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THE INFLUENCE OF VASCULAR DISEASE IN THE RETINA ON THE PROGNOSIS AS REGARDS LIFE.*

BY

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THE most numerous cases of general medical interest that we, as ophthalmic surgeons, see are those that have some form or other of disease of the vascular system. It is by no means unusual for the failure of vision to be the first symptom that obtrudes itself on the notice of the patient, and sends him to seek advice of the eye specialist. These cases one examines and finds various pathological manifestations in the retina, returns them to their general medical adviser for treatment, and not infrequently loses sight of them henceforth, or else they attend the hospital, are put on to potassium iodide, and attend for a variable length of time, and then are no more seen.

With the idea of finding out what happens to these patients and when, I have undertaken an enquiry and endeavoured to trace the end of such cases. When I began, I imagined the majority of them would be dead, and accordingly first applied to the various registrars for details, but meeting with somewhat poor results, I next sent reply-paid postcards to the patients themselves, enquiring after their health, and was very agreeably surprised to find the number who were still living.

The types of retinal lesions I selected were flame-shaped hæmorrhages and signs of vascular disease in the retina, venous thrombosis and hæmorrhagic retinitis, "embolism" of the central artery, retinitis circinata; in fact, all those conditions usually associated with the condition of arterio-sclerosis. I purposely omitted true albuminuric retinitis, as the fate of such patients is well-known. A few cases of diabetic retinitis have crept in accidentally and a few traumatic hæmorrhages, but these latter have not been included in the statistics.

In one way or another I have collected 159 cases from the

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records of the Oxford Eye Hospital and my private records, and have managed to trace 124 of them; of the total number 63 were males, the remainder 96 females—58 of them married and 38 single.

To examine more accurately the prognostic influence of these lesions, I have arranged the cases according to their ages, taking, first, cases under 50, the majority being between 40 and 50; then, cases between 50 and 60; then those between 60 and 70; next, those between 70 and 80; and, lastly, those over 80.

Considering the first group, cases under 50 years of age. These number 26, and of these 18 are women and 8 men.

One finds a remarkable difference in the length of life in the various cases, and this difference is seen to be due to the presence of albumen in the urine.

For example—of those with albumen present:

Two died after five years, one of cerebral hæmorrhage, the other of phthisis.

One died after three years ten months, of chronic Bright's disease.

One „ three „ five „ , of nephritis.

One alive after two „ three „

One died in three months, of granular kidney.

One „ four „ , a syphilitic subject.

One alive after six years, in spite of a blood pressure of 220 mm., but comparing these with those that had no albumen, one finds:—

One living after 28 years. Age 74.

„ „ „ 25 „ Age 40. (Case of embolism.)

„ „ „ 17 „ Age 66.

„ died „ 16 „ of cerebral thrombosis, pneumonia, and heart failure, at the age of 67, but he had four strokes.

One living after 15 years. Age 50.

„ „ „ 11 „ Age 55.

„ „ „ 4 „ Age 48.

In many of the cases I, unfortunately, have no note as to the state of the urine; but one has enough evidence, I think, to say quite definitely that in young patients with vascular disease of the retina, the presence or absence of albumen in the urine is by far the most important factor in forming an opinion as to the prognosis *re* life.

Taking next the cases between 50 and 59. They number 47, of whom 28 are women and 19 men.

The difference in prognosis between those with and without albumen is not so marked as in the preceding group. Whereas in that group the longest life I could find with albumen was six years, many in this one have lived a considerable time. I need not weary you with reciting the whole number, but just refer to a few, such as Case No. 64. At the age of 58 had flame-shaped hæmorrhages in the left eye, and some albumen in the urine. She is still alive, age 71

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—13 years after the original lesion. Another lived nine years, dying of syncope, age 63. She had hæmorrhagic retinitis and thickened arteries.

Another case of interest is No. 67—a man who had a vitreous hæmorrhage, arteries enormously thick, blood pressure of 200, and a good deal of albumen in the urine. When I first saw him, eighteen months ago, he was quite broken down, could not manage his business, and was altogether in a most tottery condition. I saw him again a month ago. His vitreous hæmorrhage had practically cleared up; he was altogether better and brighter in himself; and he had had a severe attack of appendicitis, with bad operation, in the meantime.

Of cases without albumen, two died under two years; one of them (No. 46) had a blood pressure of 200 mm. and died of a stroke. Others died at 4, 5, 6, and 12 years respectively. Many of the rest are alive at times varying from $1\frac{1}{2}$ to 16 years, the latter being a woman who had extensive retinal hæmorrhage at the age of 54, and who is still alive, age 70; although she is beaten by Case No. 42, a man with hæmorrhagic retinitis at the age of 54, but no albumen, who is still alive, age 76; 22 years after the original lesion.

Passing on to those cases developing between 60 and 69, they number 54, and are evenly divided, 27 females and 27 males. As before, cases with albumen compare unfavourably with those without.

Examples of cases with albumen:

One died in four years with cardiac asthma.

One „ six months with a stroke.

One living after three and a half years, but in poor health.

One „ two years, age 66.

One „ three and a half years, age 68.

Comparing these with those known to have had no albumen:

(114) Retinitis circinata R.E. at the age of 67. Retinitis circinata L.E. at the age of 66 and much hæmorrhage. Still alive and well after 10 years. Another died after six years, age 70.

(80) Had a blood pressure of 250 at the age of 64, with flame-shaped hæmorrhages. Died four and a half years later, old hemiplegia and acute bronchitis.

(84) Had hæmorrhages in the left eye followed by glaucoma twenty-five years ago, and is still alive, age 84.

(85) Another at 65 years, who had venous thrombosis, died of senile decay, aged 81, sixteen years later.

(91) At 68 years, thickened arteries and? embolism, died at the age of 78 of cerebral hæmorrhage, about ten years later; and so on.

Thus at this age the prognosis *re* life of retinal vascular disease

is, on the whole, extraordinarily good, the normal expectation of life at 60 being roughly $13\frac{1}{2}$ years, and at 69 nearly 9 years.

Now coming to the cases between 70 and 80. These number 26; 20 females and 6 males. They show the remarkable age to which these patients live.

(129) Age 75, male, with much albumen. Hæmorrhages and thickened arteries, is still alive, age 83, after 8 years.

Other cases are:—Alive, age 75, after 2 years; 77, after 5 years; died at 83, after 10 years; died at 79, after 8 years; alive at 75, after 5 years.

(136) Alive at 80, living 8 years and 3 months.

(139) Alive at 80, after 6 years.

(143) Blood pressure 220, no albumen, died aged 78, of a cerebral hæmorrhage, living $5\frac{1}{2}$ years.

(145) Hæmorrhage at age of 75, alive at 82, after 7 years.

(149a) Vascular disease and diabetic retinitis, alive after 5 years, age 78.

One other case I forgot to mention is a man (No. 75) who had both albumen and sugar at the age of 60, and who lived for 7 years before his death, the actual cause of which I could not discover.

Finally, those 80 years of age and over.

There are 5 of these cases—3 men and 2 women.

(151) Age 87, with hæmorrhage, died, aged 93, of senile decay.

(152) Age 81, with albumen and hæmorrhage, still alive, aged 86.

(153) Age 86, embolism, died, aged 89, of cerebral hæmorrhage.

(154) Age 80, hæmorrhage and thickened arteries, still alive, aged 84.

The fifth I cannot trace after seven months, but these few cases bear out the fact, I think, that the older the patient, the less important from the point of view of prognosis to life are the vascular diseases of the retina.

As regards the treatment of these cases, this, of course, is the treatment of their general condition. Rules for their course of life, and instructions as regards diet, are important, with the idea of giving their kidneys as light work as possible; but perhaps the most important is, to avoid all physical strain.

As regards use of the eyes, I should like to hear the opinion of others. Whilst it is common-sense not to work a damaged organ hard, I must confess I have never seen any damage done to these eyes by ordinary use; and as it is a condition which may last more or less to the end of the patient's life, it seems to me a mistake to prohibit the use of the eyes, as is sometimes done, for, after all, what is the use of having eyes if they are never used.

Lastly, as regards causation. Very many are no doubt due to thrombosis of vein or artery, and in some cases it is difficult to

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determine exactly which vessel is at fault. Some years back, after Sir Almroth Wright's suggestion, that many ocular hæmorrhages might be due to thrombosis, I measured the coagulation-time of the blood, but, as a rule, rarely found much variation from the normal. Nor is this, I think, to be wondered at. The lesion may have occurred a few days to a few months before being seen, and the coagulation-time is known to vary very rapidly with differences in diet, time of day, length of time after meals, etc. The only thing of interest I did come across was the fact that potassium iodide had by far the most powerful action in prolonging the coagulation time of any drug I tried. In my experience, it was much more potent in this respect than citric acid, and in those cases of iodism where the symptoms are almost if not entirely due to this property, they can, to a certain extent, be obviated by giving calcium at the same time, or, what comes to the same thing, giving it in large doses of milk, as one used to be taught some years before anyone took any notice of coagulation-times.

This fact, in addition to its power of lowering the blood pressure, makes the drug of real value in the treatment. Other means of lowering the blood pressure, such as electrical treatment, I have been disappointed in; the effect seems to be only temporary, and blood pressure, after all, is but a symptom, and one that the patient does not object to. One old man, in particular, I remember used to say, "I'm sure my blood pressure is well over 200; I feel so fit and energetic."

Final conclusions from study of statistics.—Retinal lesions are considerably more common in women than men, and that not altogether due to child-bearing, as 38 of the 96 women were, as far as I could discover, unmarried. The cases were most numerous between the ages of 60 and 70, and next between 50 and 60.

The older the patient, the better the prognosis as regards life, irrespective of the presence of albumen in the urine to a large extent, whilst the younger the patient, the worse the prognosis, especially so if albumen is present in the urine.

Lastly, I wish to thank Dr. A. L. Ormerod, M.O.H. for the City of Oxford, and Dr. E. Morton, M.O.H. for part of the County of Oxford, for their valuable advice and assistance in the tracing of many of the cases.

Number and Initials and Sex.	Reference Number.	Age and First Attendance.	Diagnosis. First Hæmorrhages.	Age and Last Attendance.	Duration of Life.	Age at and Date of Death.	Cause of Death.
1 J. C. (M)	A 24910	48—May 22, 1912	Stroke 18/12 ago. Many hæmorrhages. Vascular disease	48—May, 1912	3/12	48—13 Aug., 1912	Granular kidney. Cerebral irritation. Exhaustion
2 M. H. (F)	A 18124	49—July, 1909	Few small hæmorrhages in both. Albumen. No sugar	July, 1911	5 years	54—July 18, 1914	Cerebral hæmorrhage (35 days)
3 D. D. (F) S.	A 29807	25—Feb., 1914	Hæmorrhage at macula. Myopia.	May, 1914	2½ years	27—Alive	—
4 A. Y. (M)	A 33562	39—June 14, 1915	Retinal hæmorrhage, traumatic.	Jan., 1916	1 year	40—Alive	—
5 L. R. (F) S.	A 27487	16—April 9, 1913	Coag. time, 3 h. 3½ min. Anæmia. Neuro-retinitis. Hæmorrhages. B.P. 140	June, 1914	—	No trace	—
6 A. E. (M)	A 21519	23—Jan. 12, 1911	Traumatic hæmorrhage. R. retina. Albumen in urine	March, 1911	2 years 4/12	May, 1913	Uræmia
7 H. S. (F) Md.	12661	49—April, 1896	2 weeks. Hæmorrhagic retinitis. Probably venous thrombosis L.	63—August, 1908	16 years	67—June 30, 1912	Pneumonia. Cerebral thrombosis and heart failure
8 C. A. (M)	A 16104	63—Aug., 1908	4 strokes				
	A 933	46—Marc', 1888	Hæmorrhages R. macula. Urine 1009. No albumen. No sugar. Slight optic neuritis R.E. Hæmorrhage L.E.	60—Sept., 1902	28 years	Alive	—
9 R. J. K. (M)	A 25562	38—Aug. 16, 1912	Thick arteries. Hæmorrhage in both. B.P. 190. Syphilitic. Hemianopsia.	Dec. 1912	4 months	Dec., 1912	Cerebral softening, occipital lobe. Chronic endocarditis, etc. Arteries thickened.
10 H. S. (M)	6491	27—Nov., 1891	Hæmorrhage in retina. No albumen or sugar	40—April, 1904	25 years	Alive	—
10A E. C. (F)	A 3128	46—Nov. 28, 1901	Hæmorrhages and flecks R.E. Albumen in urine	46—Nov., 1901	3 years 10/12	Sept. 6, 1905	Chronic Bright's disease. Uræmia
11 M. A. B. (F) Md.	A 9438	44—March, 1905	Hæmorrhages in retina L. No albumen. No sugar	55—April, 1916	11 years	Alive	—

12 R. C. (F) S.	A 27305	44—Feb., 1910	Hæmorrhages in retina. Gross arterio-sclerosis. Albumen. B.P. 210-220	50—May, 1916	6 years	Alive	—
13 M. S. (F)	A 1181	43—Oct. 3, 1900	Embolism of central artery L.	Dec., 1900	7 3/12	No trace	—
14 F. H. (M)	A 1655	35—Jan. 23, 1901	L. E. hæmorrhages in retina. Arterial thrombosis. No albumen or sugar	35—May, 1904	15 years 5/12	Alive	—
15 M. A. H. (F)	A 13674	47—May 29, 1907	Hæmorrhages in retina R. E. Arteries + +. Albumen in urine	47—Oct., 1907	3 years 5/12	51—Oct. 31, 1910	Chronic nephritis
16 E. S. (F)	A 30795	48—June 10, 1914	Retinal hæmorrhage L. E. No albumen. No sugar	48—June, 1914	2 years	50—Alive	—
17 E. S. (F) S.	A 10723	44—Jan. 19, 1895	Embolism of central artery L.	Sept., 1895	7 9/12	No trace	—
18 L. W. (F) Md.	16888	44—Dec. 14, 1898	Hæmorrhage L. macula. No albumen.	Nov., 1902	4 years	No trace	—
19 A. A. S. (F) Md.	A 30216	44—Mar. 25, 1914	Hæmorrhages in both. Albumen.	45—April, 1915	1 1/2	?	—
20 J. B. (M)	A 3932	38—May 21, 1902	Hæmorrhages in both. No albumen. No sugar	April, 1903	1 year ?	No trace	—
20A I. T. (F) Md.	13779	49—Nov. 25, 1896	White flecks in R. retina. No albumen. May 1913. Recent hæmorrhages	66—Dec., 1913	17 years	No trace	—
21 H. B. (F) Md.	A 2065	48—Apr. 24, 1901	3/12 Hæmorrhages in both. Albumen	April, 1901	5 years	53—Jan. 20, 1906	Phthisis
22 P. W. (M)	A 26433	24—Nov., 1912	Traumatic hæmorrhages	Jan., 1913	3 1/2 years	Alive	—
23 A. L. (F)	8445	19—May, 1893	Embolism central artery	22—Feb., 1896	21 years	Alive	—
24 E. B. (F) Md.	A 31072	41—July, 1914 9/12 Hist	B.P. 270. Arteries bright. Patches of œdema. Hæmorrhages.	Sept., 1914	1 year	41—Nov., 1914	Chr. nephritis, parenchym.
25 N. W. (F) Md.	A 30205	37—March, 1914	Arterio-sclerosis. Hæmorrhages in retina. High tension and albumen	July, 1914	2 years	Alive	—
26 E. C. (F) Md.	A 34363	41—Sept., 1915	Hæmorrhages in both retinæ.	Sept., 1915	9/12	Alive	—

Number and Initials and Sex.	Reference Number.	Age and First Attendance.	Diagnosis. First Hæmorrhages.	Age and Last Attendance.	Duration of Life.	Age at and Date of Death.	Cause of Death.
27 G. B. (M)	A 31478	50—Sept., 1914	Hæmorrhage, left retina	50—Sept., 1914	1 year 9/12	52—Alive	—
28 E. D. (F)	A 7698	50—May 7, 1913	Arterio-sclerosis and hæmorrhages in both eyes. B.P. 240. Albumen	51—Feb., 1914	3/12	Alive	—
29 W. T. (M)	13367	53—Aug. 26, 1896	Retinitis hæmorrhagica. Aortic disease	53—August, 1896	—	—	—
30 E. H. (F)	A 28717	52—Sept., 1913	2/12. Hæmorrhage. Right macula.	52—October, 1913	29/12	54—Alive	—
31 R. W. (F)	A 9813	52—May, 17, 1905	2 weeks. Venous thrombosis R.	52—July, 1907	11 years	63—Alive	—
32 G. M. (M)	11237	52—May, 15, 1895	3 weeks. Plugging arteria centralis	July, 1896	5 years 5/12	57—Oct. 13, 1900	Softening of the brain.
33 E. N. (M)	P. P.	53—Nov., 1905	Retinitis circinata	April, 1914	11 years	64—Alive and well	Syncope
34 A. W. (M)	P. P.	53—March, 1914	Partial thrombosis of vein. Arteries +, B.P. 180. No albumen	March, 1914	2½ years	55—Cardiac asthma	—
35 A. H. (F) Md.	A 36785	53—Oct. 13, 1914	Partial venous thrombosis. Arteries +. Flame-shaped hæmorrhages	June, 1916	1 year 9/12	56—Alive and fairly well	—
36 J. (F)	A 6944	51—July, 1915 Aug. 1915	Hæmorrhage in L. E. White flecks at macula L. B.P. 180. Trace of albumen occasionally	—	1 year	Alive and well	—
37 G. B. (M)	15784	53—May, 1898	Hæmorrhagic retinitis. No albumen. Aortic disease	May, 1898	4 years	57—1902	?
38 M. J. (F)	A 62	54—January, 1900	Venous thrombosis. No albumen or sugar	March, 1900	3/12	No trace	—
39 A. P. C. (F) Md.	A 714	54—July 4, 1900	3/7. Hæmorrhages in retina R.E. extensive	Dec., 1902	16 years	70—Alive	—
39a J. H. (M)	A 12516 A 4254	58—July 30, 1902	1 year R. retinal hæmorrhages. No albumen. No sugar	Oct., 1906	12 years	68—Jan. 25, 1913	Cerebral softening, arterio-sclerosis, cerebral hæmorrhages

Number and Initials and Sex.	Reference Number.	Age and First Attendance.	Diagnosis. First Hæmorrhages.	Age and Last Attendance.	Duration of Life.	Age at and Date of Death.	Cause of Death.
54 M. G. (F) Md.	A 30267	55—April, 1914	Flame-shaped hæmorrhages No albumen. No sugar	April, 1914	—	?	?
55 J. H. (F) Md.	A 32501	55—Feb. 10, 1915	Hæmorrhages R. retina. No albumen. No sugar	Sept., 1915	1 year 6/12	56—Alive	—
56 E. V. (F) Md.	A 15335	56—April, 1908	3/7. Stroke 5 years ago. Albumen. Hæmorrhages retina. Arteries + + .	Nov., 1908	4 years 1/12	60—May 26, 1912	Chronic nephritis, cardiac dilatation and failure.
57 W. H. S. (M)	11819	56—Sept., 1895	Hæmorrhages L. retina. Proliferating membrane	August, 1896	11 months	No trace	—
58 E. E. (F) Md.	A 6908	57—Nov. 25, 1903	3/7 Flame-shaped hæmorrhages R. Albumen	Sept., 1904	8 years 4/12	65—Mar. 3, 1912	?
58a S. H. (F) Md.	A 30509	56—Apr. 30, 1914	Arterio-sclerosis. Retinal hæmorrhages. Albumen. Sugar. B.P. 150-160	56—June, 1914 58—May, 1916	2 years	Alive. Fairly good health	—
59 D. A. (F) Md.	A 22848	59—Aug. 2, 1911	Vascular disease of retina and hæmorrhages. Urine 1035. No albumen. No sugar	59—August, 1911 60—April 13, 1912	8/12	No trace	—
60 M. A. K. (F) Md.	16722	56—Nov. 9, 1898	Hæmorrhages both eyes, especially L. Albumen in urine	56—Nov., 1898	No trace	—	—
61 S. H. (F)	16238	56—Aug. 3, 1898	Hæmorrhagic retinitis	56—Oct., 1898	3/12	No trace	—
62 S. S. (F)	14594	56—June 30, 1897 1900	Vitreous opacities. Arteries + + , and hæmorrhages R. E.	Oct., 1914 74—June, 1916	3 years	77—Alive and well	—
63 J. P. (M)	A 11825	74—July, 1913 59—June 6, 1906	2/12. R. retinal hæmorrhages. No albumen. No sugar. 1009. Coagulation time : 2 minutes	July, 1907	1 year 3/12	?	?
64 E. C. (F) Md	A 6255	58—Aug. 5, 1903	Retinal hæmorrhage L. E. Some albumen. No sugar	58—Oct., 1903	13 years	71—Alive	—
65 F. K. (M)	A 1678	59—Jan. 30, 1901	1/7 hæmorrhages L. retina. No albumen. Sugar present	59—April, 1901	6 years	26—Feb., 1907	Meningitis and coma

	P.P.	57—Jan., 1912 April, 1914	Hæmorrhagic retinitis	August, 1915	2 years 3/12	Alive and well	
66 B.	(F)						
67 W. W.	A 6476 (M) P.P.	58—Jan., 1915	Vitreous hæmorrhages R. Hæmorrhages and thick arteries L. B.P. 200. Albumen	June, 1916	1 year 6/12	Alive and well	—
68 H.	(M)	57—August, 1908 60—August, 1911 61—Sept., 1912 64—May, 1915	Veins full. Arteries tortuous Albumen 1/6. Hæmorrhages in both. Arteries +++. Much hæmorrhage in both. B.P. 180, 200, 212 Hæmorrhagic retinitis both eyes. No albumen. No sugar	June, 1915	4 years	64—	Cardiac asthma
69 I. F.	(M)	58—April, 1895		July, 1895	17 years	75—1912	Stroke
70 A. C.	(F)	57—April, 1898 July, 1901	Venous thrombosis R. Hæmorrhage L.E.	Jan., 1903	6 years	Jan., 1904	Cerebral hæmorrhage
71 M. P.	(M)	58—May, 1907	Flame-shaped hæmorrhage L.E. No albumen. No sugar. B.P. 140	May, 1908	9 years	Alive	—
72 J. D.	(M)	60—Feb. 22, 1899	Hæmorrhage, R.E.	Feb., 1899	?	Cannot trace	—
73 A. B.	(F) Md.	60—Aug. 28, 1912	Subhyaloid hæmorrhage	Dec., 1912	4/12	?	—
74 E. C.	(F) Md.	60—July, 1898	Venous thrombosis R.	63—May, 1899	12 years	72—July 20, 1909	Chronic Bright's disease, 3 years. Uræmic con- vulsions, 4 months ?
75 H. H.	(M)	60—Feb., 1907	2/12. Albumen and sugar. Hæmorrhages in both.	61—May, 1908	7 years	67—Oct., 1914	—
76 G. B.	(M)	60—Aug. 14, 1912	Retinal hæmorrhage. Ar- terio-sclerosis. Urine sp. gr.: 1010. No albumen. No sugar	Sept., 1913	4 years	Alive	—
77 S. W.	(M)	60—Dec. 5, 1900	Intra-ocular hæmorrhage. No albumen. No sugar	Oct., 1903 Nov., 1904	4 years	—	—
78 E. T.	(M)	60—Dec. 31, 1904	Embolism cent. art L.	68—June, 1912	8½ years	70—June 3, 1914	—
79 M. A. W.	(F) Md.	60—Mar. 28, 1900	3 weeks. Many hæmorrhages R.E. White patches No albumen.	76—August, 1900	16 years	Alive	—

Number and Initials and Sex.	Reference Number.	Age and First Attendance.	Diagnosis. First Hæmorrhages.	Age and Last Attendance.	Duration of Life.	Age at and Date of Death.	Cause of Death.
80 J. L. (M)	A 22083	64—April 12, 1911	Small flame-shaped hæmorrhages R.E. and L.E. Urine: no albumen or sugar. B.P. max. 250 mm. min. 190	April, 1911	4½ years	Nov. 22, 1915	Old hemiplegia (R.) and acute bronchitis
81 J. C. (F) Md.	A 24510	66—March, 1912	Vitreous opacities. Hæmorrhages R. No albumen or sugar	May, 1912	3/12	No trace	—
82 U. G. (M)	A 12533	67—Oct. 10, 1906	Hæmorrhage in L.E. Arteries +.	68—May, 1907	3 years 9/12	71—Jan. 25, 1910	Morbus cordis
83 T. B. (M)	A 3116	69—Oct. 27, 1901	4/7. R. embolism	Nov., 1903	2 years 3/12	70—Jan., 1904	Cerebral hæmorrhage. Coma
84 T. C. (M)	13676	64—Nov. 1896	Hæmorrhage in L.E. Glaucoma, 1905	Sept., 1905	28 years	Alive	—
A 9291	66—	66—Nov. 1898	Venous thrombosis R.E.	May, 1904	16 years	81—Nov. 6, 1912	Senile decay. Heart failure
85 A. M. (F)	13610	65—Oct. 21, 1896	Embolism central artery L.	Nov., 1895	4 years 9/12	70—June 20, 1900	Cerebral hæmorrhage
86 H. P. (F) Md.	11868	66—Oct. 2, 1895	Chronic glaucoma R.E. Retinitis. Hæmorrhages. No albumen. No sugar	August. 1912	4 years	Alive	—
87 J. G. (M)	A 25341	66—July, 1912	March, 1898. Aged 68. Hæmorrhagic retinitis	March, 1898	7 years	75—Aug. 13, 1905	Cystitis (10 years) and uræmia. Exhaustion (3 days)
88 J. A. (F) Md.	7159	62—1892	Retinal hæmorrhages. Arterio-sclerosis. Flame-shaped hæmorrhage L.E. No albumen. No sugar	Jan., 1916 April, 1916	4 years	66—June 18, 1916	Cerebral hæmorrhage
89 E. G. (F)	A 26095	63—Oct. 23, 1912	Embolism central artery. No albumen	65—Oct., 1900	8 years	73—Feb. 28, 1908	Morbus cordis
90 E. C. (F) Md.	A 1182	65—Oct., 1900	1/7. Heart-sounds normal. Arteries thick. ? Embolism	68—Nov., 1904	10 years 5/12	78—Feb. 25, 1915	Cerebral hæmorrhage. Coma
91 S. C. (F) Md.	A 8601	68—Sept., 1904					

92 S. K. (M)	A 15058	68—Feb., 1908	Hæmorrhage L. macula. Coag. 1.45 B.P. max. 149, min. 95	Aug., 1913	6 years 9/12	75—Nov. 26, 1914	Stroke
93 A. C. (F) Md.	A 3965	65—May, 1902	Hæmorrhagic retinitis. No albumen. No sugar	May, 1903	1 year	No trace	—
94 J. C. (M)	A 309	68—April, 1900	Hæmorrhagic retinitis	Oct., 1900	6/12	No trace	—
95 E. C. (F) Md.	A 31188	65—Aug. 5, 1914	Had 2 strokes. Albumen. Few hæmorrhages	Aug., 1914	2 years	Alive, not very well	—
96 A. R. (F) Md.	A 9207 A 17498	67—Feb., 1905 71—April, 1909	Hæmorrhages L. retina. Vitreous hæmorrhage	April, 1909	7 years	74—Mar. 20, 1912	Heart failure and old age
97 E. A. (F) M.	A 21371	69—Dec. 21, 1910	Hæmorrhages in both. Ar- teries thick. B.P. 122 max. 105 min. Urine, no albu- men, no sugar	73—Sept., 1915	6 years	Alive	—
98 O. C. (F)	A 6939	64—Jan. 9, 1915	Thrombosis of branch of retinal vein and hæmorr- hages L.E. No albumen	Nov., 1915	1 year 7/12	Alive and well	—
99 J. R. (M)	10511	63—Nov., 1894	L.E. hæmorrhagic retinitis. No albumen or sugar	65—Jan., 1896	2 years	Dead	?
100 F. P. (M)	A 661	61—June 27, 1900	7/7. Venous thrombosis	64—Nov., 1903	8 years 3/12	69—July, 1908	Cerebral hæmorrhage
101 E. S. (F) Md.	16643	65—Oct. 26, 1898	Hæmorrhagic retinitis, white flecks in both	65—Nov., 1898	7 years	72—Dec., 1905	?
102 D. (F) Md.	A 31041	64—July, 1914	Hæmorrhages. Vascular disease. Albumen	July, 1914	2 years	Alive	—
103 W. F. (M)	A 34674	65—Oct. 23, 1915	6 days. Thick vessels. Hæ- morrhages right retina. Albumen in urine. Urine, 1020	65—Nov., 1915	6/12	27—March, 1916	Stroke
104 M. W. (F) Md.	A 31258	62—Aug. 19, 1914	Hæmorrhages both. No albumen. No sugar	62—August, 1916	1 year 10/12	Alive	—
105 E. B. (F)	A 5672	64—April 22 1903	Retinal hæmorrhage R.E.	64—April, 1903	1 week	25—April, 1903	Pneumonia and heart failure
106 W. G. (M)	A 28200	65—July 9, 1913	Retinal hæmorrhage. Lead poison. No albumen. No sugar	65—April, 1914	2 years	67—August, 1915	Heart failure

Number and Initials and Sex	Reference Number.	Age and First Attendance.	Diagnosis. First Hæmorrhages.	Age and Last Attendance.	Duration of Life.	Age at and Date of Death	Cause of Death.
107 J. P. (M)	15337	64—Feb. 9, 1898	Venous thrombosis. No albumen. Ht. sound.	64—Nov., 1898	6 years	70—1914	?
108 M. P. (F)	A 9281	64—Feb. 8, 1905	July, 1912. Retinal hæmorrhages R. Age 71	74—August, 1914	4 years	75—Alive	—
109 J. P. (M)	A 20915	62—Oct., 1910	Hæmorrhages R. retinal. B.P. 125 max., 105 min. Some albumen	63—May, 1911	4 years	1914	—
110 J. W. (M)	A 22463	68—June 7, 1911	6 weeks. Large retinal hæmorrhages. Arterio-sclerosis. No albumen.	August, 1911	4 years	72—April 4, 1915	Broncho-pneumonia and heart failure
111 G. P. (M)	10688	61—Jan. 2, 1895	No sugar 3 weeks. L. many hæmorrhages	Jan., 1895	—	No trace	—
112 D. C. (M)	A 7973	69—June, 1904	2/7. L. embolism central artery. Slow pulse	69—July, 1907	7 years	76—June 12, 1911	Morbus cordis. Bronchitis. Asthenia
113 J. (M)	A 6482	61—Nov., 1912	Flame - shaped hæmorrhages in both eyes. Albumen in urine	June, 1916	3½ years	Alive. Poor health. R.E. gone. L.E. hæmorrhages Alive and well	—
114 D. (F) Md.	A 6686 P P	67—1906 76—1915	Retinitis circinata R.E. Retinitis circinata L.E. and much hæmorrhage	June, 1916	10 years	—	—
115 M. (F) Md.	A 7572	65—May, 1914 66— „ 1915	Arteries bright. Thrombosis of branch of retinal vein. B.P. 200. No albumen	June, 1916	2 years	Alive and well	—
116 G. T. (F.)	A 15382	68—April, 1908	Flame - shaped hæmorrhages, L.E. Dropsy	May, 1908	1 year, 6/12	69—October, 1909	Dilated, fatty heart. Bronchitis
117 G. B. (M.)	A 2079	66—April, 1901	Diabetic retinitis	—	2 years	1903	—
118 E. W. (F)	A 162	67—Dec., 1893 Choroiditis R.	74—Hæmorrhagic retinitis R.E. Feb., 1900	Aug., 1901	8 years 18 months	81—1908	Heart disease
119 E. C. (F) Md	10599	63—May, 1889	67—Dec. 1894. Hæmorrhages in retina	Jan., 1895	5 years	69—1900	?

120 I. P. (M)	11548	64—July, 1895	Punctate hæmorrhage, R. Venous thrombosis L. Albumen, trace	Nov., 1895	5 months	?	?
121 T. C. (F) Md.	A 6207	65—July, 1903	Thrombosis vein L.E. Vit- reous hæmorrhages R. No albumen	Sept., 1903	7 months	66—January, 1904	?
122 A. M. (F)	A 15829	64—July, 1908	Retinal hæmorrhages. No albumen or sugar. B.P. 185-135	August, 1911	7 yrs. 4 mnts.	71—Nov., 1915	Influenza
123 B. (M)	A 31499	62—Sept., 1914	Hæmorrhages in retina. No albumen or sugar	Sept., 1914	2 years	Alive	—
124 J. J. (M)	A 33942	69—July, 1914 10 months' history	Retinal hæmorrhages. Chronic glaucoma	Still attending	1 year	Alive	—
125 J. T. (M)	A 26685	68—Jan., 1913	Hæmorrhages in retina. L.E. arteries thick. Al- bumen in urine.	Sept., 1913	3½ years	Alive	—
126 E. P. (F) Md.	A 7162	72—Jan. 13, 1904	1/12. Hæmorrhages R.E.	January, 1904	?	No trace	—
127 E. S. (F)	A 29974	75—Feb. 25, 1914	Hæmorrhage L.E.	77—Feb., 1916	2 years, 4/12	77—Alive	—
128 M. E. (F) Md.	A 3908	76—May 14, 1902	Venous thrombosis L.	76—Aug. 13, 1902	?	No trace	—
129 W. W. (M)	A 15913	75—July, 22, 1908	Arteries + +. Hæmorrhage ? Embolism. Much albu- men	August, 1908	8 years	Alive	—
130 S. R. (F) Md.	A 30790	73—June 10, 1914	Chr. Glaucoma. Hæmo- rrhage L.E.	August, 1914	2 years	Alive	—
131 E. G. (F)	A 22578	72—June, 1911 August, 1913	Albumen in urine. Hæmo- rrhage in R.E.	August, 1913	5 years	Alive	—
132 H. R. (F) Md	14972	73—Sept., 1897	Arteries +. Hæmorrhage in both	October, 1897	10 years	83—Mar. 12, 1907	Bronchitis. Asthenia
133 M. C. (F)	18309	70—Oct. 4, 1899	Hæmorrhage in ret. Sugar in urine	Nov., 1899	7 years	77—Aug. 2, 1906	Senile decay
134 S. H. (F)	A 22751	70—July 19, 1911	Neuro-retinitis. Hæmo- rrhage. No albumen. No sugar	October, 1915 May, 1916	5 years	Alive	—

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135 J. V. (F) Md.	17751	76—June 7, 1899	Hæmorrhage R.E.	76—June, 1899	?	No trace	—
136 M. S. (F) Md.	A 15788	72—Mar. 19, 1908	5 days. Hæmorrhage right retina. Urine, no albumen, no sugar	72—Sept., 1910	8 years 3/12	80—Alive	—
137 E. P. (F) Md.	A 32824	74—Mar. 17, 1915	Hæmorrhage right retina	74—June, 1915	1 year 3/12	75—Alive	—
138 C. K. (M)	A 6232	77—July 29, 1903	Embolism art. cent. R.	77—August, 1903	?	Dead	?
139 K. N. (F)	A 21489	74—Jan. 11, 1911	6/12. Retinal hæmorrhage both. B.P. 197. No albumen. No sugar. Sp. gr. 1005. Arteries +.	July, 1911	6 years	80—Alive	—
140 Z. C. (F) Md.	16832	72—Nov., 1898	3/12. Hæmorrhagic retinitis	Nov., 1898	6 years	78—Died 1904	Unknown
141 A. P. (F)	17086	79—Jan. 18, 1899	Hæmorrhages in both eyes.	Jan., 1899	—	Dead	Unknown
142 M. S. (F)	A 30882	72—June 24, 1914	Hæmorrhages in both. High tension pulse. Third nerve paralysis	July, 1914	—	No trace	—
143 M. C. (F) Md	A 18764	72—Nov., 1909	Retinal hæmorrhage R. B.P. 220 max. 140 min. No albumen. No sugar	78	5½ years	78—April 11, 1915	Cerebral hæmorrhage, coma
144 L. (F)	A 6942	70—July 12, 1915	Hæmorrhages both retinæ	Aug., 1915	1 year	71—Alive and well	—
145 F. K. (M)	A 18178	75—July, 1909	Hæmorrhages in retina. No albumen. No sugar	—	7 years	82—Alive	—
146 L. S. (F) Md.	13692	70—Nov., 1896	Hæmorrhages in retina	7 —June, 1899	3 years?	?	?
147 I. J. (M)	18253	71—Sept., 1899	Embolism central artery	Dec., 1899	—	—	Stroke
148 B. (M)	A 8449	74—Aug., 1904	Hæmorrhages in retina. Faint albumen. No sugar. Pulse, high tension. Four strokes	76—July, 1906	3 years	76—Feb., 1907	Cerebral hæmorrhages