pregnant, and had given no evidence of albuminuria until immediately before admission. A cardiac case had a bad history of alcoholism and strangeness of manner. She was sent in for heart failure, and was improving when labour came on. She then became very excited and violent, and died in a few minutes. In both of these cases post-mortem Caesarean section was performed unsuccessfully. The remaining deaths are attributed to a variety of conditions. It should perhaps be mentioned that as far as possible diagnoses were verified pathologically. The following is a table of causes:

General peritonitis following spontaneous delivery ...	5
General peritonitis following assisted delivery ...	1
Septicaemia following spontaneous delivery ...	2
Septicaemia following assisted delivery ...	1
Shock ...	2
Pulmonary embolism ...	2
Pelvic abscess ...	2
Influenzal broncho-pneumonia ...	4
Abscess of lung ...	1
Pneumonia developing during puerperal insanity ...	1
Cerebellar glioma ...	1
Aplastic anaemia with suppurative pyelonephritis ...	1
Generalized tuberculosis ...	1
Acute dilatation of the stomach ...	1
Exhaustion following acute mania ...	1

Some of the cases recorded in the above table merit further notice. In one of the cases of shock death followed manual removal of the placenta for haemorrhage in the third stage in a woman with marked albuminuria; in the other the patient was a very fat woman with chronic bronchitis and albuminuria, who died very soon after an easy forceps delivery. One case of pulmonary embolism followed white leg; the other, mitral stenosis. Of the patients with pelvic abscess, one was admitted five weeks after she had had her baby at home; the other had arrived very ill from West Africa suffering from pyelonephritis. The albuminuria cleared up, but the urine remained offensive and infected. Two days after the labour rigors returned, and pelvic abscess gradually developed. This was drained, but the patient died in five weeks.

Of the twenty-six patients who died, only seven had received any assistance in labour; one of the remaining nineteen was attended by her doctor in a normal labour; sixteen were midwives' cases; two were "B.B.A.'s."

An analysis was made of the infantile deaths, of which there were ninety-one in this series. In the following table the word "uncertain" refers to cases in which no post-mortem examination was made, or syphilis was suspected but not proved, etc.

	Stillbirths.	Neo-natal Deaths.	Total.	Proportion per cent.
Prematurity ...	5	19	24	26.3
Albuminuria ...	10	5	15	16.5
Fatal deformities ...	6	6	12	13.2
Ante-partum haemorrhage ...	3	1	4	4.4
Pneumonia ...	—	1	1	1.1
Syphilis ...	1	1	2	2.2
Specific injuries ...	5	5	10	11.0
Following difficult labour ...	10	—	10	11.0
Uncertain ...	10	3	13	14.3
Totals ...	50 (3.84 %)	41 (3.15 %)	91 (7.0 %)	100

The fatal deformities were extremely varied, as the following list shows. Minor deformities have not been classified.

Anencephaly ...	4
Exomphalos ...	1
Multiple deformities (all different) ...	3
Patent interventricular septum ...	1
Meningocele (occipital) ...	1
Meningocele (frontal) ...	1
Duodenal stenosis ...	1

As regards injuries, lumbar puncture appeared successful in saving two or three infants. The fatal injuries were as follows:

Ruptured liver ...	3
Torn tentorium ...	6
Cerebellar haemorrhage without tear ...	1

Most of these occurred in cases of spontaneous delivery.

It is perhaps worthy of mention that many infants of apparently very feeble vitality (excluding birth shock) responded remarkably to the administration of one to two drops of adrenaline in a small quantity of saline by the mouth every hour.

REMARKS.

1. A somewhat incomplete summary is here presented of a series of maternity cases showing a deplorably high rate of mortality of 2 per cent. If, however, patients admitted for puerperal complications whose deaths were due to other diseases are omitted, a figure is reached of 0.4 per cent. This is still very high, and yet not high enough to represent the true mortality, since some of the other diseases would not have proved fatal apart from pregnancy and labour.

2. After five years' experience with mercurochrome in glycerin it is considered that this is a reliable, harmless, and absolutely efficacious antiseptic as far as the endometrium is concerned, and, possibly, for all mucous membranes.

3. The suggestion is made that 1/100 grain of hyoscine in 2 c.cm. sterile 50 per cent. magnesium sulphate solution is a safe and fairly effective analgesic for labour, though admittedly it has not yet received sufficient trial here.

SOME OBSERVATIONS ON SYPHILIS OF THE NERVOUS PARENCHYMA.

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"NATURE does not deal in schemes and diagrams: every separate individual and each case has its own peculiarity." It is now generally recognized that dementia paralytica and tabes dorsalis are affections separated from each other by no distinct line, and that it is the individuality alone which determines on what part of the central nervous system the lesion shall fall; but it does not appear to be acknowledged that the same relation exists between tabes and syphilitic myelitis, the former being classed as quaternary syphilis and the latter as tertiary syphilis.

In some races in Malaya syphilitic myelitis is very much more common than in Europe, while in the same races tabes and dementia paralytica are proportionally rarer. In England Williamson² records only 32 cases as compared with 118 cases of tabes seen during the same period, and the opinion of many neurologists in Europe is that it is a rare disease. On the other hand, Mon Fah Chung³ in Peking puts its incidence at 39 per cent. of all cases of spinal disease.

I record here the findings in a series of consecutive cases of parenchymatous spinal syphilis in one race—namely, the Chinese—admitted to the Singapore General Hospital during a period of eighteen months. One case of transverse myelitis with a negative Wassermann reaction and two of gummatous pachymeningitis are omitted from the series. It has been impossible in all cases to get a history of the time that elapsed between infection and the onset of nervous manifestations owing to the low intelligence of many of the patients, the frequency of multiple chancres at different times, and the fact that a true Hunterian chancre without secondary infection is rare; if present, it often passes unnoticed in consequence of being painless. Similar series have been made at the great pauper hospital of Tan Tock Seng, but as they only show the same features they are not recorded.

The series consists of two clerks, aged 56 and 45, one house-boy, aged 40, one cook, aged 33, one mortuary priest, aged 52, one sailor, aged 40, one fireman, aged 26, and ten coolies, average age 39 years—17 cases in all. All these patients had positive Wassermann reactions both in the spinal fluid and in the blood. I have divided them into groups, commencing with those that can be classified as *tabes dorsalis* and ending with those that approached Erb's syphilitic paraplegia.

The first group consisted of the clerks, the house-boy, and the mortuary priest, and were definite cases of *tabes dorsalis*. All had Argyll Robertson pupils, absence of the knee- and ankle-jerks, Romberg's sign, ataxic gait, and paraesthesia in the legs; one clerk had lightning pains, but none showed any signs of pyramidal tract involvement. The second group, consisting of three coolies, aged 48, 35, and 30, begins to show involvement of the pyramidal tracts. All had Argyll Robertson pupils and Romberg's sign, but the first had both knee- and ankle-jerks present, with a bilateral Babinski sign, and the second had increased knee- and ankle-jerks with slight spasticity of limbs, but the plantar reflex was flexor, and there was commencing optic atrophy. The third coolie, whose loss of pupil light reflex showed only on the right side, had lost both knee- and ankle-jerks, yet gave a shortening reflex in the left leg and a normal plantar reflex. The third group, consisting of two coolies, both aged 35, is only separated from the above because neither exhibited any alteration of the pupil reflexes; both showed Romberg's sign and had absent knee- and ankle-jerks, yet one had a bilateral Babinski sign with girdle pains and the other no Babinski sign, but paraesthesia and paresis of both legs. The fourth group is composed of the fireman, aged 26, and two coolies, aged 52 and 49, all exhibiting normal pupil reflexes, a positive Romberg sign, and greatly increased knee- and ankle-jerks. The fireman had also retention of urine, a Babinski sign, and shortening reflex on the left side, with hypotonia in both legs. The elder coolie had complete loss of pain sense to the level of the iliac crests, and no plantar reflex could be elicited, although he showed a shortening reflex in both legs; the younger had optic atrophy, difficulty in micturition, with shortening reflex, but no Babinski sign. The final group is composed of five cases: one cook, aged 33, one sailor, aged 40, and three coolies, aged 42, 39, and 34. The symptoms varied from those suggesting transverse myelitis, exhibited by the cook and the sailor, with complete paralysis of both legs, anaesthesia to the waist, a bilateral Babinski sign, and increased knee- and ankle-jerks (with, in the former, complete incontinence of urine and faeces, and in the latter retention of urine), to those of incomplete transverse myelitis in the coolies aged 39 and 34, and to the coolie aged 42, who showed extreme spasticity in both legs, difficult micturition, and whose sole sensory change was some tingling with diminution of localization sense in the legs.

This is a small series, but for the purpose of this note it is sufficient, since other series collected in Singapore show exactly the same features; the cases are therefore a representative consecutive series of what we are accustomed to see. The noticeable features are: (1) that the grading from pure posterior root and tract lesions to almost pure pyramidal tract lesions is too gradual to warrant the assumption of differing etiologies; (2) that the lesions of *tabes dorsalis* are shown most characteristically in the first group containing those patients who had not spent their life in hard manual labour—namely, the two clerks, the house-boy, and the mortuary priest; and (3) that some improvement often occurs in those cases with paralysis of the legs (which is usually of sudden onset) with the enforced rest alone, and before the commencement of specific treatment. To explain these features we can, of course, invoke the usual hypothetical toxins which, being hypothetical, will do whatever is required of them to explain difficulties—toxins of that extraordinary biological conception of a neurotropic strain of *Treponema pallidum*; truly extraordinary since, impotence being the rule in the large majority of the cases, the strain must be one with a suicidal tendency.

Considering now the pathology of the disease, with a view to confirmation or otherwise of the suggestion that

bodily activity has an important influence on the consequences of infection, it may be recalled that "the type of the soil in which *Treponema pallidum* is sown is more important in determining the type of syphilis than is the strain of the organism."⁴ Buzzard and Symonds note that syphilitic myelitis is more common in England among soldiers, and suggest that great fatigue, exposure, and alcohol may be the determining cause.⁵

The changes which are present in all types of syphilis, and are common to all, are the vascular changes. Beatty and Dickson write: "We regard the internal change as the result of a chronic inflammation caused by the poison of syphilis acting directly on the inner coat of the vessel, the *Spirochaeta pallida* being found in this coat, though it is also present, as already stated, in the degenerated areas of the media. The narrowing of the vessels may give rise to nutritional changes and overgrowth of fibrous tissue in the various structures to which they are distributed: or it may cause thrombosis in the vessel itself, just as do the changes in atheroma."⁶ In dementia paralytica we find the main changes in the capillaries which show a perivascular infiltration in the Virchow-Robin adventitial spaces. These spaces are packed with lymphocytes and plasma cells, and occasionally there may be seen elongated cells resembling collapsed capillaries.⁷ The vessel walls are thicker than normal, and the tissue is highly vascular, owing partly to the dilatation of vessels and partly to the sprouting of new capillaries, which are themselves soon surrounded with a perivascular infiltration.

The change that occurs in the vessels after malarial treatment is merely a lessening of the amount of infiltration of the adventitia and diminution of the number of plasma cells, causing them then to resemble the capillaries seen in lesions of tertiary syphilis. Similar changes are seen in myelitis, the perivascular infiltration, or rather infiltration of the adventitia, being sometimes combined with a capillary thrombosis.⁸ As Mon Fah Chung notes, the thrombosis of vessels occurs without signs of inflammation.³

Considering these changes we should expect to find that, owing to the general involvement of the capillaries, the nervous tissue must show signs of a chronic slowly evolving condition of undernutrition. There is ample confirmation of this view: first, in juvenile paresis and *tabes* there is a characteristic hypoplasia of both brain and cord, and in acquired dementia paralytica and *tabes dorsalis* there is an atrophy of both the brain and the cord.

Microscopically we find that: (1) the degeneration is not dependent upon any inflammatory process; (2) there is no correlation between the number of spirochaetes present and the changes found in the tissues; (3) the characteristic multiplication of the nuclei of the Purkinje cells in juvenile paresis suggests more an incomplete development than any poisoning by toxins; (4) the lesion in both is chiefly manifest in parts with a small blood supply—the cortex and dorsal region of the cord; (5) the condition of miliary necrosis in dementia paralytica, the only time where the number of spirochaetes and findings correspond, is a necrosis accompanied by no inflammatory reaction; and (6) the growth of fresh capillaries indicates an attempt to supply the deficiency in nutriment. The history also seems to show interesting points, the long incubation period in both juvenile and adult cases suggesting a slowly acting cause.

The rarity of a noticeable primary sore, and the mildness or absence of early symptoms, both suggest an individual who has a high resistance to the infection, and is not likely to be suddenly overwhelmed by hypothetical toxins, which are often even incapable of producing the typical syphilitic inflammations—as witness the rarity of the usual tertiary lesions other than aortitis in these complaints.

If then we picture the patient suffering from a very slowly increasing state of malnutrition of both the brain and cord, it must follow that those parts which are called upon most frequently are likely to suffer the most, provided that the blood supply, or rather the density of the capillary bed, is the same. However, since the blood supply is not by any means equal throughout the different parts of brain and cord, the final picture will depend upon both factors—the blood supply, and the mental and bodily activities of the

infected individual. We might instance in this connexion the practical arrest of the disease which so often follows tabetic optic atrophy; as the result of this lesion all the activities are so severely affected and so much less is required of the nervous tissues, that it can continue to function at this lower level in spite of the decreased blood supply. W. M. Malamud and K. Lowenberg⁹ state that an affection of the meningeal capillaries may lead to meningitis, and of the cortical capillaries to general paresis.

It is now clear why the soldier, the fireman, the rickshaw puller, and the coolie are so liable to suffer from involvement of the pyramidal tracts. In these cases the motor functions of the nervous tissue are so often called upon for such a tremendous output, since they must continue to function in spite of exhaustion, that the individual often becomes an almost senseless automaton, marching, running, or working oblivious to pain and all the finer senses, but still calling upon the motor system, including its arterial supply, for a full output of energy. The symptoms in these cases appear usually earlier than the sensory symptoms of tabes dorsalis, and it is hardly to be wondered at, considering what strain is put on the system.

Buzzard and Greenfield note in syphilitic myelitis that in some cases there is disease, or diminution, or complete occlusion of the lumen of the vessel; in others there is excessive perivascular infiltration with suggestion of slowing of the circulation and blood stasis, and in further cases paralytic vaso-dilatation ensues with very moderate perivascular infiltration and capillary thrombosis. In all cases there is, again, interference with the normal blood supply to the cells.

We have, further, a striking confirmation of this view in the more modern treatment with malaria of dementia paralytica. Malaria is supposed to increase the amount of antibodies and spirocides present in the blood and cerebro-spinal fluid. To those who know malaria as the disease above all others that reduces the resistance of an individual to an infection, and renders him more liable to fall a victim to any contagious or infectious disease, the hypothesis that induced malaria has the opposite effect in syphilis appears to be a totally unjustifiable assumption. The real effect malaria or other infections have in these cases is to give what might be termed a histamine shock effect—an action that causes dilatation of the capillaries, increasing the blood flow through them, and at the same time bringing more nutrition to the starved nerve cells as well as to the walls of the capillaries and tissues surrounding them. Only in this way can the effect of malaria without chemotherapy be explained, and also the fact that, although in some cases of late quaternary syphilis the spirochaetes appear to have died out, the degeneration of the nervous tissue progresses, and progresses in proportion to the strain thrown upon it. Again, one can note that the actual fever present has no relation to the ultimate curative effect of the procedure, except that if it is too severe the secondary debilitating effect damages the patient irretrievably. A similar effect can also often be seen in tabes after an irritant dose of x rays to the spinal cord, where a temporary amelioration of the symptoms frequently occurs as the blood flow increases in the irritated tissues.

In conclusion, I have brought forward evidence that the later manifestations of neurosyphilis must be regarded as only a result of the general vascular disease. They appear to be due to a slow starvation of all the nervous tissue, as well as of the tissues of the body; all through the body those tissues will first show signs of degeneration, which, having a small capillary bed, are yet required to do most work under conditions which render them unable to replace sufficiently the broken-down products of their activity. The areas with the least blood supply stand the least strain, and the more vital centres, being supplied better with blood, hold out the longest.

The *Treponema pallidum* is an organism which, through the centuries, has almost learned to live in symbiosis with man. Although possibly emitting, containing, or manufacturing some toxin, this toxin usually has no very virulent and rapid effect upon the tissues.

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Memoranda:

MEDICAL, SURGICAL, OBSTETRICAL.

TORSION AND GANGRENE OF TUBE COMPLICATING UTERINE PROLAPSE.

The following case seems sufficiently rare to merit publication.

A multipara, aged 54, had suffered from complete uterine prolapse since the birth of her last child eighteen years previously. The condition was controlled by means of a large "watch-spring" pessary. Recently, while on holiday in America, the patient consulted a doctor for attacks of slight pain in the right hypogastric region from which she had been suffering for a few months, and he advised removal of the pessary. When this had been done she was very pleased to find that the prolapse did not recur, though the occasional attacks of pain persisted.

Some months after her return to China she attended a social function, where she danced, and several hours later she was seized with acute abdominal pain exactly in the locality of the former attacks. I saw her an hour or so later, and found considerable tenderness and some resistance over the right hypogastric region. Her pulse and temperature were both normal, but a pelvic examination revealed a tense and painful swelling in the region of the right vaginal fornix.

A laparotomy was performed shortly afterwards, and on opening the peritoneum some blood-stained fluid was seen welling up from the pelvis. On investigating, I found a black, tense swelling, which proved to be a twisted, swollen, and completely gangrenous right Fallopian tube. The twist, which was very tight, had occurred across the isthmus of the tube and the adjacent portion of the broad ligament forming the mesosalpinx. A few adherent coils of intestine were easily separated, and the right tube and ovary excised. The uterus, which had been drawn over towards the affected side, now proved to be extremely mobile, the broad ligaments and round ligaments being very lax. The uterus was ventroflexed, and the abdomen closed. The patient made an uninterrupted convalescence.

This rather unusual condition appears to have been caused by the stretching of the broad ligament and mesosalpinx, resulting in its turn from the movements of the

Photograph showing the blood-distended and completely gangrenous right Fallopian tube removed, with the right ovary.

prolapsed uterus. I think it probable that a partial torsion had been present for some time, causing the slight attacks of pain, and anchoring the prolapsing uterus. Some sudden and unusual exertion made the twist acute, effectually strangulating the vessels in the mesosalpinx and rendering the tube gangrenous. There was no evidence of antecedent pelvic inflammation; as will be seen from the photograph of the specimen, the tube was greatly distended by blood, but the ovary seemed normal.

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