

	Age	Sex	Residence.	Duration of Symptoms.	Operation.	Date.	Stone.	Weight Grains.	Result.	Remarks.
1*	65	M	Boston	4 or 5 months	Litholapaxy	Nov. 17, 1883	Phosphatic	270	Recov.	Multiple calculi
2*	66	M	Boston	3 or 4 months	"	July 24, 1884	"	127	"	"
3	10	M	Cambridge	Since Babyhood	Lateral Lithotomy	Nov. 11, 1884	Calcic Oxalate	132	"	"
4	69	M	Brighton	1 year	Litholapaxy	Jan. 21, 1885	Phosphatic	98	Died	Death from bronchitis
5	53	M	Charlestown*	2 or 3 years	"	Jan. 28, 1885	"	78	Recov.	"
6	61	M	Milton	1 year	"	May 11, 1885	"	94	"	"
7	67	M	New Brunswick	5 months	"	June 11, 1885	"	121	"	Structure divulsed
8	73	M	New Brunswick	2 or 3 years	"	June 24, 1885	"	20	"	"
9	57	M	Brookline	A few weeks	"	Oct. 5, 1885	Uric Acid	113	"	"
10	20	M	New Brunswick	6 months	"	Oct. 10, 1885	Phosphatic	133	"	Leather shoe-string nuc.
11	67	M	Boston	14 years	"	Oct. 23, 1885	Uric Acid	150	"	Epididymitis, etc.
12	47	M	Providence	1 year	"	Nov. 6, 1885	"	80	"	"
13	60	M	Boston	1 year	"	Nov. 10, 1885	Phosphatic	140	"	"
14	50	M	Boston	2 months	"	Dec. 27, 1885	Uric Acid	23	"	Multiple Calculi
15	75	M	Needham	3 months	"	Feb. 9, 1886	"	19	"	"
16	74	M	New Brunswick	9 months	"	Mar. 30, 1886	Phosphatic	34	"	Second Oper. on No. 8
17	70	M	St. Louis	1 or 2 years	"	May 26, 1886	Uric Acid	143	"	"
18	48	M	Dakota	2 years	"	Sept. 4, 1886	Phosphatic	68	"	Stricture divulsed
19	53	M	Portsmouth	24 years	"	Sept. 11, 1886	Uric Acid	225	"	"
20	68	M	Brookline	14 years	"	Sept. 12, 1886	Phosphatic	265	"	"
21†	49	M	Medfield	8 years	Sup.-pub. Litho'my	Sept. 15, 1886	1180	"	Strict. and false passages
22	53	F	Kingston, N. H.	Several years	Litholapaxy	Sept. 20, 1886	Phosphatic	140	"	"
23	60	M	Martha's Vineyard	5 or 6 months	"	Oct. 29, 1886	"	95	"	Prostatotomy done at
24	63	M	Boston	5 or 6 months	"	Nov. 9, 1886	"	79	"	[same oper.

* See Boston Medical and Surgical Journal, Aug. 28th, 1884.

† See Boston Medical and Surgical Journal, Nov. 11th, 1886.

micturition with an occasional sudden stoppage in the full stream, hæmaturia and pain on riding in a wagon. These symptoms had existed for about a year, and Dr. H. E. Marion, of Brighton, had sounded him, and detecting a stone, had sent him to the hospital. The patient was a feeble old man with a weak pulse. An examination of the urine showed nothing beyond alkaline fermentation with purulent sediment. By the kindness of Dr. Bigelow, in whose ward he entered, I operated on January 21st. The stone was small and soft, weighing only ninety-eight grains, and the lithotrite was introduced but twice. On the following day he was very comfortable, was passing urine in good quantity, and had no tenderness or discomfort about the bladder. He had, however, a troublesome cough with profuse purulent expectoration.

January 25th, his cough was worse. Abundant sonorous and sibilant râles were to be heard over both sides of his chest with fine moist râles over the right lower front. There was considerable dyspnoea and his breath was very foul. The urine was almost clear and he had no bladder symptoms whatever.

From this time the condition of his lungs gradually became worse and he finally died on the 30th of January, nine days after the operation. No autopsy was allowed, but clinically it was evident that the fatal issue resulted from bronchitis and secondary pneumonia, and that his bladder was in good condition at the time of his death.

In only one case (No. 11), did any serious symptoms result directly from the operation. This patient was a man of sixty-seven, and infirm for his age. I saw him in October, 1885, in consultation with Dr. J. P. Reynolds, who kindly transferred him to my care.

For one and a half years he had had frequent, painful micturition, with a good deal of pain through the penis, which was greatly aggravated by riding. For the previous eight months he had had frequent attacks of hæmaturia. Otherwise the urine was that of an ordinary cystitis. For a long time he had lived alone, and, eating but little, had gradually acquired the habit of taking a good deal of stimulant, often more than a pint of whiskey in a day.

The sound touched a stone and on October 23d, 1885, I operated by litholapaxy under ether. A hard, uric-acid stone of good size was crushed and removed. At

the first use of the evacuator, a sharp, angular fragment caught in the eye of the tube and scratched the urethra considerably in its withdrawal. With this exception the operation went smoothly and at the third pumping, the bladder was found to be empty. On the following day there was a considerable rise of temperature (102.5° F., in the evening), and on the second day after the operation it rose to 104.5° F. At this time no casts could be detected in the urine.

On the fourth day the temperature fell to about 100° F., but on the fifth day it again suddenly rose to 104.6° F., at night, and the patient became delirious and tremulous. On this day an epididymitis started in the right testicle. On the sixth day, the fever continuing, the urine contained a trace of albumen and a few hyaline, granular and epithelial casts.

It was now found that by increasing the amount of stimulus to about a pint of whiskey a day, the tremulousness and delirium could be controlled. As the epididymitis subsided, the fever slowly left him and the casts and albumen disappeared from the urine. Convalescence, although tedious, was steady, until he left the Hospital, six weeks from the time of operation.

(To be continued.)

REPORT ON PROGRESS IN OPHTHALMOLOGY.

BY O. F. WADSWORTH, M.D., AND MYLES STANDISH, M.D.

STILLING¹ asserts that no one of the theories of the cause of myopia hitherto formulated has taken firm root. The accommodation theory is now generally disbelieved. There are strong arguments against the convergence theory; Arlt has pointed out that staphyloma is never developed in convergent strabismus; and myopia and staphyloma have developed in eyes which never had binocular vision.

The chief element in the production of myopia is to be sought in the action of the muscles, and especially in that of the superior oblique, which, with the inferior rectus, is in a state of continued contraction during near work. Examination of fifty eyes *in situ* showed that the course and insertion of the superior oblique is extremely variable, and its action, therefore,

¹Bericht der Ophthalmologischen Gesellschaft, Heidelberg, 1881.

very inconstant. It may run nearly transversely, or so obliquely as to approach a median direction; may be inserted far from the optic nerve, or send prolongations close up to the nerve or to its outer side. According to these variations, contraction of the muscle either causes compression and dragging, compression or dragging alone, or neither of these effects. These observations awakened the idea that the constant pressure of the muscle in reading and writing during the period of growth of the eye might produce myopia, and that the variations in direction of the staphyloma and in the shape of the disc might be explained by the different insertions of the obliquus tendon. To decide this point a second series of fifty eyes was examined in company with the anatomist Pitzner, and it was demonstrated that the course and insertion of the obliquus was in close correspondence with the form of the eye and the shape of the disc. Stilling states that it is a mistake to consider the normal eye a quite regular structure; that this is true only of the anterior portion, but behind the ciliary body there are often irregularities of shape.

Further, a number of myopic eyes were examined. Two of these were of special interest because the refraction during life (M. 5 D.) was known. The only abnormality in these eyes was a slight enlargement of the outer part and a corresponding distortion of the papilla. These eyes were normal, the moderate increase in length was in exact correspondence with the insertion of the obliquus. One was 25 mm., the other 26 mm. long, yet both had the same refraction. This fact led to the measurement of the radius of curve of the cornea in a number of myopic eyes to determine its influence. In the weaker degrees of myopia it was found larger, in the higher degrees smaller. The curve of the cornea, Stilling believes, determines the degree of the myopia.

The ordinary myopia, Stilling concludes, is due to the influence of pressure during growth; but such a myopia is not disease; the eye is not diseased, but only slightly deformed.

It is different with the highest degrees of myopia; there is disease, a *hydropthalmus*; yet the eyes are not diseased because they are myopic, but myopic because they are diseased. It is only in such diseased eyes that the widening of the space between the nerve sheaths and the separation of the outer sheath from the sclera is found. The two forms of myopia should be distinctly separated.

In the discussion which followed the reading of Stilling's paper, Cohn, while protesting against the view that the so-called school-myopia was not important as a disease, agreed with the opinion expressed that all the theories of the cause of myopia were unsatisfactory. Against the convergence theory particularly he adduced his recent investigations of watchmakers. He had examined one hundred watchmakers in Freiburg who never used the magnifying lens. These men worked on the finest machinery, pivots, screws of 1-2 mm. diameter, twelve hours daily; their eyes were generally but six inches from their work. Yet in spite of all this, only three of the hundred had during many years' work acquired myopia, and in the three it was only of small degree. The light was indeed excellent, but although converging excessively all day, and beginning at fourteen years of age, an age at which myopia often begins at school, these men had not become myopic. He had also examined

a large number of seamstresses who had been occupied for years all day long over the finest embroidery, and found none myopic. Furthermore, it was a matter of common observation that proportionally very few myopic tailors present themselves at the polyclinics. It was a probability that he had already suggested, that the close observation of small but fixed objects, as is the habit with watchmakers, is less harmful to the eye than the following of the lines in reading, writing and drawing, with the ocular movements which these occupations necessitate.

MEANS FOR THE PREVENTION OF MYOPIA.

Priestly Smith² in an article on "Means for the Prevention of Myopia," enumerates the following essentials for a school desk:

(1) The seat must be of such a height as will allow the scholar's feet to rest flat on the floor or footboard, and broad enough to support the greater part of the thigh.

(2) The seat must have a back placed at such a height as to fit the hollow of the back below the shoulder-blades, and support the body in a vertical position.

(3) The near edge of the desk must be just so high above the seat that when the scholar sits square and upright, with elbows to the sides, the hand and forearm may rest upon the desk without pushing up the shoulder.

(4) As used in writing the desk must have a slope of ten to fifteen degrees (about 1 in 5); as used in reading it must support the book at an angle of about forty-five degrees, and at a distance of at least twelve inches from the eyes — sixteen inches is better.

(5) As used in writing, the edge of the desk must overhang the edge of the seat by an inch or two, in order that the scholar shall not need to stoop forwards, and that the support to the back may be maintained.

(6) Either the desk or the seat, or some part thereof, must be movable at pleasure, so that although the desk usually overhangs the seat, the scholar may be able at any time to stand upright in his place.

(7) The desks and seats must be of various sizes, in order that the foregoing conditions may hold good for scholars of various ages.

DIRECTION OF LYMPH STREAMS IN THE EYE AND THEIR INFLUENCE IN SYMPATHETIC OPHTHALMIA.

Gifford³ reports the results of forty experiments on rabbits undertaken for the purpose of determining the direction of the lymph streams in the eye. The results obtained were definite and constant.

A small drop of sterilized water containing indigo or cinnabar in suspension was injected into the vitreous. There was generally little or no reaction, and on the next day or later, the particles could be seen, by the use of the ophthalmoscope, collecting in the optic excavation, and if the animal was killed a day or two after this, the microscopic examination of longitudinal sections of the optic nerve showed the whole course of the central canal marked by a line of the pigment, which passed out of the nerve with the vessels and could be traced toward the rear of the orbit.

Microscopically it could be seen that the granules were contained in the lymph spaces around the vessels, partly free, and partly enclosed in connective tissue, corpuscles and the occasional leucocytes. Besides the

² Ophthalmic Review, June, 1886.

³ Archives of Ophthalmology, 1886, p. 153.

granules along the main trunks, they were also present along all the smaller branches which radiate into the choroid and, farther back, into the periphery of the nerve. When the pigment was introduced near the posterior pole of the eye, it was discharged very promptly. The farther forward the injections were made, the longer the time required for the powder to reach the papilla, and the smaller the proportion of free granules. Outside the optic nerve the pigment kept close to the sheaths of the vessels and was traced to the posterior end of the orbit; here in all probability it entered the cranial cavity through the sphenoidal fissure. A small quantity of anthrax culture was injected into the posterior portion of the vitreous, and on the following day an exudation could be seen filling up the optic excavation and often concealing the papilla. The bacilli followed precisely the same channels as those into which the granules were carried, except that they did not enter the finest channels. As they multiplied wherever they were carried, they were found in considerable numbers in the orbit. From here, as will be shown in what follows, they were carried down into the intervaginal space of both nerves. These experiments were repeated on cats, dogs, and guinea-pigs, and, ophthalmoscopically, the accumulation of granules on the papilla was observed in these cases as in the experiments upon rabbits.

In regard to the lymph stream in the intervaginal space, our author's experiments were entirely confirmatory of Quinke's in 1872. The latter trephined the skull and injected cinnabar in suspension into the subdural space of rabbits and dogs: he found that the powder, besides reaching the spinal canal, was invariably carried down in considerable quantities, sometimes within a few hours, between the optic sheaths in both subdural and subarachnoidal spaces to the globes. The greatest quantity was always found next the eyeball. Cinnabar, anthrax bacilli, and blood, brought down in this manner from the cranium to the globe, are severally carried out into the orbit by the posterior vitreous stream. On the other hand, this latter shows not the slightest tendency to pass into the subvaginal space. With regard to the passage into the supra-choroidal space, it was noted in three cases that anthrax bacilli carried down between the sheaths from the brain, could be clearly traced for half a millimetre between the choroid and sclerotic. With regard to the outflow from the vitreous around the lens, our author reserves his experiments for another paper, but states that "the results of the experiments already made, have convinced me, rather against my will, that besides the posterior vitreous stream there is also an anterior stream flowing forward around the lens; as is, of course, generally accepted.

Gifford⁴ follows this article by another upon the influence of these lymph streams in the propagation of sympathetic ophthalmia.

Deutschmann, as is well known,⁵ by injecting into the vitreous of rabbits the ordinary white and yellow pus-cocci, was able, almost without exception, to obtain well-marked sympathetic neuro-retinitis of the fellow-eye. The time required for its development varied from a few days to three weeks. With the microscope the micrococci could be traced from one eye to the other by the way of the optic nerves, their sheaths, and the chiasma.

Our author failed altogether to obtain an unquestionable inflammation in the fellow-eye in twenty-one cases in which he inoculated the vitreous of rabbits with pure cultures of pathogenic cocci. *Staphylococcus pyogenes aureus* was used in nine cases; *staphylococcus pyogenes albus* in eight cases; and *streptococcus pyogenes albus* in four cases. The inoculated eye invariably underwent a severe inflammation, which generally became chronic and ended in more or less pronounced phthisis. The microscopic examination showed, according to the stage, the vitreous chamber filled with a purulent or semi-caseous exudation, and the layers of the choroid pressed apart by a dense infiltration of round cells; the deep physiological excavation plugged with the same; and the retina, more or less thoroughly disorganized. The lymph spaces around the central vessels of the optic nerve, the orbital tissue below the nerve itself, for a distance of 3-4 mm. back of the eyeball, were all markedly infiltrated with round cells. The orbital tissue and the pial sheath were especially strongly affected in the neighborhood of the exit of the central vessels from the nerve into the orbit.

The difference between Deutschmann's observations and Gifford's, is as follows. Deutschmann describes the micro-organisms as occurring all through the first eye and in both optic nerves and their sheaths, without mentioning any special relation to blood or lymph vessels. In Gifford's cases they were generally limited to the vitreous of the inoculated eye, occurring in greatest numbers in the exudation just before the papilla and just behind the zonula. In no case were they found farther back than the bottom of the physiological excavation. In the infiltration filling the central canal, along the small vessels of the nerve, in the sheaths, subvaginal space, and orbital tissue, he searched for them long and in vain. Why the micrococci are not swept out into these canals and spaces, as it has been shown in the previous paper, particles of india-ink and cinnabar are, depends, in all probability, on the choking of the lymph vessels with leucocytes, which was a marked feature of all these cases.

Convinced by these experiments that with the rabbits obtainable at Erlangen and Zurich, it was practically impossible to produce sympathetic ophthalmia with a fungus that excited a quick and strong reaction, and equally convinced by experiments with amorphous powders that a micro-organism capable of living in the lymph without exciting too intense an inflammation, must of necessity be carried around from one eye to the other, our author found such an organism in the bacillus of anthrax. This bacillus Gifford succeeded in tracing from the vitreous of one eye around to the perichoroidal space of the other, although the course was completed in but three out of twenty-five cases, owing to the rapidity with which the animals die when the subconjunctival tissue is inoculated, and in making injections into the vitreous, it is exceedingly difficult to avoid such inoculation.

We must now consider how far these results can be used in explaining the phenomena of sympathetic ophthalmia in man. First, with regard to the lymph stream from the vitreous, our author assumes that a condition occurring in animals so widely separated as cats and rabbits, also exists in man, there being no anatomical peculiarities to make it unlikely. This also holds good of the stream in the intervaginal space. When, however, we come to the passage from the

⁴ Archives of Ophth., 1886, p. 280.

⁵ See Journal, Vol. xiii, p. 176.

latter into the space around the choroid, we have the well-known fact that the supra-choroidal space can be injected from the intervaginal space with ease; the papilla and retina, on the contrary, with difficulty or not at all. With regard to the clinical history of these cases, the most difficult point to explain is why we have no cranial nor orbital symptoms in sympathetic ophthalmia if the micro-organisms pass through these cavities on the way to the second eye. Our author's explanation is that there undoubtedly is a slight lymphangitis in the orbit and meningitis at the anterior part of the base of the brain, but that the lymph stream generally keeps the micro-organisms from collecting in sufficient numbers to do serious mischief at these points, and he reminds us that certain pathogenic bacteria, as pus-cocci, pass from one part of the body to another, producing merely a slight lymphangitis on the way, and causing no severe inflammation until they accumulate, as, for instance, in the lymphatic glands.

The fact that in so many of these experiments the posterior lymph channels were quickly closed against the passage of micrococci, Gifford thinks explains the non-occurrence of sympathetic trouble in many cases where the primary inflammation in the first eye is violent. Leber and Deutschmann have sought the explanation of this non-occurrence after panophthalmitis, in the supposed destruction of the fungi by the violence of the suppuration and in the emptying of the infectious contents when the eye bursts.

INNERVATION OF PUPIL AND CILIARY MUSCLE.

Mr. Jessop⁵ has brought forward arguments to show that the fifth nerve is concerned in some of the functions of the pupillary and ciliary muscles. The pupil not only contracts when the ciliary muscle does so, but also dilates when the latter relaxes; the latter act, Mr. Jessop states, is carried out through the intermediation of the long ciliary nerves from the nasal branch of the fifth. The ordinary light-reflex of the pupil takes place through the agency of the third nerve; and the cervical sympathetic, as the inhibitory nerve, causes the dilatation of the pupil. In mammals the two chief motor functions of the pupil are thus separated; whereas in birds, possessing voluntary control over the irides, this is not so, for the cervical sympathetic has no control over the pupil, the nerve causing dilatation being the fifth. Mr. Jessop draws a clear distinction between the modes of action of cocaine, eserine, and atropine on the neuro-muscular intra-ocular apparatus. The first of these agents acts on the terminations of the cervical sympathetic in the iris, and probably of the fifth in the ciliary muscle; whilst the action of the other two drugs is on the muscular tissue directly. Hence it is that, even after section of all the nerves going to the intra-ocular muscles, atropine and eserine can cause further dilatation or relaxation, and contraction, respectively.

NEURO-RETINITIS IN BRIGHT'S DISEASE.

C. S. Bull⁶ in an article upon exudative neuro-retinitis associated with chronic Bright's disease, says that the period of duration of the disease, when the eyes were examined, as indicated by the occurrence of the symptoms, was very difficult to determine. Of the 103 cases observed, in 56 cases, or more than 50 per

cent., it was entirely unknown. In 47 cases, or somewhat less than 50 per cent., it varied from six months to several years. The sex of the patients was nearly evenly divided, 56 being men and 47 being women. The vision ranged from $\frac{3}{80}$ to zero. It was improved in 32 cases, or about 31.5 per cent., but this was mainly due to improvement in the renal disease and in the general health, for, as the disease in the kidneys reasserted itself and the general health failed, fresh exudation, or hæmorrhages, or both occurred in the retina, and vision again deteriorated. Uræmic amblyopia or transient attacks of more or less complete blindness in one or both eyes occurred in 37 cases, but in all these cases there was retinitis or neuro-retinitis. Both eyes were affected either at the time of the first examination or subsequently in ninety-three cases. Both optic nerve and retina were inflamed in both in about 25 per cent. of the cases. In 34 cases there were no hæmorrhages. In 30 of these 34 cases there was hypertrophy of the left side of the heart, while among the 69 cases in which hæmorrhages occurred there were five in which there was no cardiac disease demonstrable. The retinal hæmorrhages were associated with a diseased condition of the bloodvessels.

Bull examined these cases with special reference to the duration of life, and was impressed very strongly with the extremely unfavorable prognosis to be made, and with the comparatively short lease of life which these patients still possess. Of the 103 patients examined, extending over a period of thirteen years and six months, 86 have died and 17 are still living. Of the 86 who have died, 57 died within the first year; 18 within the second year; six within the third year; four within the fourth year; and one within the sixth year. Of the 57 who died within the first year, 30 died within six months. Of the 17 patients who are still living, 14 were seen for the first time within the last six months, and in all but one of these fourteen the renal disease had probably lasted a long time. Two of those still living were first seen within the past year, and one of the seventeen was first seen seven years ago and has been examined at intervals since.

PARALYSIS OF INTRA-OCULAR MUSCLES AFTER DIPHTHERIA.

Remak⁷ writes as the results of the observation of 100 cases of post-diphtheritic paralysis of the intra-ocular muscles that the amount of the paralysis varied greatly. In some cases it was so light as only to bring to the surface a certain amount of latent hypermetropia, and in some it required +4.00 D. to enable the patient to read small test letters at ten or twelve inches. He divides his cases into three classes: severe, requiring from +3.00 D. to +4.00 D. to read with, as above; medium, requiring +1.50 D. to +3.00 D.; and light, needing less than +1.50 D. Dividing his cases as above, he classifies 24 cases as severe, 16 cases as light, and the remaining 60 cases as of medium severity. He states that severe paralysis sometimes follows a very mild attack of diphtheria, and that the converse is also true.

In these 100 cases there was not a single case of optic neuritis.

— The recent death of Lady Wilson brings to the Royal College of Surgeons, \$1,000,000.

⁵ Lancet, June, 1886, p. 123.

⁶ New York Med. Jour., Vol. xlv, p. 119.

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⁷ Centralblatt f. prakt. Augenheilk.