

## TUMORS

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This section reviews the literature from January, 1917, to July, 1918. Certain benign tumors are mentioned in the sections relating to the regions in which they occur, as cysts in the anterior chamber under Anterior Chamber, subconjunctival cysts under Conjunctiva, etc.

**LACRIMAL TUMORS.**—Alt describes the microscopic structure of a partly *pigmented nevus* of the caruncula lacrimalis. The arrangements of the nevus cells in the tumor gave the impression that they had their growth from the deeper connective tissue parts towards the epithelium. Very few nevus cells proper contained pigment, the larger amount of chromatophores lay in the small layer of connective tissue. This seems to support Ribbert's view, that nevus cells are of connective tissue origin, rather than Unna's opinion that they are derived from the outer epithelium.

Pfingst removed a mass from the region of the lacrimal gland. It extended well back in the orbit, measuring half an inch in length, and weighing three and a half drachms. Histologically, the growth resembled a salivary gland. It was benign and of mixed tissue. The tumor, which had been present about three years, was observed in a male, aged 48 years. A case of lacrimal tumor is also presented by Jocqs. Urayama discusses lymphoma of the tear sac with elephantiasis of the upper lid.

**TUMORS OF THE LIDS.**—*Sarcoid* of the eyelid is reported upon by Derby; the pathologic examination is by Verhoeff. The authors were unable to find in ophthalmic literature any reference to "sarcoid," which they use in the restricted meaning given it by Boeck in 1899. The accompanying case history is that of a female, aged 25 years, from whom a small growth in the outer half of the right upper lid was removed. Three months later, there was recurrence, at which time a more complete excision of the parts was done, with no return. A very complete record of

the pathologic findings, a full discussion of the subject, together with some twenty-four references follows. The paper is of unusual interest, and should be read in the original, as it does not lend itself easily to abstract.

Prevedi describes a transparent *cyst* of the ciliary margin of the lids. Castresana's contribution is on congenital *dermoid* of the lid. Levitskaya reports on an extensive lymphoma of the cul-de-sac of the upper eyelid, penetrating into the orbit.

An Italian, aged 50 years, was exhibited by Holloway. The patient was first observed March 25, 1915; at which time there was present a large *epithelioma* about the internal canthus, involving the inner portion of both lids. Beginning at the middle of the lower lid, there was an ulcerating area the size of a five-cent piece. Attached to the inner edge was a flap-like mass partially covering the globe. A rather smaller area involved the upper lid. An extensive curettement and application of pure carbolic acid were followed with satisfactory results. Recurrences three months later necessitated a second and third curettement, followed by three applications of radium. At the time of reporting, about two months later, the eye looked well with only about 5 mm. of the outer extremity of the lower lid remaining.

Jessop observed a man, aged 55 years, with an *epithelioma* at the center of the left upper lid. The accessible parts were removed, and 10 mg. of the pure radium bromid was applied unscreened, for one hour. No recurrence in two months. The patient was an X-ray worker who had lost all fingers of one hand. Of the three cases of *epithelioma* of the lower lids ob-

served by **Katayama**, two were at the canthus. In **Johnson's** second patient, a case of epithelioma of the cheek and eyelid, in a female aged 50 years, was of four years duration. The fat and Wolff graft were taken from the abdomen. There was no recurrence for six months.

In view of the relative frequency of epithelioma due to certain irritants, **Herz** reports a case in a man aged 56 years. The growth, one centimeter in diameter, was at that part of the nose where his tortoise shell spectacles rested. The mass was excised with satisfactory results.

The occurrence of two different types of malignant disease, in the same patient, within a year, was **Valentine's** unusual experience. A female, aged 55 years, had an epithelioma of the lid removed. One year later, vision of the left eye failed. Examination revealed an intraocular growth. The enucleated eye revealed a mass 9x10 mm. One pathologist stated that it was a glioma. A further examination found it to be a fairly typical leucosarcoma. The author does not believe there is any connection between the two conditions.

**Johnson** observed a squamous celled sarcoma, involving both lids, the ball of the right eye and extending downward on the nose. The growth began ten years previous, in a female, aged 65 years. Complete exenteration of the orbit, removal of all affected parts, and filling in of the orbit with fat, from the thigh, and swinging into place a large skin flap from the forehead was the surgical procedure. Two years after the operation there was no evidence of recurrence. **Kosima's** patient was a man, aged 41 years, with *bilateral endo-thelioma* of the lower lids. Death ensued from brain tumor.

**TUMORS OF THE CONJUNCTIVA.**—**James** and **Trevor** report the clinical histories of two cases of *hemangioma* of the palpebral conjunctiva forming pedunculated tumors. One patient was a youth, aged 17 years; the second a girl, aged 13 years. The term "nevus" used in the pathologic reports on these two cases has been applied to tumors of

which the strictly correct description should be "hemangioma simplex." The term nevus is applied commonly to vascular tumors without regard to their more intimate structure. It is generally agreed that a simple vascular nevus is a congenital malformation rather than a true neoplasm.

The cases here described belong to the class of true blastomas, and consist of large endothelial cells arranged in many layers around spaces or tubules containing blood. In both cases, the growths are slightly lobulated, the second case more than the first. In both, there is an irregular area around the periphery of the tumors, and, in the second case, this bears on the outside the patchy remains of a covering of several layers of flattened cells belonging to the palpebral conjunctival epithelium. The authors found surprisingly few references in literature to similar cases.

*Angioma* of the conjunctiva of traumatic origin was observed by **Marin**. A female, aged 52 years, four years previous, injured the superior culdesac with a stick. The mass was about the size of a small hazel nut. At its outer part, the palpebral opening was occupied almost in its whole length by another growth of the size and shape of an almond. The two swellings were parts of the same tumor. A complete cure was obtained by three treatments with bipolar electrolysis at intervals of about three weeks.

**Fuchs** observed a *lymphangioma* at the site of a cystoid cicatrix. The eye had been removed on account of a mild endophthalmitis, ten days after an extraction of cataract. The lymphatics passed thru the scar onto the posterior surface of Descemet's membrane and the stump of the iris.

A highly pigmented *dermoid* was observed by **Shikano**, occupying the exact center of the lower palpebral conjunctiva. A Chinese farmer observed by **Kosima** showed a sausage-like thickening of the conjunctivas of both eyes, which were composed entirely of small lymphocytes. A rice granule was found in the left eye. *Papilloma* of the conjunctiva is discussed

by Hepburn. Valli's paper deals with experimental granuloma of ocular tissues.

Crisp states that primary epithelioma of the conjunctiva is not of extreme rarity. A peculiar feature is that they may exist and develop over long periods of time without involving vital structures. The sclerocorneal limbus is, perhaps, the most frequent site. A few cases described have developed on the base of an old pterygium. The case reported was in this position. It measured 4x5x2 mm. No recurrence was observed four months after removal. Finnoff made a microscopic diagnosis of epithelioma.

Jean presented a case of *sarcoma* of the conjunctiva which had occurred after removal. Radical measures were not resorted to owing to the fellow eye being practically blind. Complete exenteration is to be done. Kurkoff reports a case of epibulbar melanosarcoma. Casolino's patient had a lymphosarcoma of the bulbar conjunctiva. Gallenga's patient presented a lymphangio-endothelioma of the same tissue.

**TUMORS OF THE CORNEA AND LIMBUS.**—Very excellent microphotographs accompany Marchi's contribution on some rare observations of atypical trachomatous pannus of the cornea in the form of a tumor. One interested in the pathology of this subject should read the original. Two cases are described in which the masses approximated 10 mm. by 6 mm. and 2 mm. elevation. In one, the mass occupied the center of the cornea; in the other, the superior internal quadrant. Microscopically, the tumors were covered with epithelium somewhat altered in places. Round and oval cells gave the staining reaction for plasma cells. Here and there were numerous round hyalin globules. Bowman's membrane was completely destroyed. Levitskaya reports the rather unusual condition of *fibroma* of the cornea.

Willettts demonstrated Meanor's patient with melanotic sarcoma of the cornea. The patient, a male, aged 68 years, stated that a spot had been noticed on his right eye for ten years. When first observed by Meanor, the

growth was entirely corneal extending from the temporal limbus to the center of the cornea. Later melanotic spots appeared in the neighboring conjunctiva.

Lamb reports the microscopic findings in five cases of growths of a papillomatous nature. The condition was observed in patients ranging in age from 51 years to 75 years. One patient had multiple growths at the limbus; another at the nasal limbus; the third, at the temporal limbus; one, at the nasal canthus; and the fifth, at the center of the margin of the lower lid. Microscopically, these growths may be confused with spring catarrh, fibroma, tuberculosis, acanthosis nigricans, and, most frequently, with epithelioma. *Papilloma* is a benign growth possessing a great tendency to recur. They should be removed early, going well out into healthy tissue, and this to be followed by cautery.

A patient, aged 53 years, with a small pterygium-like growth at the temporal margin of the cornea was observed by Koellner. The mass was excised, but during the succeeding five years, six recurrences took place, following as many removals. This occurred at different points about the limbus. At the time of the last excision, 10 mg. of mesothorium was employed, and six applications of from one to three minutes were administered daily for eighteen days. The patient was then allowed to go home without any particular change. On his return five months later the growth had entirely disappeared. Microscopically the tumor was an epithelial new formation, without blood vessels and benign in character, the epithelial prolongations not having penetrated the underlying connective tissue.

*Epithelioma* of a papillomatous type was the microscopic findings in Stieren's case of tumor at the limbus. The mass was observed in a man, aged 45 years. It was mushroom shape, and extended from the external canthus overlapping the cornea. Marbourg reports a patient struck at the limbus by a piece of coal, several years ago. There remained quite a little pigment, which

subsequently was examined by a pathologist, who reported an absence of melanosarcoma. Two years after enucleation, the patient died from metastatic sarcoma of the liver.

**TUMORS OF THE IRIS.**—*Primary sarcoma* of the iris was observed by Bell. A man, aged 80 years, with a history of paralytic stroke twelve years, and a trauma of the left eye two years previous, complained of severe pain and loss of vision. In the upper nasal quadrant, between the cornea and iris, and apparently involving the latter structure, was a mass 3x6 mm. Tension was 52 mm. The patient refused surgical interference. Six months later the mass had increased, tension was 90 mm., and the eye painful. The organ was removed at this time. Dixon's pathologic examination showed a primary melanosarcoma of the iris, spindle cells predominating. The author concludes by stating: "I feel that the prognosis is always unfavorable when the sarcoma is excised. Iridectomy should be done only as an aid to diagnosis. I quite agree with Wood and Pusey who, after a thoro investigation of the subject, came to the conclusion that, when the diagnosis of iris sarcoma is established, the globe containing the growth should be immediately enucleated. That they do recur sooner or later when excised and are apt to produce general metastases. I feel that it is not fair to jeopardize the life of the patient by a compromise in the treatment, and, after all is said and done, in my opinion the radical operation is by far the safest in the end."

Gifford reports his experience of having systematically treated sarcoma of the iris by *radium*. Some two and a half years later the unusual opportunity of securing the specimen for pathologic study was afforded. His observations presented much the condition described by Levin and Joseph, Morson, Wassermann, and Prime. The cells showed no mitosis or evidence of spreading into neighboring tissues. The author's comment on this form of treatment is that the iris offers very favorable conditions for treatment by radium or X-ray. The rays reach the growth

thru the clear cornea almost as if it were on a skin surface and the results of treatment are as open to observation.

Of the two accepted treatments, iridectomy and enucleation, the author quotes Wintersteiner's opinions in favor of primary enucleation, except under certain well defined favorable conditions. (1) Vision in the eye is good. (2) The iridectomy offers no obstacle to complete removal. (3) The tumor is small, slow growing, well defined and at the pupillary edge. It must not reach into the anterior chamber, touch the lens or cornea, there must be no other pigment flecks of the iris, and tension must not be increased. There is some danger of iridectomy producing metastasis, but this is also true of enucleation.

Argañaraz and Belgeri found in all about twelve cases of leucosarcoma in the literature. Their experience is one for every 80,000 cases. Hirschberg, one to every 85,000, while Kotomo reported one for every 3,500 cases. The case reported is that of a woman, aged 28 years, who eleven years previously suffered a traumatism over the right eye. At the time of observation there was marked inflammatory ocular disturbance. Histologically the enucleated eye showed a perithelial angiosarcoma.

Ziegler's patient, with sarcoma of the iris, was a male aged 55 years. The anterior chamber was obliterated on the nasal side due to a tumor mass springing from the root of the iris. Sections of the globe showed a large pigmented tumor, located between the iris and lens, and an equally large leucomatous mass extending subretinally from the ciliary region into the vitreous chamber.

**TUMORS OF THE CHOROID.**—The use of the term *melanoblastoma* as a group name for all tumors composed of melanoblasts or chromatophores, Forman and Hugger believe has the advantage of not placing any emphasis upon benign or malignant forms. This compels a more accurate study of the individual tumor. The authors give the results of their studies from the labora-

tory of pathology of the Ohio State University. Four specimens of malignant melanoblastomas arising in the choroid are recorded. Each illustrates one of the four stages of the disease: The small growth, with no marked symptoms; the type with marked pain, the one with extraocular involvement, and the fourth which has metastasized.

Komoto contributes to the knowledge of primary uveal tract *sarcoma* with a report of 100 cases. This is the end of a long series, and the author selects from many observations the following: (1) Frequency, 0.018%; (2) Average age, 49.4 years (one case aged 90 years, another aged 9 years); (3), Sex, the same; (4) No difference between right and left eye; (5) The tumors are usually spindle cells, leucosarcoma. The round cell form is seldom seen; (6) Pigmented and leucosarcoma shade gradually into each other; (7) The flat form of sarcoma may extend outside the globe by blood vessel extension; (8) Peripheral sarcoma may extend along the optic nerve and also the blood vessels, so the prognosis is worse; (9) Pigmented sarcoma appears more in the posterior portion; leucosarcoma the anterior; (10) The upper and the under portions of the globe are more affected; (11) phthisis bulbi may come on thru infection of the necrotic area, and more often occurs in the round-celled form.

By means of the ophthalmoscope, and the supporting evidence **Castresana** states that a diagnosis of sarcoma of the choroid can be made. The haze, the luminous sensation, scotoma, with diminution of the field, increased tension and metamorphosis, when the tumor is situated at the macula, form a clinical picture sufficient for an early diagnosis. Three cases are reported in which many of these symptoms were present.

**Alt** observed an unusual type of intraocular *angiosarcoma*. Microscopic examination of the cornea showed a great many more cells in the parenchyma than normal, especially in the periphery. The ciliary body was greatly atrophied. The patient gave a history of the eye becoming suddenly blind and

painful; this was later corrected in that the sight had gradually failed during the previous four or five months. At the time of observation, acute glaucoma, +3 tension, and the uncommon experience of exophthalmos were present. Later the inflammatory symptoms subsided and the tension became -1. There was nothing in the histologic findings to explain the rapid increase of glaucoma, combined with the marked exophthalmos, after the instillation of a few drops of eserine. Neither is there any explanation of the lowering of the tension, as we must assume the intraocular tumor was still growing within the eye.

A round-celled leucosarcoma of the choroid, in a man aged 52 years, is reported by **Shumway**. The first microscopic sections showed an isolated round nodule, lying between the thickened detached retina, and the lens, and composed of nonpigmented round cells, of the same size as the nuclear cells of the retina. There was necrosis of a considerable part of the tumor, leaving well staining mantles of cells surrounding the blood vessels, as in glioma; and the growth had the appearance of having sprung from the retina. Further sections of the other half of the eyeball, however, showed the tumor to have sprung from the choroid.

A case of sarcoma of the choroid, with certain striking features, by **Jackson** and **Finnoff**, is of especial interest. Over fourteen years elapsed from the time sight was noticeably impaired, and two and one-half years after glaucomatous symptoms had arisen, until the eye was enucleated. Microscopic examination demonstrated a spindle-celled melanoid sarcoma of the choroid, with metastases thru the globe into the conjunctival and orbital tissues. There was a mild panophthalmitis with a peripheral annular infiltrate of the cornea without perforation of the globe. The course of these protracted cases indicates that within the eye, influences are exerted which may retard or wholly check the development of such growths. One of these is probably the influence on cell life of intraocular pressure. The effect of abnormally high in-

traocular pressure is fairly well known thru the changes produced in previously normal tissues by glaucoma. It is rather probable that the normal intraocular pressure exerts some such influence unfavorable to cell life of a new growth. A good review of the literature on this type of case is given.

**McGuire** found of all malignant neoplasms, sarcoma to be the chief intraocular growth of adult life. Of all pathologic conditions of the eye, it occurs in only from .03% to .06% of cases. The writer reports three very instructive case histories. The first patient presented typical symptoms of acute inflammatory glaucoma in one eye, and in its fellow a deep cupping of the nerve was observed. Microscopic findings in the inflamed eye showed a spindlecell sarcoma.

The second patient gave a history of having been kicked by a horse, above the right temple, some years previous. There was a small corneal opacity. The retina was detached, no pain or tension. Six weeks later slight pain was felt, and by oblique illumination, fairly accurate outlines of an intraocular growth were made out. The microscope indicated a melanotic sarcoma.

The third patient, a man, aged 48 years, had previously lost his right eye as the result of a specific iridocyclitis. The left eye showed thru a dilated pupil, a large reddish brown mass. A diagnosis of malignant growth was made. Enucleation and microscopic examination showed a melanotic sarcoma. The patient was still alive eighteen months later.

In a resumé regarding certain features of intraocular tumors, **Harbridge** reports of a man, aged 50 years, with a growth within the globe, who totally lost his vision in the right eye, two months previous to observation. No pain, redness or unusual appearance was complained of; the pupil was enlarged Tn. + 1. By oblique illumination a mass could easily be seen at the nasal side behind the plane of the lens. A very excellent microscopic report by **Finnoff** showed the growth to be a small spindlecell melanotic sarcoma,

arising from the lamina fusca choroidea. A 7 mm. section of the optic nerve, which was obtained, showed no invasion. At the age of 61 years, eleven years after the enucleation, the patient was well and showed no secondary involvement.

**De Schweinitz** and **How** have detailed the case history of a *melanosarcoma* arising from the vascular layer of the choroid posterior to the base of the ciliary body. The growth was observed, by oblique illumination, as a chocolate brown mass. The woman, aged 40 years, gave a negative history. The tumor was sharply circumscribed and noninfiltrating; sections were very hard.

**Moore** refers to his previously reported four cases of *melanomata*. His recently reported patient was a man, aged 53 years. The general appearance was very similar to that of his former cases. There was no irregularity of pigmentation nor stippling of the tumor; the edges were slightly feathered, and not hard or sharp. The sectioned eye showed a mass 1.9 mm. in diameter, 4 mm. in thickness. It appeared to be formed in the more superficial layers of the choroid and composed of very broadly, spindle-shaped cells with pigment scattered unevenly thruout the growth. These tumors are of uncommon occurrence, and usually discovered by accident during routine ophthalmoscopic examination.

Five weeks following a fundus examination, in which the appearances seemed normal, **Clapp's** patient returned with a marked failure of vision. At this time, detachment of the retina was observed. Transillumination showed no dullness. About eleven months later, secondary glaucoma developing, the eye was removed. Three months later the patient died with metastasis of the liver. Microscopic examination showed melanosarcoma of the choroid. It is most probable that the failure of transillumination was due to the light not getting far enough back. Attention is called to the value of making a small conjunctival opening and carrying the light backward toward the optic nerve. **Desogus** and

also Fagin each report cases of melanotic sarcoma.

De Salterain found upon examination of the literature on sarcoma of the choroid but thirteen or fourteen reported cases in children. One of his patients was a girl, aged six months, the other a boy aged 22 months. Prompt enucleation was done with no recurrence during the interval of the time of reporting, four and eight months.

Church discusses the clinical symptoms of sarcoma of the choroid. His first patient showed no evidence of metastasis in four years; the second patient did not submit to operation until four years after first being observed, at which time the sclera had become sacculated. Fraxanet and also Berg each report on cases of choroidal sarcoma. Hughes presented a patient in whom a diagnosis of sarcoma of the choroid was made. Section of the enucleated eye two months later showed no microscopic evidence of the growth.

Rumsey's experience with five cases of tumor of the eye is impressive of the importance of an early diagnosis, because of the light they are apt to throw on obscure parts of general pathology. Prompt enucleation often affords a very favorable prognosis. His first patient was a child, aged four years, with endophytum *glioma*. Enucleation of the eye showed no recurrence. The second patient, a woman aged 45 years, had a sarcoma of the choroid of a hematogenous pigmented type; no recurrence. A round and spindle-celled sarcoma of the posterior pole was observed in a man, aged 34 years. The growth followed some time after a head injury. At first a diagnosis of detached retina was made. The fourth case, a suspected melanotic sarcoma, covering a third of the cornea. Microscopic examination showed it to be an epithelioma; no recurrence. The fifth case was an extensive growth of the lower lid, lacrimal sac and part of the upper lid, in a man, aged 67 years. The eyeball, together with lids and sac, were removed. Microphotographic reproductions illustrate the paper.

Malignant growths of the eye is the subject of a communication by Allen. Shiso's observations are on *metastatic carcinoma* of the choroid. Benign growth of the choroid is the subject of a paper contributed by Opin.

Adams reports the autopsy findings in which microscopic sections of the lung and liver tissue revealed melanotic sarcoma. The patient, a female aged 30 years, gave a history of having trouble with the right eye four years previous. Two years after this the organ was removed, presumably for an intraocular growth in the second stage. No microscopic examination was made at that time, but it is believed to have been the primary focus. Wheeler's patient, aged 40 years, showed an intraocular growth with a Wassermann +4. Specific medication was continued to the point of tolerance, but vision failed slightly.

Heed presented a boy, aged 15 years, exhibiting a subretinal mass in the temporal field of the right eye. He found an area of choroiditic atrophy, encroaching upon the macula; and, in juxtaposition to the lower border, there was a greyish circumscribed area protruding at least three diopters in advance of the retinal plane. Wassermann and von Pirquet reactions were negative. There has been no change in two years. A definite diagnosis has been deferred. An organized exudate resulting from the choroiditis had been considered.

**TUMORS OF THE RETINA.**—In the left eye of a female patient, aged 64 years, Hird found extensive ophthalmoscopic changes, especially in the macular region; V., hand movements; no rise in tension. Under the impression that he had to deal with a new growth, and after consultation, the eye was removed. The opinion was expressed by a pathologist that "it was a form of malignant growth springing from the retinal pigment cells rather of a sarcomatous nature." A subcommittee of the Ophthalmological Society, however, after examining sections, reported that "the case belongs to the type which was described by the late Mr.

George Coats as a form of retinal disease with massive exudation."

As far as **Griffith** was able to make out, he found six cases of *hereditary glioma* on record, which, with his own two cases, brings the total to eight. In a family of six children, four had double glioma, the mother having lost one eye in infancy, from the same cause. The two who escaped were bot-tled. Whether one can ascribe this immunity to this fact is not known. In the second family, of three children, one had bilateral, and two unilateral glioma. The mother lost one eye in infancy, from the same cause. Clegg is inclined not to place too much importance on the transmission from the mother. He believes this impression has been formed largely for the reason that it is usually the mother who brings the child, and the surgeon notes whether or not she has lost an eye.

**O'Connor** makes a most excellent contribution, together with illustrations, and a very complete list of references on *glioma* retinae. Interest in the case history cited centers in making a diagnosis, owing to the marked symptoms; and also whether the phthisis bulbi, or the glioma, was the primary conditions. Previous history of the case was vague and uncertain. A female, aged nine months, shortly after birth had a "blood-shot" eye, with a slight discharge. At the time of coming under observation, the globe was shrunken and irritable; rather later, its fellow became irritable, and under the impression that it was a case of sympathetic ophthalmia, the phthisical globe was removed. Pathologic diagnosis by Verhoeff was glioma retinae and atrophie bulbi. Subsequently the remaining eye developed all the clinical evidences of glioma. This eye was removed, followed two months later by death due to sepsis and exhaustion. The paper is well worth consulting by one interested.

Three weeks after a trauma of the left eye, in a child aged 8 years, **Ring** made a diagnosis of retinal *neuroepithelioma*. Upon the suggestion of an immediate enucleation the patient disappeared, and was not seen again for nine months, at which time the eye was re-

moved. Three months later there was a recurrence in the orbit, two-thirds the size of a baseball. The mass was removed by Clark's method of electrothermic surgery. Subsequently the child died, showing evidence of metastases. The report contains a good review of the literature.

In **Taylor and Fleming's** case of *bilateral glioma*, in a female child, aged 3 years, there was orbital recurrence followed by multiple metastases. In the same report Lawson read notes concerning a recurrent case in a boy aged 3½ years. Reference is made to all reported cases or metastases. **Knapp** presented the photograph of a case of bilateral glioma in a child, aged 2 years. The appearance was that of a fungus hematodes. The extension of glioma, if left to itself, is to proceed back, enlarging the optic sheath, which it then perforates. The minute the growth gains the loose tissue of the orbit, its progress is remarkably rapid.

In **Hugger and Forman's** case of so-called glioma of the retina, the group term *neuroblastoma* is used. There is present in the sectioned eye four whitish nodules. So completely does the tumor line the vitreous cavity that it is not possible to identify the retina at all. At the posterior portion of the tumor, cells have invaded the choroid and sclera. Pathologic notes and illustrations accompany the report. Both **Leal** and **Haas** have contributed to the subject of glioma.

**TUMORS OF THE OPTIC NERVE AND SHEATH.** — Photographs illustrate the good cosmetic effects obtained by **Bane** in his patient with *cyst of the dural sheath* of the optic nerve. A lad, aged 6 years, at the time of his first visit showed vision with the left eye almost nil a pearly white disc and a hyperopia of 3 D. Two and a half years later the eye ball protruded 5 mm. forward, downward and inward. The hyperopia had increased to 6 D. A tentative diagnosis of fibroma was made. The X-ray did not reveal any evidence of sinus involvement or solid tumor. The mass, together with a section of the optic nerve, was removed through a conjunctival incision 30 mm. long and 5 mm. external



to the cornea. During the operation the cyst collapsed, permitting the escape of a clear fluid. Finnoff's pathologic findings showed the optic nerve fibers atrophic; the pial sheath of a honeycombed appearance; and the dural sheath, greatly thickened; the endothelium in the anterior portion filling the space between the pia and dura. Posteriorly, the cells gradually thinned.

**Eleonskaia** reports the case of a tumor of the optic nerve in a boy, aged 6 years, of three years duration, apparently of benign character, in which all the topographic relations of the nerve are preserved, but considerably increased in their dimensions. There was a polymorphic character in the microscopic structure, and in the central parts, corresponding to the nerve trunk, a resemblance similar to *glioma* and *gliosarcoma*. There was also some degeneration and edema of tissue.

**Cecchetto** describes an ingenious new method of operation for the removal of a retrobulbar fibroma. **Shiosi** used the Krönlein operation for the removal of a tumor which proved to be a *lymphoendothelioma*. The growth had its origin from the posterior portion of the sclera, causing a kink in the optic nerve.

A *psammoma* of the sheath of the optic nerve was observed by **Ferro**. In **Shiosi's** two cases of intradural tumor of the optic nerve, histologically, one was a *glioma* while the other was a *myxoma*.

**Mansilla's** patient with *sarcoma* of the right optic nerve was a woman, aged 63 years. Exophthalmos, immobility of the eye and optic neuritis were present. The tumor, which was situated in the posterior part of the orbit, was adherent to the eye ball and optic nerve. The entire orbital contents were removed. Microscopically the growth was a fibrosarcoma. The descriptive pathology of a necrotic tumor of the sclerotic is contributed by **Alt**. **Edmondson** reports a lipoma of the optic nerve, successfully removed by the Krönlein operation.

**TUMORS OF THE ORBIT.**—A clinical diagnosis of sarcoma of the orbit was made in **Wible's** patient. The dura-

tion of the growth was about two years. Following exenteration, the pathologic report of the specimen was *rhabdomyoma*. Few cases of this rare growth have been reported in literature.

The cosmetic results were almost perfect in the patient **Posey** exhibited, from whom he had removed an *adenoma* of the orbit. **Wright** reports a rare growth observed in a female, aged 58 years. Six years previous, she was operated upon for a femoral hernia, which may have been an ovariectomy. During a period of some twenty months the patient suffered attacks of pain in the left eye, followed by perceptible loss of vision. The eye was enucleated for chronic glaucoma. About six months later, a secondary mass was removed from the orbit. Microscopic examination showed the presence of a *malignant papillary cyst adenoma*. The walls of the eyeball were involved. Tumors of this type are usually found in ovaries, breast and intestinal tract, and never as a primary growth, at least, about the orbits.

**Coover** presented a patient, aged 11 years, from whom he had removed a *fibroma* of the orbit. The mass, 25 x 35 mm., was adherent to the foramen and optic nerve on the temporal side. In its removal the optic nerve was injured, necessitating enucleation of the globe. **Sander's** patient proved to have a tubercular tumor of the orbit.

**Griffith** exhibited a patient, a female, aged 33 years, with proptosis of the left eye, movements free in all directions. A distinct new growth was palpable, at the back of the eye. There was no light perception or pupil reaction; nevertheless, the optic disc was of good color and the vessels were full. **Calderaro** did an excision of a tumor of the orbit, without appreciable cicatrix and without enucleation of the globe. **Jansson's** patient has bilateral exophthalmos, due to tumor of the orbit.

**Cirincione** contributes the history and operative procedure in three cases of endorbital *osteoma*. In the first two patients, the mass occupied the upper inner part of the orbit. One occurred

in a man aged 25 years; the other in a girl, aged 16 years. The third patient was a man 21 years old, in which the mass occupied the whole orbit, pushing the eyeball forward so that the posterior pole was on a plane with the margin of the orbit. The operation consisted of practically excavating a new orbital cavity. The growths were from three to five years' duration.

In **Blanco's** case of *osseous tumor* of the upper part of the orbit, the eye deviated down and out. Removal of the mass was accomplished without any damage to the eye. **Stern's** patient had an osteoma. **Posey** exhibited a patient, a male, aged 19 years, with an orbital growth, possibly an osteoma. The mass was hard and bosselated, confluent with the supraorbital rim and merged with the inner wall of the orbit. The growth was first observed eight or nine years previous. Vision equalled 5/10. The mass was to be extirpated thru a large incision under the brow.

**Hupp's** case of *exostosis* of the orbit occurred in a man aged 26 years, who gave a negative family and personal history. Fifteen years ago, without apparent cause, there was noticed a small hard lump within the right orbit, on the nasal side. While for years this bony growth remained quiescent, a few months before examination, blurring of vision, diplopia and pain became manifest. A hard, rounded, bony tumor, the size of an English walnut, protruded from the nasal side well beyond the orbital margin. The tumor was removed and proved to be attached to the orbital plate of the ethmoid.

**Kalt's** case of multiple exostosis occurred in a boy aged 13 years. His personal history was negative, but the mother gave a history of exostosis of the ramus of the lower jaw. One of the bony growths was situated at the inner orbital margin on the left side, pushing the globe backward and upward. The tumor, the size of a walnut was removed. Its attachment was near the junction of the os planum of the ethmoid and the lacrimal bone. Similar exostoses were present on the left external nasal wall, the anterior lacrimal

crest, and the ascending apophysis of the superior maxillary bone.

An interesting experience is reported by **Chance**, in the removal of a *cavernous angioma* of the orbit. The patient was a female, aged 16 years, with a tumor first noticed soon after birth, which had gradually increased in size until it occupied the upper half of the left orbit. The mass extended from the upper margin of the internal rectus across the globe to the external rectus and backward indefinitely. The mass was accommodated by an absence of the middle third of the orbital ridge and roof, together with a fenestrum in the external orbital wall. Dissection of the mass was most tedious. The base rested on the upper outer aspect of the globe and was quite adherent to the sclera. Histologic study showed no capillaries or glandular elements, no cysts or signs of degeneration.

**Boot** observed a female, aged 21 years, with an angioma of the orbit. The first evidence of the trouble began about nine months previous. Of late the mass has markedly increased in size. There is a soft swelling at the inner part of the orbit; the upper eyelid is swollen. There is a distinct thrill felt and bruit heard. The growth does not extend into the nose. X-ray pictures show no evidence of erosion. The reporter discusses the various types of this class of tumor, their infrequency and possible appropriate methods of treatment.

An unusual orbital tumor was removed by **Wheeler** by the Krönlein method. A female, aged 40 years, gave a history dating back ten years, at which time she observed a small red spot in the right eye. At the time of examination, there was a large subconjunctival hemorrhage and a decided protrusion in the region of the lacrimal gland. Operation revealed a jellylike mass adherent to the lacrimal gland and outside the muscle cone. A small arca of the upper part of the temporal wall of the orbit was deficient. Dixon considered this to be a hemorrhagic form of degenerating connective tissue tumor; Weeks, probably sarcoma;

Verhoeff, an unusual form of hemangioendothelioma. **Satake** also observed a hemangioendothelioma of the orbit.

Primary *sarcoma* of the orbit with anterior adhesive iridocyclitis is reported by **Ischreyt**. Exenteration revealed a necrotic sarcoma with a large cyst. In the enucleated eye, there was a close attachment of the root of the iris to the cornea and sclera. In spite of this fact, the tension was not increased but diminished. In **Posey's** patient with sarcoma of the orbit, the eye had been enucleated elsewhere four years previously, perhaps for sarcoma of the choroid. The recurrence in the orbit was a firm black mass occupying the position of the eyeball. Exenteration was followed by marked hemorrhage, which ceased upon the application of the Clark method of desiccation. **Zentmayer** observed a growth in the orbital fold of the left eye. The mass, 40x25 mm., extending from midline to the external canthus; it being encapsulated, was easily removed thru an incision. Microscopic examination showed a predominance of large round sarcoma cells.

**Darier** reports a case of melanosarcoma of the orbit which began as a small conjunctival speck. Ophthalmoscopically pigmented points in the retina, which had been noted, were found to be connected with the mass by means of vascular filaments. Thirteen months after exenteration there had been no recurrence. **Curry's** patient had the same type of malignant growth, while, in **Krebs' patient**, the sclera was involved.

Symmetrical bilateral *endotheliomas* of sarcomatous type, of the orbits, were removed by **Kirkpatrick**. They occupied the site of the lower lids and extended well back into the orbits. There was no glandular involvement. When last seen, three months later, there was no recurrence.

**Posey** exhibited a patient, aged 67 years, upon whom he operated and also used a desiccation, for a very extensive *epithelioma* of the orbit. One year previous, the first operation, with a pedicled flap from the temple, was per-

formed. Four months following this, there was a recurrence. Preceding the last operation an overripe cataract was removed from the fellow eye. Present appearances are very satisfactory.

A tentative diagnosis of an ethmoid osteoma was made by **Sattler**, following an exploratory operation. A lad, aged 14 years, during the preceding two years, had noticed a prominence of the left eye. Two months prior to his first visit, the protrusion became more pronounced. Thru a Krönlein incision, a very thoro examination of all parts of the orbit was made. An extremely hard protrusion of inner and upper wall was discovered, and the globe was enucleated to permit an easier access to the region of the ethmoid or sphenoid bones. After careful consideration it was determined not to proceed with the removal of the small and probable osteoma, but await results of future observation.

**Zentmayer** exhibited from the service of Chance, a probable case of malignant growth of the antrum. The patient, a female aged 60 years, had a firm ridgelike mass palpable just within the inferior orbital margin. A thoro examination of the patient had not been completed.

**TREATMENT OF TUMORS.**—**Clark** reports the *electrothermic coagulation* technic, which he employed on **Ring's** patient with recurrent neuroepithelioma. The protruding portion of the growth was removed by means of the bipolar d'Arsonval current, applied by a chain snare which was gradually tightened. In the second stage of the procedure, the same current was applied by means of a short knitting needle. The growth in the orbit was curretted away after coagulation by the current.

**Ring** exhibited a male patient, aged 65 years, from whose lower right lid he had removed, by surgical means, fifteen years previous, an extensive epithelioma. The denuded area was covered by epithelial grafts from the forearm. The lids remained normal until two months ago. The cicatricial ectropion now present is the outcome of a plaster treatment which had been applied to an epitheliomatous splotch on

the cheek; X-ray and radium having failed. Ring's purpose in presenting the case is not to advocate the use of plasters, notwithstanding its merit in this case, but to emphasize the fact that prompt, definite and more satisfactory results can be accomplished by the application of electrothermic desiccation, as carried out by Clark.

Massey has obtained very satisfactory results in the treatment of epitheliomas of the lids. For smaller growths, zinc ionization by the unipolar method is well adapted; while in the more extensive invasions the bipolar is quicker and more effective. The histories of twelve operable, and six inoperable cases are given.

## INJURIES.

THEODORE B. SCHNEIDEMAN, M. D., F. A. C. S.

PHILADELPHIA, PA.

This section reviews the literature of its subject from January, 1917, to July, 1918. The late results of injuries are often noticed in the sections referring to the various portions of the eye and its adnexae, which are involved.

**INJURIES FROM HEAT.**—In Ramsey's case of burn of both lids, the upper had been completely destroyed and there was marked ectropion of the lower. There was a small corneal opacity at the lower margin, probably resulting from a traumatic ulcer. Marked purulent conjunctivitis was also present. The treatment of a case like this is perplexing. A case of burn of the cornea from exposure to the heat of an electric arc is reported by Osborne. Two gray lines of coagulated corneal epithelium corresponded to the edges of the partially closed lids. These disappeared in twenty-four hours. Denig has reported a large number of cases of burn treated by transplantation of mucous membrane from the mouth.

**INJURY FROM ELECTRICITY.**—Mikami observed an extensive burn of the entire face from an electric current of 38,000 volts, resulting in complete bilateral ectropion. This was perfectly remedied by a large transplantation of skin without a pedicle. Burge has repeated his conclusions with regard to the influence of *ultraviolet* radiations in causing cataract. (See p. 88.)

**CHEMICAL INJURIES, GASSING.**—Gremeaux, of the French Army, comes to the following conclusions: The lacrimatory gases employed to date by the Germans cause more or less violent conjunctival reaction, accompanied by

exfoliation of the tissue of the limbus. The lesions rapidly attain their maximum, and under early treatment remain quite limited and progress towards cure under appropriate management. Length of exposure to the gases appears without influence, either as regards intensity of the symptoms or their ultimate course. The treatment of these cases is as follows: No occlusive bandage; mild lotions; pupil to be kept dilated, watching the tension; every second day 1% zinc sulphate; potato starch poultices in frequency according to the intensity of the hyperemia; a "floating" bandage to protect from light while leaving the eye uncovered. No cocain, as the epithelium has already been rendered friable by the action of the gas.

Teulières and Valois report the effects of gas upon the apparatus of vision. The gas affects both the anterior and posterior segments of the eye and also the adnexae. The lid margins show burns aggravated by excessive flow of tears. The lids themselves are edematous; there is excessive lacrimation without other lesion. The conjunctiva is congested, most markedly near the limbus; slight chemosis. There is severe and protracted congestion of the iris but no posterior synechia; the color is less vivid than normal and has a flocculent appearance; the pupil re-