The Malarial Treatment of General Paralysis; Some Psychological and Physical Observations.(1)

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NUMEROUS articles have appeared within the last few months in both Continental and English literature describing the value of the malarial treatment in cases of general paralysis. Thus Yorke and Macfie (13) state that out of 84 general paralytics treated with malaria, 23 (or 27·4 *per cent.*) had been, or were about to be, discharged, at the time of writing, from the mental hospitals. Weygandt (12) in 50 cases obtained good remissions in 48 *per cent.*, and Kirschbaum (5) in 51 in 58·8 *per cent.* Scripture (9) states that in Wagner-Jauregg's clinic complete remissions were obtained in 44 *per cent.* out of 141 cases treated. This percentage of complete remissions is still being maintained, Gerstmann (14) reporting recently that 40 *per cent.* show complete remissions with ability to work, 30 *per cent.* improvement, and 30 *per cent.* no improvement. If only early cases are treated Wagner-Jauregg (10) states that nearly 100 *per cent.* of cures can be obtained. These figures compare very favourably with the percentage of spontaneous remissions recorded by Kirschbaum. This writer found that spontaneous remissions occurred in only 11·4 *per cent.* of untreated general paralytics. At present it is too early to make any definite statement with regard to the permanence of the remissions, although the three oldest successful cases in Wagner-Jauregg's clinic have now shown complete remissions for 6½ years.(14)

The improvement following the malarial treatment is progressive. It extends over many months, and it is, therefore, impossible to form an accurate estimation of the value of the treatment in any one case until a considerable period has elapsed since the cessation of the rigors.

Up to the present time 73 inoculations have been performed at Claybury Mental Hospital, but it is proposed in this paper to deal with only 31 of these cases, for these 31 patients have now been watched for some months since the cessation of their rigors, whereas the remainder have been inoculated more recently. Of this series of 31 cases, 16 were females and 15 males. The cases in this series have now been watched for periods varying from 2½ to 14 months after the cessation of the rigors. The same strain of benign tertian parasite (*P. vivax*) was used throughout, and all inoculations

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were by the subcutaneous route. Two cases in the series were inoculated by Lieut.-Col. S. P. James by means of mosquitoes. Neo-kharsivan injections were given in a few cases, the majority having quinine only.

PSYCHOLOGICAL OBSERVATIONS.

(*a*) *Delusions of grandeur.*—Grandiose ideas show a marked tendency to disappear following malarial treatment. The manner in which they do so is interesting. If the delusions are of a quantitative nature, the patient stating definite numbers, these numbers become progressively smaller after the cessation of the rigors. Six such instances are described below.

i. A female patient stated on March 26, 1924, that she possessed two or three thousand diamonds. She was inoculated with malaria, the last rigor occurring on May 24. On the 31st of the same month the patient stated that she had twelve diamonds. On August 14, ten and a half weeks later, she said that she possessed no diamonds and that she could not have known what she was saying when she said that she possessed twelve diamonds.

ii. On August 12, 1924, a male patient stated that he owned two hundred motor-cars and that he paid his brother-in-law £50 a week to take care of them. The malarial rigors occurred from August 29 to September 5. On September 10 the patient stated that he owned two or three motor-cars, for which he paid his brother-in-law £50 a week to take care of. At this stage one delusion, that referring to the motor-cars, had diminished in intensity, whilst the other had not done so. A similar disparity between the disappearance of the grandiose delusions occurred in Case iv below. On October 11 the patient stated that he had sold his cars, numbering four or five, and that when his brother-in-law had been taking care of them he had paid from him £10 to £15 a week. On November 9 the patient stated that he owned two or three cars. He did not know how much his brother-in-law was receiving, as the patient's wife was paying him.

iii. A male paralytic stated on June 14, 1924, that he had bought four shops. On June 17 he added that he was going to build 10,000 houses and that he had millions of pounds. Malarial treatment ceased on August 3. Eleven days later the patient was indefinite as to how much money he possessed, saying that he had £17,000, or "two or three thousand pounds." He was, however, quite definite that he was going to build a hotel and that he owned five or six tobacco shops. On September 13 he stated that he was going to open three tobacco shops. The number became less and the past tense became the future. He added, however, that he was going to build six houses, not 10,000 as he had stated in June. Asked if he had the necessary money with which to carry out these schemes, the patient stated he would proceed on credit. He said that all his previous remarks about money "must have been dreams." On October 14 the patient stated that he had been going to open two tobacco shops, but as his wife did not want him to do so he had given up the idea. He was going to open them on credit.

iv. On May 29, 1924, the patient, a male, stated that his usual score at cricket was 154 runs. On June 2 he said that he was going to claim and receive £500,000 as compensation for a previous accident. On August 3 he gave his usual score at cricket as being from 150 to 160 runs, but did not know how much he was going to claim as compensation for the accident. Rigors, which had commenced on July 27, terminated on August 9. On September 2 the patient's average score was about 100 runs, and he was going to claim from £100 to £1,000 as compensation. On October 2 the average score was from 80 to 100 runs, and the patient expected that his society would claim about £100 as compensation. On November 14 the patient stated that he had sometimes made between 80 and 100 runs. He was not going to claim compensation for the accident, as the employers under whom he had had the accident had offered him a situation for life.

It is worthy of note in this case that although the figures dealing with the number of runs progressively decreased after the malarial treatment, the patient gave a different score at different interviews. Thus in May and August he gave his *usual* score, in September and October he gave his *average* score, but in November he gave a score he had *sometimes* made.

v and vi. Case v believed he was a great athlete, able to jump to very great heights and to swim rapidly. Case vi believed that he was a famous comedian who was able to earn large salaries on the music-hall stage. The progress of the delusions in these two patients is shown below. Column 1 gives the height to which patient v stated he was able to jump. Column 2 shows the speed at which the same patient stated he could swim. Column 3 gives the weekly earnings which patient vi stated he was capable of earning on the music-hall stage.

Patient v.			Patient vi.	
Date.	Col. 1.	Col. 2.	Date.	Col. 3.
13.4.24	3 miles	—	25.3.24	£250
29.4.24	5,000 ft.	—	28.3.24	£100
5.5.24	—	100 yds. in 5 secs.	4.4.24	£1,500
22.5.24	Rigors ceased		26.4.24	£8,000
26.5.24	8 ft.	—	20.5.24	Rigors ceased.
2.6.24	5 ft. 7 in.	—	1.6.24	£500
—	Mild seizure.		5.6.24	£300
14.6.24	6–7 ft.	4 m.p.h.	Previous to 3.7.24	£8
12.7.24	—	5 m.p.h.	24.7.24	See below.
11.8.24	10 ft.	8 m.p.h.	—	—
11.9.24	7 ft. 8 in.	2½ m.p.h.	—	—
11.10.24	9 ft. 14 in.	3 m.p.h.	—	—
10.11.24	10 ft.	3 m.p.h.	—	—

The above table shows that, following the mild seizure which patient v suffered, the grandiose delusions, as regards the power of jumping and swimming, increased slightly in intensity. At the same time the speech, which had become less slurred, became markedly so, the tremor, which had greatly diminished in the tongue, again became prominent, and a double carpo-metacarpal reflex appeared for the first time. The patient still retains the delusion, which was present on admission, that he is King of England.

Although patient vi was very ready to discuss his prospects upon the music-hall stage, he became irritated on being questioned about this subject on July 3. Three weeks later, on again being questioned, he stated that his idea of going on the stage "was all a delusion." His occupation was that of a kennel-man. This case shows very clearly the quantitative increase of the delusions before the malaria treatment and the decrease after it.

The following case is described as showing a gradual decrease in intensity of the grandiose delusions following malarial treatment, but the ideas were not expressed numerically:

The patient, a postman, stated on January 11, 1924, that he had been promised the position of Postmaster-General. Rigors ceased on March 3. Twelve days

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later the patient stated that he could be made Postmater-General if he appealed to the King. On March 22 he was thinking of applying for the position on his leaving Claybury Mental Hospital. On the 29th of the same month he had decided not to apply for the position. Asked why he had changed his mind, he stated that he would be amongst people of a higher social status and so would not be happy, adding, "Money is not everything." Seven days later he made a similar statement, whilst still later he declared the whole idea was "ridiculous." Although, during the period of his delusions, the patient made no mention of money, yet when he had returned to an apparently normal mentality he stated that he could remember thinking that he saw heaps of gold around him, and that he could possess the gold by putting out his hand. When he stated this he realized it had been a delusion.

When the patients were being questioned about their delusions, care was taken to exclude suggestion as far as possible. It is unfortunately impossible to exclude it absolutely. When no definite number was given by the patient he was asked to state an approximate number.

(*b*) *Desire to escape.*—When the female patient is compared with the male, a striking difference is observed in the mental condition shortly after the cessation of the rigors. In the great majority of male patients an intense desire to leave the hospital manifests itself. This desire has occurred in no females in the series under review. The intense desire to leave is abnormal in that the patient thinks he can leave, not by being discharged in the routine manner, but by either his friends fetching him away, or by a nurse unlocking a door for him to go through. He asks the very people who are keeping him in the hospital to let him out, apparently not even thinking that it would be extraordinary for them to do so. In the most advanced stage of this condition the patient does not attempt to hide his desires, although as the condition passes off he may attempt to do so. The patient is exceedingly persistent in his demands to be let out. It would appear that the desire for release is present, but not the intelligence necessary to realize the manner of escape, or discharge, that would be most likely to be successful. This abnormal desire to escape passes off gradually, to be replaced by a normal desire to be discharged in the usual routine manner.

(*c*) *Amnesia.*—A comparatively common feature of the post-malarial stage of the treatment is a period during which the patient shows a definite loss of memory. The loss of memory refers to the time during which the patient was mentally acutely ill. Usually the period before admission can be remembered, and also the period from the end of the malarial rigors up to the time of examination. The period of amnesia may not include the febrile paroxysms. Outstanding incidents as, for instance, lumbar puncture occurring during the amnesic period may be remembered. Several months after the rigors, however, the patient may regain memories of the previously amnesic period. As a general rule the delusions are not remembered once they have disappeared, although the memory

may be good for events occurring during the period when the delusions were present.

(*d*) *Well-being.*—Immediately following the cessation of the rigors many patients experience a feeling of pronounced physical health. This is not the common euphoria of the general paralytic, but appears to be of a more normal character. It is less boastful. The patient, without being asked, volunteers the statement that he has not felt so well for two or three years, or whatever period has elapsed since he last felt so well. The untreated general paralytic has always felt well, not only recently. The feeling appears to be of more modest dimensions than is the common euphoria of the untreated patient. It persists after the mental condition has become normal. No doubt this feeling is, in the male, the cause of the desire to escape. The patient, feeling so well, is sure that he is fit to leave the hospital. His mental condition is such, however, that he is unable to realize that the correct mode of procedure must be followed in order to obtain his release.

(*e*) *Other manifestations.*—Following the rigors, attacks of excitement or depression become progressively less frequent and less severe, and may eventually disappear. During the rigors some patients become more restless and excited. Orientation, previously incorrect, may become accurate after the malarial paroxysms.

PHYSICAL OBSERVATIONS.

I. General.

(*a*) *General appearance.*—The general appearance of the patient improves greatly after the rigors. A previously untidy, dirty patient becomes clean and careful over his personal appearance, taking great care over brushing his hair, polishing his boots, and keeping his clothes clean. Treated patients usually become more attentive and helpful to patients in a worse condition than themselves, apparently becoming less important in their own estimation.

(*b*) *Complexion.*—The skin of the untreated general paralytic often has a pale, somewhat earthy appearance. It is dry and coarse. A few weeks after the cessation of the rigors the pallor passes off, and the cheeks become red and the texture of the skin regains its normal appearance. A month or two after the rigors a flushing, or over-reddening, of the face occurs in most cases. In one case in which physical and mental improvement was delayed for some months the flushing of the face was also delayed. This flushing resembles that of polycythæmia, except that the blue element which is present in cases of the latter disease is absent. Perhaps the most suitable description consists in saying that the facies

resembles that of a healthy person who has held his head down for a few minutes. This flushing of the face persists for a number of days, and then passes off gradually, to be replaced by a more normal colour.

(*c*) *Temperature.*—Some cases of general paralysis show an irregularly raised temperature, apparently persisting indefinitely. The elevations of temperature may consist of a sudden rise, occasionally to 104° F., returning to the original level within a few hours; of an irregular temperature, sometimes rising above normal every evening, thus resembling a tuberculosis fever; or of rises that become progressively greater each day and then smaller. These elevations of temperature have been observed upon 4-hourly charts, and do not always show on twice-daily charts.

Following the malarial rigors these elevations of temperature usually disappear, the 4-hourly chart showing a fairly steady, subnormal temperature. In one such case the temperature rose above normal, usually in the evening, on 124 days during an observation period of 138 days. Frequently the rise of temperature reached 101° F., and occasionally 103° F. The malarial rigors commenced on the 139th day, and since their cessation the temperature has remained subnormal for the last 77 days, not once rising above normal. Before the inoculation with malaria this patient was given quinine in order to determine whether this drug affected the rise of temperature. No effect was observed. As no other treatment was given it is clear that the malarial treatment was the cause of the cessation of the elevations of temperature.

(*d*) *Condition immediately following the rigors.*—At the termination of the rigors the patient is very anæmic; in one case the red blood-corpuscles fell to 1,700,000 per c.mm., and there is often, in addition, a trace of conjunctival jaundice. The latter disappears a day or two after the commencement of the course of quinine. In patients who received a course of neokharsivan in addition to the quinine, it was found that the normal red-cell count was reached three weeks after the cessation of the rigors.

After a patient had lain in bed for from two to three weeks and had undergone from eight to twelve rises of temperature to 104° or 105° F., usually accompanied by profuse perspiration, it might be expected that he would feel weak and be unsteady in his gait on first rising from his bed. In many patients this is far from the case. Little or no weakness is seen in patients who were comparatively strong before the onset of the rigors. The following case is of interest. The patient, a female, æt. 40, had a history of general paralysis of six years' duration. Since the end of March, 1924, she had been becoming progressively weaker, and had been continuously in bed

for four months before the onset of the malarial rigors. By this time, August 12, 1924, the weight of the patient had fallen to 6 st. 3 lb. from 8 st. 7 lb. in March of the same year. The malarial rigors terminated spontaneously on August 24. Six days later a relapse occurred, two rigors being allowed before the usual quinine course was commenced. The patient got up shortly after the second rigor. At this time she was too feeble to stand, and once, owing to her weakness, fell out of a chair. On September 22, only 18 days after getting up, the patient was dancing at a patients' dance. Beyond the usual course of quinine, consisting of 200 gr. in all, no treatment or alteration in diet was made. This case is instructive as showing the extraordinary physical improvement which may occur following the malarial treatment of general paralysis.

(*e*) *Menstruation.*—The majority of female patients treated have been approaching the menopause, but in two cases menstruation recommenced after the rigors, although it had been absent for many months before the febrile paroxysms. No general conclusion can be drawn from so few cases.

(*f*) *Weight.*—The weight of the untreated general paralytic varies with the stage of the disease. In the earlier periods there is usually a loss of weight, especially in the more excited types. A few months later the weight gradually increases, but only to be followed by a steady decrease preceding death.(1) It is therefore difficult to decide whether malarial treatment influences the body-weight to any great extent. During the rigors there is usually a marked loss in weight, but this is regained shortly after with no extra diet. MacBride and Templeton (6) have reported a case in which a gain of 20 lb. had occurred three months after the rigors. In one patient in the present series a gain in weight of 22 lb. occurred six months after the cessation of the rigors, but the weight was then no more than it had been earlier in the disease. The weights are shown below:

1923: June, 7 st. 7 lb.; September, 8 st. 8 lb.; December, 9 st. 10 lb.;

1924: March, 8 st. 2 lb.; April to May, rigors; June, 6 st. 7 lb.; September, 9 st. 7 lb.; October, 9 st. 7 lb.; November, 9 st. 10 lb.

In most cases the body-weight does not increase once the loss due to the rigors has been made up. On the other hand, it is only in cases with a very long history of general paralysis that the weight decreases after the treatment. In the majority of patients the weight remains stationary, once the loss due to the rigors has been remedied.

(*g*) *Work.*—Patients who before treatment refused to work, or

were unable to work on account of their poor physical condition, often became willing and energetic workers after the rigors. They may commence working immediately they get up from bed, or may not start until some weeks have elapsed, but in the majority of cases, although the mental condition may not have returned to normal, the patient becomes a ready worker in the hospital.

II. Neurological.

(*a*) *Tremor.*—In many cases the tremor becomes less marked after the cessation of the rigors, and in a few cases has disappeared completely. Similarly the speech becomes less slurred, and if the slurring was slight before the treatment it may cease.

(*b*) *Pupillary signs.*—In eight cases changes have been observed

Case 1.		Case 2.		Case 3.		Case 4.	
Date.	Reaction.	Date.	Reaction.	Date.	Reaction.	Date.	Reaction.
27.5.24	O	30.5.24	O	20.1.24	O	15.3.22	V.Sg.
14.8.24	Sg., Sp.,	2.7.24	O	26.3.24	*Rt.*,S.R.	11.5.22	V.Sg.
4.9.24	C.R.	20.7.24	C.R.		*L.*, O	12.3.24	C.R.
16.9.24	Sg., Sp.,	3.8.24	*Rt.*, S.R.	24.5.24	C.R.	13.9.24	O
	but less		*L.*, O	31.5.24	O	1.11.24	*Rt.*, R.
	reaction	4.9.24	S.R., Sp.	13.9.24	O		*L.*, S.R.
	on *L.*	12.11.24	S.R.	1.11.24	*Rt.*, R.		
14.11.24	*Rt.*, R.				*L.*, O		
	L., S.R.						

Case 5.		Case 6.		Case 7.		Case 8.	
Date.	Reaction.	Date.	Reaction.	Date.	Reaction.	Date.	Reaction.
18.8.22	Sg.	5.9.22	Sg.	6.10.23	Sg.	30.3.22	Sg.
19.7.23	O	11.10.23	O	3.1.24	C.R.	26.10.23	C.R.
24.9.23	C.R.	31.10.23	O	3.1.24	*Rt.*, Sp.	31.10.23	S.R.
18.10.23	S.R.	13.11.23	C.R.		*L.*, R.	9.6.24	*Rt.*, R.
31.10.23	R.	17.2.24	O	17.1.24	*Rt.*, Sp.		*L.*, Sg.
17.3.24	C.R.	28.5.24	O		*L.*, R.	11.9.24	R.
15.6.24	R.	6.8.24	O	24.3.24	*Rt.*, ? R.	15.11.24	R., Sp.
13.9.24	S.R.	8.9.24	O		*L.*, R.		
12.11.24	R.+, Sp.	6.11.24	S.R.	28.6.24	*Rt.*,Sg.		
					L., R.		
				11.9.24	S.R.		
				14.11.24	*Rt.*, R.,		
					Sp.		
					L., R.		

C.R. = cessation of rigors; *L.* = left; O = no reaction; R. = reacts well; R.+ = reacts briskly; *Rt.* = right; Sg. = sluggish reaction; V.Sg. = very sluggish reaction; Sp. = springing reaction; S.R. = reacts through small range. Where no mention is made of right or left the notes refer to both eyes.

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in the reaction of the pupil to light following malarial treatment. These changes had not occurred when my former note was written(8). In no patient was the change for the worse. The foregoing table gives the details of the alterations that were observed to occur.

In the above table the term "springing reaction" has been confined to cases which showed a contraction of the pupil to the light, immediately followed by a dilatation, although the eye remained exposed to the stimulus. This springing reaction differs from Arroyo's asthenocoria (16), in that the contraction of the iris is not flabby or asthenic, the dilatation persists without being followed by further myosis and mydriasis, and the reaction is completed in from five to ten seconds. It would appear that the springing reaction cannot be due to a lack of tone in the sphincter iridis, for although the pupil dilates after the primary contraction, yet the final diameter of the pupil is, as a rule, smaller than was the diameter before the eye was exposed to the light-stimulus. This shows that the sphincter iridis is able to maintain a small degree of contraction. On accommodation, moreover, it is found that in most cases the pupil does not show a springing reaction. Contraction occurs normally and is maintained. There can therefore be no lack of tone in the sphincter iridis. If all pupils that showed the springing reaction gave a brisk initial contraction to the light-stimulus, the springing reaction might be due to a primary *over*-action, the subsequent dilatation of the pupil being an adjustment, of a more accurate nature, to the stimulus. Many of the pupils that show this reaction, however, present sluggish contraction and dilatation, so it is unlikely that an *over*-contraction occurred at first. It would, however, appear more probable that the failure to maintain contraction is due to faulty innervation of the pupil. This presumably would be due to a diminution of function of the afferent fibres of the light reflex arc in the neighbourhood of the aqueduct. The accommodation fibres in this region are far removed from those of the light-reflex arc (Kinnier Wilson) (3, 4).

(*c*) *Other reflexes.*—With the exception of the carpo-metacarpal reflex, no definite changes have been observed to occur in the arm-reflexes after the malarial treatment. In 15 cases, 6 men and 9 women, however, the carpo-metacarpal reflex increased in degree, or appeared for the first time either uni- or bilaterally, after the cessation of the rigors. There was no apparent relation between the appearance of the carpo-metacarpal reflex and the mental or general physical condition of the patient. One female was so well that she was discharged from the hospital a few days after a well-marked double carpo-metacarpal reflex had been found for the first time.

No change was observed in the reflexes of the lower limbs. In one instance unilateral ankle-clonus occurred for the first time eight months after the rigors. In two cases ankle-clonus disappeared after the treatment. The table below shows the occurrence of the carpo-metacarpal reflex as the ankle-clonus disappeared. This was observed in two cases.

Case 1.			Case 1.		
Date.	Carpo-metacarpal reflex.	Ankle-clonus.	Date.	Carpo-metacarpal reflex.	Ankle-clonus.
4.2.24	—	R. tendency; L. present	29.5.24	Present on L. only	Present on L. only
5.3.24	Cessation of rigors.		2.7.24	Cessation of rigors.	
3.5.24	Bilaterally absent	R. absent; L. tendency	5.7.24	Present on L. only	R. present; L. marked
20.8.24	Bilaterally present	Bilaterally absent	4.9.24	—	R. absent; L. marked
			13.11.24	R. present, L. marked	R. absent; L. marked

(*d*) *Sphincter control.*—During the rigors a large number of patients become incontinent of both urine and fæces, although previously they were not so. This incontinence ceases with the termination of the rigors. The patients incontinent before the febrile paroxysms remain so during them. In every case incontinent before the rigors, 13 patients in all, complete control over both anal and vesical sphincters has been regained after the rigors. In some of the cases the control only lasted for a few months; these cases were those with a long history of general paralysis, but in most instances the control has now lasted for many months. In addition to the incontinence, one man and two women required frequent catheterization before malarial treatment was undertaken. During the twelve months the male case was in hospital before the onset of the rigors, the longest period during which he did not require catheterization was two months. For a period of about two months after the cessation of the rigors the patient was incontinent of urine, although he did not require catheterization. For the last four months there has been complete control over both anal and vesical sphincters. The incontinence of urine of one of the female cases, whose rigors ceased in October, 1923, stopped immediately after the malarial paroxysms, but recommenced about ten months later. This patient showed a long history of general paralysis before malarial treatment, and, although she improved considerably for several months after the treatment, relapsed and

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died in November, 1924. No catheterization was required at any time after the rigors. The other female patient has had complete control over both anal and vesical sphincters since the rigors terminated about three months ago.

(*e*) *Seizures.*—Seizures after malarial treatment have occurred in only one or two cases, these having been patients who had long histories of general paralysis before inoculation. The seizures have been very slight and no succession of attacks has occurred. In one patient in this series severe seizures occurred between the inoculation and the onset of the rigors, the latter commencing shortly after the termination of the seizures.

General Considerations.

Although many of the changes recorded above may occur in any one patient, they do not all occur in each case treated. Some patients may improve physically, but not mentally, others may change from maniacs to simple dements, while still others may improve to such an extent mentally and physically that they are able to be discharged to the care of their friends. The degree of improvement varies, according to Wagner-Jauregg (11), with the length of time that has elapsed between the first appearance of anything abnormal in the patient's condition and the date of onset of the malarial rigors. The shorter the period the better the prognosis. In addition, Gerstmann (2) states that the best results are obtained in cases of simple dementia and tabo-paresis, and Pilcz (7) adds cases with maniacal symptoms. Although the series under review contains cases with long as well as with short histories of general paralysis, yet physical improvement occurred in every patient treated. Marked mental improvement has up to the present occurred in the more recent cases only.

In conclusion I wish to express my thanks to Dr. G. F. Barham, Medical Superintendent of Claybury Mental Hospital, for permitting me to publish the cases referred to.

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Observations on Delinquent Mental Defectives.[1] By W. Rees Thomas, M.D., M.R.C.P.Lond., D.P.M., Medical Superintendent, and Cecil H. G. Gostwyck, M.B., F.R.C.P.Edin., Dipl. Psych., Assistant Medical Officer of the Rampton State Institution, near Retford.

The problem of delinquency has a peculiar interest for the alienist as well as the social reformer, for it is now accepted that intelligence and mental disorder have a close relationship with antisocial conduct.

It has long been recognized that those persons in whom intelligence and mental capacity are very highly developed in special directions tend to show a mental instability often amounting to legal insanity, and at the other end of the scale idiopathic imbecility and idiocy are accepted as defects of development resulting in the inability of such subjects to care for themselves. The latitude allowed to the genius and the imbecile was not at first extended to the great mass of the population, faulty conduct being visited by punishment of a character and intensity which varied according to the nature of the delinquency and the prejudice of the period.

Modern ideas have tended to bring more and more to the front the necessity for reformatory measures rather than punitive action, and this kindly attitude has resulted in the differentiation of criminals and delinquents into two classes, *i.e.*, the responsible and the irresponsible. With the former we are not now concerned.

[1] A paper read at a meeting of the Northern and Midland Division held at the Grange, Rotherham, on October 23, 1924.