

# GENERAL PARESIS OF THE INSANE IN PEKING BETWEEN 1933 AND 1943

By

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## INTRODUCTION

ALTHOUGH some years have passed since the end of the period under consideration, the subject matter is not altogether inappropriate. Neurosyphilis is now rare, though by no means completely abolished in the Western countries, and it is necessary to bear it in mind, for long-forgotten and undiagnosed cases are still liable to confront busy practitioners or specialists. In many parts of the world the situation is different and neurosyphilis is still frequently seen. Its global incidence may be waning but it is not yet a historical curiosity.

The present work was to be a complete analysis of 134 cases of general paresis of the insane (G.P.I.) admitted to the Peking Municipal Psychopathic Hospital between 1933 and 1943. As mentioned in our previous paper, Chu and Liu (1960), G.P.I. accounted for 7.3 per cent., after schizophrenia and manic depressive psychosis, ranking third in order of frequency. Its clinical manifestations, the main types of treatment and the remission rate of a 3-year follow-up period are especially considered. This study had to be completed in a very short time and certain information was unobtainable. Publication in the *Chinese Medical Journal* had been intended, but circumstances made this impossible and it is now offered in the belief that it will form a useful comparison in the evolution of the modern advances of the subject.

## PRESENTATION

Of the 1,716 consecutive admissions to the Peking Municipal Psychopathic Hospital during the 10-year period 1933-1943, 134 were diagnosed as having general paresis of the insane. Of these, 109 were males, giving a male-female ratio of 4.4:1. The age range was from 20 to 73 years, the mean being 44. Nine were unmarried.

Table I shows the various provinces from which the patients originated.

TABLE I  
*Various Provinces Where the Patients Originated*

	No. of Patients	Percentage
North China (Ho-pei = 67 or 50 per cent.) ..	83	62.0
Peking .. .. .	18	13.4
South China .. .. .	16	11.9
Manchuria .. .. .	13	9.7
Mongolia .. .. .	1	0.8
Others .. .. .	3	2.2
Total .. .. .	134	100.0

The occupation and, therefore, the social status of these patients are indicated in Table II. It is interesting to note that they form an atypical group of

TABLE II  
*Classification of Occupations*

	No. of Patients	Per-centage
Business men .. .. .	27	20·1
Labourers, rickshaw pullers, domestic servants, cooks .. .. .	22	16·4
Government officials, lawyers, telegram and post office workers	17	12·8
Policemen .. .. .	14	10·5
Military and army men .. .. .	11	8·3
Tailors, carpenters, Blacksmiths, chauffeurs } semi-skilled group .. .. .	6	4·5
Prostitutes .. .. .	3	2·2
Peasants .. .. .	2	1·4
From poor house .. .. .	2	1·4
No occupation .. .. .	2	1·4
Student .. .. .	1	0·7
Housewives .. .. .	22	16·4
Not recorded .. .. .	5	3·6
<b>Total .. .. .</b>	<b>134</b>	<b>99·7</b>

Chinese, the great bulk of whom had the serene, non-migratory pattern of life of a peasant community. Wechsler (1947) pointed out that civilization and urbanization are accompanied by a greater liability to the contraction of venereal diseases. My own personal observations in China were that people without steady jobs, settled permanent homes and happy marital lives were much more prone to venereal diseases than those whose daily lives and environment were more stable, for instance, among the 22 housewives with G.P.I., only one patient, whose husband was a peasant, while 21 had husbands whose occupations were constantly changing. Financially, people of these types were better off with their ready-money wages and their better chances of making new social contacts. On the other hand, the peasants, though not financially inferior, had more limited opportunities for loose living, because their wealth was in a less fluid form and thus they had little ready money to spend; also the vast distances from country to town and communication difficulties impeded their chances. Further, the old traditional teachings, moral and family codes, respect and civility were still preserved in the rural areas, and a victim of any form of venereal disease would certainly be regarded as a disgrace and as a person lacking in regard to ancestral ethics.

#### CLINICAL HISTORY

The majority of the present series had advanced G.P.I. with severe psychosis and mental deterioration. Details of primary infection, its duration and treatment were therefore not readily obtainable. In 51 cases however, the incubation period between primary infection and the manifestation of G.P.I. was recorded, and ranged from one to thirty-nine years, the mean being 18·2 years. Eighteen cases out of the total of 134 received antisyphilitic treatment at the time of the primary infection. Another three received Chinese herb drugs (details not known), while the majority of the series had no antisyphilitic treatment before the development of psychosis and other clinical manifestations of G.P.I. In 118 cases, the period between the recognition of the first manifestation of G.P.I. to the time of admission was mentioned, the shortest being one week and the longest 5 years. The mean was one year one month, while in those with the dementing form, the period was much longer, being 1 year

9 months. During this period they were chiefly cared for by their relatives at home. Their unreasonable and progressively more degraded behaviour and conduct and their various psychotic episodes were well tolerated. Even their loud yelling and screaming noises were seldom complained of by their next-door neighbours, since the usual high-walled courtyard of the Chinese house served for better seclusion and privacy. What is more, a readiness to complain is not as a rule a typical Chinese character. It has been the general opinion among the Chinese people that any kind of mental illness is evil and the result of misconduct, discontent and unhappiness in life, and a neglect on the part of the younger members of the family. The resulting sense of guilt of the younger generations would induce them to keep the patient at home in the hope that special effort and re-awakened filial piety would bring about a cure. As a result, the patient was often deprived of antisiphilitic treatment and an early chance of cure. However, in the present series, 68 cases were brought to the hospital by their relatives, most of these being in a critical state of general health, such as severe emaciation, due to refusal of food, current infections or severe neurological or other medical complications. Another 58 were sent in by the police, because of absconding from home and consequently getting lost or creating public disturbances and so forth. Six were transferred from other hospitals or other social agencies.

#### MODE OF PRESENTATION AND REASONS FOR HOSPITALIZATION

The necessity for hospitalization was largely due to progressing mental deterioration leading to personal negligence. There was consequently a high percentage of poor general health with malnutrition and severe emaciation complicated by secondary infection such as pulmonary tuberculosis and the dysenteries. Acute neurological catastrophes of various types were the reason for immediate admission to hospital in a number of cases, for instance, convulsions occurred in 10, hemiplegia in four, paraplegia in one and "fainting attacks" in two. Other neurological complications such as loss of sphincter control or a mental state such that tube feeding was essential were also problems demanding admission.

As the patients were already in the late stage of the illness with fully-developed psychosis and mental deterioration, subjective somatic complaints such as headache, visual disturbances were rare. Very few sensory changes and lightning pains were mentioned even in cases of taboparesis.

Of the 134 patients, two had juvenile paresis (one died in hospital and the other was discharged without follow-up), and 13 had taboparesis. As shown in Table III, 98 (83 per cent.) of the 118 cases had psychosis. Sixteen (12 per cent.)

TABLE III  
*Types and Frequencies of Psychosis in General Paresis*

Types of Psychosis	No. of Patients	Percentage	Total No. of Patients	Percentage
Expansive type .. ..	38	39.0	98	83
Manic type .. ..	31	31.6		
Schizophrenic state .. ..	22	22.4		
Agitated state .. ..	5	5.0		
Depressed state .. ..	2	2.0		
Dementing form .. ..			20	17
Not recorded .. ..			16	(or 12%)
Total .. ..		100.0	134	

of the total of 134 cases either had only mild personality changes, or information concerning the initial symptoms or the presenting pattern of the disease was lacking. A few of the patients had mixed psychosis.

Most authors included manic phenomena as part of the expansive variety of psychosis or otherwise not clearly stated. While Bunker and Kirby (1926) classified 53 per cent. of their 106 patients as simple dementing type, only 19 per cent. expansive and 17 per cent. manic. Grinker and Bucy (1949), Elliot, Hughes and Turner (1952) also mentioned these as different types and considered that the dementing form was more common. The latter stated that the psychotic features often mask the underlying progressive mental deterioration, which commences in the early stages of the disease and ends in complete dementia. Conversely, Wechsler (1947) thought that the expansive form was the most common type. In practice it is not always easy to differentiate between the expansive and manic types of psychosis, a difficulty previously appreciated by Bunker and Kirby. In this study, an attempt was made to separate the two types on the basis of the criteria of presence of delusions of grandeur, euphoria and complete lack of insight in the expansive type; and flight of ideas, liability to change of mood and over-activity in the manic. Thus in the present series about 70 per cent. belonged to the expansive and manic types. Only 20 (17 per cent.) cases showed frank dementia, which was considered as a more advanced stage of the disease rather than a separate clinical type. Pfister (1926) mentioned that the psychotic manifestations of neurosyphilis of the Chinese patients followed the same pattern as those seen in Germany. My personal impression is that Chinese people are more reserved as a race, and therefore unless there is a preponderance of the extroverts contracting syphilis and eventual G.P.I.; or the destructive nature of the disease itself is the chief factor producing the expansive type of symptoms, it appears that the conventional concept that the pre-existing traits of personality make-up is the sole cause influencing the resulting psychosis is untenable for the Chinese patients with G.P.I.

#### PHYSICAL FINDINGS

Apart from the poor general health, malnutrition and current infections, frank evidence of the primary or secondary infection of syphilis was often present, such as penile scars which were frequently observed, and enlarged epitrochlear glands which, though not specific, were added proofs of the disease. Aortic regurgitation occurred only in one patient. Abnormal neurological signs were observed in most cases and in only 13·4 per cent. (Table IV)

TABLE IV  
*Abnormal Neurological Manifestations*

	No. of Patients	Percentage
Reflex abnormalities .. .. .	35	30·0
Tremors .. .. .	29	25·0
Slurring speech .. .. .	28	24·1
Ataxia .. .. .	13	11·2
Hemiplegia .. .. .	4	3·4
Paraplegia .. .. .	1	0·9
Deafness .. .. .	1	0·9
Impaired sphincter control .. .. .	5	4·3
Not recorded .. .. .	18	
	(or 13·4%)	
Total .. .. .	134	

were there either normal findings or a deficiency in the recorded information. The majority of the abnormal findings were exaggerated deep reflexes, such as knee jerks and ankle jerks, absence of the superficial reflexes and positive Babinski and Romberg signs. In five cases the knee and ankle jerks were diminished and in another seven, absent. Unfortunately, these latter patients had the additional complication of malnutrition and vitamin deficiency, especially of the B Group, and the diminished or absent reflexes may be related to this rather than to the neurosyphilis. Tremors of the facial muscles, tongue or extremities, slurring of speech and ataxia all occurred in decreasing order of frequency. Sensory changes including superficial, deep and vibratory sense loss were only recorded on a few occasions. This was largely due to the patients' mental state and the pressure of work of the medical staff during the war years, both of which contributed to the failure to record this information. Thus the result seems much lower than the 20–30 per cent. given by Grinker and Bucy (1949). Pupillary abnormalities are given in Table V.

TABLE V  
*Pupillary Abnormalities*  
No. of Patients

	Male	Female	Total No. of Patients	Per- centage
Argyll Robertson pupils ..	54	8	62	46·3
Irregular and fixed pupils ..	0	3	3	2·3
Optic atrophy .. ..	1	2	3	2·3
Normal findings .. ..	54	12	66	49·2
Total .. ..	109	25	134	100·1

Sixty-two patients (46·3 per cent.) presented with Argyll Robertson pupils on admission; in a further three, all women, the pupils were irregular, fixed and non-responsive to light or convergence. Two of the three gave a history suggesting G.P.I. of at least 4 years duration, while in the third, the duration of symptoms was not known. There were three cases of optic atrophy, of which two were of very mild form. Another four cases had blurred vision, but no evidence of optic atrophy was observed, although one had taboparesis.

#### LABORATORY INVESTIGATIONS AND DIAGNOSIS

The diagnosis was based mainly on clinical findings and confirmed by the laboratory investigations. Wassermann reaction (W.R.) on blood and cerebral spinal fluid were performed routinely before treatment, during intervals between courses of treatment and during the follow-up period. The anti-complementary (A.C.) results for C.S.F. in 6 (5·2 per cent.) cases shown in Table VI were possibly due to other parasitic infections or delayed transportation to the laboratory. Delivery had to be done under unfavourable and difficult conditions and contamination was not unlikely and thus explains the comparatively low percentage of positive W.R. of the C.S.F. The qualitative globulin tests were done by the Pandy and Nonne methods. Quantitative estimations of protein were not recorded. Lymphocyte counts were within the expected range for similar cases of G.P.I. Because of missing data in some of the recorded cases, these were excluded from calculation of the percentage.

TABLE VI  
*Laboratory Investigations*

	No. of Patients	Per-centage
<b>Blood:</b>		
Positive W.R. with Paretic Lange curve .. .. .	123	95.5
Negative W.R. with positive C.S.F., W.R. and Paretic Lange curve .. .. .	6	4.5
Note missing or not recorded .. .. .	5	
Total .. .. .	134	
<b>C.S.F.:</b>		
Positive W.R. .. .. .	105	92.2
Negative W.R. with positive blood W.R. and Paretic Lange curve .. .. .	3	2.6
A.C. (4 of these with positive paretic curves) .. .. .	6	5.2
Note missing or not recorded .. .. .	20	
Total .. .. .	134	
<b>Lange colloidal gold test</b>		
Paretic curve .. .. .	112	98.2
Non-paretic curve .. .. .	2	1.8
Note missing or not recorded .. .. .	20	
Total .. .. .	134	
<b>Total protein and globulin</b>		
Increased .. .. .	63	92.7
Normal range .. .. .	5	7.3
Note missing or not recorded .. .. .	66	
Total .. .. .	134	
<b>No. of Cells (Lymphocytes)</b>		
<b>No. of Patients</b>		
0- 9 .. .. .	10	80
10- 45 .. .. .	35	
50-109 .. .. .	25	
110-199 .. .. .	6	
200-300+ .. .. .	4	
Note missing or not recorded .. .. .	54	Excluding missing cases
Total .. .. .	134	

#### TREATMENT

As seen in Table VII, a total of 93 patients received antisyphilitic treatment. Owing to poor general health, secondary infections or other complications,

TABLE VII  
*Treatment*

	No. of Patients proved	Im- proved	Per cent.	Station- ary	Per cent.	Worse	Per cent.	Died	Per cent.	No Follow Up	Per cent.
Neoarsenical compounds	39	10	25			4	10	8	20	18	45
Arsenical compounds (Arsphenamine)	1										
Tryparsamide .. .. .	45	21	47	10	22			9	20	5	11
T.A.B. vaccine .. .. .	21	9	43			3	14	3	14	6	29
Malaria therapy .. .. .	20	8	40			5	25	3	15	4	20
Relapsing fever therapy	3	2	67	1	33						
Bismuth and iodides	17										
Total No. of patients received treatment .. .. .	93										

antisyphilitic treatment had often to be postponed. 13.4 per cent. of the patients discharged themselves before the full course of treatment had been completed. A further small number of patients were too ill to continue treatment and in others death occurred before treatment was commenced. The outstanding

limiting factors in treatment were the patients' lack of capacity for co-operation, and the high cost of drugs and of hospital treatment in general.

Combined and alternating schemes of antisyphilitic drugs and fever therapy were adopted for most of the patients. A course of treatment usually consisted of bismuth and arsenicals, and in certain cases iodides were also used. In the early years, trivalent arsenicals were mainly used, but in the latter part pentavalent arsenicals (tryparsamide) were employed more frequently. Between the courses of arsenicals, one of the forms of fever therapy was given. Some patients received two or three courses of treatment in a one-, two- or sometimes three-year period. Others for medical or financial reasons had fever therapy alone.

Of the 45 cases treated with pentavalent arsenicals (tryparsamide), 21 (47 per cent.) improved, 10 (22 per cent.) did not improve or became worse, 9 (20 per cent.) died and 5 (11 per cent.) discharged themselves against advice and thus no further information was recorded. Of the 40 patients treated with trivalent arsenicals, 10 (25 per cent.) improved, 4 (10 per cent.) got worse, 8 (20 per cent.) died and 18 (45 per cent.) discharged themselves. The improvement rate with tryparsamide therapy was obviously better than that with trivalent arsenicals, a finding which is universally agreed by all clinics and these figures are closely parallel with those of Solomon and Epstein (1936) who claimed 42 per cent. remissions. As in other clinics (Moore, 1947), we found that a better result was obtained by the use of tryparsamide following malarial therapy. In our experience, relapsing fever was a promising method of induced fever therapy, but unfortunately the *spirochaeta recurrentis* blood was not always readily available.

When fever was induced by T.A.B. vaccine, the standard technique and dosage was used. For instance, a small test dose was given initially, followed by a gradual increase in the amount, until the desired dose was reached. This was maintained for a minimum of 12 injections, given daily, every other day, or every few days according to the tolerance of the patient. Further adjustment of dose was regulated as necessary by the height and duration of the pyrexia required. Unfavourable side-effects were seldom encountered. There was, however, one patient, a man aged 44, who gave a history of contracting primary infection when he was 28 and having received an incomplete course of anti-syphilitic treatment at the Peking Union Medical College Hospital. He was ill with general paresis for a year before admission. Diagnosis was confirmed by blood and C.S.F. investigations. He was treated with tryparsamide and T.A.B. vaccine and was doing well both clinically and serologically until the 9th injection of T.A.B. vaccine, in the second course of which he suddenly developed severe anaphylactic reactions and died quickly of acute pulmonary oedema. This was the only death attributed to treatment in the present series.

Tertian malarial blood was generally obtained from fellow patients for malarial therapy. Two-thirds of the cases treated with malarial therapy received 5 c.c. of blood subcutaneously immediately after withdrawal from a malarial patient. The incubation period for this method was of the order of two weeks or a little longer. Another one-third of the patients received 2 c.c. of the malarial blood intravenously. The incubation period of this method was 6–10 days. No untoward side-effects resulted from malarial therapy.

Comparison between treatment with T.A.B. vaccine and malaria is shown in Table VII and indicates that there was no difference between the two from the remission point of view, though Wagner von Jauregg (1922) reported better results with malaria in his pioneer work and this was found by many others.

The disadvantages of T.A.B. vaccine therapy were that, in our experience, it was more expensive and that the dosage had to be gradually stepped up and separate injections were required for each attack of pyrexia. However, once the trial dose and the subsequent adjusted dose were obtained, the numbers and heights of the pyrexias and the intervals between pyrexias could be regulated at will. On the other hand, in malarial therapy, the malarial blood could be obtained free, but it also had its drawbacks, especially when given by the subcutaneous route as the exact incubation period was not always certain, particularly in an endemic area where large percentages of patients have had previous infection and immunity was high. The classical pattern of clinical manifestations was often modified, and the long uncertain interval before the onset of pyrexia was often a cause of anxiety among the medical and nursing staff, as well as the relatives. Furthermore, it was our experience that the desired number of attacks of pyrexia was frequently not reached before the disease terminated itself and quinine or other anti-malarial drugs were seldom needed, and there was usually no rigor preceding the febrile phase. The reason for this is probably due to the immunity gained by previous infection, and thus some form of resistance was present and, as a result, two or three attempts of administration of the malarial blood were required before success. Other drawbacks included the frequent irregularity of the attacks and the failure to reach the desired degree and duration of pyrexia. On the other hand, because of this high resistance often met in the patients with chronic malaria, there was no death directly attributable to malarial therapy. In contrast to similar therapy in malarial free countries, high mortality rate was often mentioned, e.g. Nonne (1925) in Germany, Bunker and Kirby (1926) in America and many others.

#### FOLLOW-UP

Table VIII shows the follow-up figures after a three-year period for all cases except the last 10 who had either a shorter period or no follow-up at all. Of the 48 deaths, 29 occurred in hospital and 11 within 3 years of discharge,

TABLE VIII  
*Three Year Follow-up*

	No. of Patients	Percentage
Recovered or complete clinical remissions ..	13	9.7
Improved .. .. .	24	17.9
Stationary .. .. .	12	9.0
Worse .. .. .	3	2.2
Discharged—cannot be traced .. .. .	13	9.7
Discharged against advice .. .. .	18	13.4
Transferred to other hospital (P.U.M.C.) ..	3	2.2
Died .. .. .	48	35.8
Total .. .. .	134	99.9

eight died of intercurrent disease, three to five years after discharge. No worthwhile records of serological studies are available for statistical purposes during the follow-up period. Since most of the information available was obtained by home visits and questionnaires, only 10 per cent. of patients returned for checking of psychoneurological status, serological and C.S.F. examinations. The rate (10 per cent.) of complete clinical remissions in a three-year period is much lower than that (20 per cent.) given by Nicole and Fitzgerald (1934) in



their 10-year follow-up. The main reason for this may be that most of the present series were very advanced cases.

#### DISCUSSION

The percentage (7·3 per cent.) of G.P.I. represented at the Peking Municipal Psychopathic Hospital is not especially low when compared with Grinker and Bucy's (1949) 5–8 per cent., and Henderson and Gillespie (1950) summarized as 5–15 per cent. for the British mental hospitals. The present work does not support the statement by Lennox (1923) who found on proportion basis that syphilis was more common in China than in America and neurosyphilis comparatively rare. It seems the figures given at different periods before the antibiotics were much the same, for instance, the analysis by Furbuch (1924) which was approximately 10 per cent. It was only since the intensive use of antibiotic therapy that the figures had sharply declined. This was illustrated by the work of Bauer (1952), and the declined incidence of neurosyphilis in this country was well summarized by Purdon Martin (1956).

The bulk of the patients in the present series belonged to the urban population, only 1·4 per cent. coming from the rural community. The disease was often hopelessly advanced by the time of admission to hospital, due mainly to the special social and family traditions and customs that existed. Of the 29 that died in hospital, 23 occurred soon after admission or soon after the treatment started. In addition, there was the frequent difficulty or impossibility of raising sufficient money for expensive treatment and hospitalization, none of which could be obtained free for the majority of the patients. Only 18 patients (13·4 per cent.) received antisyphilitic treatment before the onset of neurosyphilis. Therefore in the majority, the pattern of the disease was unaltered by the advent of modern treatment. The incubation period and clinical manifestations of onset and development could be observed as in the original descriptions of the disease.

Following the original report of Wagner von Jauregg (1922), better clinical results from malarial therapy soon appeared from all clinics. Its value was not limited to therapeutic instances alone, such as Wilson (1928) and Greenfield (1929) after examining the brain tissue of patients who died following malarial therapy found that the spirochaetes had either disintegrated or disappeared. It was also effective as a prophylactic measure. O'Leary (1931), Moore (1947), Grinker *et al.* (1949) and many others based on their accumulative experience, emphasized its use in early and asymptomatic neurosyphilis to prevent late parenchymatous syphilis. However, other workers, Fraser and Duncan (1921) and Pfister (1926) deduced from their experience that treatment, especially at the stage of the development of natural resistance, might encourage the production of G.P.I., and suggested that the unbalanced process of establishing immunity resulted in the antisyphilitic therapy leading to the invasion of the parenchymatous tissue of the central nervous system by the spirochaetes. However, in the present series, only 13·4 per cent. received inadequate antisyphilitic treatment at early stages of the disease.

Experience in an endemic area suggests that repeated attacks of malaria stimulate body resistance and progressively increase immunity to malarial infection. Moore (1947) put forward the suggestion that malaria induces mesoblastic, but resists parenchymatous types of lesions. The work of Mingazzini (1927) illustrated that previous malarial infection did not prevent developing immunity and cure in induced malarial therapy. This possibly

explains the claims by Parsons (1928) and Dumolard, Aubrey and Sarrony (1930) of the absence or rarity of G.P.I. in Haiti Island (where mainly the pernicious strain of malaria was prevalent), or among the native Algerians. Peking is certainly not situated subtropically; however, it is very much an endemic malarial area (Meleney, Lee and Chung, 1927) and, according to the previous argument, the logical conclusion might be drawn that G.P.I. should be less prevalent there than in malaria-free areas. Conversely, Wu (1927) in his work on incidence of syphilis in various cities in China showed that his figures were closely correlated with that reported in Germany, Great Britain and U.S.A., and Wei (1927) found that the incidence of tabes dorsalis, being 4·6 per cent. among the syphilitic patients, was considered as not less common than in Europe and America. Unfortunately, no reliable statistical studies have been made of the relative incidence of neurosyphilis in those who had malaria before or after the primary syphilitic infection and those who did not. Mingazzini, limited to only 7 cases, led him to conclude that previous malarial infection did not prevent the development of G.P.I., nor did it alter the incubation period between the primary syphilitic infection and the onset of G.P.I. He was of the opinion that G.P.I. is no less common in endemic malarial areas than elsewhere. The incidence of G.P.I. among the population of the Peking Municipal Psychopathic Hospital was certainly comparable with that in Britain and America, and thus does not support the supposition that G.P.I. is less common than in malaria-free areas.

Another debatable point of interest is that in the present series, the rate of remissions in both the T.A.B. vaccine and malarial treated groups was the same. This is contrary to Wagner von Jauregg's original finding and to most other authorities favouring malarial therapy. Could the natural high immunity, both for malaria and typhoid fever, which existed in Peking among the majority of the patients, be postulated as one of the factors for this controversy? Within the limit of my observation, I am unable to give a satisfactory explanation.

#### SUMMARY

A summary of the present survey is as follows:

1. General Paresis of the Insane occurred in 7·3 per cent. of the inmates of Peking Municipal Psychopathic Hospital between 1933 and 1943, a figure which is similar to that in Britain and America. Age incidence averaged 44 years. Sex ratio of male : female=4·4 : 1.
2. The dominant form of psychosis in the present series studied were expansive and manic types, consisting of 72 per cent.
3. 95·5 per cent. blood and 92·2 per cent. C.S.F. gave positive Wassermann reactions.
4. Equally effective results were obtained from both malarial and T.A.B. vaccine therapy. Significantly higher remission rate obtained from pentavalent than that of trivalent arsenicals.
5. Malaria was the cheapest form of fever therapy in Peking. No mortality occurred during or immediately following malarial therapy.
6. A 3-year follow-up period is reviewed and showed 10 per cent. of complete remissions, and 18 per cent. with clinical improvement. The high rate (36 per cent.) of death is probably due to the advanced state of the disease on admission.

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