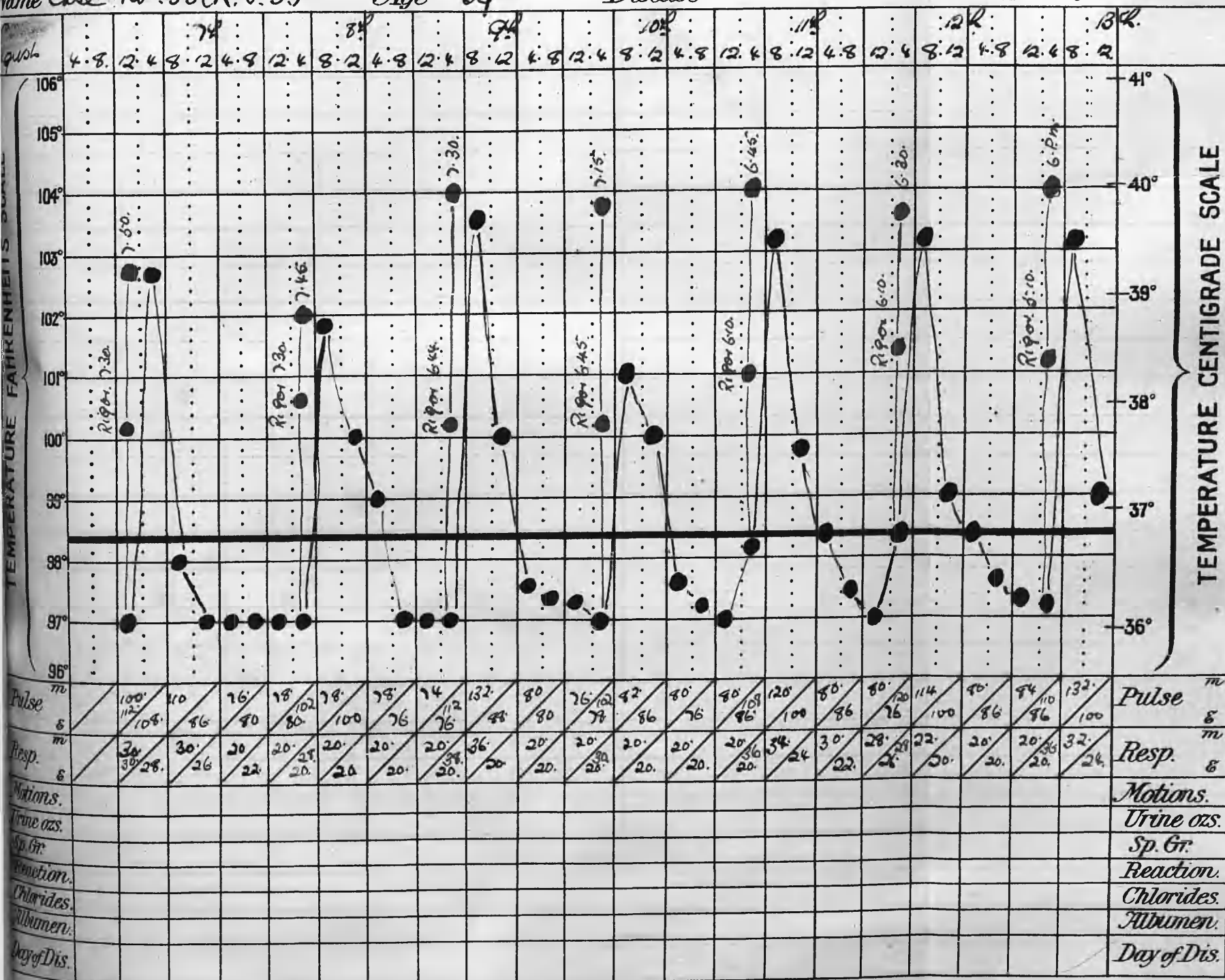
Inj Malarial Blood 5 c.c.

Name Case No. 33 (R.T.S.)

Age 34

Disease

Result



Case No 33 (R.T.S.)

Age

34

Disease

Result

		14 ^h		15 ^h		16 ^h		17 ^h		18 ^h		19 ^h		20 ^h	
		4-8	12-4	8-12	4-8	12-4	8-12	4-8	12-4	8-12	4-8	12-4	8-12	4-8	12-4
106°															
105°															
104°															
103°															
102°															
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100°															
99°															
98°															
97°															
96°															
		TEMPERATURE CENTIGRADE SCALE													
Use	m	80	80	112	80	74	92	82	76	80	76	78	70		
	g	76	80	80	80	85	84	86	78	86	72	72	72		
sp.	m	20	20	22	20	20	20	20	20	20	20	20	20		
	g	20	20	20	20	20	20	20	20	20	20	20	20		
Motions.															
Urine ozs.															
Sp. Gr.															
Reaction.															
Chlorides.															
Albumen.															
Day of Dis.															

Hypo. Inf: Osmine Gt. Vi given 3.0, 10-12-32

improved. The disease was arrested but the improvement did not warrant his discharge.

Present State - He shows considerable enfeeblement mentally but is a good routine worker, has parole of the grounds and is allowed out for an occasional short holiday. No change has resulted serologically in the blood or cerebrospinal fluid.

Case No.34. (J.S.C.)

Type - Expansive.

Age - 37.

Single.

Occupation - Barman.

History - Patient joined the Army at the age of 17 $\frac{1}{2}$ and was a regular with the Scots Greys where he became a wireless operator and signaller. At the Armistice he was demobilised and became a barman. Up till fifteen months before admission he had been quite well, then he began to have tremors, became confused and forgetful when conversing and complained of headaches and weakness of one side.

State on Admission.

Mental - He showed some slight confusion and incoherence and his memory was impaired to some extent. He was disorientated for time and place and was excited, noisy and restless and expressed delusions of grandeur. At times he was very talkative and childish and talked volubly and incoherently, said he was related to Royalty and, in general, was very pleased with himself.

Physical - General physical condition was weak.

Nervous System - Gait was ataxic. Tremors of tongue, lips and fingers were present. Speech was hesitating and slurring. Pupils were unequal and the Argyll-Robertson reaction was present.

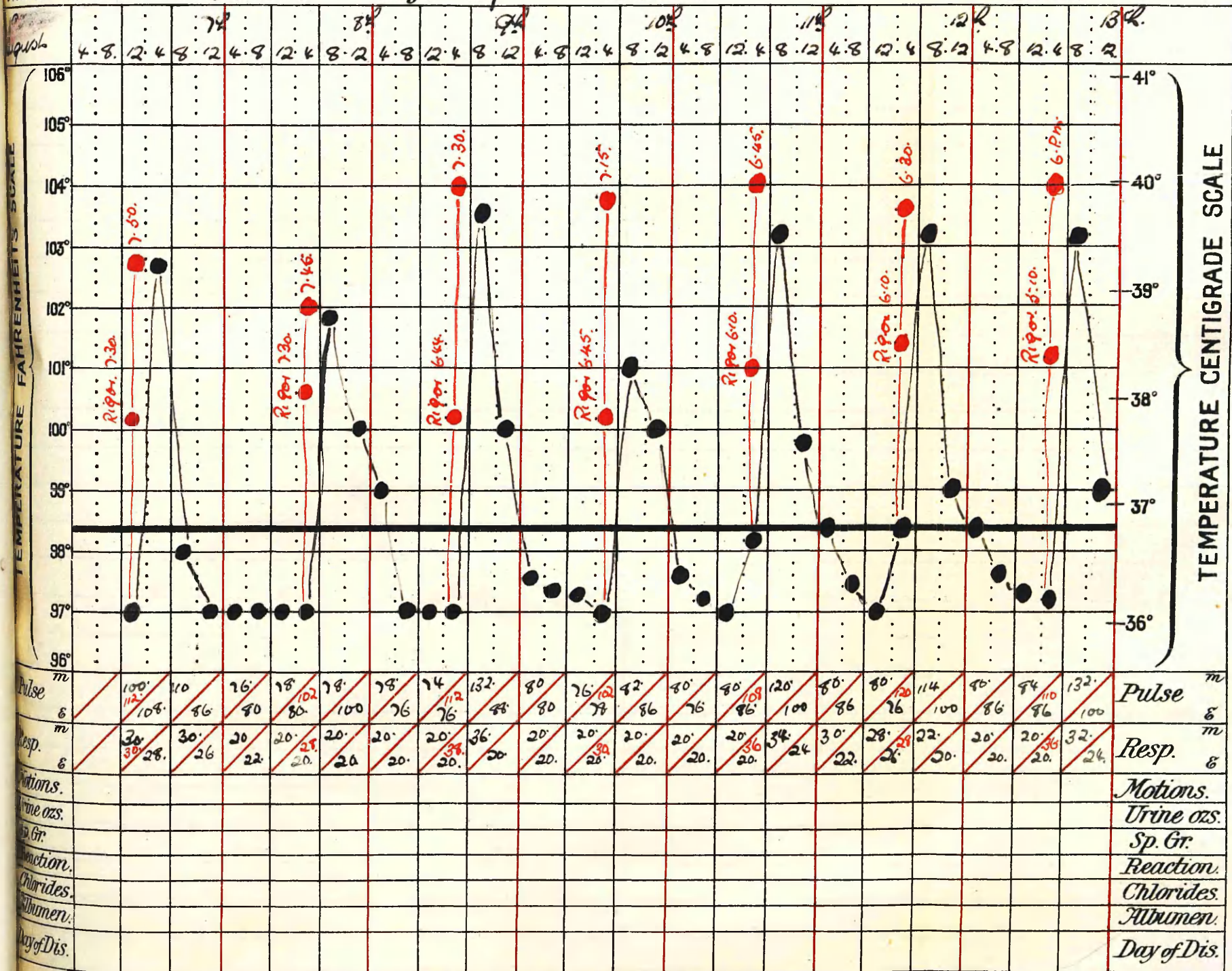
Treatment/

Name Case No. 33 (R. J. S.)

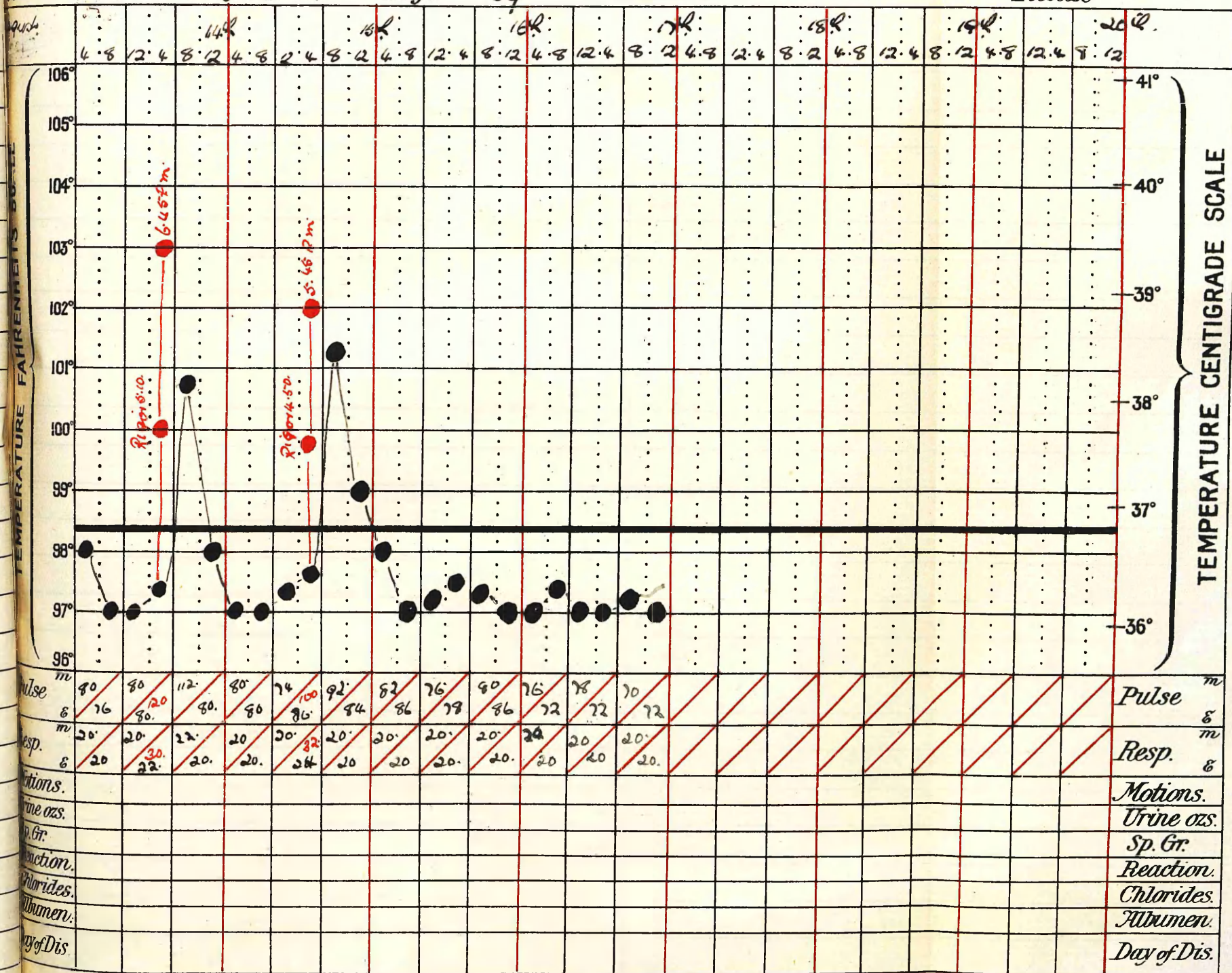
Age 34

Disease

Result



Result



improved. The disease was arrested but the improvement did not warrant his discharge.

Present State - He shows considerable enfeeblement mentally but is a good routine worker, has parole of the grounds and is allowed out for an occasional short holiday. No change has resulted serologically in the blood or cerebrospinal fluid.

Case No.34. (J.S.C.)

Type - Expansive.

Age - 37.

Single.

Occupation - Barman.

History - Patient joined the Army at the age of $17\frac{1}{2}$ and was a regular with the Scots Greys where he became a wireless operator and signaller. At the Armistice he was demobilised and became a barman. Up till fifteen months before admission he had been quite well, then he began to have tremors, became confused and forgetful when conversing and complained of headaches and weakness of one side.

State on Admission.

Mental - He showed some slight confusion and incoherence and his memory was impaired to some extent. He was disorientated for time and place and was excited, noisy and restless and expressed delusions of grandeur. At times he was very talkative and childish and talked volubly and incoherently, said he was related to Royalty and, in general, was very pleased with himself.

Physical - General physical condition was weak.

Nervous System - Gait was ataxic. Tremors of tongue, lips and fingers were present. Speech was hesitating and slurring. Pupils were unequal and the Argyll-Robertson reaction was present.

Treatment/

Treatment and Progress - 8 c.c. of malarial blood were injected intramuscularly and in about three weeks quotidian rigors began. The temperature during the attacks was sometimes elevated to 105°F. Twelve rigors were allowed when the attacks were cut short by the administration of quinine. In about two months time there was marked physical improvement, the tremors being less noticeable and his gait being to some extent improved. His acute mental symptoms abated but a considerable mental enfeeblement remained.

Present State - He is a useful worker and is employed as a messenger and postman in the village but is rather enfeebled to be allowed home. The blood and cerebro-spinal fluid Wassermann Reactions which were strongly positive have undergone no change.

Case No.35 (J.L.)

Type - Expansive.

Age - 41.

Single.

Occupation - Labourer.

History - About a fortnight before admission his brother noticed that he had become very talkative, which was unusual for him, and began telling everyone his business. He became reckless with money, giving it away freely to everyone he met and not to his friends alone. Gradually he became restless and excited and could not stay at home. He imagined he was an Irish Comedian and also said he was opening a big bookmaking business in addition to expressing many other wild schemes. At times he was uncontrollable being noisy and singing frequently.

State on Admission -

Mental - He was excitable, talkative and euphoric with markedly grandiose delusions and had no insight into his condition. There was some confusion and impairment of memory and powers of comprehension. He said he was here/

here for a holiday and had eight businesses in Edinburgh. At other times he said he was a great boxer and had a cousin who was also a famous boxer.

Physical - General physical condition was weak.

Nervous - There were tremors of the tongue and extended fingers and muscular incoordination was present.

Rombergism was present. Speech was slurring. Pupils were pin-point in size but were equal and regular. The pupillary light reflex was absent but accommodation was unimpaired.

Blood Report.

Wassermann - +

C.S.F. Report.

Wassermann - +

Treatment and Progress - 7 c.c. malarial blood were injected intramuscularly and in a fortnight a series of benign tertian rigors began. The highest point reached by the temperature during the series was 104°F. He stood the attacks well and was allowed to have twelve before the administration of quinine. During the fever patient was very excited, talkative and restless, occasionally requiring a paraldehyde draught at night. In the six weeks following the treatment patient showed marked improvement mentally and physically. He became quiet, rational in behaviour and conversation and slept well at night. At intervals he continued to express his grandiose ideas but they have not been in evidence for months, his condition now being one of mental enfeeblement.

Present State - His disease has been arrested but he is definitely mentally enfeebled. Physically he is in good health and is a useful worker, being employed on the farm where he works without supervision. The blood/

blood Wassermann has changed from positive to doubtful positive or negative but the cerebrospinal fluid shows no change.

Case No.36. (A.M.)

Type - Expansive.

Age - 30.

Married.

Occupation - Engineer's
Turner.

History - At three years of age he had suffered from "fever" and had been constantly "under the doctor". With regard to his present illness he had consulted a doctor himself because of headaches and because he could not speak properly.

State on Admission -

Mental - He was talkative, excited, very happy and pleased with everything and had no appreciation of his condition or surroundings. He said he had had a "break-down" and could not do his work but had suffered from general tiredness which compelled him to sit a great deal more than he would have otherwise done. In spite of these complaints he said he was quite happy, stated he had £500 in the bank and told many stories of his doings in ships during the War. His next venture he said would be the joining of the R.A.F.

Physical - General physical condition was weak.

Nervous - There was considerable slurring of speech. Tremors of lips, tongue and extended fingers were present and there was some muscular incoordination. Pupils were unequal and sluggish in their reaction to light. Knee jerks were present but not exaggerated.

Blood Report.-

Wassermann - + + +

C.S.F.Report.

Wassermann - + + +

Treatment and Progress - 5 c.c. malarial blood were injected/

RESULT

DATE													DAY OF MONTH		DAY OF DISEASE		TIME					
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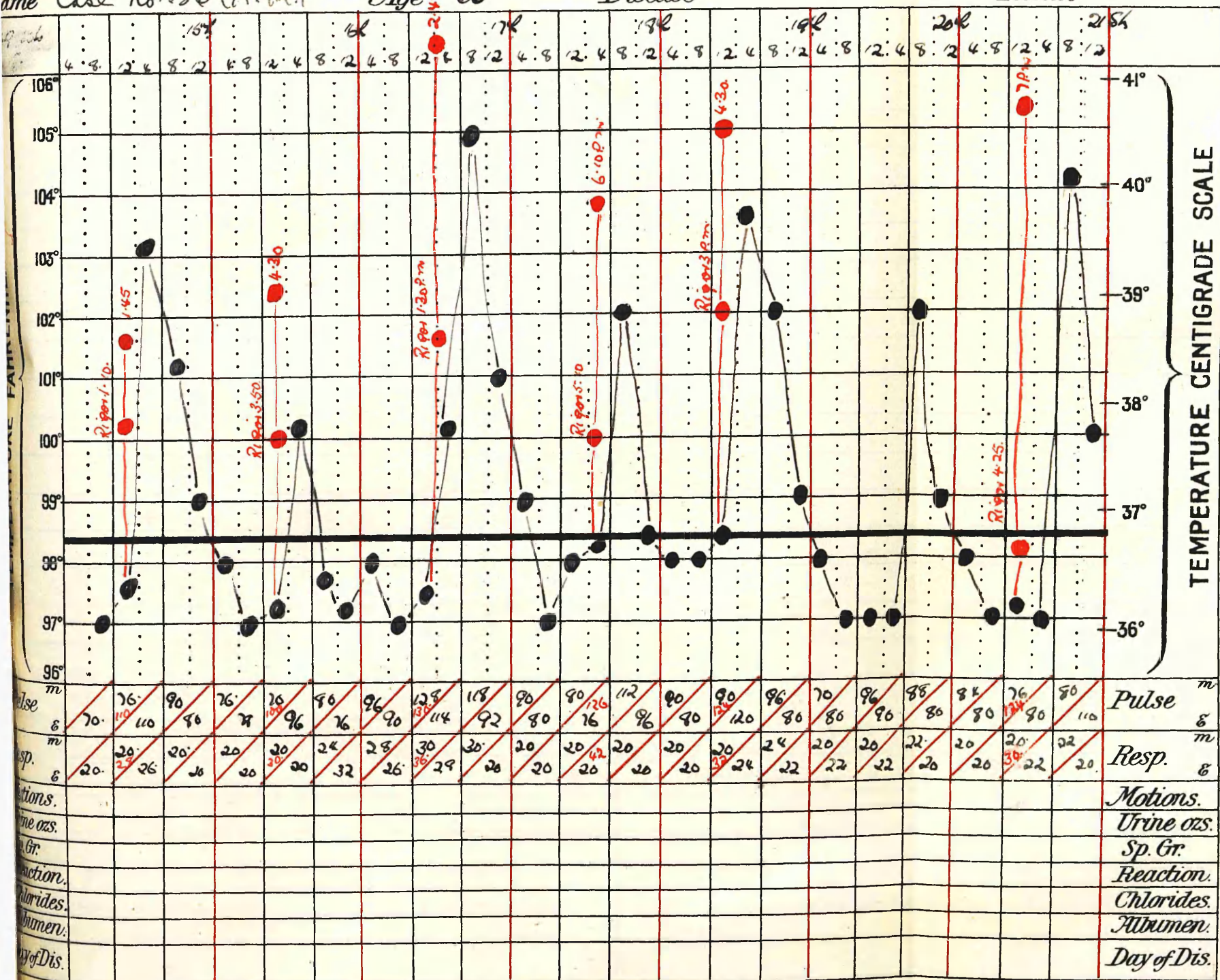
MARKS

Case No. 36 (A.M.)

Age 30

Disease

Result

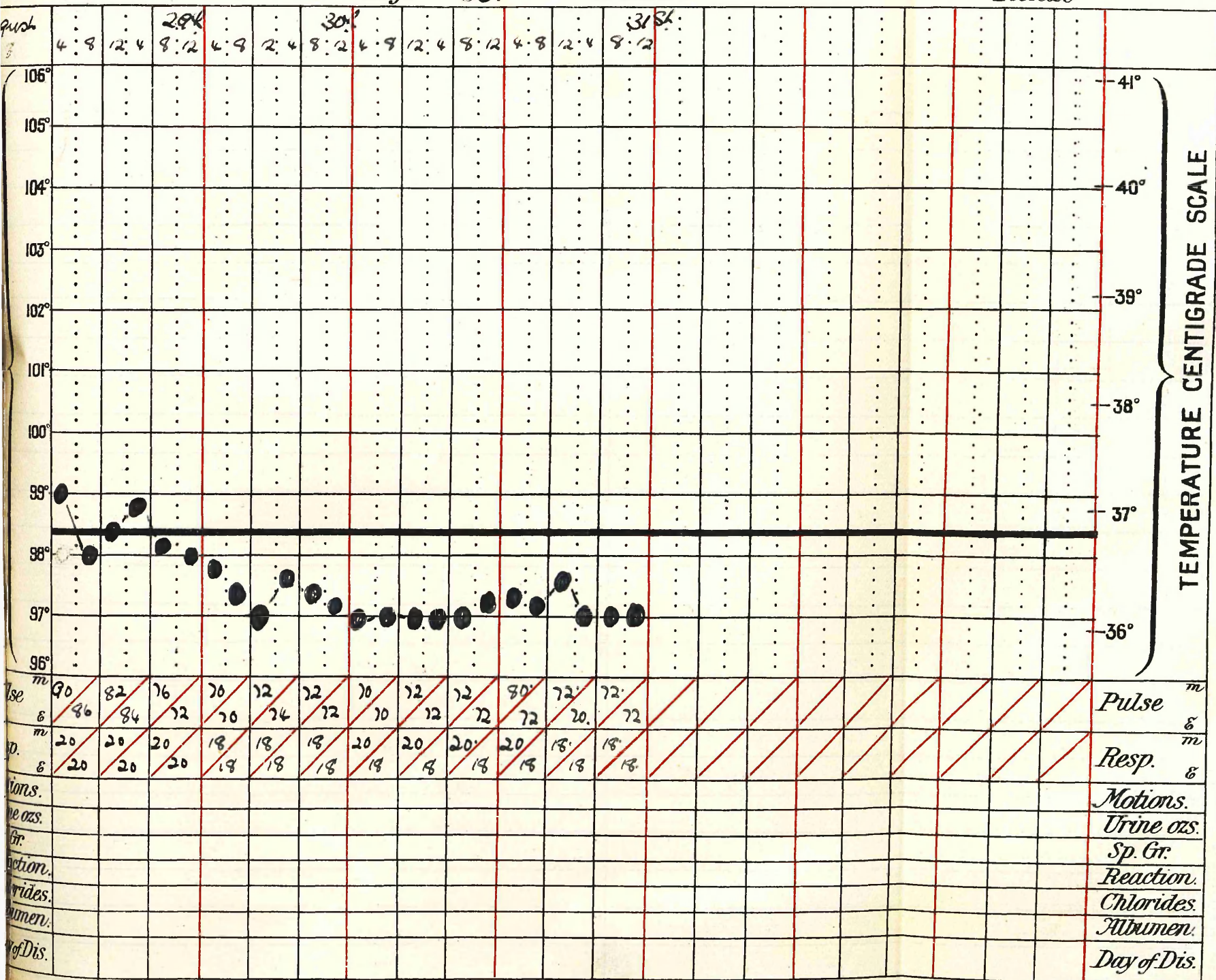


Inf. Malarial Blood: S.C.C.

me Case No 36 (A.M.). Age 30.

Disease

Result



injected intramuscularly and five days later typical rigors began. Those were quotidian and a series of thirteen was allowed before cutting short the infection by the administration of quinine. The average temperature was 104°F. (See Chart.) No improvement took place in his condition but the disease progressed with steady mental and physical deterioration. There was no change in the Wassermann Reactions of the blood or cerebrospinal fluid.

Present State - He is demented but is quite happy and contented, is incoherent in speech and is easily managed. His physical health is satisfactory.

Case No. 37. (T.M.)

Type - Demented.

Age - 30.

Married.

Occupation - Chauffeur

State on Admission -

Mental - He was much enfeebled, incoherent, confused and was completely disorientated for time and place. No delusions were expressed and no hallucinations were elicited. He did not respond to questions and looked as if he could not comprehend their import. There was much motor restlessness present.

Physical - General physical condition was poor.

Nervous System - Tremors of the lips and extended fingers were present and there was fibrillary twitching of the tongue. Gait was ataxic and speech was slurring. Pupils were medium in size and equal. The reaction to light was sluggish but accommodation was unimpaired.

Blood Report.

Wassermann - + + +

C.S.F. Report.

Wassermann - + + +

Treatment and Progress - 8 c.c. of malarial blood were injected/

injected intramuscularly and after eighteen days the attacks of malaria developed. He had twelve rigors, which he stood well, before the administration of quinine. On no occasion did the temperature rise above 103°F. Within a few weeks a distinct change was noted. He became bright and cheerful and the physical signs were also much improved.

Present State - Patient is mentally enfeebled but, otherwise, the disease appears to have been arrested. There has been no change in the Wassermann Reactions of the blood and cerebrospinal fluid.

Case No. 38. (D.S.)

Type - Depressed.

Age - 40.

Single.

Occupation - Seaman.

State on Admission -

Mental - There was much mental enfeeblement present and his memory was much impaired as were his powers of comprehension. He was confused, dull, morbidly depressed and expressed vague delusions of suspicion and persecution. At intervals he became noisy and restless and was resistive to treatment.

Physical - General physical condition was weak.

Nervous System - Gait was unsteady. There were tremors of hands, lips and tongue. Articulation was slurred. The pupils were unequally contracted, the right being the larger and the pupillary light reflex was absent.

Blood Report.

Wassermann - ++

C.S.F. Report.

Wassermann - +

Treatment and Progress - 8 c.c. malarial blood were injected intramuscularly and a series of benign tertian rigors followed at the expiration of two weeks. He did not stand those well and quinine was administered after/

after the eighth. No improvement result but dementia became pronounced. His physical condition remained the same.

Present State - He is now completely demented, rarely speaks or replies to questions and is completely disorientated for time or place. He takes no interest in himself or his surroundings.

Blood Report.

Wassermann

- +

C.S.F. Report.

Wassermann

- +

Case No. 39. (J.W.W.)

Type - Expansive.

Age - 30.

Single.

Occupation - Chartered Accountant.

History - He was always difficult and exacting. During the War he served in the Army after which he became a C.A. and worked in London where he latterly consulted a doctor for Neurasthenia. He then returned home where he was noticed to be peculiar in his behaviour and had vague ideas about plots. He was excitable and became very concerned about his health and diet.

State on Admission.

Mental - He showed some enfeeblement and impairment of memory but his powers of comprehension were good. His reasoning power was much impaired and there was some slight confusion present. He was exalted, euphoric and, at times, truculent and irritable on slight provocation. He expressed delusions chiefly of a grandiose, amorous and persecutory nature. He desired a complete new outfit from very special shops and said he "was never fitter mentally or physically". His capabilities, he said, were enormously increased, and he had an unsurpassed understanding/

understanding of everything now. He wished to marry every nurse he met and said his wedding would set the seal on his recovery. He spent much time writing love letters and making plans to meet his "fiancee." It would be a good plan, he said, to be married before all the staff.

Physical - General bodily health and condition was indifferent.

Nervous System - There was slight labial and facial tremor and twitchings of the tongue, slight incoordination of the upper extremities and a moderate degree of ataxia in his gait. The knee and ankle jerks were exaggerated. The pupils were unequal and slightly irregular.

Blood Report.

Wassermann - +

C.S.F. Report.

Wassermann - ++

Treatment and Progress - 5 c.c. of malarial blood were injected intramuscularly and in ten days typical benign tertian malarial attacks began. He was allowed to have nine rigors after which they were stopped by the administration of quinine. Within a short time some improvement became noticeable. His delusions were no longer so prominent a feature of his condition but mental enfeeblement was marked.

Present State - He is enfeebled but a useful and industrious worker, being engaged in carpet-making. His physical condition is very satisfactory, in fact, on one occasion he has been called upon to play in the football team. The blood Wassermann is now negative, that of the cerebrospinal fluid doubtful positive or negative.

The following four cases were treated in a similar fashion and were so recovered as to be discharged.

Name Case No 40 (J.C.)

Age 42

Disease Prot.

Result

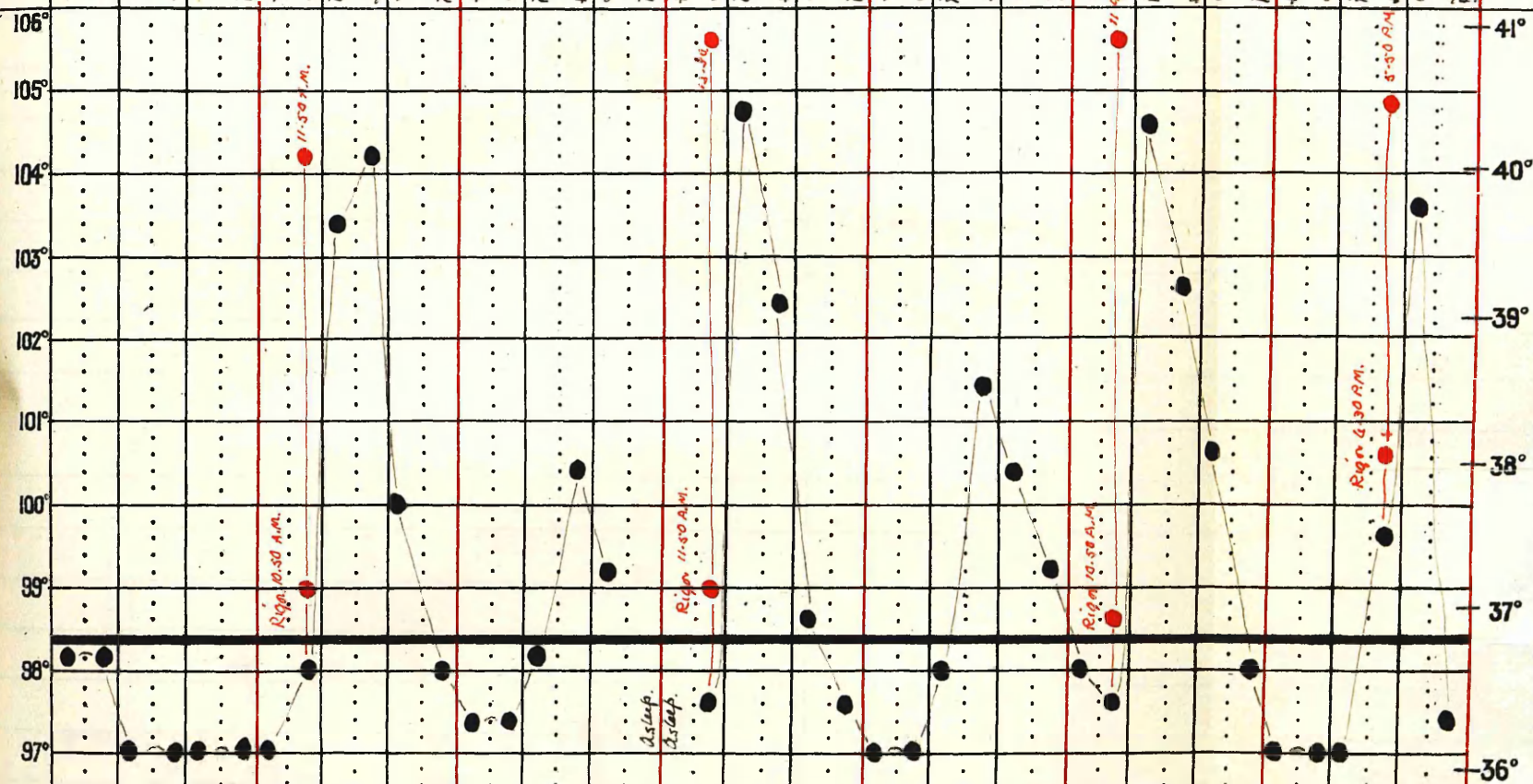
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102°								
101°								
100°								
99°								
98°								
97°								
96°								
Pulse	m	66.	66.	114.	110.			
8	66.	90.						
resp.	m	18.	18.	20.	25.			
8	18.	28.						
Motions.		1.						
Urine ozs.								
Sp. Gr.								
Reaction.								
Chlorides.								
Albumen.								
Day of Dis.	6.	8.	6.	6.	6.	6.	7.	

TEMPERATURE CENTIGRADE SCALE

Result

50	
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DECEMBER.
1932.



TEMPERATURE CENTIGRADE SCALE

Pulse	60.	60.	70.	66.	112.	108.	88.	70.	68.	104.	120.	96.	70.	84.	98.	70.	120.	100.	66.	66.	108.	Pulse
Sp.	60.	62.	64.	60.	112.	108.	72.	70.	90.	76.	116.	90.	64.	90.	92.	70.	120.	70.	64.	90.	76.	Sp.
Motions.	20.	18.	20.	18.	30.	22.	22.	20.	20.	20.	26.	22.	22.	21.	21.	20.	30.	28.	20.	18.	26.	Motions.
Urine ozs.	1.				2.					1.			2.				3.				1.	Urine ozs.
Sp. Gr.																						Sp. Gr.
Reaction.																						Reaction.
Chlorides.																						Chlorides.
Albumen.																						Albumen.
Day of Dis.	7.		7.				7.			6.		7.				6.			7.			Day of Dis.

blood or cerebrospinal fluid Wassermann Reaction.

State on Discharge - Exaltation and delusions were absent. His physical condition was much improved.

Case No.41 (J.A.C.)

Type - Expansive.

Age - 48.

Married.

Occupation - Commercial Traveller.

History - Several years before admission he became very irritable and unlike his former self and also became careless and slovenly about himself whereas before he was most particular. He made scenes with his wife and openly insulted her before other people. Finally he began to neglect his business and left bills unpaid.

State on Admission.

Mental - He was very excited, voluble and noisy and was exalted and superior in manner. He demanded his discharge, said there was nothing the matter with him and that important business with the King and God awaited him. The world, he said, could not get on without him.

Physical - General Physical Condition was weak.

Nervous System - Tremor of the lips and slurring articulation were present. Pupils were small and displayed the Argyll-Robertson reaction.

Blood Report.

Wassermann - + +

C.S.F.Report.

Wassermann - +

Treatment and Progress - 8 c.c. malarial blood were injected intramuscularly and a series of quotidian rigors followed which were terminated by quinine after the eighth as his condition was much weakened by the pyrexial bouts. He became quiet and well-behaved though he still talked of important business transactions which required settlement. Those delusions however were also soon/

soon gone and he talked in a normal rational fashion.
State on Discharge - Mental symptoms were absent and his physical health was also much improved. There was no change in the blood or cerebrospinal fluid reactions.

Case No.42 (A.M.)

Type - Demented.

Age - 52.

Married.

Occupation - Gas Worker.

History - His wife stated that he had been in Morningside with a similar attack, three years before his admission here. He had gone back to work and had remained well. Then he had a "faint", became unconscious and slept all day. He went to work next day then, four months later, he had another seizure, became speechless but his limbs were unaffected and he recovered in about twenty minutes. The next feature was that he began to talk incessantly, became very excited and his speech became bad. He went for long walks and forgot to come home. He went into shops and obtained goods on false pretences. He stated he had plenty of clothes and plenty of money.

State on Admission.

Mental State - He was restless, excited and noisy and was very talkative and euphoric. At times he became emotional. He said he was a very wealthy man and stated that he intended to buy up the whole Institution. Delusions, on the whole, however, were not much in evidence.

Physical - General physical condition was indifferent.

Nervous System - There was some tremor of the lips and slight incoordination of the limbs. Articulation was slurred/ on pronouncing "test words". Pupils were pin-point/

pin-point with no reaction to light.

Blood Report.

Wassermann - + +

C.S.F. Report.

Wassermann - + +

Treatment and Progress - Patient had an injection of 5 c.c. malarial blood intramuscularly. At first he had several bouts of fever without rigors then they occurred more regularly with attendant rigors. He stood those well but they did not last out the proper course, dying out spontaneously after he had had nine. However, improvement was soon noticeable. He became quiet and easily managed, gave no trouble with getting out of bed as formerly and became rational and sensible in conversation. He became an obliging and helpful patient, took an interest in himself and his surroundings and showed no symptom of instability.

State on Discharge - He was quiet, pleasant, well-behaved and rational in speech and conduct. His physical health had improved. There was no change in the Wassermann Reactions of the blood and cerebrospinal fluid.

Case No. 43. (T.M.S.)

Type - Expansive.

Age - 40.

Married.

Occupation - Joiner.

State on Admission.

Mental - He displayed some mental enfeeblement but his memory and powers of comprehension were good. He was grandiose, exalted, euphoric and at times irritable. If not allowed home, he said he would jump out of the window as, every day he was detained, meant the loss of a considerable amount of business. Contracts, he said, were in his hands to build hundreds of houses, he had "tons of money" and was the possessor of many wives.

Physical/

Physical - General physical condition was weak.

Nervous System - Tremors of tongue and lips were present.

Speech was slow but showed no marked defect. Gait was ataxic and Rombergism was present. Pupils were unequal, the right being dilated. There was no reaction to light but accommodation was present.

Blood Report.

Wassermann - +

C.S.F. Report.

Wassermann - +

Treatment and Progress - 5 c.c. of malarial blood were injected intramuscularly. A fortnight later his rigors commenced. They were quotidian in type but he was able to tolerate twelve of them before it was considered necessary to administer quinine. The highest temperature recorded was 106°F. and there was considerable weakness and debility at their conclusion.

He became less excited and exalted and became quiet and rational in behaviour and conduct. All symptoms gradually disappeared.

State on Discharge - He was free from mental symptoms but was rather enfeebled, not, however, to such an extent as to prevent his performing his ordinary duties. Physically he was much improved.

The following three cases died, and, in one of them, death was quite decidedly due to the malarial infection.

Case No. 44. (J.C.)

Type - Demented.

Age - 43.

Single.

Occupation - Labourer.

State on Admission.

Mental - He was much enfeebled and his memory was very poor/

poor especially for recent events. Powers of comprehension were considerably impaired and there was some slight confusion present. He was dull, apathetic and took no interest in himself or his surroundings and his consciousness was much blunted. He did not appreciate his surroundings beyond the fact that he was in a hospital.

Physical - General physical condition was weak.

Nervous System - Pupils were unequal and the light reaction was absent. There were fine tremors of the tongue, lips and fingers and articulation was slurred. Incoordination and Rombergism were present.

Blood Report.

Wassermann - +

C.S.F. Report.

Wassermann - +

Treatment and Progress - 5 c.c. malarial blood were injected intramuscularly and he had a series of well-maintained tertian rigors, eleven in all. Unfortunately no improvement followed but he gradually became more demented and feeble, with untidy and dirty habits. There was no change demonstrable in the Wassermann Reactions of the blood or cerebrospinal fluid. As the months passed, his condition - mental and physical showed a steady deterioration terminating eventually in death.

Causes of Death - (a) General Paralysis. (b) Fatty Degeneration of Heart.

Case No. 45. (J.R.)

Type - Demented.

Age - 33.

Married.

Occupation - Seaman.

State on Admission.

Mental - There was gross intellectual enfeeblement, memory/

memory was much impaired, there was some incoherence and his powers of comprehension were poor. He expressed no delusions and no hallucinations were elicited. There was much blunting of consciousness and his apprehension of surroundings was much impaired. His affective state was one of depression and apathy. At times there was much motor restlessness.

Physical - General physical condition was very weak.

Nervous System - Pupils were unequal and irregular. There was marked muscular tremor and incoordination present. The tendon reflexes were exaggerated and unequal. Rombergism was present.

Blood Report.

Wassermann - + + +

C.S.F. Report.

Wassermann - + + +

Colloidal Gold - 555,555,321,00.

Pandy's Test - + + +

Total Protein - 78 mgms. per 100 c.c.

Cell Count - 46 per cmm.

Treatment and Progress - 5 c.c. malarial blood were injected intramuscularly and, in about ten days' time rigors were occurring. By the end of the ninth his condition was rather weak, therefore quinine was administered to cut short the attacks. He was debilitated for some time then began to improve physically but there was no accompanying mental change. He became demented rapidly and became dirty and untidy in his habits. After this his condition continued to deteriorate steadily and, for several weeks before death, cerebral seizures were frequent.

Cause of Death - (a) General Paralysis.

Case No.46. (D.V.)Type - Demented.Age - 39.Married.Occupation - Maltman.State on Admission.-

Mental - He was dull, apathetic and took no interest in himself or his surroundings. Considerable confusion was noticeable and he was disorientated for time and place. He expressed no delusions and no hallucinations were elicited.

Physical - General physical state was indifferent.

Nervous - Tremors of the extended fingers were present and fibrillary twitchings of the tongue. Gait was ataxic to a moderate degree. Pupils were small and unequal in size. Accommodation was unimpaired but the pupillary light reflex was very sluggish.

Blood Report.

Wassermann - + + +

C.S.F. Report.

Wassermann - + +

Treatment and Progress - 8 c.c. malarial blood were injected intramuscularly and sixteen days later typical malarial attacks developed after several prodromal elevations of temperature for a few days before. He had eight rigors - quotidian in type - and no cause for undue alarm had arisen until the last when he complained of pain in his chest and cough. Temperature continued to remain elevated (See Chart) and examination of the chest demonstrated the presence of bronchopneumonia. His condition became rapidly worse and he died the following day.

Causes of Death - (a) General Paralysis. (b) Bronchopneumonia - Acute.

Malarial/

RESULT

CENTIGRADE SCALE.

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N^o 31

CASE BOOK N°

PAGE

DISEASE

RESULT

~~State~~ ~~File~~ Case No. 46 (D.V.).

AGE 39.

~~OCCUPATION~~

Prot-

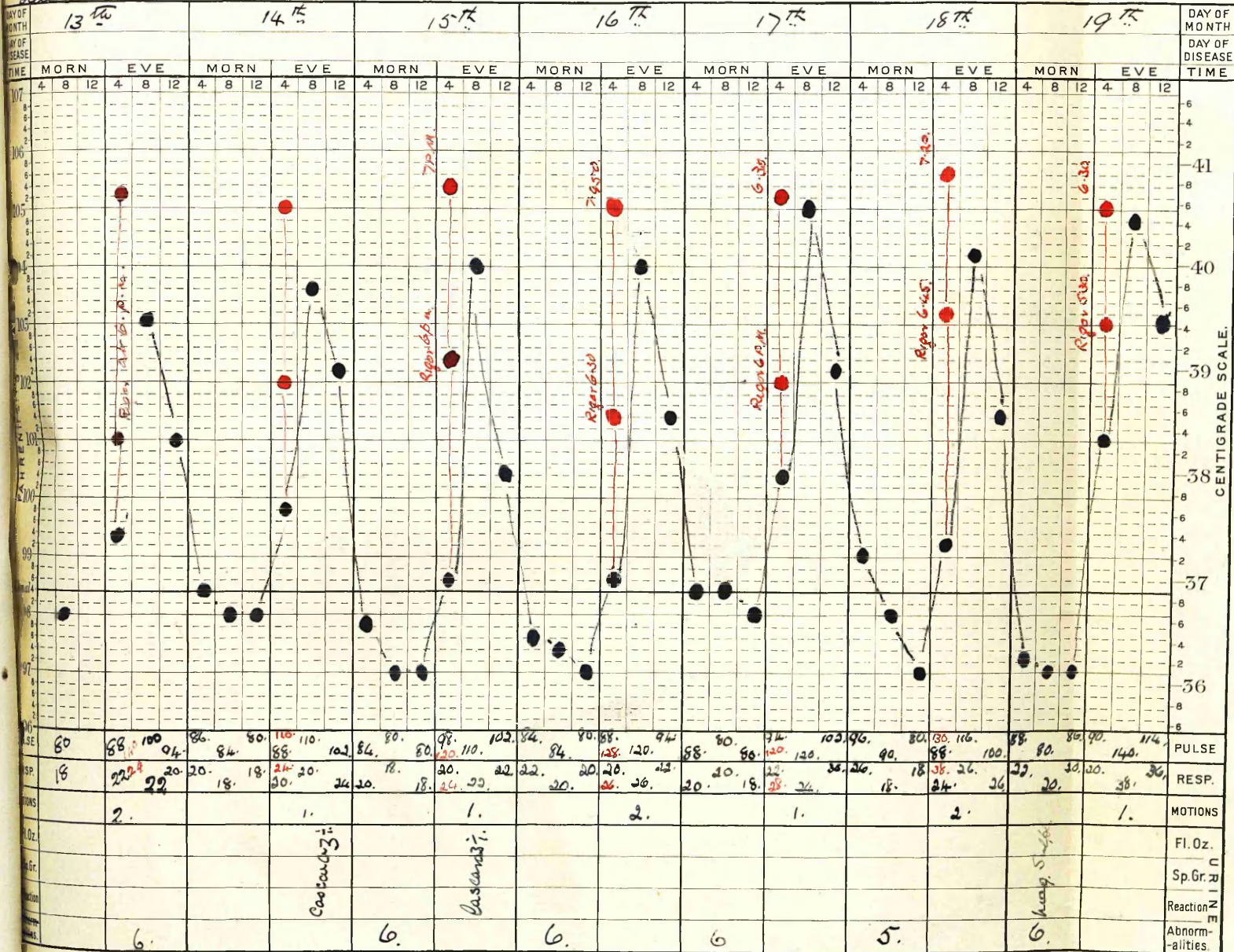
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SE, BOOK N: September 1931.

PAGE

DISEASE

RESULT



MARKS.

Inj. malarial Blood S.C. given intramuscularly: 27. 11. 31.

NAME & ADDRESS

~~Quint~~ ~~V. 11~~ Case No 46 (D.V.).

AGE 39.

~~OCCUPATION~~

Pro-

SE BOOK NO *December,* PAGE *1031*

DISEASE

RESULT

[illegible]

MARKS

Inj: malarial Blood S.C. given intramuscularly: 27. 11. 31.

Malarial Therapy.Conclusions.

- (a) Recovery is to be expected in a fairly high percentage of the cases treated. In this case, of those treated, twenty-nine per cent recovered from their symptoms and were discharged from the hospital.
- (b) Improvement takes place in a percentage of cases. The percentage in this case was thirtysix which is considerably higher than the percentage of improvements in either of the preceding methods of treatment. From this, it is to be expected that the percentage of recoveries and improvements taken together will be greater than in Tryparsamide Therapy, or in Tryparsamide Therapy associated with treatment by Metallic Bismuth.
- (c) No Improvement occurs in a certain number of cases. Of those treated fourteen per cent were unimproved. Of course, it must always be borne in mind that, in an unselected series of cases, such as this - there are certain cases in which, the disease being too far advanced or the patient being debilitated the chances of recovery are, at best, slender. Be that as it may, it will be observed that the percentage of cases unimproved is considerably less than in either of the preceding methods of treatment.
- (d) Death in one case (No.46) was undoubtedly precipitated by the malarial treatment but in neither of the other cases was death hastened by treatment as the disease merely progressed along its ordinary lines.
- (e) Age - From the results obtained in this series it would appear that the older patient benefitted more by treatment than the younger because, in this case, the average age of those who recovered was 45, of those who/

who were relieved and not improved 35, and of those who died 38.

- (f) Type - Again it is clearly seen that the expansive type of General Paralysis is most likely to derive benefit from treatment. Seventy-five per cent of the recoveries in this series were of that nature while in those relieved eighty per cent suffered from this particular form of the disease.
- (g) Blood and Cerebrospinal Fluid - Change in the serological reactions is not to be expected in many cases.
From Table No.3 it will be seen that only in a few cases was there any change and in one case only did the blood Wassermann become negative.
- (h) Complications may be expected but do not occur in many cases.
 - (1) Acute Excitement may arise during the attacks of pyrexia as was demonstrated in one case (No.38).
 - (2) Death may be hastened. This occurred in one case.
 - (3) The fever itself may cease spontaneously before the patient has had his quota of rigors. This, in itself, is not of immediate import as far as the life of the patient is concerned, but is unfavourable from the point of view of ultimate recovery.

(d) CASES TREATED WITH MALARIA, TRYPARSAMIDE AND BISMUTH.

Table No.4 illustrates the results in general obtained from the use of malaria, followed by Tryparsamide and Bismuth treatment. A series of twelve cases was treated and, of those, eight were discharged as recovered, two were improved or had the progress of their malady arrested and two showed no improvement. Patients treated by this method show:-

Recovered.	...	67%
Relieved.	...	17%
Not Improved.	...	17%
Deaths	...	—

The average age of those who recovered was 38, and of those who were relieved and not improved 31.

In a few cases only was there any change in the Wassermann Reactions of the blood and cerebrospinal fluid.

TABLE NO.4.CASES TREATED WITH MALARIA, TRYPARSAMIDE AND BISMUTH.

CASE.	AGE.	TYPE.	WASSERMANN.		RESULT.
			Before Treatment.	After Treatment.	
Still in Institution.			Blood. +	+	
47.J.R.A. 27.		Expansive.	C.S.F. +	+	Relieved.
			Blood. +++	++ - +++	
48.D.F.G. 28.		Expansive.	C.S.F. —	—	Relieved.
			Blood. +	—	
49.F.J. 32.		Demented.	C.S.F. +	+	Not Improved.
			Blood. +++	+	
50.J.D.P. 37.		Demented.	C.S.F. +++	++	Not Improved.
Discharged.			Blood. +++	++	
51.A.B. 37.		Depressed.	C.S.F. —	—	Recovered.
			Blood. ++	+ / —	
52.F.C. 39.		Depressed.	C.S.F. —	—	Recovered.
			Blood. ++	+	
53.B.I.D. 30.		Expansive.	C.S.F. +	+	Recovered.
			Blood. —	—	
54.W.N. 32.		Expansive.	C.S.F. +++	++	Recovered.
			Blood. +	+ + ++	
55.J.O. 48.		Demented.	C.S.F. ++	++	Recovered.
			Blood. —	—	
56.C.Q. 47.		Depressed.	C.S.F. +	+ / —	Recovered.
			Blood. +	+	
57.J.R. 36.		Expansive.	C.S.F. +	+	Recovered.
			Blood. +++	++	
58.W.R.S. 38.		Demented.	C.S.F. +	+	Recovered.

Case No.47.(J.R.A.)Type - Expansive.Age - 27.Married.Occupation - Brewery
Labourer.State on Admission.

Mental - Intellectually he was much enfeebled and his memory was poor, he was coherent but his powers of comprehension were poor and there was some slight confusion. He was mildly exalted and expressed delusions of grandeur and power. He stated that he had been given a warrant to arrest any person he chose and also that he was an exceptionally skilful boxer. Irritability was well-marked and he threatened to attack the nurses if not at once released. There was much motor restlessness.

Physical - General physical condition was indifferent.

Nervous System - Gait was slightly ataxic and there was slurring of speech. Pupils were medium in size but slightly unequal. Accommodation was present but the reaction to light was very sluggish. The abdominal reflexes were present, the plantar was flexor and the knee jerks were brisk.

Blood Report.

Wassermann	-	+
------------	---	---

C.S.F. Report.

Wassermann	-	+
------------	---	---

Gold Sol.	-	0111000,000.
-----------	---	--------------

Cell Count	-	1 per cmm.
------------	---	------------

Treatment and Progress - 5 c.c. malarial blood were injected intramuscularly and, after ten days, rigors began. They were of the typical benign tertian variety and the temperature ranged from 103°F to 105°F. His strength was well maintained throughout the course and at the end of twelve rigors quinine was administered. A course of tryparsamide and bismuth was then instituted. Within/

Within three months some improvement was present in that his grandiose delusions were absent and his irritability was less marked. A considerable degree of mental enfeeblement, however, remained.

Present State - He is mentally enfeebled but is a useful routine worker and is quite incapable of doing anything on his own initiative. His physical health is good. No change has occurred in the Wassermann Reactions of the blood or cerebrospinal fluid.

Case No. 48. (D.F.G.)

Type - Expansive.

Age - 28.

Single.

Occupation - Footman.

History - In 1918 patient had influenza followed by pneumonia and ever since he had had headaches and, in fact, had never been quite well. He had had several attacks of depression and was not to be trusted. He had moments of aberration. For two months prior to admission he had been lost, during which time he had stayed in Edinburgh but had kept away from home.

State on Admission.

Mental - Intellectually he was somewhat enfeebled, his memory was impaired and his powers of comprehension were poor. His reasoning power was poor and there was some blunting of consciousness. No delusions were expressed and no hallucinations were elicited but he was extremely elated and euphoric. It gave him pleasure to describe his doings, and his work with certain people in whose service he had been, but the tales he told were highly coloured and an exaggerated sense of his own importance was dominant in them all.

Physical - General physical condition was weak.

Nervous System - Pupils were equal, contracted, of irregular outline and reacted only slightly to light and accommodation was sluggish. Tendon jerks were grossly exaggerated and ankle clonus was present. Speech was slightly/

Case No. 48 (D.F.G.)

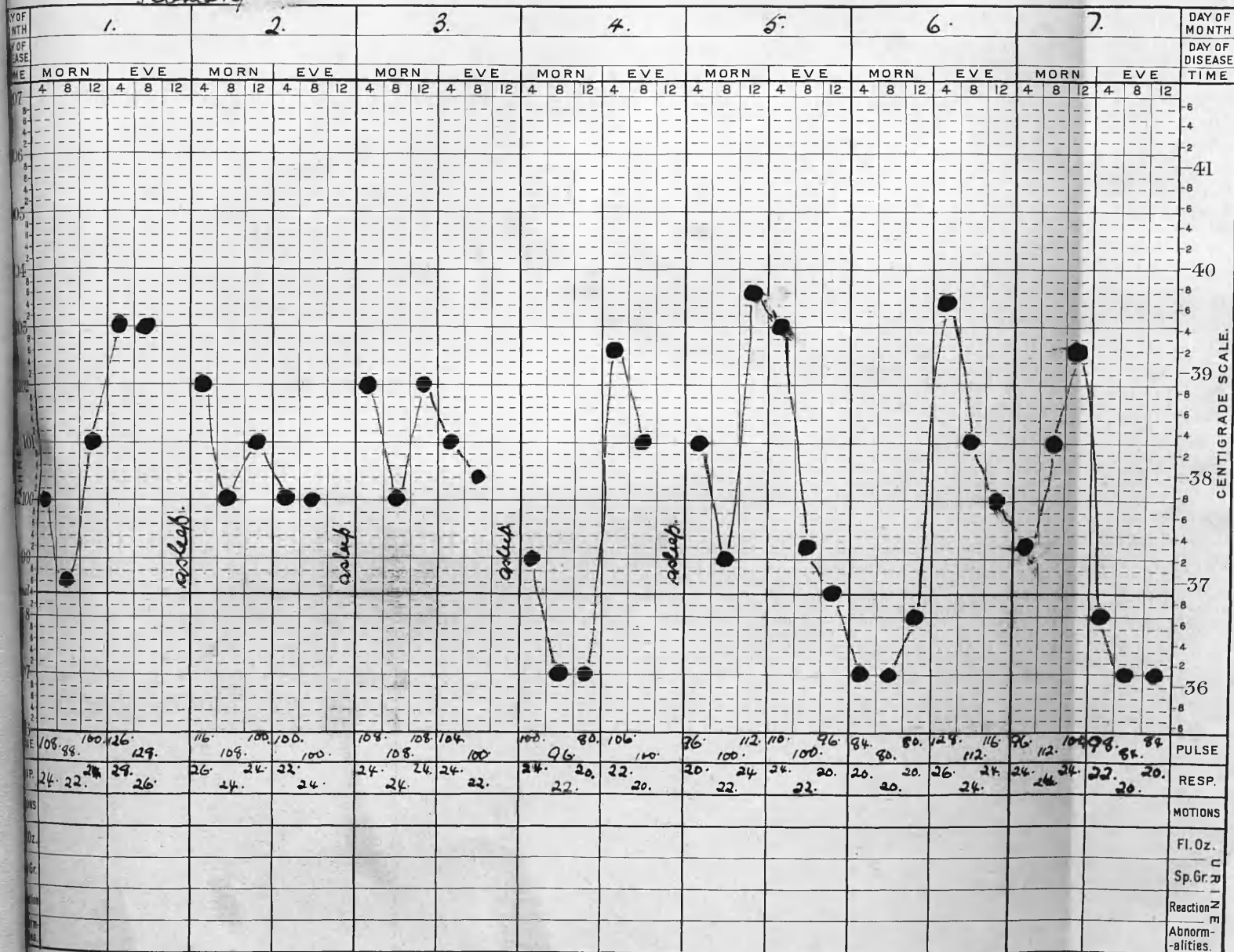
AGE 28. OCCUPATION

SF BOOK N°

PAGE

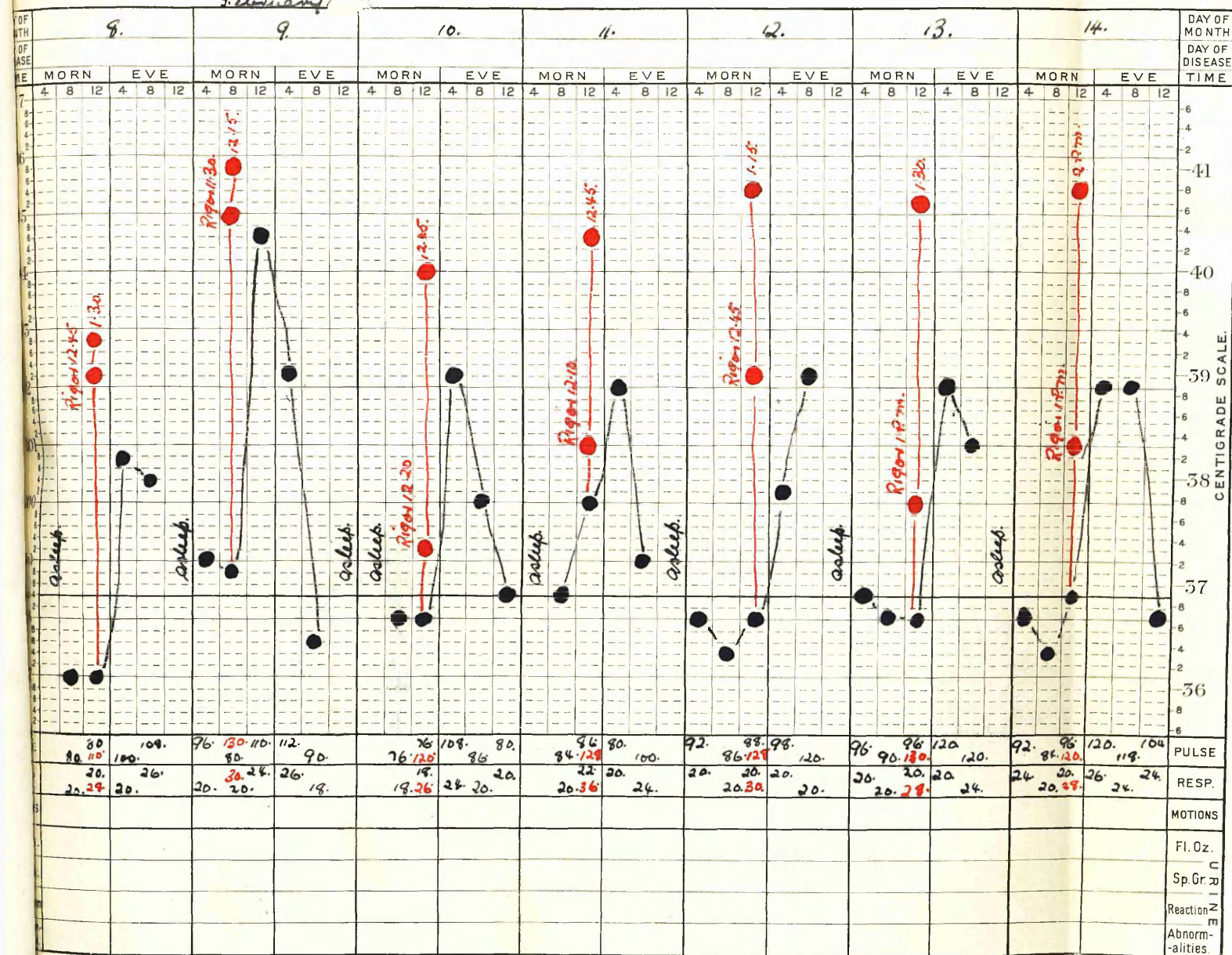
DISEASE

RESULT



MARKS

Spec. Malarial Blood 4.c.c. 2 7 1777



Inf. Material Blood. 4. C.C.

NAME & ADDRESS *Case No 48 (D.F.G.).*

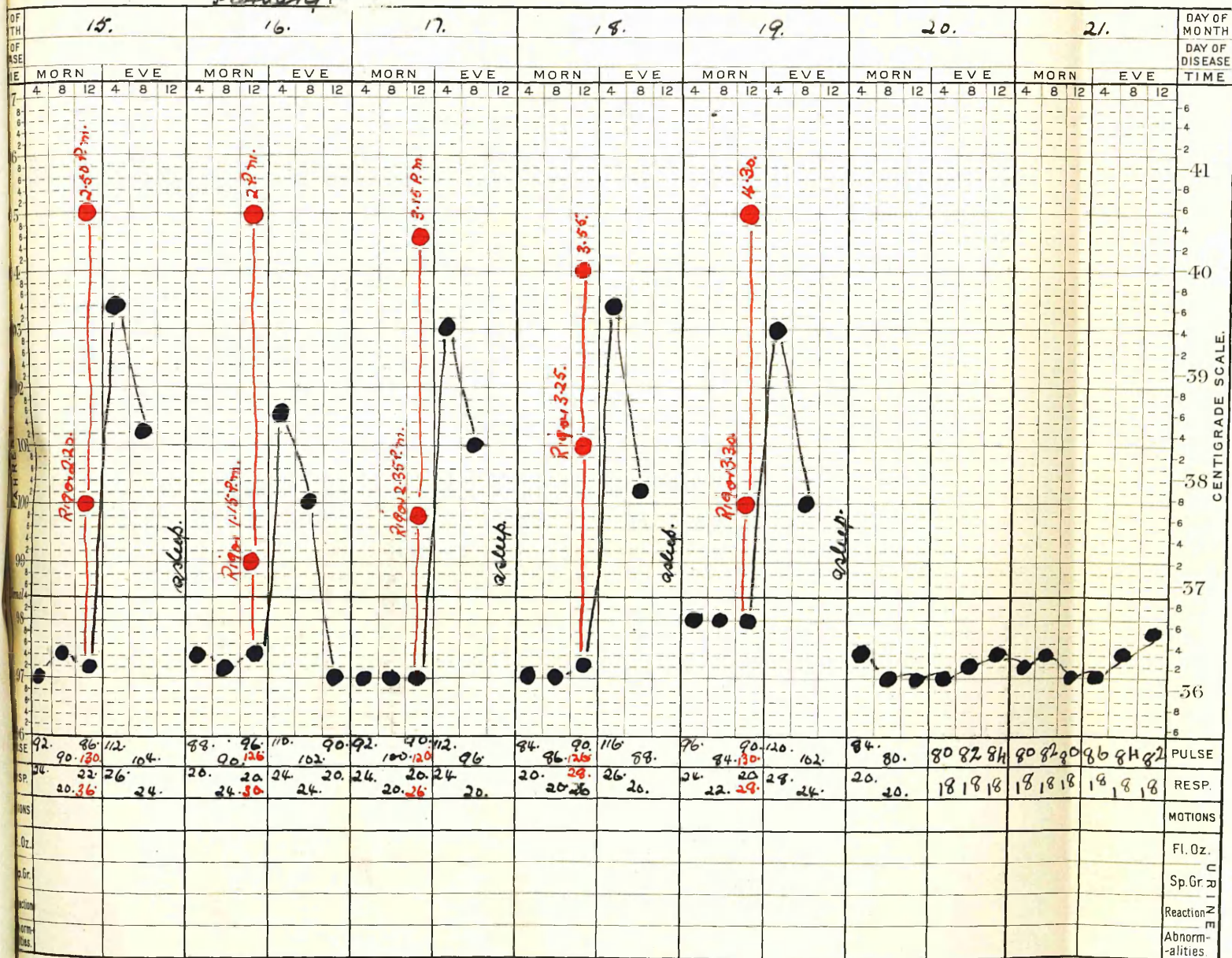
AGE *28.* OCCUPATION

BOOK NO

PAGE

DISEASE

RESULT



MARKS

Quinine mist 3ss. T.I.D. 19 - 21

Inf. Malarial Blood & C.C. 21 - 22

slightly slurring and gait was slightly ataxic. Coordination of arms and legs was fairly good and Rombergism was slight. Fine tremors of lips, tongue and fingers were present.

Blood Report.

Wassermann - +++

C.S.F. Report.

Wassermann - —

Colloidal Gold - 122,210,000,00.

Pandy's Test - +/— (a faint trace).

Total Protein - 40 mgms. per 100 c.c.

Cell Count - 1 per cmm.

Treatment and Progress - 4 c.c. malarial blood were injected intramuscularly and after ten days he began to have daily elevations of temperature without having rigors. The temperature reached as high as 103.6°F. during this time. This continued for a week after which he had a series of twelve rigors. (See Chart.) The highest point reached by the temperature was 105.8°F. A course of tryparsamide and bismuth therapy was instituted and, after a rest period of one month, another was given. The blood and cerebrospinal fluid were then again examined.

Blood Report.

Wassermann - ++ to +++

C.S.F. Report.

Wassermann - —

Colloidal Gold - 122,222,110,00.

Pandy's Test - Negative.

Total Protein - 30 mgms. per 100 c.c.

Cell Count - 1 per cmm.

Mentally and physically some improvement took place.

He/

He was bright, cheerful and his memory was better. He was, however, rather restless and unsettled at times. Muscular coordination was improved.

Present State - He is still mildly exalted, but is pleasant, behaves and converses rationally and is a very useful and willing worker in the Ward.

Case No.49. (F.J.).

Type - Demented.

Age - 32.

Single.

Occupation - Rubber-Worker.

State on Admission.

Mental - He was much enfeebled, facile, pleasant and very childish in behaviour. He had no power of voluntary attention but flitted from one thing to another and showed his powers of comprehension to be very poor. There was partial disorientation for time and place.

Physical - General physical condition was indifferent.

Nervous System - The speech was slurring and there was spasmodic twitching of the muscles of the neck and chest and tremor of the tongue. The knee jerks and ankle jerks were exaggerated.

Blood Report.

Wassermann - +

C.S.F.Report.

Wassermann - +

Gold Sol Test - 3555310000.

Cell Count - 45 per cmm.

Treatment and Progress - He was treated initially with Malaria and had a series of twelve rigors after which quinine was administered. The only complication to the malarial treatment was an attack of retention of urine which lasted for a few days. A course of tryparsamide and bismuth was next administered and after a period of rest a second was given. The blood and cerebrospinal fluid were again examined.

Blood/

Blood Report.Wassermann - ~~+~~C.S.F. Report.

Wassermann - +

Gold Sol Test - 1233100000.

Cell Count - 9 per cmm.

In spite of treatment little or no change was noted in his mental condition. His physical health was improved.

Present State - He is a quiet, placid, elated and euphoric individual, showing much mental enfeeblement.

Case No. 50 (J.D.P.)Type - Demented.Age - 37.Married.Occupation - Pedlar.

History - Wife stated that, for over a year, he had complained of pain in his head and, lately, had been excited and exalted. He was continually singing and speaking about the money he intended to make. He was very emotional and became depressed if interfered with.

State on Admission.-

Mental - His affective state was one of apathy but, at times, he became mildly exalted and euphoric. Those latter moods, however, were not of long duration, and he rapidly became apathetic and depressed again. He displayed much mental enfeeblement and powers of comprehension were very poor. Consciousness was considerably blunted.

Physical - General physical condition was poor.

Nervous System - Speech was slow and halting and fibrillary twitchings of the tongue were present. Pupils were medium in size but the pupillary light reflex was sluggish. Knee jerks were weak.

Blood Report.

Wassermann/

Wassermann - + + +

C.S.F. Report.

Wassermann - + + +

Colloidal Gold - 455,555,532,10.

Pandy's Test - + + +

Total Protein - 85 mgms. per 100 c.c.

Cell Count - 33 per cmm.

Treatment and Progress - 8 c.c. malarial blood were injected intramuscularly and patient had a series of twelve rigors. Afterwards tryparsamide and bismuth were administered when the blood and cerebrospinal fluid were again examined. The blood Wassermann Reaction was now positive, that of the cerebrospinal fluid, double positive.

No improvement resulted from treatment. His mental state deteriorated - he became much more incoherent, confused and dirty and untidy in his habits. His physical condition deteriorated also.

Present State - He is a dirty, untidy dement, confined to bed and requiring continuous supervision and nursing.

The following eight cases were treated in a similar fashion as the foregoing and were all so improved as to be discharged recovered.

Case No. 51 (A.B.)

Type - Depressed.

Age - 37.

Married.

Occupation - Labourer.

State on Admission.

Mental - He was excited, noisy and expressed very exalted ideas. He was irritable and truculent to anyone who spoke to him and talked excitedly and volubly about his detention. He was extremely suspicious and expressed/

expressed definite delusions of persecution. He stated that everyone was against him, threatened to take his own life and also stated that he would do grievous bodily harm to his own family. He was slightly confused at times, his memory was poor and his powers of comprehension were impaired.

Physical - General physical condition was fair.

Nervous System - His speech was slurring and some degree of ataxia was present. There were fibrillary twitchings of the tongue and coarse muscular tremors of the hands. Pupils were unequal, accommodation was present as was also the pupillary light reflex.

Special Senses - He suffered from interstitial keratitis.

Blood Report.

Wassermann - +++

C.S.F. Report.

Wassermann - —

Treatment and Progress - 3 c.c. malarial blood were injected in this case intravenously but no rigors occurred until eighteen days later. When they did take place they were irregular in their onset, four of them only occurring in the typical tertian fashion. (See Chart.) After the sixth, the infection died out spontaneously. A course of tryparsamide and bismuth injections was then administered.

Improvement was soon observed. Depression, irritability and delusions vanished but there was left some residual enfeeblement of a slight nature. The physical signs rapidly improved.

State on Discharge - Mental signs and symptoms were absent, slight enfeeblement only remaining. Physical signs were much improved. The blood Wassermann had now changed from triple to double positive.

June, 1932. PAGE

DAY OF MONTH		DAY OF DISEASE		TIME		CENTIGRADE SCALE		PULSE		RESP.		MOTIONS		FL. Oz.		Sp. Gr.		Reaction		Abnormalities			
MORN		EVE		MORN		EVE		MORN		EVE		MORN		EVE		MORN		EVE		MORN		EVE	
4	8	12	4	8	12	4	8	12	4	8	12	4	8	12	4	8	12	4	8	12	4	8	12
4	8	12	4	8	12	4	8	12	4	8	12	4	8	12	4	8	12	4	8	12	4	8	12
4	8	12	4	8	12	4	8	12	4	8	12	4	8	12	4	8	12	4	8	12	4	8	12
4	8	12	4	8	12	4	8	12	4	8	12	4	8	12	4	8	12	4	8	12	4	8	12
4	8	12	4	8	12	4	8	12	4	8	12	4	8	12	4	8	12	4	8	12	4	8	12
4	8	12	4	8	12	4	8	12	4	8	12	4	8	12	4	8	12	4	8	12	4	8	12
4	8	12	4	8	12	4	8	12	4	8	12	4	8	12	4	8	12	4	8	12	4	8	12
4	8	12	4	8	12	4	8	12	4	8	12	4	8	12	4	8	12	4	8	12	4	8	12
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MARKS.

Intravenous Inj. Malarial Blood 30 c.c. given 18. 5. 32.

NAME & ADDRESS

BOOK NO.

PAGE

DISEASE

AGE

OCCUPATION

RESULT

DAY OF
MONTH
OF
YEAR

2

~~Ab...~~

3

Case No 51 (A.B.)

39

Prot.

May, 1932.

Tum.

DAY OF MONTH DAY OF DISEASE TIME	31.			1.			2.			3.			4.			5.			6.			CENTIGRADE SCALE.	
	MORN	EVE		MORN	EVE		MORN	EVE		MORN	EVE		MORN	EVE		MORN	EVE		MORN	EVE			
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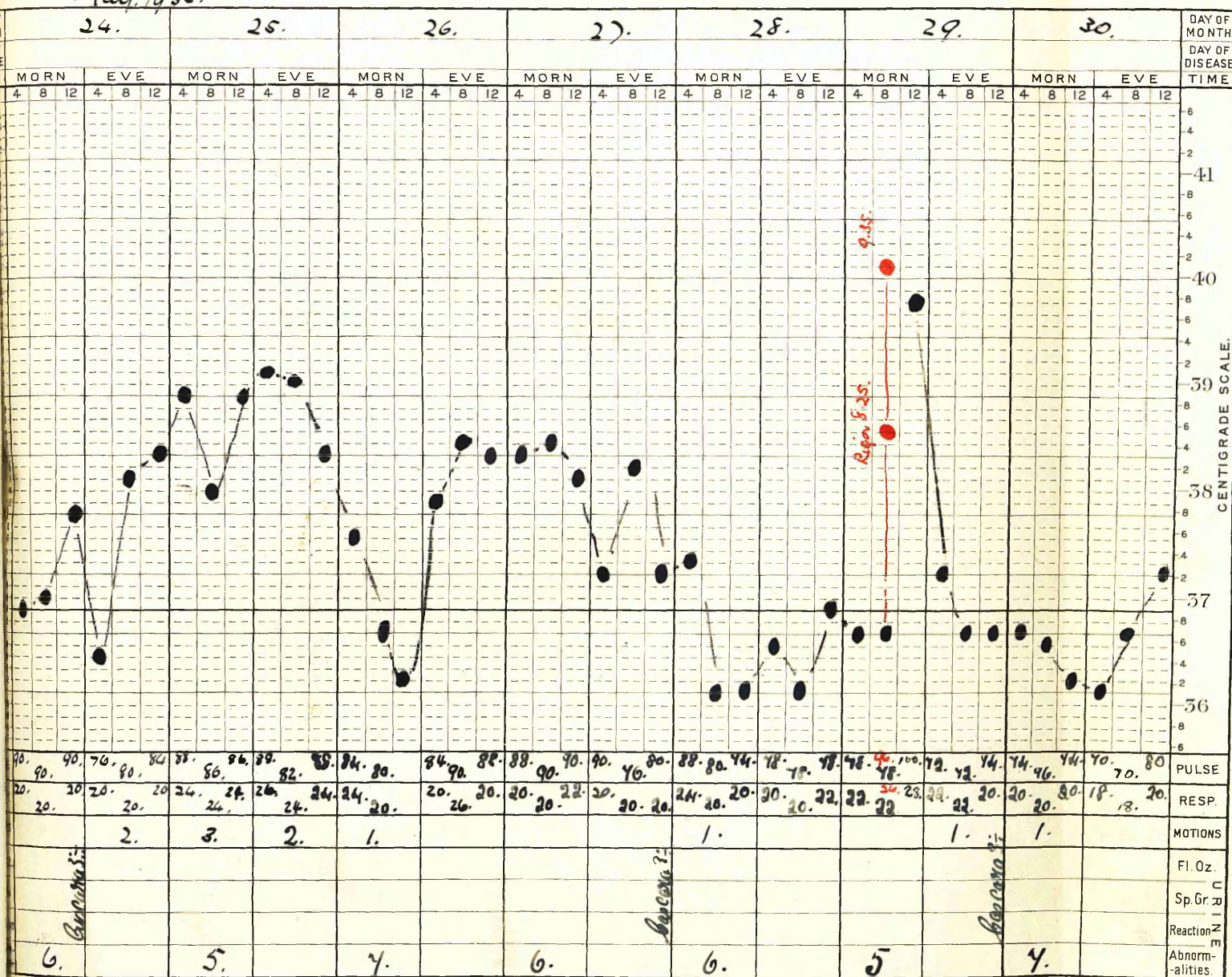
BOOK N°

PAGE

DISEASE

RESULT

DAY OF MONTH
DAY OF DISEASE
TIME



Intravenous Inj. Malarial Blood 3 c.c. given 18.5.32.

Case No.52. (T.C.)Type - Depressed.Age - 39.Single.Occupation - Labourer.State on Admission.

Mental - Some mental enfeeblement was present, memory was impaired and powers of comprehension were very poor. He was morbidly depressed and apprehensive, freely expressing many visceral delusions; he said that his bowels would not act, that he was unable to take food because he had no powers of digestion and that his intestines were diseased. He was hallucinated for hearing, voices accusing him of having committed various crimes. As a result of his delusional ideas, he refused food.

Physical - General physical condition was indifferent.

Nervous System - Slight muscular incoordination was present. Pupils were dilated and equal. Accommodation was present but pupillary light reflex was sluggish.

Blood Report.

Wassermann - ++

C.S.F.Report.

Wassermann - -

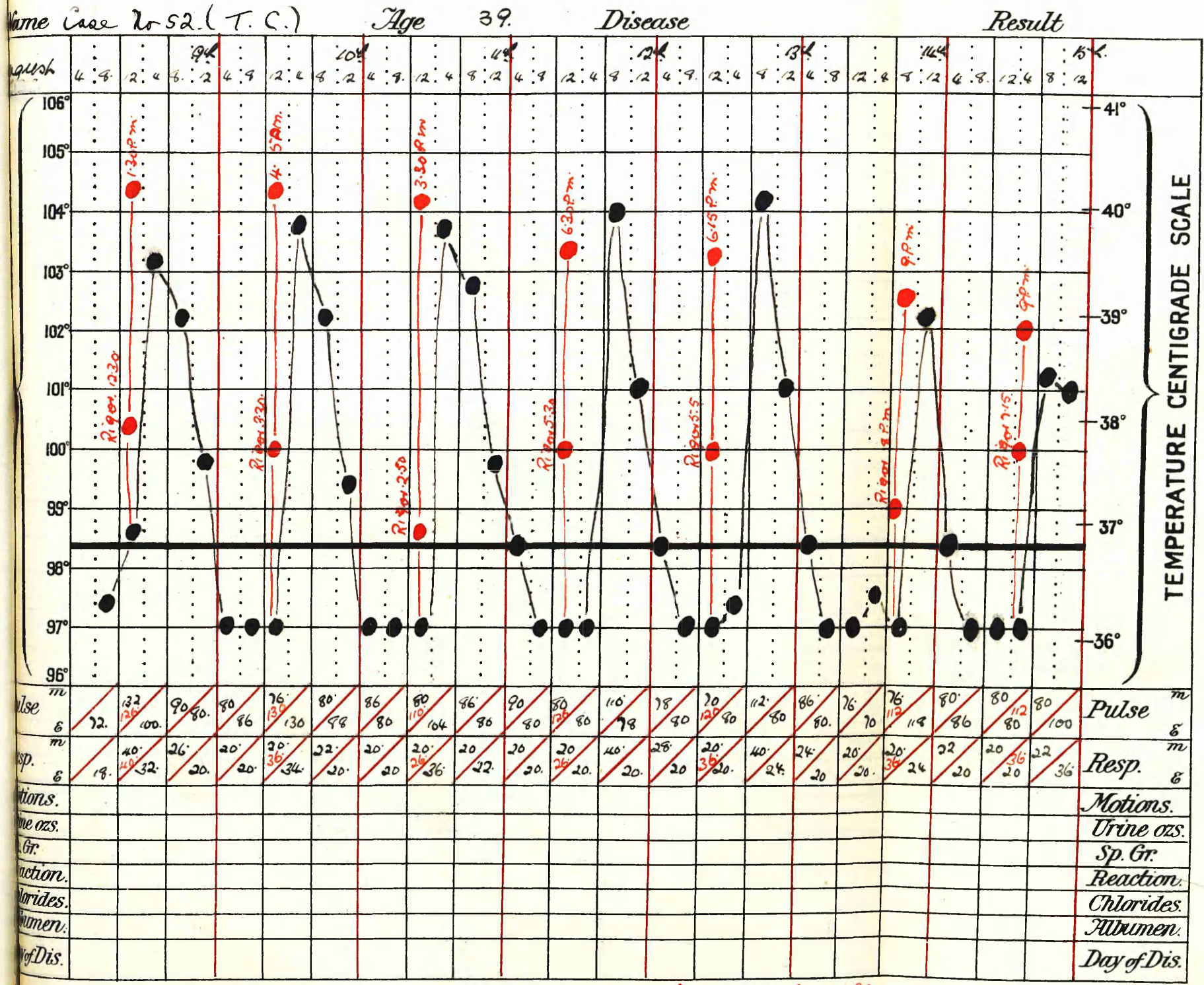
Treatment and Progress - 5 c.c. malarial blood were injected intramuscularly and a series of nine rigors occurred after there had been several prodromal rises of temperature. The highest temperature attained was 104.4°F. (See Chart.) A course of tryparsamide and bismuth metal was next administered.

Within two months there was a very marked improvement in this patient's mental and physical condition. He gave up completely his hypochondriacal, delusional ideas, became brighter, more cheerful and conversed rationally. This improvement was maintained.

State on Discharge - He continued to do well in every way and when he left he was bright, cheerful and rational/

CENTIGRADE SCALE.

Inj. Material Blood 5cc given



Sup. S.C.C. Malarial Blood :

rational in behaviour and conversation, taking a keen interest in all that went on and in the daily newspapers. He was a useful and willing worker. The blood Wassermann was now changed from double positive to positive.

Case No. 53. (B.I.D.)

Type - Expansive.

Age - 30.

Married.

Occupation - Motor Bus Driver.

History - For two years he had been subject to severe headaches but had displayed no mental symptoms till the day before admission. He was all right in the morning when his wife went out, but when she returned in the afternoon he was lying on the floor complaining of severe pain and had the feeling as if something were passing over his head. He then also believed that there was a pool of blood on the stair. He did not sleep at all that night but spent the time striking matches and said he was about to be operated upon.

State on Admission.

Mental - He was acutely excited and exalted, freely expressing many grandiose delusions and suffering from hallucinations of hearing. He was well-pleased with himself and said he and his friends had heaps of money. He had just lent his brother £150,000. Several attacks of maniacal excitement occurred when it was necessary to give him Morphine grs. $\frac{1}{2}$. + Hyoscin. grs. $\frac{1}{100}$ hypodermic-ally.

Physical - General physical state was weak.

Nervous System - There was muscular tremor of the lips, tongue and fingers. There was muscular incoordination of the arms and legs. The tendon reflexes were grossly exaggerated. Rombergism was present. The gait was ataxic.

Blood/

Blood Report.

Wassermann	-	+++
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C.S.F. Report.

Wassermann	-	+++
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Cell Count	-	51 per cmm.
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Globulin	-	+
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Colloidal Gold	-	255,432,100,00.
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Treatment and Progress.- 5 c.c. malarial blood was injected intramuscularly and, after nineteen days, patient had a short rigor followed by a rise of temperature to 104°F. Thereafter he had well marked quotidian rigors with pyrexia, the temperature usually rising to 105°F. He had in all twelve rigors when the attack was terminated by the administration of quinine. He then had a course of tryparsamide in conjunction with Bismuth Metal.

Under treatment the psychosis gradually cleared up leaving some mental enfeeblement.

State on Discharge - Mental symptoms were absent and marked physical improvement had taken place.

Blood Report.

Wassermann	-	+
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C.S.F. Report.

Wassermann	-	+
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Cell Count	-	19 per cmm.
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Case No. 54 (W.N.)Type - Expansive.Age - 32.Married.Occupation - Guide.

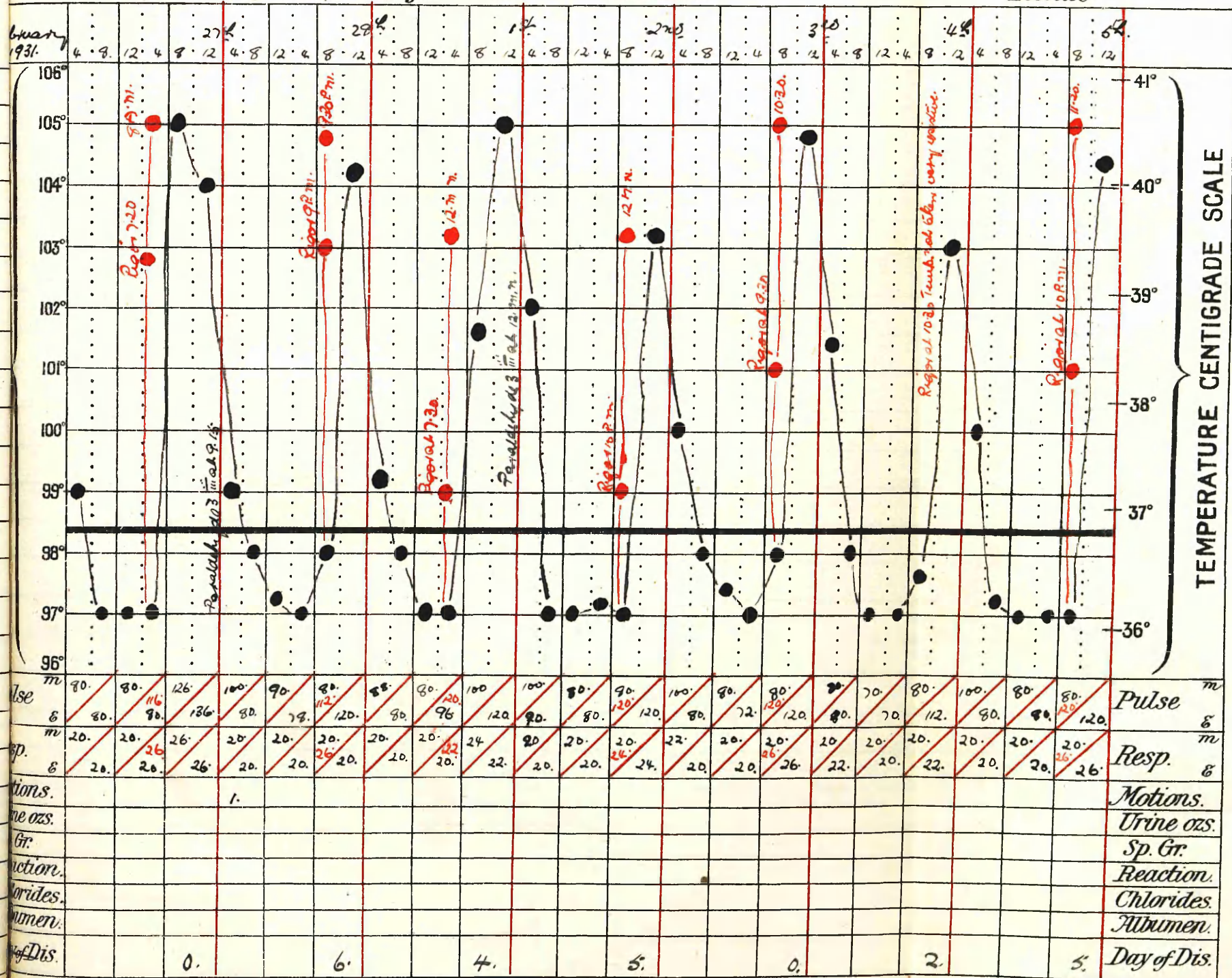
History - Patient had been apparently well till the day before admission when he suddenly began to dance and play the gramophone continuously. Then he became acutely excited, boastful and talkative. He said he was God and proceeded to smash up his home and to assault his wife. She was forced to summon Police assistance/

Name	Case No 54 (W.N.)												Age	32.	Disease												Result											
February 1931.	20th				21st				22nd				23rd				24th				25th				26th													
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106°																													41°									
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98°																																						
97°																																						
96°																																						
TEMPERATURE CENTIGRADE SCALE																																						
Pulse																																						
Resp.																																						
Motions.																																						
Urine ozs.																																						
Sp. Gr.																																						
Reaction.																																						
Chlorides.																																						
Albumen.																																						
Day of Dis.																																						

TEMPERATURE CENTIGRADE SCALE

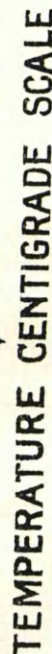
Inf. Malaria Blood 700. given 6:2:31.

Time	Case No.	Age	Disease	Result
	54 (W.N.)	32.		



Inf. natural blood 7.55 given 6:2:31.

Result



Inj. maternal blood 7cc. 6:2:1931.

assistance. He was taken to the Police Office where he proceeded to smash the windows.

State on Admission.

Mental - He was acutely excited and violent, making attempts to attack those around, and expressed grandiose ideas, saying he was God, owned the world and had millions of pounds in gold which he would distribute.

Physical - General physical condition was fair.

Nervous System - Fine tremors of the fingers and fibrillary twitchings of the tongue were present. Pupils were equal, concentric and medium in size. The Argyll-Robertson Reaction was present.

Blood Report.

Wassermann - —

C.S.F. Report.

Wassermann - + + +

Colloidal Gold - 245,555,531,10.

Pandy's Test - + + +

Total Protein - 78 mgms. per 100 c.c.

Cell Count - Valueless owing to presence of red blood cells.

Treatment and Progress - 7 c.c. malarial blood were injected intramuscularly and, after eighteen days, quotidian rigors were instituted. Previous to this there were several prodromal elevations of temperature. He was allowed to have twelve after which quinine was administered. The highest elevation of temperature was 106°F. (See Chart.) A course of Tryparsamide and Bismuth injections was next administered.

The improvement in this patient was dramatic and complete. Within a few weeks after the rigors his conversation and behaviour were rational. He became bright, cheerful and worked well for the remainder of his stay.

State/

State on Discharge - Mental symptoms were absent and his physical health was very good. Cerebrospinal fluid Wassermann had now changed from triple to double positive.

Case No.55 (J.O.)

Type - Demented.

Age - 48.

Married.

Occupation - Traveller.

History - His wife stated that, about three years ago, he became careless about his personal habits and began to talk of great wealth, imagining himself to be a Lord. His walking became unsteady but his habits improved. Of late his habits had been becoming worse and his general condition weaker.

State on Admission.-

Mental - He was markedly enfeebled, incoherent and confused and was disorientated for time and place. He was unable to attend to ordinary wants and was very dirty and untidy in his habits.

Physical - General physical condition was poor.

Nervous System - Pupils were equal, regular, medium in size and accommodation was present. The reaction to light was sluggish.

Blood Report.

Wassermann	-	+
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C.S.F.Report.

Wassermann	-	+
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Gold Sol Test	-	4433106000.
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Globulin	-	No increase.
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Cell Count	-	6 per cmm.
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Treatment and Progress - 8 c.c. malarial blood were injected intramuscularly and, after three weeks, he had a series of nine benign tertian rigors. The highest elevation of temperature was 103.8°F. A course of tryparsamide and bismuth was then given.

Improvement slowly took place. He began to talk/

talk and behave rationally and was interested in himself and his surroundings. His habits became clean and tidy and his physical health became stronger.

State on Discharge - Except for some enfeeblement of mind, mental symptoms were absent and his physical health was good. The blood Wassermann was now positive to double positive, the cerebrospinal fluid Wassermann remained unchanged.

Case No.56. (C.Q.)

Type - Depressed.

Age - 47.

Married.

Occupation - Labourer.

State on Admission.-

Mental - He was morbidly depressed, dull and apathetic, taking no interest in himself or in his surroundings. There was slight confusion present and consciousness was blunted.

Physical - General physical state was indifferent.

Nervous System - Pupils were medium in size and equal, accommodation was present but the reaction to light was very sluggish. Knee jerks were exaggerated.

Blood Report.

Wassermann - -

C.S.F.Report.

Wassermann - +

Treatment and Progress - 5 c.c. malarial blood were injected intravenously and twenty one days later rigors began but, before this, there were several elevations of temperature. (See Chart.) Eleven rigors were allowed in all but those occurred at irregular intervals. (See Chart.) Afterwards a course of tryparsamide and bismuth was administered.

Improvement occurred shortly after the malarial bouts had been terminated and all symptoms and signs gradually disappeared.

State/

Result

TEMPERATURE CENTIGRADE SCALE

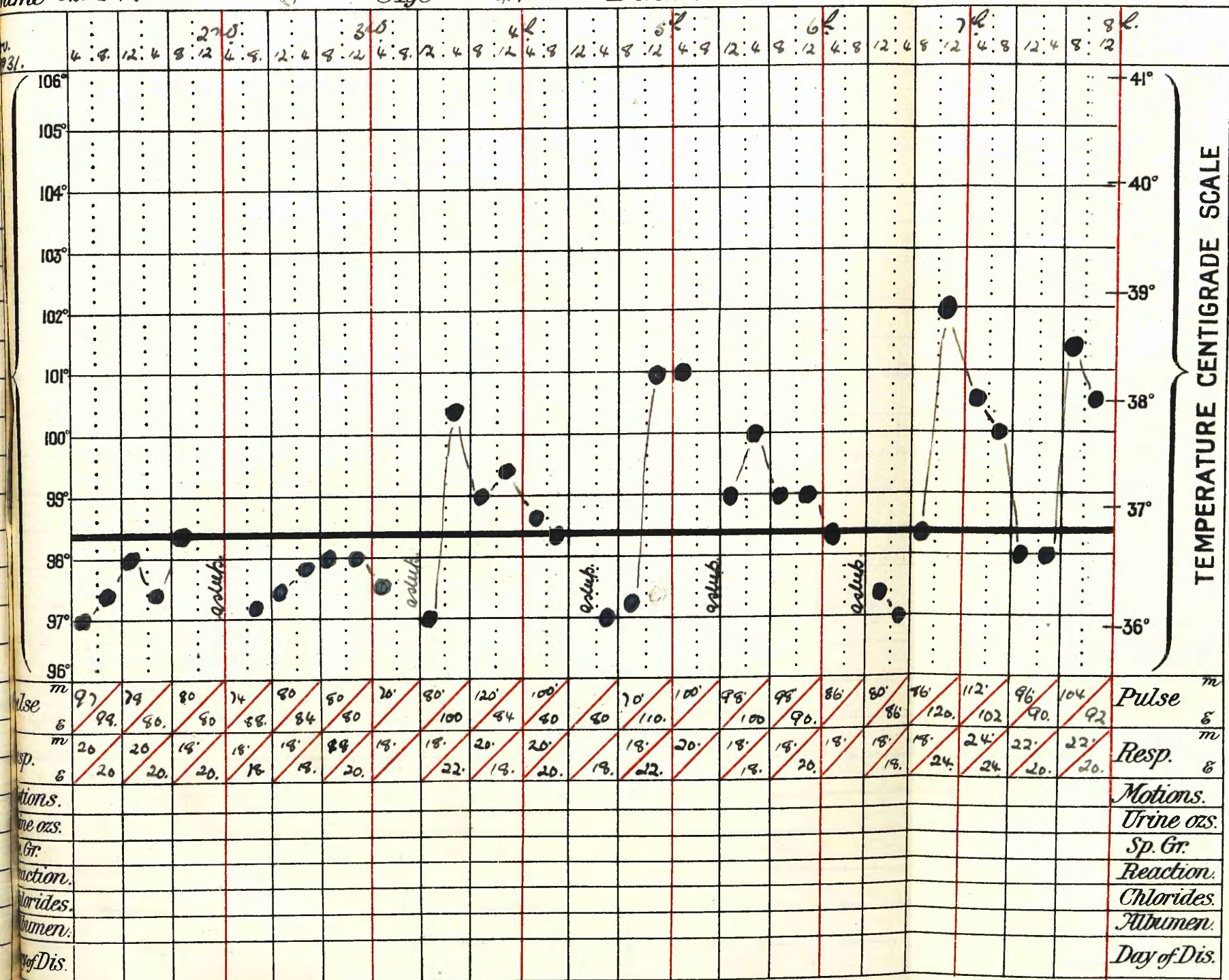
Name Case No. 56 (C. Q.)

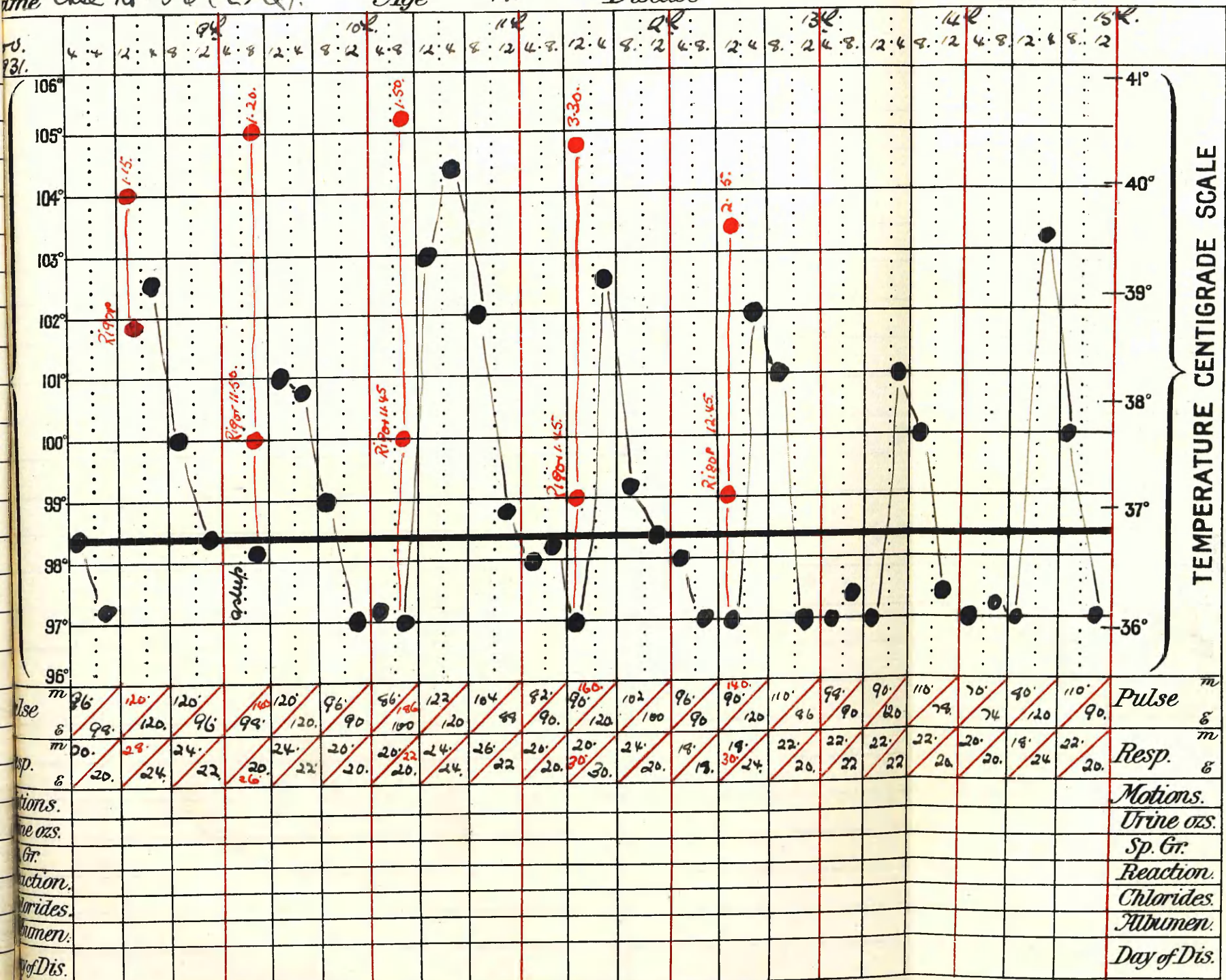
Age

47.

Disease

Result





Result

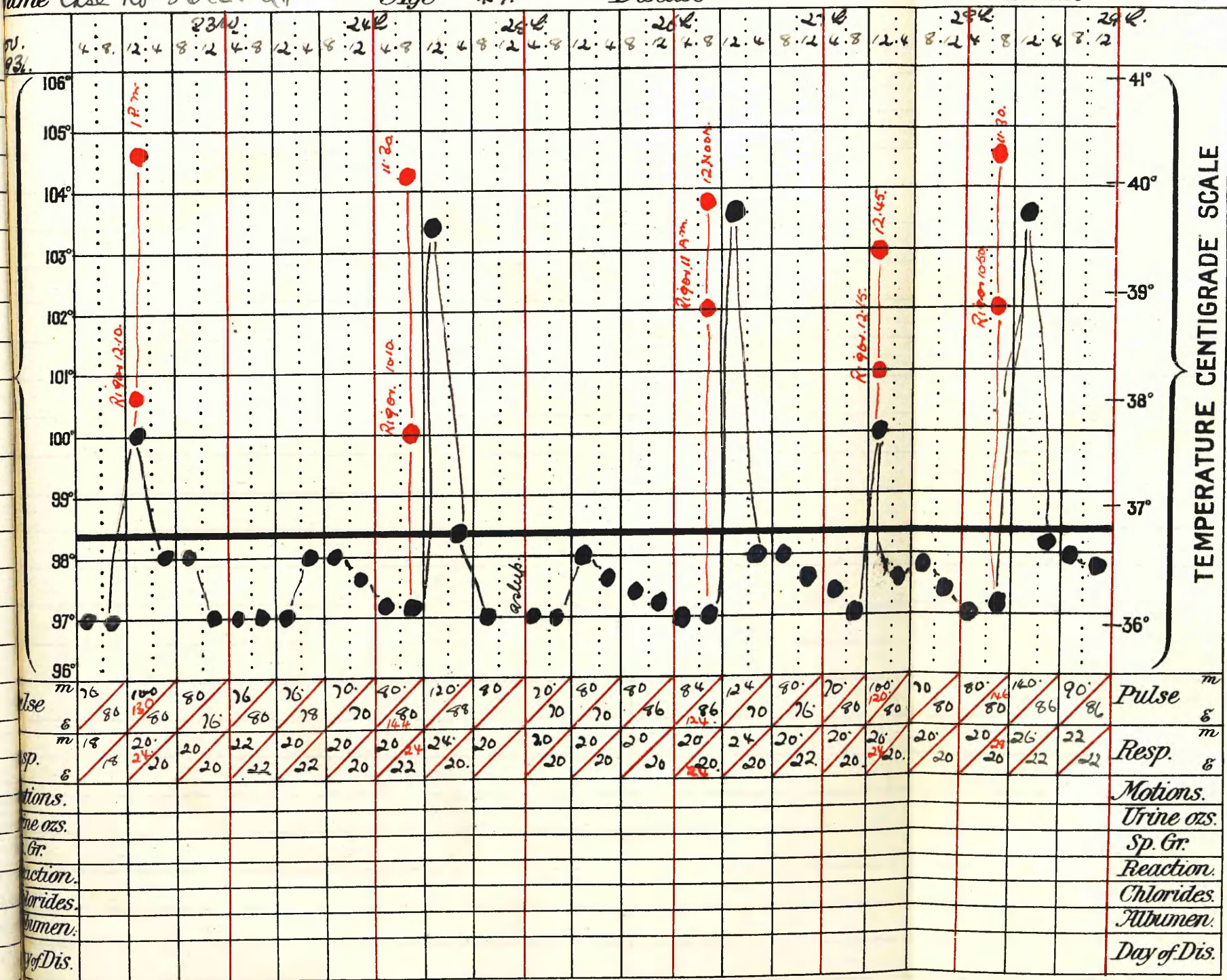
TEMPERATURE CENTIGRADE SCALE

Name Case No 56 (C. Q.)

Age 47.

Disease

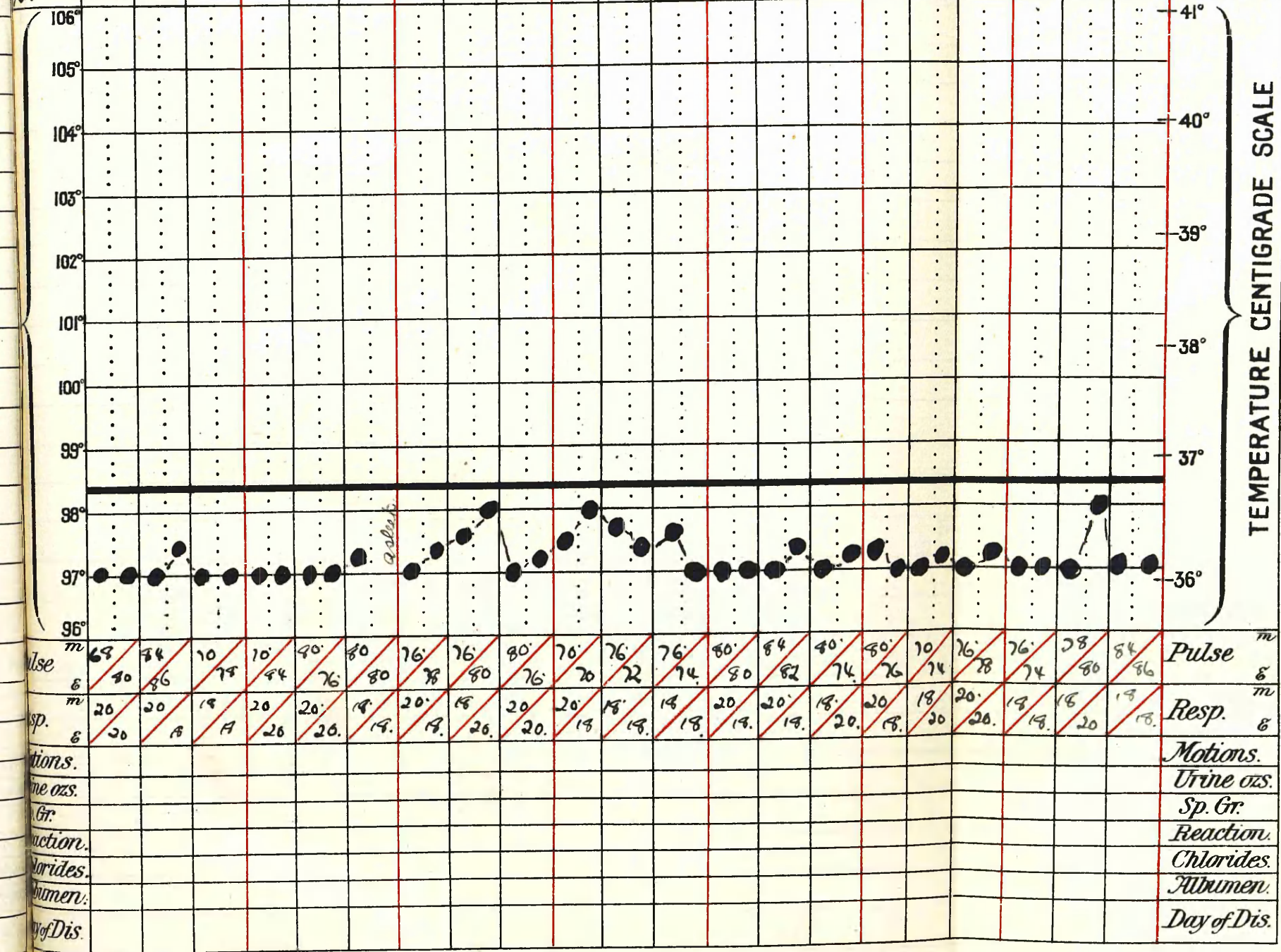
Result



Result

u 304.
931.

Decr. 1931.



State on Discharge - He was bright, cheerful but a little enfeebled. Physical condition was very good.

Case No.57. (J.R.)

Type - Expansive.

Age - 36.

Married.

Occupation - Ship Steward.

History - He had been a steward on the Mauretania but was reduced for disobedience. A month before admission he became very excited and said he was going on the stage. He sang and behaved very foolishly and said he must buy a car because he had just been given £8000. He was in the habit of drinking three bottles of whisky a week.

State on Admission -

Mental - He was very happy and hilarious, euphoric and was well pleased with his surroundings. He was disorientated for time and place. He imagined he was in Liverpool and thought his wife was also there. Some confusion and incoherence was present.

Physical - General state was weak.

Nervous System - Speech was slurring. Tongue and lips were slightly tremulous. Rombergism was present. Slight incoordination of limbs was present.

Blood Report.

Wassermann - +

C.S.F. Report.

Wassermann - +

Treatment and Progress - 5 c.c. of malarial blood were injected intramuscularly. A series of twelve rigors followed which he stood well. Next a course of tryparsamide and bismuth was given.

Within three months definite improvement was observed. He continued to be mildly elated and excitable but was fairly rational in speech and behaviour.

State/

State on Discharge - All elation, excitement and delusions were absent and he conversed rationally and behaved well. His physical health was also much improved. There was no change in the reactions of the blood or cerebrospinal fluid.

Case No.58. (W.R.S.)

Type - Demented.

Age - 38.

Married.

Occupation - Seaman.

State on Admission.

Mental - He was confused, incoherent and disorientated for time and place. His memory was very poor and he did not appear to have any powers of comprehension. His voluntary attention could not be obtained and he lay in bed tossing restlessly and muttering continuously to himself.

Physical - General physical state was very poor.

Nervous - There was marked twitching of the tongue and coarse tremors of the hands were present. Speech was slurring and his gait was ataxic. Pupils were unequal but regular. Accommodation was present but the light reflex was absent. Knee jerks were weak.

Blood Report.

Wassermann - + + +

C.S.F.Report.

Wassermann - +

Treatment and Progress - 8 c.c. of malarial blood were injected intramuscularly. A few days later he became acutely excited, had attacks of vomiting and very persistent hiccough. The hiccough improved with washing out the stomach and the administration of morphine. Twenty-five days after injection rigors began. He had a series of nine (See Chart) after which the infection began to die out without the administration of Quinine.

In/

October 1931.

DAY OF MONTH	DAY OF DISEASE	TIME	TEMP.	PULSE	RESP.	MOTIONS	FL. Oz.	Sp. Gr.	Reaction	Abnorm.										
26	27	28	29	30	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
8	6	4	2	8	6	4	2	8	6	4	2	8	6	4	2	8	6	4	2	8
06	05	04	03	02	01	00	99	98	97	96	95	94	93	92	91	90	89	88	87	86
8	6	4	2	8	6	4	2	8	6	4	2	8	6	4	2	8	6	4	2	8
06	05	04	03	02	01	00	99	98	97	96	95	94	93	92	91	90	89	88	87	86
8	6	4	2	8	6	4	2	8	6	4	2	8	6	4	2	8	6	4	2	8
06	05	04	03	02	01	00	99	98	97	96	95	94	93	92	91	90	89	88	87	86
8	6	4	2	8	6	4	2	8	6	4	2	8	6	4	2	8	6	4	2	8
06	05	04	03	02	01	00	99	98	97	96	95	94	93	92	91	90	89	88	87	86
8	6	4	2	8	6	4	2	8	6	4	2	8	6	4	2	8	6	4	2	8
06	05	04	03	02	01	00	99	98	97	96	95	94	93	92	91	90	89	88	87	86
8	6	4	2	8	6	4	2	8	6	4	2	8	6	4	2	8	6	4	2	8
06	05	04	03	02	01	00	99	98	97	96	95	94	93	92	91	90	89	88	87	86
8	6	4	2	8	6	4	2	8	6	4	2	8	6	4	2	8	6	4	2	8
06	05	04	03	02	01	00	99	98	97	96	95	94	93	92	91	90	89	88	87	86
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06	05	04	03	02	01	00	99	98	97	96	95	94	93	92	91	90	89	88	87	86
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06	05	04	03	02	01	00	99	98	97	96	95	94	93	92	91	90	89	88	87	86
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06	05	04	03	02	01	00	99	98	97	96	95	94	93	92	91	90	89	88	87	86
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06	05	04	03	02	01	00	99	98	97	96	95	94	93	92	91	90	89	88	87	86
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06	05	04	03	02	01	00	99	98	97	96	95	94	93	92	91	90	89	88	87	86
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06	05	04	03	02	01	00	99	98	97	96	95	94	93	92	91	90	89	88	87	86
8	6	4	2	8	6	4	2	8	6	4	2	8	6	4	2	8	6	4	2	8
06	05	04	03	02	01	00	99	98	97	96	95	94	93	92	91	90	89	88	87	86
8	6	4	2	8	6	4	2	8	6	4	2									

MARKS

Name Cure No. 58 (W.R.S.)

Age 38.

Disease

Result

October. 1931.	10. 4	12. 4	8. 4	4. 8	13. 4	8. 4	10. 4	12. 4	8. 4	11. 4	12. 4	8. 4	13. 4	12. 4	8. 4	14. 4	13. 4	15. 4
106°																		
105°																		
104°																		
103°																		
102°																		
101°																		
100°																		
99°																		
98°																		
97°																		
96°																		
Pulse	70.	90.	98.	80.	86.	100.	100.	100.	96.	80.	86.	88.	98.	90.	90.	86.	86.	90.
Resp.	18.	18.	20.	20.	20.	24.	24.	24.	20.	20.	20.	20.	24.	22.	24.	22.	20.	24.
Motions.																		
Urine ozs.																		
Sp. Gr.																		
Reaction.																		
Chlorides.																		
Albumen.																		
Day of Dis.																		

TEMPERATURE CENTIGRADE SCALE

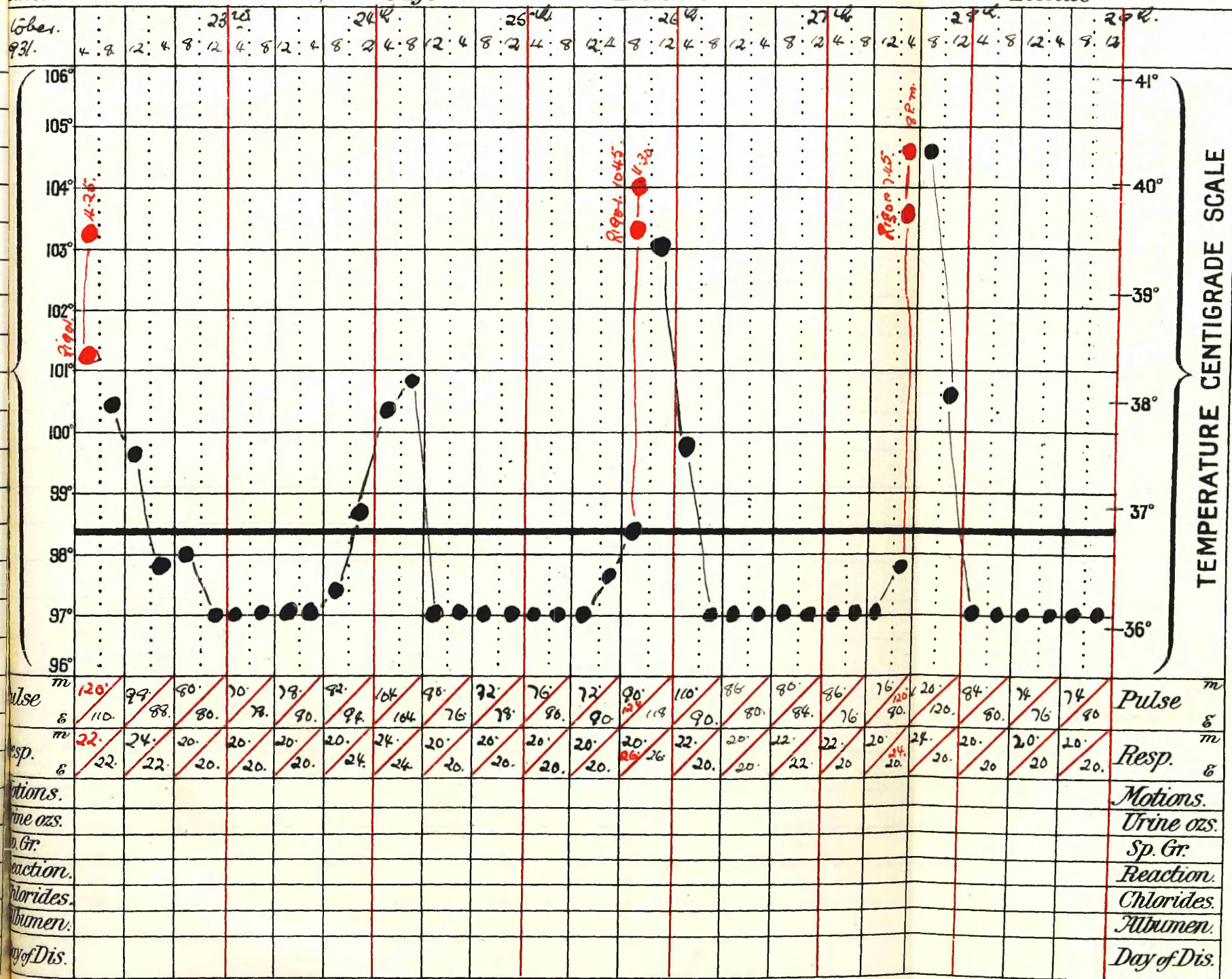
Game Case No. 58 (W.R.S.)

Age 38

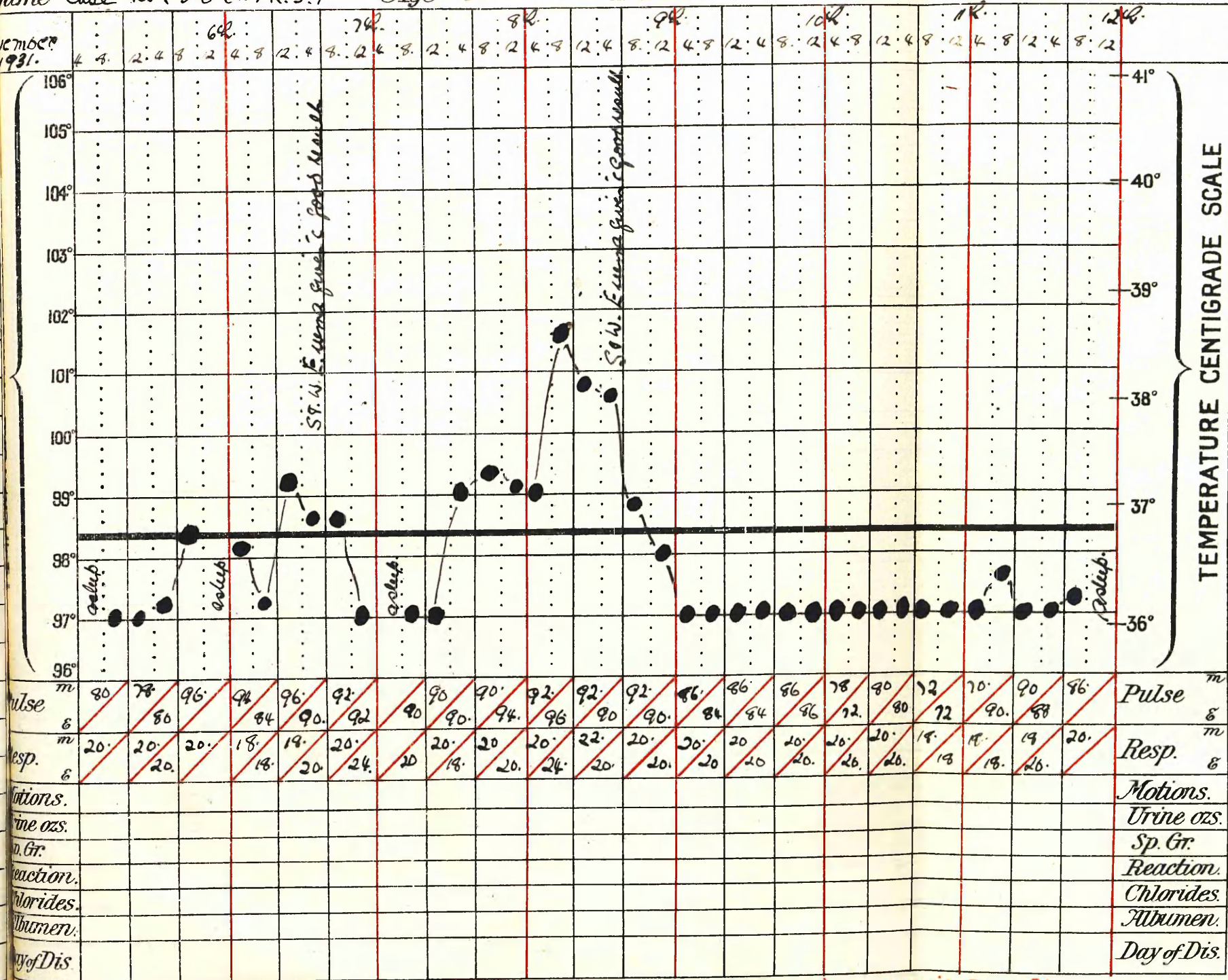
Disease

Result

4



MEMBER
1931.



Quinine 4 in I.C. given morning and evening. 9:11:31.

In two months time, patient displayed much improvement. His physical condition was much stronger. Speech had improved and the ataxia was considerably diminished. A course of Tryparsamide and Bismuth injections was then given. His condition continued to improve from day to day.

State on Discharge - Some enfeeblement remained but otherwise he was very well and his physical health was good. The blood Wassermann was now double positive, the cerebrospinal fluid Wassermann was unchanged.

Malarial, Tryparsamide and Bismuth Therapy - Conclusions.

- (a) Recovery is to be expected in a very large percentage of cases. In this case, of those treated, sixty-seven per cent recovered from their symptoms and were allowed home recovered. This shows a considerable increase in recoveries in this series as compared with the recoveries in the preceding series.
- (b) Improvement takes place in certain cases. In this series, seventeen per cent of the cases had the disease arrested.
- (c) No Improvement is to be expected in some cases. In this series seventeen per cent were not improved.
- (d) Death - In this series of cases no deaths occurred.
- (e) Age - The older patient in this case appeared to benefit more than the younger.
- (f) Type - In this series those suffering from the expansive form of the disease were either recovered or improved. All those who failed to be improved belonged to the demented type.
- (g) Blood and Cerebrospinal Fluid - Reference to Table No. 4 will show that the Wassermann Reactions of the blood and cerebrospinal fluid are modified in a large number of cases, although the reaction is not necessarily/

necessarily converted from a positive to a negative.

(h) Complications may arise.

(1) Retention of urine was the only complication which arose in this series of cases. (See Case No.49.)

The Treatment of General Paralysis - General Conclusions

It would appear from the results shown in the four groups of cases, treated by different methods that a considerable number of cases may recover or at least be much improved by treatment, either by Tryparsamide and Bismuth or by Malaria alone, or by Malaria combined with Tryparsamide and Bismuth. It would seem, therefore, that treatment should be pushed in all cases as soon as the disease is recognised as such.

Fifty-eight cases in all received treatment. Of those twenty-two had recovered clinically and were discharged recovered. In those cases symptoms and signs were absent and, up till the present, none of those cases have been readmitted, although several of them have been now out of Hospital for a period of about three years. Eleven of those cases have been improved. Those cases do not show active signs of the malady but are not quite well enough to be allowed out of supervision. Nevertheless, treatment has been beneficial. It means that, their life is prolonged, they are made more happy by being able to be about and to be able to do useful work, even if still under supervision. Above all things, it has served a useful purpose by warding off the evil day when they are confined to bed as helpless, dementing cases.

Twelve cases were not improved by treatment. It must, of course be borne in mind that in this series every case/

case, on admission, was treated. Needless to say, many of them were well advanced in their illness and, to hope for recovery, was perhaps too optimistic. It serves again to show that early diagnosis of the disease is vital as so much may be done if treatment is instituted at an early stage of the malady.

Thirteen cases died, but, as has been shown elsewhere, the treatment was not responsible except in one case. Several of those also were so far advanced as to be almost moribund before treatment began.

In a series of fifty eight cases we finally find:-

Recovered	...	...	...	38%
Relieved	...	...	...	19%
Not Improved..	...	...	...	20%
Died	..	...	...	23%

Let us again refer to Tables - 1,2,3 and 4, in order to compare the recoveries by each method of treatment.

	Recoveries.	
(a) Tryparsamide Therapy	26%	(Table 1.)
(b) Tryparsamide and Bismuth Therapy	44%,	(Table 2.)
(c) Malarial Therapy	29%	(Table 3.)
(d) Malaria, Tryparsamide and Bismuth Therapy	67%	(Table 4.)

From this it is obvious that the best results are to be obtained by the use of Malaria followed by Tryparsamide and Bismuth. The one objection to this line of treatment is that clinical improvement results rather than serological. One would feel that the best results had been obtained if the Wassermann Reactions of the blood and cerebrospinal fluid had been changed from positive to negative. Otherwise/

Otherwise the results justify the pushing of this line of treatment to the utmost.

From our results by all methods there is no doubt that the age factor is important in successful treatment.

All younger cases are more likely to derive most benefit, but, at the same time, surprisingly good results are obtained even in older cases. The balance, however, is in the favour of the young General Paralytic.

In looking over the cases again, it will be seen that the ~~extensive~~^{expansive} form of the disease is also more suitable for treatment than others. Of twenty-two cases discharged as recovered, twelve were of the expansive type. This type of patient appears, for some reason or other, to be most suitable for treatment.

Certain complications may arise. The symptoms of the disease may be intensified or death may supervene, but, as has been shown, few cases so terminated. Where tryparsamide was used jaundice developed in a few cases and, in one, exfoliative dermatitis occurred. Those untoward results of treatment, in this series were, fortunately, of small account. Finally, General Paralysis is a disease in which much may be done by treatment to produce, if not absolute cures, at least remissions. Malaria is undoubtedly, at present, the best method of treatment known and should be adopted, where practicable, in all cases. Tryparsamide and Bismuth Therapy is a useful method of treatment and where there is difficulty in obtaining malarial blood, treatment by those agents should be employed.

If it is desired the other arsenical preparations may be used in place of Tryparsamide. For example salvarsan/

salvarsan may be used but, as it has a greater degree of toxicity then untoward results are more likely to follow. On the other hand the prospects of producing a negative Wassermann are greater. To conclude I do not know that any better results may be produced clinically than by malaria in association with Tryparsamide and Bismuth this method giving, in my opinion, the most satisfactory results.