liver. The breaking down of the haemoglobin produces various forms of abnormal pigment, which become deposited throughout the body and in the skin. The condition is known as "haemochromatosis," and the alteration in the colour of the skin is sometimes of a most remarkable character. If recognized, it may serve as an important sign of the internal disorder. Most of the cases already described have been associated with disease of the liver or of the intestinal tract, not infrequently associated with glycosuria. This association, however, does not seem to be always necessary.

I have under observation now a patient suffering from the disease, whom I first was called to see by one of my colleagues in the hospital.

She was a young woman, a Board School teacher, of about 24 years of age, emaciated to an extreme degree. On further examination, the abdomen was noted to be greatly distended, and obviously contained fluid. The most striking feature, however, was the fact that she had become deeply pigmented from head to foot. The pigmentation, as usual, was most intense in the flexures of the body, where the tint could be compared to a very deep grey-blue slate colour. It was not of the usual brown or black tint characteristic of the deposit of melanin. An abdominal section was performed for the purpose of removing the collection of fluid and of exploring the abdomen. A large quantity of free, clear fluid, containing a few flakes of lymph was evacuated. The abdominal viscera, so far as could be seen, were normal with the exception that in the upper and back part of the abdominal cavity and on the under surface of the liver a small quantity of lymph lining the peritoneal surface and a few adhesions were seen. The operation was concluded, and I am glad to say that the patient made an uninterrupted recovery not only from the operation but of her general health. She soon commenced to increase in weight, to take her food properly, and was discharged from the hospital. She is still under my observation, having resumed her work as a Board School teacher eighteen months ago. She is in vigorous health, working eight or nine hours or more in the day in spite of my protests. The pigmentation gradually disappeared, and now can be made out with difficulty. The patient, however, says that the skin has never quite regained its original colour.

This case is very instructive as an illustration of the subject to which I have directed your attention. The unnatural pigmentation suggested a more accurate diagnosis than had previously been made, as the patient had been suspected of suffering from complications associated with ovarian cyst. It is possible that some cases of this abnormal pigmentation may arise from chronic inflammatory processes involving the upper regions of the abdomen, the neighbourhood of the suprarenal capsules and the liver, and are not necessarily fatal in their results.

Jaundice.—The other great anomaly of pigmentation which will, I am sure, be in your mind is jaundice, the most common and most important of the indications of liver disease. The consideration of the indications afforded by the varieties of jaundice I have purposely omitted from our discussion this evening. The subject is a complicated one, and worthy of detailed consideration, both from the point of view of accurate diagnosis and also because jaundice is associated with severe cutaneous troubles, which may be greatly alleviated by properly advised treatment.

This sketch that I have attempted to make this evening is incomplete, and leaves many parts to be filled up, but I hope that I have been able to show the importance of attempting to interpret some of the neglected signs of visceral disease.

A RETURN recently issued by the Minister of the Interior for Egypt, and relating to births and deaths during 1907 in the principal towns of that country, shows a birth-rate for natives of 43.7 per 1,000 on an estimated population of 1,530,672, and a death-rate, calculated on the same basis, of 36.7 per 1,000. During the same period the infant mortality was 309 per 1,000 registered births. The foreigners in the same towns are calculated as numbering 104,051 persons, the death-rate given being 24.4 per 1,000. In this case, however, the population is taken as being the same as the census of 1897, so the percentage figures are without material interest.

AN ANALYSIS OF 263 CASES OF TABES.

BY

BYROM BRAMWELL, M.D., F.R.C.P.E., F.R.S.E.,

SENIOR ORDINARY PHYSICIAN TO THE EDINBURGH ROYAL INFIRMARY, ETC.

In this communication I have analysed 263 cases of tabes dorsalis met with in hospital and private practice. The notes of the earlier cases are necessarily in some respects incomplete, but all the later cases have been carefully studied. Further, I have followed out the cases, so far as it has been possible to do so, and brought them up to date. I have consequently been able to trace the course of the disease during a period of several years, in a considerable proportion of the 263 cases, and, in most of the fatal cases, to give the total duration and the immediate cause of death.

TYPE OF THE DISEASE.

Of the 263 cases, 192, or 73 per cent., were in the ataxic, and 71, or 22.9 per cent., in the preataxic, stage of the disease.

SEX AND AGE.

Sex.—239, or 90.8 per cent. of the 263 cases, were males, and 24, or 9.1 per cent., females.

Age at Onset.—The age at which the first symptoms of tabes were said to have developed was noted in 258 of the 263 cases, and is shown in Table I and Fig. 1. In 5 of the

Fig. 1.—Graphic representation of the age at onset in 258 cases of tabes.

263 cases the age at which the first symptoms developed is not stated in the notes.

TABLE I.—Age at Onset in 258 Cases of Tabes.

Age.	No. of Cases.	Per Cent.
From 20 to 30 years ...	37	14.3
„ 31 „ 40 „ ...	121	46.8
„ 41 „ 50 „ ...	70	27.0
„ 51 „ 60 „ ...	25	9.6
Above 60 „ ...	5	1.9
Total ...	253	99.6

In the 258 cases in which the age at onset was ascertained, the disease commenced in 191 cases, or 73.6 per cent., between the ages of 30 and 50. In one case, in which the patient not only denied syphilis and gonorrhoea, but stated that he had never been exposed to infection, in which there were no appearances indicative of syphilitic disease, and in which there was no evidence of inherited syphilis, the disease commenced at the early age of 21. In one case in which the symptoms were in every way typical, the disease commenced at the age of 66; and in another case, characterized by marked ataxia, Rombergism, loss of the knee-jerk, and the Argyll-Robertson condition of the pupils, but in which there were no lightning pains, at the remarkably advanced age of 73.

SOCIAL STATUS.

Married, Widowed, or Single.—In 159, or 60.4 per cent., of the 263 cases, the patients were married; in 18 cases, or

6.8 per cent., widowers or widows; in 52 cases, or 21.2 per cent., single; and in 30 cases, or 11.4 per cent., the condition as regards marriage is not stated in the notes.

Occupation.—The occupations of the patients were very various, and are shown in Table II.

TABLE II.—Showing the Occupation in 263 Cases of Tabes.

Accountant 1	Manager public company 1
Actor 1	Manufacturer 1
Architect 1	Mason 3
Auctioneer 1	Machinist 1
Author 1	Medical practitioner ... 8
Baker 1	Merchant 5
Bank agent 1	Merchant (corn) 1
Barman 1	Merchant (wine) 1
Blacksmith 4	Miner 7
Boatman 1	Nurse 1
Bookbinder 3	Organist 1
Brassfinisher 1	Painter (coach) 2
Bricklayer 2	Painter (house) 5
Cabinet maker 2	Painter on china 1
Cabman 1	Paper maker 1
Cab proprietor 1	Plasterer 3
Carter 1	Police officer 2
Charwoman 1	Porter 1
Checker 2	Press reader 1
Chemist 3	Quarrymaster 1
Clergyman 2	Railway agent 1
Clerk 11	Railwayman 1
Coachman 2	Railway foreman 1
Comptroller of telegraphs 1	Ranchman 1
Commercial traveller ... 9	Riveter 1
Confectioner 2	Rubber worker 3
Cooper 1	Saddler 1
Dairyman 1	Sailor 4
Domestic servant 1	Sailor and pawnbroker ... 1
Draper 1	Salesman 2
Draughtsman 2	Saw miller 1
Engineer 14	Schoolmaster 1
Engine minder 1	Shipwright 1
Farmer 2	Shoemaker 4
Fisherman 1	Soldier 4
Flax dresser 1	Soldier (old) and coal
Florist 1	miner 1
Fruiterer 1	Soldier (old) and cooper .. 1
Furnaceman 1	" " labourer 1
Furniture packer 1	" " mason ... 1
Gardener 2	" " night
Gentleman (private means) 7	watchman 1
Glass cutter 1	Soldier (old) and painter ... 1
Golf club maker 1	" " railway-
Grocer 4	man 1
Groom 2	Spinner 1
Hairdresser 1	Stableman 1
Hosier 1	Stationmaster 1
Hotelkeeper 3	Stationer 1
House agent 1	Stockbroker 2
Housewife, or living at	Stoker 1
home 19	Street singer 1
Inland revenue officer ... 1	Tailor 1
Insurance agent 2	Telegraphist 1
Ironmonger 2	Tinplate worker 1
Jockey 1	Tramwayman 1
Joiner 2	Warehouseman 1
Labourer 9	Whisky agent 2
Land agent 2	Wireworker 1
Lawyer 6	Workman in distillery ... 1
Lithographer 1	Not stated 10
Lorryman 1	

263

ETIOLOGY.

In 253 of the 263 cases a definite statement as regards syphilis, and in 10 cases no statement as regards syphilis, was made in the notes.

Syphilis.

In 155, or 61.2 per cent., of the 253 cases in which there is a definite statement as regards syphilis, the patients admitted syphilis; in 12 cases, or 4.7 per cent.,

it is practically certain—from the family history of repeated miscarriages, stillborn children, husband syphilitic, etc.—that the patient had had syphilis; in 16 cases, or 6.3 per cent., the history as regards syphilis was doubtful; and in 70 cases, or 27.6 per cent., the patients denied syphilis.

Gonorrhoea.

In 42 cases in which the patients denied syphilis, or in which syphilis was doubtful, the patients admitted gonorrhoea.

Consequently, in 197 of the 253 cases there was a definite history of some form of venereal disease, and in 12 other cases it is practically certain that the patients had had syphilis. It is, therefore, practically certain that in 209, or 82.6 per cent., of the 253 cases the patients had had some form of venereal disease. In one case in which syphilis was denied the condition of the teeth suggested congenital syphilis.

Further, it is, of course, certain that in some (perhaps a considerable proportion) of the 70 cases in which the patients denied syphilis they had actually suffered from that disease. In several of the cases in which syphilis was ultimately admitted the patients had, at first, emphatically denied that they had suffered from the disease. In several cases the syphilis had been treated very thoroughly for long periods of time with mercury. These cases show—and this is an important practical point from an insurance point of view—that prolonged and thorough mercurial treatment does not, in all cases at all events, prevent the subsequent development of tabes.

In these statistics I have not attempted to discriminate between a true syphilitic ("hard") chancre and a "soft" sore, for, in many cases, I have found it impossible to get reliable information regarding the nature of the primary sore (whether "hard" or "soft") and as to the occurrence of slight secondary symptoms long years before. Further, "soft" sore may of course "carry" the syphilitic poison, and be followed by secondary and tertiary symptoms.

Length of Time between the Occurrence of the Venereal Sore and the First Symptoms of Tabes.

This point, which is of great importance from an insurance point of view, was definitely determined in 141 of the total 263 cases. The results are shown in Table III and Fig. 2.

TABLE III.—Time between the Chancre and the First Symptoms in 141 Cases of Tabes.

	No. of Cases.	Per Cent.
Under 1 year	1	0.7
1 to 5 years (inclusive)	26	18.4
6 " 10 " "	26	25.5
11 " 15 " "	30	21.2
16 " 20 " "	33	23.4
21 " 25 " "	11	7.8
26 " 30 " "	2	1.4
26 " 40 " "	1	0.7
41 " 45 " "	1	0.7
Total	141	99.8

From this table it will be seen that in 63 of the 141 cases, or 44.6 per cent., the tabes developed within the first ten years after infection; and in 78 cases, or 55.3 per cent., more than ten years after infection; in 63 cases, or 44.6 per cent., between ten and twenty years after infection; and in 15 cases, or 10.6 per cent., more than twenty years after infection.

Sexual Excess.—In 13 of the 263 cases marked sexual excess was admitted; but since the presence or absence of this form of excess was not particularly inquired for in all cases, it may have been present in a considerably larger proportion of cases. In 9 of the 13 patients who admitted marked sexual excess, there was a definite history of syphilis, and in 4 cases syphilis was denied.

Marriage.—In 7 of the 263 cases (in addition to the 13 cases in which sexual excess was admitted) marriage

seemed to have a decided influence either in producing or aggravating the disease. In 4 cases the symptoms developed soon or immediately after marriage; and in 3 cases the symptoms were markedly aggravated by marriage. In 5 of the 7 cases in which marriage seemed to produce or accelerate the development of the disease there was a definite history of syphilis; in 1 case syphilis was probable, and in 1 case doubtful.

Alcoholic Excess.—In 26 of the 263 cases marked excess as regards alcohol was admitted; the actual number was probably much larger. In 20 of the 26 cases in which marked alcoholic excess was present there was a definite history of syphilis; in 2 cases syphilis was probable, in 1 case doubtful, and in 3 cases definitely denied.

Injury.—In 7 cases an injury or operation was blamed by the patient as the cause of the disease, but it is very doubtful if in any of these cases the injury was the real cause. In all of these 7 cases there was a definite history of syphilis. In 1 case in which the disease commenced with optic atrophy in one eye, that eye had been habitually exposed to the glare of a bright light, and this was thought by the patient to be the cause of the condition. This patient admitted syphilis.

Exposure to Cold and Wet; Lying Out at Night.—This was blamed by the patient in 8 cases. In 4 of these 8 cases there was a definite history of syphilis, in 1 case syphilis was doubtful, and in 1 case definitely denied.

Mental Worry.—This was said to be the cause in 4 cases. In 3 of these there was a definite history of syphilis, and in 1 case syphilis was doubtful.

Infectious Diseases.—In 2 cases influenza, in 1 case scarlet fever, and in 1 case diphtheria were said to be the cause of the disease.

Lead Poisoning.—In 1 case lead poisoning was thought by the patient to be the cause of the disease.

The etiological factors detailed above are summarized in Table IV.

TABLE IV.—Showing the Chief Etiological Factors in 253 Cases of Tabes.

	the only apparent cause	105
	+ sexual excess	9
	+ marriage*	5
	+ alcoholic excess	17
	+ alcoholic excess + exposure to cold	1
	+ alcoholic excess + injury	1
	+ alcoholic excess + morphine excess	1
Syphilis admitted	+ injury	5
	+ injury + mental worry	1
	+ exposure of eye to light	1
	+ exposure to cold and wet	5
	+ mental worry	3
	+ influenza	1
	—	155
	the only apparent cause	8
	+ marriage*	1
	+ alcoholic excess	2
	+ influenza	1
	—	12
	the only apparent cause	12
	+ marriage*	1
	+ alcoholic excess	1
	+ exposure to cold and wet	1
	+ mental worry	1
	—	16
	and no other apparent cause	58
	but sexual excess	4
	but alcoholic excess	3
	but exposure to cold and wet	1
	but scarlet fever	1
	but diphtheria	1
	but injury	1
	but lead poisoning	1
	—	70
	—	253
Not noted	—	10
Total	—	263

*In the cases in which marriage is suggested as a cause of the disease, the symptoms either developed soon after marriage or became greatly aggravated soon after marriage.

The Length of Time the Disease had been in Existence before the Patients came under Observation.

This was definitely ascertained in 257 of the 263 cases, and varied from a few months (less than one year) in

28 cases, to 30 years in 1 case. In the remaining 6 cases in which the exact duration of the disease when the patient first came under observation is not definitely stated, the period is stated to have been many years in

Fig. 2.—Graphic representation of the length of time which elapsed between the occurrence of the venereal sore and the first symptoms in 141 cases of tabes.

2 cases, and some years in 3 cases. The details are given in Table V.

TABLE V.—Duration of the Disease, when the Patients were First Seen, in 263 Cases of Tabes.

Less than a year	28 cases	14 years	1 case
1 year	37	15	1
2 years	38	16	2 cases
3	30	17	1 case
4	34	19	1
5	16	20	5 cases
6	20	22	1 case
7	7	25	3 cases
8	9	30	1 case
9	5	Many years	2 cases
10	6	Some	3
11	4	?	1 case
12	7		

THE NATURE OF THE FIRST SYMPTOMS.

For the diagnosis of early tabes this is a point of considerable practical importance. In 258 of the 263 cases the nature of the first symptom, as stated by the patient, was as follows:

TABLE VI.—Nature of the First Symptoms, as stated by the Patient, in 258 Cases of Tabes.

Nature of Symptom.	Cases.	Per Cent. of 258 Cases.
Lightning pains (alone)	133	51.5
Diplopia	20	7.7
Dimness of vision	20	7.7
Ataxia	17	6.5
Lightning pains and ataxia	14	5.4
Derangement of urination	10	3.8
Gastric crises	6	2.3
Numbness (in feet, etc.)	5	1.9
Pains and loss of vision	3	1.1
Ataxia, pain in back, and numbness in feet	2	0.7
Vomiting (not due to gastric crisis)	2	0.7
Pains and giddiness; diplopia and giddiness; derangement of urination and debility; pain in the back; pain in the back and ataxia; coldness of feet; weakness; ataxia and loss of sexual desire and power; ataxia and bladder trouble; lightning pains and bladder trouble; joint affection; numbness in the feet and catching of the toes; pain in the back and bladder trouble; ataxia and cramps in the hands; ataxia and girdle sensation; noise in the ear (like a singing bird); loss of sexual power and desire; numbness and cough; anaesthesia of thorax; tired feeling in legs; pains; bladder trouble, and weakness in legs; inordinate sexual desire; pains, ataxia, and bladder trouble; pains and numbness; pains and girdle sensation; loss of vision and giving way of legs; 1 case each	26	10.0
	258	99.3
Not stated	5	
Total cases	263	

ANALYSIS OF INDIVIDUAL SYMPTOMS.

I will now consider serialim the different symptoms and signs of the disease, as manifested in the 263 cases under analysis.

Lightning Pains.

Lightning pains were present in some part or other of the body in 244 of the 263 cases, or 92.2 per cent., and were absent in 19 cases, or 7.2 per cent.

In my experience, lightning pains are by far the most frequent of all the symptoms and signs of tabes (they occurred in 92.2 per cent. of the cases), and are by far the most common initial symptom (they were the first symptom in 60.3 per cent.).

The lightning pains affected the legs only in 113 cases, or 42.9 per cent.; the legs and other parts in 239 cases, or 90.6 per cent.; other parts than the legs only in 5 cases, or 1.6 per cent.

TABLE VII.—*Parts affected by the Lightning Pains in 263 Cases of Tabes.*

Parts Affected.	No. of Cases	Per Cent. of 263 Cases.
Legs alone	113	42.9
Legs and trunk	39	14.8
Legs, arms and trunk	48	18.2
Legs and arms	24	9.1
Legs, trunk, arms and head ..	12	4.5
Legs, trunk and head	3	1.1
Arms and trunk	2	0.7
Arms, trunk and head	1	0.3
Head alone	1	0.3
Trunk alone	1	0.3
Absent	19	7.2
Total cases	263	99.4

In 1 case the pains were worse if the patient was constipated. In 1 case riding and hunting were repeatedly observed to be the exciting cause of very severe lightning pains, requiring morphine for their relief. In 1 case the occurrence of the gastric crises was always followed by very severe pains in the legs. In 1 case sexual excitement "had a bad effect on the pains." In 1 case very severe shooting pains were referred to the left forearm and hand, which had been amputated eight years previously.

Pain in the Back.—This was present in 86 of the 263 cases, or 32.7 per cent.; absent in 94 cases, or 35.7 per cent.; and not specifically mentioned in the notes in 83 cases, or 31.5 per cent. Consequently, in the 180 cases in which pain in the back is specifically mentioned in the notes, it was present in 86, or 47.7 per cent., and absent in 94, or 52.2 per cent. In 1 case, in which there was a very severe and persistent pain under the left scapula, an aneurysm of the descending thoracic aorta was found *post mortem*.

Girdle Sensation.—This was present in 107 of the 263 cases, or 40.6 per cent.; absent in 76 cases, or 38.8 per cent.; and not specifically mentioned in the notes in 80 cases, or 30.4 per cent. Consequently, in the 183 cases in which the presence or absence of the girdle sensation is mentioned in the notes, it was present in 107 cases, or 58.4 per cent., and absent in 76 cases, or 41.5 per cent.

Paraesthesiae.—Some form of paraesthesia was present in 178 of the 263 cases, or 67.6 per cent.; absent in 36 cases, or 13.3 per cent.; and was not specifically mentioned in the notes in 49 cases, or 18.6 per cent. Consequently, in the 214 cases in which the presence or absence of paraesthesiae is specifically stated in the notes, paraesthesiae of some form or another were present in 178 cases, or 83.1 per cent., and absent in 36 cases, or 16.8 per cent.

TABLE VIII.—*Nature of the Paraesthesiae in 178 Cases of Tabes.*

Numbness	53
Numbness and pins and needles	11
Numbness and cold feet	27
Numbness and ground felt soft	17
Numbness, pins and needles, cold feet, and ground felt soft ...	13
Numbness, pins and needles, and cold feet	14
Numbness, cold feet, and ground felt soft ..	11
Numbness, pins and needles, and ground felt soft	2
Pins and needles	4
Pins and needles and cold feet	4
Pins and needles, cold feet, and ground felt soft	1
Cold feet	12
Cold feet and ground felt soft	4
Ground felt soft	5
No paraesthesiae	36
Presence or absence of paraesthesiae not noted	49
Total	263

Consequently, in the 214 cases in which the presence or absence of paraesthesiae was noted, numbness (in feet, legs, hands, etc.) was present, either alone or in conjunction with other forms of paraesthesia, in 145 cases, or 69.1 per cent.; coldness of the feet (a feeling as if standing on snow, etc.), either alone or in combination with other forms of paraesthesia, in 85 cases, or 39.7 per cent.; "the ground felt soft," either alone or in combination with other forms of paraesthesia, in 53 cases, or 24.7 per cent.; and pins and needles, either alone or in combination with other forms of paraesthesia, in 49 cases, or 22.9 per cent. In the 178 cases in which the above forms of paraesthesia—numbness, pins and needles, cold feet, the ground felt soft—were present, other forms of paraesthesiae—such as hyperaesthesia, coldness in the back, a damp cold feeling about the testicles, etc.—were also present in some cases.

Anaesthesia in the Legs.—In 100, or 38 per cent., of the 263 cases there was more or less anaesthesia in the legs; in 114 cases, or 43.3 per cent., there was no anaesthesia in the legs; and in 49 cases, or 18.6 per cent., the presence or absence of anaesthesia in the legs was not specifically mentioned in the notes. Consequently, in the 214 cases in which the presence or absence of anaesthesia in the legs was specifically mentioned in the notes, it was present in 100 cases, or 46.7 per cent., and absent in 114 cases, or 53.2 per cent. In many of the 100 cases in which anaesthesia was present in the legs it was slight in degree and limited in distribution.

Anaesthesia in the Arms.—In 51 of the 263 cases, or 19.3 per cent., there was more or less anaesthesia in the arms; in 123 cases, or 46.3 per cent., there was no anaesthesia in the arms; and in 89 cases, or 33.8 per cent., the presence or absence of anaesthesia in the arms was not specifically mentioned in the notes. Consequently, in the 174 cases in which the presence or absence of anaesthesia in the arms was specifically mentioned in the notes, it was present in 51 cases, or 29.3 per cent., and absent in 123 cases, or 70.6 per cent.

Anaesthesia in the Trunk.—In 77 of the 263 cases, or 29.2 per cent., there was more or less anaesthesia in the trunk; in 98 cases, or 37.1 per cent., there was no anaesthesia in the trunk; and in 88 cases, or 33.4 per cent., the presence or absence of anaesthesia in the trunk was not specifically mentioned in the notes. Consequently, in the 175 cases in which the presence or absence of anaesthesia in the trunk was specifically mentioned in the notes, it was present in 77 cases, or 44 per cent., and absent in 98 cases, or 56 per cent.

Anaesthesia in the Face.—In 8 of the 263 cases, or 3 per cent., there was more or less anaesthesia in the face; in 151 cases, or 57.4 per cent., there was no anaesthesia in the face; and in 104 cases, or 39.5 per cent., the presence or absence of anaesthesia in the face was not specifically mentioned in the notes. Consequently, in the 159 cases in which the presence or absence of anaesthesia in the face was specifically mentioned in the notes, it was present in 8 cases, or 5 per cent., and absent in 151 cases, or 94.9 per cent. In 1 case there was complete anaesthesia and analgesia of one—the left—side of the face and tongue, obviously due to a lesion of the fifth nerve or its central connexions. In 1 case there was complete

hemianaesthesia and hemianalgesia of the left side of the body (face, arm, and leg).

Analgesia in the Legs.—In 107, or 40.6 per cent., of the 263 cases, there was more or less analgesia in the legs; in 89 cases, or 33.9 per cent., there was no analgesia in the legs; and in 67 cases, or 25.4 per cent., the presence or absence of analgesia in the legs was not specifically mentioned in the notes. Consequently, in the 198 cases in which the presence or absence of analgesia in the legs was specifically mentioned in the notes, it was present in 107 cases, or 54.5 per cent., and absent in 89 cases, or 45.4 per cent.

Analgesia in the Arms.—In 96, or 36.5 per cent., of the 263 cases, there was more or less analgesia in the arms; in 80 cases, or 30.4 per cent., there was no analgesia in the arms; and in 87 cases, or 33 per cent., the presence or absence of analgesia in the arms was not specifically mentioned in the notes. Consequently, in the 176 cases in which the presence or absence of analgesia in the arms was specifically mentioned in the notes, it was present in 96 cases, or 54.5 per cent., and absent in 80 cases, or 45.4 per cent.

Ulnar Analgesia.—In 54, or 20.5 per cent., of the 263 cases, ulnar analgesia was present; absent in 49, or 18.6 per cent.; and not mentioned in the notes in 160, or 60.8 per cent. Consequently, in the 103 cases in which the presence or absence of ulnar analgesia was specifically mentioned in the notes, it was present in 54 cases, or 52.4 per cent., and absent in 49 cases, or 47.5 per cent.

Analgesia in the Trunk.—In 123 of the 263 cases, or 46.7 per cent., there was more or less analgesia in the trunk; in 60 cases, or 22.8 per cent., there was no analgesia in the trunk; and in 80 cases, or 30.4 per cent., the presence or absence of analgesia in the trunk was not specifically mentioned in the notes. Consequently, in the 183 cases in which the presence or absence of analgesia in the trunk was specifically mentioned in the notes, it was present in 123 cases, or 67.2 per cent., and absent in 60 cases, or 32.7 per cent.

Thoracic Analgesia.—In 62 of the 263 cases, or 23.5 per cent., thoracic analgesia was present; in 42 cases, or 15.9 per cent., absent; and in 159 cases, or 60.4 per cent., not specifically mentioned in the notes. Consequently, in the 104 cases in which the presence or absence of thoracic analgesia was specifically noted, it was present in 62 cases, or 59.6 per cent., and absent in 42 cases, or 40.3 per cent.

Analgesia in the Face and Head.—In 4 of the 263 cases, or 1.4 per cent., there was more or less analgesia in the face and head; in 153 cases, or 58.1 per cent., there was no analgesia in the face and head; and in 106 cases, or 40.3 per cent., the presence or absence of analgesia in the face and head was not specifically mentioned in the notes. Consequently, in the 157 cases in which the presence or absence of analgesia in the face and head was specifically mentioned in the notes, it was present in 4 cases, or 2.5 per cent., and absent in 153 cases, or 97.4 per cent.

Sensibility to Heat and Cold.—This was only carefully investigated in such a small number of the 263 cases that I am not able to make any definite and reliable statement regarding its condition in the different areas of the body.

The Stereognostic Sense.—This was examined in a limited number of cases; in 2 cases it was defective; in all the other cases in which it was examined it was unaffected.

Ataxic Gait.—In 192 of the 263 cases, or 73 per cent., an ataxic gait was present; and in 71 cases, or 26.9 per cent., absent.

Rombergism.—In 190 of the 263 cases, or 72.2 per cent., Rombergism was present; in 72 cases, or 27.3 per cent., absent; and in 1 case, or 0.3 per cent., the presence or absence of Rombergism was not specifically mentioned in the notes.

Inco-ordination in the Legs.—In 184, or 69.9 per cent., of the 263 cases, inco-ordination was present in the legs; in 75, or 28.1 per cent., inco-ordination was absent in the legs; and in 4, or 1.5 per cent., the presence or absence of inco-ordination in the legs (other than the inco-ordination shown by the ataxic gait) was not specifically mentioned in the notes. Consequently, in the 259 cases in which the presence or absence of inco-ordination in the legs was specifically mentioned in the notes, it was present in 184

cases, or 71 per cent., and absent in 75 cases, or 28.8 per cent.

Inco-ordination in the Arms.—In 58, or 22 per cent., of the 263 cases, inco-ordination was present in the arms; in 156 cases, or 59.3 per cent., there was no inco-ordination present in the arms; and in 49 cases, or 18.6 per cent., the presence or absence of inco-ordination in the arms was not specifically mentioned in the notes. Consequently, in the 214 cases in which the presence or absence of inco-ordination in the arms was definitely stated in the notes, it was present in 58 cases, or 27.1 per cent., and absent in 156 cases, or 72.8 per cent.

Muscular Sense in the Legs.—In 94 of the 263 cases, or 35.7 per cent., the sense of movement was affected; in 81 cases, or 30.8 per cent., unaffected; and in 88 cases, or 33.4 per cent., the condition of the sense of movement in the legs was not specifically mentioned in the notes. Consequently, in the 175 cases in which the sense of movement in the legs was specifically stated in the notes, it was impaired in 94, or 53.7 per cent., and was not affected in 81, or 46.2 per cent.

Muscular Sense in the Arms.—The sense of movement in the arms was affected in 26 of the 263 cases, or 9.8 per cent.; unaffected in 127, or 48.2 per cent.; and not specifically mentioned in the notes in 110 cases, or 41.8 per cent. Consequently, in the 153 cases in which the condition of the sense of movement in the upper extremities was specifically stated in the notes, it was affected in 26, or 16.9 per cent., and unaffected in 127, or 83 per cent. In the great majority of the 26 cases in which the sense of movement in the arms was affected the impairment was only slight.

Muscular Analgesia in the Legs.—This was present in 81 of the 263 cases, or 30.7 per cent.; absent in 51 cases, or 19.3 per cent.; and not specifically mentioned in the notes in 131 cases, or 49.8 per cent. Consequently, in the 132 cases in which the presence or absence of muscular analgesia in the legs was mentioned in the notes, it was present in 81 cases, or 61.3 per cent., and absent in 51 cases, or 38.6 per cent.

Muscular Hypotonia.—This was present in 70 of the 263 cases, or 26.6 per cent.; absent in 48 cases, or 18.2 per cent.; and not stated in 145 cases, or 55.1 per cent. Consequently, in the 118 cases in which the presence or absence of hypotonia was mentioned in the notes, it was present in 70 cases, or 59.3 per cent., and absent in 48 cases, or 40.6 per cent. In many of the cases in which hypotonia was present it was only slight. Hypotonia in the legs was regarded as present when, the patient lying flat on the back, the extended leg could be brought to a right angle, or less than a right angle, with the trunk.

The Condition of the Knee-jerks.—In 224 of the 263 cases, or 85.1 per cent., the knee-jerks were lost (on both sides, in 212, or 80.6 per cent., and on one side in 12, or 4.5 per cent.); in 31 cases, or 11.7 per cent., the knee-jerks were present on both sides. In 8 cases, or 3 per cent., the condition of the knee-jerks was not specifically mentioned in the notes. Consequently, in the 255 cases in which the condition of the knee-jerks was specifically stated in the notes, they were lost on one or both sides in 224 cases, or 87.8 per cent., and present on both sides in 31 cases, or 12.1 per cent. The exact frequency with which the knee-jerk is absent in any series of cases of tabes will, of course, to some extent depend upon the relative proportion of the cases of preataxic and ataxic in that series. We now recognize many obscure cases as cases of preataxic tabes, which were not recognized as tabes a few years ago. This is probably the explanation of the fact that, in my series of cases, the knee-jerks were lost in a somewhat smaller percentage of cases—87.8—than in the series of cases recorded by other observers a few years ago.

Achilles-jerk.—In 138 of the 263 cases, or 52.4 per cent., the Achilles-jerk was absent on one or both sides (in 136, or 50.1 per cent., on both sides, and in 6 of these cases, or 2.2 per cent., on one side only); in 21 cases, or 7.9 per cent., the Achilles-jerk was present on both sides; and in 104 cases, or 39.5 per cent., the Achilles-jerk was not examined. Consequently, in the 159 cases in which the Achilles-jerk was examined, it was absent in 138 cases, or 86.7 per cent., on one or both sides (on both sides, 136 cases, or 85 per cent.; and in 6 cases, or 3.7 per cent., on one side); and in 21 cases, or 13.2 per cent., it was present on both sides.

The Relationship between the Achillis-jerks and the Knee-jerks.

A comparison of the relative frequency with which the knee-jerks and the Achillis-jerks were absent shows that the knee-jerks were absent (on one or both sides) in 87.8 per cent., and the Achillis-jerks in 87.5 per cent. The greater frequency with which the knee-jerks were absent was without doubt, I think, due to the fact that, in 169 cases in which the Achillis-jerks were examined, there was a larger number (proportion) of cases of preataxic tabes than in the 255 cases in which the knee-jerks were examined.

In 169 of the 263 cases the condition of both the knee-jerks and Achillis-jerks was noted.

In 144, or 85.2 per cent., of the 169 cases, the knee-jerk was absent (on both sides in 135 cases, or 79.8 per cent., and on one side in 9 cases, or 5.3 per cent.); and in 25 cases, or 14.7 per cent., both knee-jerks were present. In 148, or 87.5 per cent., of the 169 cases the Achillis-jerk was absent (on both sides in 142 cases, or 84 per cent., and on one side in 6 cases, or 3.5 per cent.); and in 21 cases, or 12.4 per cent., both Achillis-jerks were present. In 130, or 76.9 per cent., of the 169 cases, both knee-jerks and both Achillis-jerks were absent; in 17 cases, or 10 per cent., both knee-jerks and both Achillis-jerks were present; and in 22 cases, or 13 per cent., the knee-jerks and Achillis-jerks were unequally affected. In the 22 cases in which the knee-jerks and Achillis-jerks were not affected in the same way, the knee-jerks were both absent in 5 cases, and the Achillis-jerks both absent in 12 cases; one knee-jerk was absent in 9 cases, and 1 Achillis-jerk in 6 cases; both knee-jerks were present in 8 cases, and both Achillis-jerks in 6 cases.

TABLE IX.—*The Condition of the Achillis jerks and Knee-jerks in 22 Cases of Tabes in which the Two Jerks were not affected in the same way.*

No. of Case	Right Leg.		Left Leg.	
	Knee-jerk.	Achillis-jerk.	Knee-jerk.	Achillis-jerk.
43	Normal	Normal	Normal	Absent.
60	Absent	Normal	Absent	Absent.
69	Absent	Exaggerated	Exaggerated	Exaggerated.
145	Absent	Absent	Present on re-inforcement	Absent.
157	Absent	Present and active	Absent	Present, very slight.
158	Present and active	Absent	Absent	Absent.
167	Normal	Absent	Normal	Absent.
175	Absent	Normal	Normal	Absent.
180	Absent	Absent	Normal	Absent.
191	Absent	Absent	Absent	Normal.
196	Present, very slight	Absent	Present, very slight	Absent.
197	Normal	Absent	Absent	Absent.
200	Absent	Absent	Present, very slight	Absent.
201	Absent	Normal	Absent	Present, slight.
210	Normal	Absent	Normal	Absent.
214	Present, slight	Absent	Present, slight	Absent.
220	Normal	Absent	Normal	Absent.
222	Normal	Absent	Normal	Present, slight.
240	Absent	Normal	Absent	Normal.
254	Normal	Present, slight	Absent	Absent.
255	Present, slight	Absent	Normal	Absent.
263	Normal	Absent	Normal	Absent.

Deep Reflexes in the Upper Extremities.—In 62 of the 263 cases, or 23.5 per cent., the deep reflexes in the upper extremities were absent, or not obtained,* on one or both sides; in 70 cases, or 26.6 per cent., present on both sides; and in 131 cases, or 49.8 per cent., the presence or absence of the deep reflexes was not recorded in the notes. Consequently, in the 131 cases in which the condition of the

deep reflexes in the upper extremities was noted, they were absent, or not obtained, on one or both sides, in 62, or 46.9 per cent., and present in 70 cases, or 53 per cent.

Jaw-jerk.—In 30, or 11.4 per cent., of the 263 cases, the jaw-jerk was absent, or not obtained; in 86, or 32.6 per cent., present; and in 147, or 55.8 per cent., not specifically mentioned in the notes. Consequently, in the 116 cases in which the condition of the jaw-jerk was specifically mentioned in the notes, it was absent, or not obtained, in 30 cases, or 25.8 per cent., and present in 86 cases, or 74.1 per cent.

Plantar Reflex.—In 26 of the 263 cases, or 9.8 per cent., the plantar reflex was absent; in 187 of the 263 cases, or 71.1 per cent., present on one or both sides; and in 50 cases, or 19 per cent., the condition of the plantar reflex was not specifically mentioned in the notes. Consequently, in the 213 cases in which the condition of the plantar reflex was noted, it was present on one or both sides in 187 cases, or 87.7 per cent., and absent in 26, or 12.2 per cent. In many of the cases the plantar reflex was exaggerated. This exaggeration of the superficial reflexes in tabes is, I think, of some diagnostic importance, more especially in the early stages of ill-developed cases.

The Toe Movement: Babinski's Sign.—In 135 of the 263 cases, the condition of the toe movement was noted. In 17 cases, or 12.8 per cent., of these 135 cases, there was no movement of the toes; in 110 cases, or 82.9 per cent., the movement of the toes was flexion; in 7 cases, or 5.2 per cent., extension on one or both sides; and in 1 case, or 0.7 per cent., there was doubtful extension. In 4 of these cases of tabes in which the toe movement was extension, the presence of the Babinski sign could be satisfactorily accounted for by the presence of some associated lesion or complication.

Cremasteric Reflex.—In 54 of the 263 cases, or 20.5 per cent., the cremasteric reflex was absent on both sides; in 12 cases, or 4.5 per cent., absent on one side; in 95, or 36.1 per cent., present on both sides; and in 102, or 48.7 per cent., the condition of the cremasteric reflex was not specifically mentioned in the notes. Consequently, in the 161 cases in which the condition of the cremasteric reflex was specifically noted, it was present in 95 cases, or 59 per cent.; absent on both sides in 54 cases, or 33.5 per cent.; and on one side in 12 cases, or 7.4 per cent.

Abdominal Reflex.—In 118, or 44.8 per cent., of the 263 cases the abdominal reflex was present; in 32 cases, or 12.1 per cent., absent; and in 113 cases, or 42.9 per cent., the condition of the abdominal reflex was not specifically mentioned in the notes. Consequently, in the 150 cases in which the condition of the abdominal reflex was specifically mentioned in the notes, it was present in 118 cases, or 78.6 per cent.; and absent in 32 cases, or 21.3 per cent.

Bladder Reflex.—In 186 of the 263 cases, or 70.7 per cent., the bladder reflex was affected in some way or another (forcing, dribbling, retention, incontinence, precipitant urination, etc.); in 65 cases, or 24.7 per cent., the bladder reflex was not affected; and in 12 cases, or 4.5 per cent., the condition of the bladder reflex was not specifically mentioned in the notes. Consequently, in the 251 cases in which the condition of the bladder reflex was specifically mentioned in the notes, urination was affected in 186 cases, or 74.1 per cent., and unaffected in 65 cases, or 25.8 per cent. The vesical crises are not included in the derangements of urination just considered; they will be dealt with subsequently.

Rectal Reflex.—In 143 of the 263 cases, or 54.3 per cent., the rectal reflex was (apparently)* affected; in 105 cases, or 39.9 per cent., not affected; and in 15 cases, or 5.7 per cent., the condition of the rectal reflex was not specifically mentioned in the notes. Consequently, in the 248 cases in which the condition of the rectal reflex was specifically stated in the notes, it was affected in 143 cases, or 57.6 per cent., and unaffected in 105 cases, or 42.3 per cent.

Sexual Reflex.—In 115 of the 263 cases, or 43.7 per cent., the sexual reflex was affected; in 63 cases, or 23.9 per cent., not affected; and in 85 cases, or 32.3 per cent., the condition of the sexual reflex was not specifically mentioned in the notes. Consequently, in the 178 cases in which the condition of the sexual reflex was specifically

* I say not obtained, for in some cases it is difficult to obtain these reflexes, especially the triceps-jerk, in health.

* I say "apparently," for constipation is such a common symptom that in many of these cases the constipation was probably accidental, and not the direct result of the tabes.

mentioned in the notes, it was affected in 115 cases, or 64.6 per cent., and unaffected in 63 cases, or 35.3 per cent.

Paralysis.—Paralysis, other than ocular paralysis, was present in 19 of the 263 cases, or 7.2 per cent.; absent in 199 cases, or 75.6 per cent.; and not specifically mentioned in the notes in 45 cases, or 17.1 per cent. Consequently, in the 218 cases in which the presence or absence of paralysis (other than ocular paralysis) was specifically mentioned in the notes, it was present in 19 cases, or 8.7 per cent., and absent in 199 cases, or 91.2 per cent.

The Condition of the Pupils.

(a) **Equality in Size.**—In 99 of the 263 cases, or 37.6 per cent., the pupils were unequal in size; in 100 cases, or 38 per cent., the pupils were equal; and in 64 cases, or 24.3 per cent., the equality of the pupils was not specifically mentioned in the notes. Consequently, in 199 cases in which the condition of the pupils as regards their equality was specifically mentioned in the notes, they were unequal in 99 cases, or 49.9 per cent., and equal in size in 100 cases, or 50 per cent.

(b) **Size.**—The pupil was measured in a moderate light. Pupils above 5 mm. in size were classed as dilated; between 5 and 3 mm. as of medium size; at or below 3 mm. as contracted. In several of the 122 cases in which the pupils were contracted, they were extremely myotic—1 to 1½ mm. In 122 of the 263 cases, or 46.3 per cent., the pupils were contracted; in 72 cases, or 27.3 per cent., of medium size; in 14 cases, or 5.3 per cent., dilated; and in 55 cases, or 20.9 per cent., the size of the pupils was not specifically mentioned in the notes. Consequently, in the 208 cases in which the size of the pupils was specifically mentioned in the notes, they were contracted in 122 cases, or 58.6 per cent.; of medium size in 72 cases, or 34.6 per cent.; and dilated in 14 cases, or 6.7 per cent.

(c) **Regularity of Margins.**—In 36 of the 263 cases, or in 13.6 per cent., the margins of the pupils were regular; in 32 cases, or 12.1 per cent., irregular; and in 195 cases, or 74.1 per cent., the condition of the pupil in respect to this point was not specifically mentioned in the notes. Consequently, in the 68 cases in which the condition of the pupils as regards regularity of their margins was noted, they were regular in 36 cases, or 52.9 per cent., and irregular in 32 cases, or 47 per cent.

(a) **Contractility to Light.**—In 222 of the 263 cases, or 84.4 per cent., the pupil reflex to light was completely lost or very sluggish in one or both eyes (in 215 cases, or 81.7 per cent., in both, and in 7 cases, or 2.6 per cent., in one eye); in 30 cases, or 11.4 per cent., the pupils reacted briskly to light; and in 11 cases, or 4.1 per cent., the condition of the light reflex was not specifically mentioned in the notes. Consequently, in 222 of the 252 cases, or 88 per cent., in which the condition was specifically mentioned in the notes, the light reflex was lost or very sluggish, and in 30 cases, or 11.9 per cent., present.

(e) **Contraction on Accommodation.**—In 37 cases, or 14 per cent., of the 263 cases, the contraction of the pupil on accommodation was either completely absent or very sluggish (in both eyes in 34 cases, or 12.9 per cent., and in one eye in 3 cases, or 1.1 per cent.); in 215 of the 263 cases, or 81.7 per cent., both pupils contracted briskly on accommodation; and in 11 cases, or 4.1 per cent., the activity of the pupil on accommodation was not specifically stated in the notes. Consequently, in the 252 cases in which the condition of the pupil as regards contractility on accommodation was noted, the contractility of the pupil on accommodation was absent or very sluggish in 37, or 14.6 per cent. (in both eyes in 34, or 13.4 per cent., and in one eye in 3, or 1.1 per cent.), and brisk in 215, or 85.3 per cent.

The Argyll-Robertson Condition (Reflex Iridoplegia).—In 186 cases, or 70.7 per cent., the Argyll-Robertson condition of the pupil was present on one or both sides (in 179 cases, or 68 per cent., on both, and in 7 cases, or 2.6 per cent., on one side). In 36 cases, or 13.3 per cent., both the light reflex and the contraction of the pupil on convergence were lost; in 30 cases, or 11.4 per cent., the pupils contracted actively to light; and in 11 cases, or 4.1 per cent., the contractility of the pupil to light was not mentioned in the notes. Consequently, the Argyll-Robertson pupil (loss or sluggish action to light with activity on convergence) was present in 186, or 73.2 per

cent., of the 252 cases in which the condition of the pupillary reaction was specifically stated in the notes.

Optic Atrophy.

In 55 of the 263 cases, or 20.9 per cent., optic atrophy was present (in 51 cases, or 19.3 per cent., in both eyes, and in 4 cases, or 1.5 per cent., in one eye); absent in 208 cases, or 79 per cent.

Other Ocular Symptoms.

Some form or other of ocular paralysis was noted in 37, or 14 per cent., of the 263 cases. Ptosis alone without other ocular paralysis in 15 cases; in 8 of these cases the ptosis was unilateral, and in 7 bilateral. Paralysis of the external rectus in 14 cases; on one side in 8 cases, and on both sides in 6 cases. More extensive and complicated paralyzes of the external muscles of the eyeball were present in 8 cases; in 2 cases complete paralysis of the third nerve on one side; in 1 case double ptosis, more marked in the right eye, with frontal overaction, paralysis of the external recti, paralysis of the right internal rectus; in 1 case paralysis of the third and sixth nerves in one eye; in 1 case ptosis and paralysis of upward and downward movements of the right eye; in 1 case ptosis and paralysis of the right external rectus; in 1 case ptosis of the left eye, slight paralysis of the right external rectus, inability to look upwards with either eye; in 1 case paralysis of both external recti and inability to converge with either eye.

Nystagmus and watering of the eyes were noted in a small number of cases.

Crises.

Visceral crises of some form or another were present in 35 of the 263 cases, or 13.3 per cent.; absent in 187 cases, or 71.1 per cent.; and not specifically mentioned in the notes in 41 cases, or 15.5 per cent. Consequently, in the 222 cases in which the presence or absence of visceral crises was specifically mentioned in the notes, they were present in 35 cases, or 15.7 per cent., and absent in 187 cases, or 84.2 per cent.

The nature of these crises was as follows:

- (a) *Gastric alone* in 20 cases.
- (b) *Rectal* in 4 cases.
- (c) *Gastric and nasal* in 1 case.
- (d) *Gastric, rectal, and vesical* in 1 case.
- (e) *Gastric, intestinal, and vesical* in 1 case.
- (f) *Gastric and intestinal* in 1 case.
- (g) *Gastric, rectal, and laryngeal* in 1 case.
- (h) *Laryngeal* in 3 cases.
- (i) *Intestinal* in 2 cases.
- (j) *Sexual* in 1 case.

Consequently, the different forms of crisis were present, either alone or in combination with other forms of crisis, as follows:—*Gastric* in 25 cases; *rectal* in 6 cases; *intestinal* in 4 cases; *laryngeal* in 4 cases; *vesical* in 2 cases; *sexual* and *nasal* in 1 case each.

Trophic Lesions of Bones and Joints (Charcot's Joint Disease).

Trophic lesions in the bones and joints were present in 17 of the 263 cases, or 6.4 per cent.; absent in 231 cases, or 87.7 per cent.; and not specifically mentioned in the notes in 15 cases, or 5.7 per cent. Consequently, in the 248 cases in which the presence or absence of trophic lesions in the bones and joints was specifically mentioned in the notes, such lesions were present in 17 cases, or 6.8 per cent., and absent in 231 cases, or 93.1 per cent.

Vasomotor and Trophic Lesions in the Skin and its Appendages.

In 19 of the 263 cases, or 7.2 per cent., vasomotor and trophic lesions in the skin and its appendages were present; and in 244 cases, or 92.7 per cent., absent.

General Paralysis of the Insane.

In 30, or 11.4 per cent., of the 263 cases of tabes, general paralysis of the insane developed in the course of the disease (tabes)*. And if we take into account the fact that in many of the 263 cases the progress of the case after the patients were under observation is not known, and that in many cases the disease is still in progress; it may be confidently assumed that in this series of 263 cases of tabes, general paralysis of the insane developed in a considerably larger percentage than 11.4.

* I have not included in this analysis the cases in which tabes dorsalis developed in the course of general paralysis of the insane (these cases are entered in my notebooks as "G.P.I.")

Mental Symptoms.

In the 30 cases in which symptoms more or less typical of general paralysis of the insane developed, there were of course mental symptoms. In addition, mental symptoms of some form or another (impairment of memory, mental depression, mental irritability, etc.) were noted in 27, or 10.2 per cent., of the 263 cases. In the remaining cases of the series, the mental condition was either quite normal or not specifically stated in the notes. Consequently, if the 30 cases in which general paralysis of the insane developed are included, mental symptoms were present in 57 cases, or 21.6 per cent. In the remaining cases of the series the mental condition was either quite normal or not specifically stated in the notes.

Special Senses.

Hearing.—In 25 of the 263 cases, or 9.5 per cent., hearing was more or less impaired on one or both sides; in 162 cases, or 61.5 per cent., hearing was normal; and in 76 cases, or 28.8 per cent., the condition of hearing was not specifically mentioned in the notes. I do not attach any great importance to these percentages, for in many of the 25 cases in which hearing was impaired the impairment was apparently not the direct result of the tabes.

Taste.—In 2 of the 263 cases, or 0.7 per cent., taste was affected; in 177 cases, or 67.3 per cent., taste was not affected; and in 84 cases, or 31.9 per cent., the condition of taste was not specifically mentioned in the notes.

Smell.—In 2 of the 263 cases, or 0.7 per cent., smell was affected; in 176 cases, or 66.9 per cent., smell was not affected; and in 85 cases, or 32.2 per cent., the condition of smell was not specifically mentioned in the notes.

Headache and Giddiness.

Headache was complained of in 31 of the 263 cases, or 11.7 per cent.; absent in 157 cases, or 59.6 per cent.; and not specifically mentioned in the notes in 75 cases, or 28.5 per cent. Consequently, in the 188 cases in which the presence or absence of headache was specifically mentioned in the notes, it was present in 31 cases, or 16.4 per cent., and absent in 157 cases, or 83.5 per cent.

Giddiness was present in 33 of the 263 cases, or 12.5 per cent.; absent in 153 cases, or 58.1 per cent.; and not specifically mentioned in the notes in 77 cases, or 29.2 per cent. Consequently, in the 186 cases in which the presence or absence of giddiness was specifically mentioned in the notes, it was present in 33 cases, or 17.7 per cent., and absent in 153 cases, or 82.2 per cent.

Sleep.

In the 263 cases sleep was affected in 50 cases, or 18.9 per cent.; unaffected in 150 cases, or 57 per cent.; and not specifically mentioned in the notes in 63 cases, or 23.9 per cent. Consequently, in the 200 cases in which the condition of sleep was specifically stated in the notes, sleep was affected in 50 cases, or 25 per cent., and unaffected in 150 cases, or 75 per cent.

Considerable Loss of Weight.

In 78 of the 263 cases, or 29.6 per cent., there was marked emaciation or considerable loss of weight; in 146 cases, or 55.5 per cent., there was no marked loss of weight; and in 39 cases, or 14.8 per cent., the presence or absence of emaciation and loss of weight was not specifically mentioned in the notes. Consequently, in the 224 cases in which the presence or absence of considerable loss of weight was specifically mentioned in the notes, this condition was present in 78 cases, or 34.8 per cent., and absent in 146 cases, or 65.1 per cent.

Condition of the Heart.

In 14 of the 263 cases, or 5.3 per cent., some form or another of cardiac lesion was present; in 220 cases, or 83.6 per cent., the heart was normal; and in 29 cases, or 11.1 per cent., the condition of the heart was not specifically mentioned in the notes. Consequently, in the 234 cases in which the condition of the heart was specifically mentioned in the notes, there was some form of cardiac lesion in 14 cases, or 5.9 per cent.; and in 220 cases, or 94 per cent., the heart was normal.

Condition of the Urine.

In 13 of the 263 cases, or 4.9 per cent., the urine contained albumen; in 221 cases, or 84 per cent., the urine was normal; and in 29 cases, or 11 per cent., the condition of the urine was not specifically mentioned in the notes. Consequently, in 13 of the 234 cases, or 5.5 per cent., in which the condition of the urine was specifically mentioned in the notes, it contained albumen; and in 221 cases, or 94.4 per cent., it was normal.

SUMMARY.

I append a table (X) showing the percentage frequency of the leading symptoms in (1) the total 263 cases under analysis; and (2) the frequency and percentage frequency of the same (the leading symptoms of the disease) in the cases in which the presence or absence of the special symptom under investigation was specifically stated in the notes:

TABLE X.—Frequency and Percentage of Chief Symptoms in 263 Cases of Tabes.

Nature of Symptom.	Frequency and Percentage of Different Symptoms.				
	In total 263 Cases.		In those Cases in which the Symptom was Specifically Noted.		
	No. of Cases in which present.	Per Cent.	No. of Cases in which Symptom was Specifically Noted.	No. of such Cases in which Symptom was Present.	Per Cent.
Lightning pains	144	92.2	263	244	92.8
Pain in the back	86	32.7	180	88	47.7
Girdle sensation	107	40.6	183	107	58.4
Paræsthesiæ	178	67.6	214	178	83.1
Numbness	148	55.2	214	148	69.1
Coldness of feet	85	32.3	214	85	39.7
Pins and needles	49	18.6	214	49	22.9
Ground felt soft	53	20.1	214	53	24.7
Anaesthesia in the legs	100	38.0	214	100	46.7
" " arms	51	19.3	174	51	29.3
" " trunk	77	29.2	175	77	44.0
" " face	8	3.0	159	8	5.0
Analgesia in the legs	107	40.6	196	107	54.5
" " arms	96	36.5	176	96	54.5
" (ulnar)	54	20.5	103	54	52.4
" in the trunk	123	48.7	183	123	67.2
" (thoracic)	62	23.5	104	62	59.6
" in the head	4	1.5	157	4	2.5
Ataxic gait	192	73.0	263	192	73.0
Rombergism	190	72.2	262	190	72.5
Inco-ordination in the legs	184	69.9	259	184	71.0
" " arms	58	22.0	214	58	27.1
Impairment of muscular sense in the legs	94	35.7	175	94	53.7
Impairment of muscular sense in the arms	26	9.8	153	26	16.9
Muscular analgesia in legs	81	30.7	132	81	61.3
Hypotonia in the legs	70	26.6	118	70	59.3
Paralysis, other than ocular	19	7.2	218	19	8.7
Loss of both knee-jerks	212	80.6	255	212	83.1
" one knee-jerk	12	4.5	255	12	4.7
" both Achilles-jerks	132	50.1	159	132	83.0
" one Achilles jerk	6	2.2	159	6	3.7
" deep reflexes, upper extremities	62	23.5	131	62	46.9

TABLE X—Continued.

Nature of Symptom.	Frequency and Percentage of Different Symptoms.					
	In total 263 Cases.		In those Cases in which the Symptom was Specifically Noted.			
	No. of Cases in which present	Per Cent.	No. of Cases in which Symptom was Specifically Noted.	No. of such Cases in which Symptom was Present.	Per Cent.	
Loss of jaw-jerk	30	11.4	116	30	25.8	
„ plantar reflex	28	9.8	213	28	12.2	
Babinski's sign present	7	2.6	135	7	5.2	
No toe movement	17	6.4	135	17	12.5	
Loss of cremasteric reflex	66	25.0	151	66	40.9	
„ abdominal reflex	32	12.1	150	32	21.3	
Derangement of bladder reflex	188	70.7	251	186	70.1	
„ rectal reflex	139	52.8	218	179	86.0	
„ sexual reflex	115	43.7	178	115	64.6	
Pupils:						
Inequality in size	99	37.6	159	99	62.2	
Contracted	117	44.4	208	117	56.2	
Medium	69	26.2	208	69	33.1	
Dilated	14	5.3	208	14	6.5	
Irregularity of margins	32	12.1	68	32	47.0	
Loss of light reflex	222	84.4	252	222	88.0	
Loss of contraction on accommodation	37	14.0	212	37	14.6	
Argyll-Robertson pupil	186	70.7	252	186	73.2	
Optic atrophy	55	20.9	263	55	20.9	
Ocular paralysis	38	14.4	263	33	14.4	
Crises:	35	13.3	222	35	15.7	
Gastric	25	9.5	222	25	11.3	
Rectal	6	2.2	222	6	2.7	
Laryngeal	4	1.5	222	4	1.8	
Vesical	2	0.7	222	2	0.9	
Intestinal	2	0.7	222	2	.9	
Sexual	1	0.3	222	1	0.4	
Nasal	1	0.3	222	1	0.4	
Trophic lesions in bones and joints	17	6.4	240	17	6.8	
Trophic lesions in skin and its appendages	19	7.2	240	19	7.9	
Mental symptoms	27	10.2	253	27	10.2	
General paralysis of the insane	30	11.4	263	30	11.4	
Headache	31	11.7	188	31	16.4	
Giddiness	33	12.5	186	33	17.7	
Derangement of sleep	50	18.9	200	50	25.0	
Impairment of hearing	25	9.5	187	25	13.4	
„ taste	2	0.7	179	2	1.1	
„ smell	2	0.7	178	2	1.1	
Considerable loss of weight	78	29.6	221	78	34.8	
Cardiac disease	14	5.3	234	14	5.9	
Albuminuria	13	4.9	234	13	5.5	

RESULTS.

I have endeavoured to follow out and bring up to date all of the cases. The result of this inquiry is as follows: 70 of the 263 patients have died, 88 are known to be still alive, and in 105 cases the result is not known. Of the 88 cases which are known to be still alive, 4 are quite

well; 21 are better; the remaining 59 cases are either worse or *in statu quo*.

CAUSES OF DEATH.

The immediate cause of death in the 70 cases which have proved fatal is shown in Table XI.

TABLE XI.—Causes of Death in 70 Fatal Cases of Tabes.

General paralysis of the insane	15
General paralysis of the insane and albuminuria	1
General paralysis of the insane and pyelonephritis	1
Cerebral symptoms resembling acute general paralysis of the insane	1
Apoplexy	3
Exhaustion tabes	7
Exhaustion and bedsores	2
Exhaustion and gastric crises	1
Exhaustion, prolonged vomiting	1
Cystitis	2
Kidney disease, pyelitis	1
Diarrhoea	1
Diabetes mellitus	1
Asthma	1
Phthisis	1
Phthisis and Pott's disease	1
Phthisis and morphine	1
Phthisis, ascites, etc.	1
Influenza and bronchitis	1
Pneumonia	2
Heart failure	1
Aneurysm, thoracic (one ruptured)	3
Aneurysm (abdominal)	1
Aortic regurgitation	1
Haemorrhage (? gastric)	1
Haemorrhage from bowel	1
Cut throat	1
Not known	16
	70

DURATION OF THE FATAL CASES

The average duration of the 70 fatal cases in which the exact date of death is known was 8.2 years (shortest under 1 year, longest 22 to 23 years).

The exact duration in each of the 70 fatal cases in which the dates of onset and termination are known, is shown in Table XII.

TABLE XII.—The Total Duration of the Disease in 70 Fatal Cases of Tabes.

Below 1 year	1 case	11 to 12 years	1 case
1 to 2 years	2 cases	12 „ 13 „	5 cases
2 „ 3 „	2 „	13 „ 14 „	1 case
3 „ 4 „	5 „	14 „ 15 „	1 „
4 „ 5 „	9 „	15 „ 16 „	3 cases
5 „ 6 „	8 „	16 „ 17 „	1 case
6 „ 7 „	3 „	17 „ 18 „	3 cases
7 „ 8 „	4 „	20 „ 21 „	1 case
8 „ 9 „	3 „	21 „ 22 „	1 „
9 „ 10 „	2 „	22 „ 23 „	1 „
10 „ 11 „	8 „	Not stated	4 cases

UNDER the will of the late Miss Katharine Stewart Forbes of Ascot, which has now been proved, the Brompton Hospital for Consumption and the Cancer Hospital, Brompton, each receives a sum of £10,000; the Middlesex Hospital £5,000 for its Cancer Ward, the National Hospital for the Paralysed and Epileptic £1,000 for its convalescent branch at Finchley; and the Hospital for Sick Children, Great Ormond Street, the British Home for Incurables, Streatham, and the Surgical Aid Society each a similar sum for general purposes.

PREMATURE BURIAL.—A Bill is now before the Massachusetts Legislature which provides that in every case of apparent death of a human being no fewer than eleven specified tests for the discovery of life shall be applied to the body before preparations for burial are begun. The tests are to be made personally by two medical practitioners, one of them representing the Board of Health. The cost of the service would be borne by the town or city in which the death occurred.