he to impress on his class the imperative necessity of attending to this feature in the treatment of the disease. I think we might take a lesson, in our own practice, from this rational advice, which recognises and strictly enforces the treatment which is best adapted to a malady that may be said to depend, for its sustenance, so much upon extraneous excitement.

In traumatic tetanus, the *condition* of the wound seems to have as little influence in determining the central nerve-lesion, as its nature. Punctured, contused, lacerated, very rarely incised, wounds, bruises, and burns, are followed by tetanus; and the intensity of the attack is in no degree proportioned to the severity of the injury. Sometimes the disease seems to be more prevalent than at others; and I have, on more than one occasion, observed that, at one particular period, cases of severe burn seemed to be peculiarly liable to an attack. Although tetanus is usually developed whilst the causative wound is open, this is not uniformly the case; and a healthy granulating surface is quite consistent with the presence of the disease in its most acute form, though not so commonly as an angry or sloughy wound. In the lad whose case I just now related, the wound in the wrist had healed. In another instance, the period at which the contraction of a cicatrising wound, after removal of a recurrent fibroid tumour, was most active, was that in which tetanus was developed. Whenever I have seen the disease follow a burn, it has been at an early period, before cicatrisation had commenced.

One of the few cases of acute tetanus which I have known to recover was in a patient whom I watched with much interest whilst under the care of my colleague Dr. Barker. The symptoms appeared shortly after he had received a severe blow on the back, and lasted for about a fortnight, varying in their intensity; but at times the paroxysms were remarkably severe. The treatment consisted of large doses of the tincture of Indian hemp, and afterwards of morphia. In this instance, there was no breach of surface.

I am not aware that any good purpose could be answered by discussing the medicinal treatment of tetanus. Unhappily it is an unsatisfactory topic, and throws very little light upon the pathology or diagnosis of the disease. I would, however, venture to remark, in connexion with the question of the differential characteristics between convulsion and shock to which I have referred, that the artificial substitution of the latter would seem to operate in paralysing the former. Thus the influence of tobacco is manifested in this way. An instance which I witnessed at an early period of my professional life made a great impression on me. It was that of a young girl who was under the care of Mr. Travers whilst I was his articulated pupil and dresser. Her hand had been severely lacerated on the palmar aspect by a carding-machine, and acute tetanus followed. An infusion of tobacco was injected into the rectum, and the consequence was an amount of prostration which threatened speedy extinction of life. She, however, rallied, and ultimately recovered. I have never seen so acute a case saved; but whether this result was *post hoc* or *propter hoc*, I do not pretend to decide.

[To be concluded.]

CLINICAL MEMORANDA.

[Under this head, we shall publish from time to time, as materials accumulate, short records of remarkable cases in practice which are sufficiently rare, interesting, or instructive, to deserve record, but do not call for lengthened statement or comment. Brevity and point should be the valuable characteristics of cases forwarded for this column.]

HYDATIDS PASSED BY INTESTINES.

By J. SINCLAIR HOLDEN, M.D., Glenarm, Co. Antrim.

MRS. B, aged 60, enjoyed good health to nine months before decease, when she felt some pain over the liver and right shoulder. This gradually became most intense, and produced much debility, as all remedies, outward or inward, failed to give permanent relief. The liver became slightly enlarged, and resilience was lost.

A month before her death, my attention was called to a faecal discharge, which gave her some temporary relief. It contained portions of a cyst, some as large as the segments of an orange, and having attached to their inner surface a number of pedunculated sacs, of the size of a pea. The microscope shewed with these hooklets, evidencing their hydatid origin. No more came away, and I failed to obtain a *post mortem* account to confirm my view that the hydatid fragments had come from a pill-box cyst which had opened direct from the liver into the intestine. The portions were too large to traverse the hepatic duct; nor was there at any time signs of jaundice.

LECTURES ON THE HISTOLOGY OF THE EYE:

(BEING THE ARRIS AND GALE ANATOMICAL LECTURES.)

Delivered at the Royal College of Surgeons of England, June 1869.

BY

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LECTURE I.—Concluded.

Vitreous Humour.—I must now pass on, gentlemen, to the *vitreous humour*. This, in a perfectly healthy state, is a clear colourless mass of gelatinous consistence, enclosed in a hyaloid membranous capsule.

In the *adult*, the traces of structure perceptible in it are scanty and indistinct, conveying a very imperfect idea of its anatomical composition; but, in the *fetus*, its formed elementary parts are recognisable without difficulty, and their combinations are easily made out; so that we naturally turn to embryology for aid; and this, as in so many other instances, explains points in the anatomy of the adult organ which would otherwise remain unintelligible.

Genetically, the corpus vitreum is an extension of the deeper stratum of the cutis, intruded into the secondary eye-vesicle between the lens and the nervous lamina, which becomes the retina.

In order to make this quite clear, I must ask your attention to some matters in the development of the eye.

The first trace of the eye in the chick, which makes its appearance very early, is a hollow protrusion from the *front and lateral part* of the *foremost cerebral vesicle*. Gradually, as this cerebral vesicle enlarges forwards, and divides into the two segments which Von Baer called the *Vordernhirn* and the *Zwischenhirn*, the primary eye-vesicle shifts its place backwards and downwards until at length it lies beneath the *Zwischenhirn*; there it becomes *pedunculated*. The *stalk*—the future optic nerve—at first is hollow, and through it the cavity of the eye-vesicle communicates freely with the cerebral ventricle.

The upper side of the eye-vesicle, where the stalk is placed, is towards the *Zwischenhirn*; whilst its opposite side is towards the external tegument, which here consists of the epidermal stratum only, as Remak thought, or which includes, as Kölliker believes, a part of the cutis. At this spot, the epidermis thickens; and an *inbud* of it, pressing on the summit of the primary eye-vesicle, pushes this inwards, so changing the *globular* shape of the vesicle into a *cup* consisting of an inner and an outer plate, separated by an interspace, the remnant of the original cavity of the first vesicle, which continues for some time longer to communicate with the brain-ventricle through the still hollow eye-stalk.

The cup thus formed, distinguished as the *secondary eye-vesicle*, is incomplete below; and through this gap—the *foetal cleft*—the deeper stratum of the cutis intrudes between the epidermal inbud, which is the matrix of the lens, and the anterior plate of the secondary eye-vesicles which is the foundation of the retina.

You will perceive that this intruded portion of cutis fills the space in the secondary eye-vesicle which corresponds to that in the completed eye occupied by the vitreous humour. So long as the foetal cleft remains open, the intruded portion of cutis (which we may now call the vitreous humour) is directly continuous through it with the exterior cutis, and nutrient blood-vessels enter the vitreous humour through this channel. At a later stage, the foetal cleft closes, which perfectly isolates the internal corpus vitreum from the external cutis. Von Ammon says that the closure of the foetal cleft begins at its middle, and proceeds hence in both directions, forwards and backwards.

Simultaneously with the transformation of the primary eye-vesicle into the secondary, the hollow eye-stalk became solid by the approximation of the upper and lower plates, and acquired the form of a flat ribbon. Next, by the inbending of its edges, the ribbon became a gutter, along which the blood-vessels gained the inside of the eye; and, lastly, the gutter, closing in the eye-stalk, takes the cylindrical form of the perfect optic nerve, and includes the blood-vessels within it.

Our knowledge of the distribution of these vessels is still very imperfect. Von Ammon, whose articles in the *Archiv für Ophthalmologie* are a fund of information on the embryology of the eye, says that the *arteria centralis*, immediately on entering the globe, gives off *fine twigs* to the *sclerotic and choroid*; next it detaches several *lateral branches* to the *retina*, upon the inner surface of which they spread out and form the *membrana vasculosa fetalis retine*; then it sends off a second set of

lateral branches, from five to seven in number, which ramify on the outer surface of the hyaloid capsule, forming here the *discus arteriosus hyaloideus*; and, finally, the diminished trunk, traversing a canal in the vitreous humour, is distributed to the vascular capsule of the lens. Thus Von Ammon describes *two vascular nets*—one *retinal*, the other belonging to the *vitreous humour*; but this has not been confirmed by later observers. The late H. Müller distinctly says that there are not any other vessels on the outer surface of the corpus vitreum than the retinal ones; and he also mentions that the retina continues long without blood-vessels—a fact which I have myself verified in the human foetus, the moment of their appearance being apparently determined by that of the obliteration of the arteria hyaloidea capsulae lentis. In the human foetus of the fifth month, in which all the retinal layers except the bacillary were distinctly recognisable, I found the retina still quite devoid of blood-vessels; the axial vessels going to the lens-capsule were still pervious; and I failed to detect the vascular net on the hyaloid capsule described by Von Ammon.

Absolutely fresh human embryos are so rarely obtainable, that the structure of the human vitreous humour in the earliest stages of development is unknown. Before and after the fifth month, it consists of a web of delicate fibres, the meshes of which contain a viscid colourless substance. Throughout this tissue, in chromic acid preparations, numerous minute bright globules occur, which, mingled with the fibres, give, under a moderate enlargement (a quarter of an inch) some resemblance to a stellary tissue. This resemblance is, however, only superficial, and disappears under a higher magnifying power; which makes it evident that the bright globules have not any definite relations to the fibres, since some of them lie free in the meshes of the web, and others cohere singly or in groups to the sides of the fibres or at their intersections. Examined with one-twelfth or one-twenty-fifth objective, these bright globules do not exhibit any trace of structure; and I am disposed to conjecture that they are artificial products, resulting from the action of the chromic acid on the interstitial albuminous substance. (Fig. 5).

Fig. 5.

But, besides the formed elements just described, there occur in the foetal corpus vitreum *other elementary parts of the highest physiological importance*—large nucleated cells, which are most abundant upon and near the hyaloid capsule and around the central canal, but which are also found throughout the whole organ. Most of them have a simple round or roundly oval shape; some are fusiform and branched. All are distinctly nucleated. Their diameter ranges between 1-4300th and 1-860th of an inch.

In the human adult's vitreous body, the foetal fibrillary net steps into the background; but it does not wholly disappear, for portions of it persist even to old age; and it is replaced by delicate membranes of such extreme tenuity, and differing so little in their refraction from that of the fluid substance of the organ, that they would elude detection, but for the presence of folds and the adhesion of minute impurities to them. The arrangement of these membranes is not yet certainly known; and, in truth, their very existence is doubted by some anatomists.

The cleavage of the vitreous humour in flakes parallel to its outer surface, when artificially hardened, has been adduced in support of a concentric lamination of the organ, but without sufficient proof that these cleavage-planes coincide with membranous septa. Hannover—I think, with a nearer approach to demonstration—thinks that the membranes radiate from the axis towards the surface.

Beyond all doubt, the most important constituents in the adult's corpus vitreum are the large nucleated cells which I mentioned as occurring in the foetus. These embryonal cells persist throughout life; and they are the starting-point of many of the morbid changes to which this organ is subject.

One consequence of the apparent want of structure is, that not a few practitioners regard the vitreous humour as an inert, scarcely vitalised mass, hardly, if at all, susceptible of the many manifestations of dis-

turbed nutrition to which all the other ocular tissues are liable. Were this not so, we should not continually hear, as we do, every sort of opacity that we see in it with the ophthalmoscope at once attributed to some extraneous source, such as the irruption of blood from a burst choroidal or retinal vessel; or to an exudation—a term which, in view of the non-vascularity of the organ, implies a foreign origin. No doubt, many of its opacities are correctly referable to these sources; but I am confident that more of them are derivatives of its normal formed elementary tissues; and, in particular, they are products of the persistent embryonal cells.

The vitreous humour offers greater advantages than even the cornea for the study of those phenomena of cell-life which manifest themselves in structural change, because its simple texture is highly favourable for the early recognition of such delicate alterations; and it is not only non-vascular, but also nerveless, and completely isolated from the neighbouring vascular and nervous parts by two structureless membranes—the capsula hyaloidea, and membrana limitans interna retinae. The hyaloid capsule and the internal membranous septa must be lacerated whenever blood bursts into the vitreous humour from the choroid or retina; they are torn, and often wondrously wrinkled, during the progress of changes originating in the nucleated cells; and they are also frequently dotted over with molecular impurities, some of them fatty and earthy products of the disintegration of blood-clots, of exudations, and of the mucin-holding fluid which fills the loculi of the organ. In one of these ways are formed the excessively delicate gauzy membranes which we perceive with the ophthalmoscope; but all these alterations are wrought upon these hyaloid membranes from without: theirs is altogether a passive rôle. Small effusions of blood into the vitreous humour disappear in the course of a week or two, but large extravasations very slowly; and, in diabetic patients, crimson blood-clots will sometimes remain in the vitreous, as also in the aqueous humour, during several months, without undergoing any noticeable change.

But, if the other elementary tissues are passive, the nucleated embryonic cells, which dot the hyaloid membranes at every age, are endowed with an extraordinary formative energy, normally latent, but promptly responsive to an appropriate stimulus, the nature of which determines the dynamical direction this energy takes—tending in one instance to the evolution of a granulation-tissue; in another instance, to the formation of pus; in a third, of fibrine or sarcoma; in a fourth, of cancer; and so on. Anatomically, this excessive formative energy principally manifests itself in two ways—one marked by a remarkable extension and fission of the cell-wall and contained protoplasm; the other characterised by inordinate proliferation of the nucleus. The first produces, in its most complete form, very finely fibrillated tissue. (Fig. 6.) In some examples

Fig. 6.

Fig. 7.

of this, I have noticed a definite arrangement of the cells, and a dominant direction of the fibrillation; the cells being grouped in lines vertical to the hyaloid capsule, and most of the fibrillæ running parallel to this. Where the fission of the cell-wall is carried to a less degree, it produces open fibre-cell-nets of coarser texture, which are often combined with corrugated hyaloid membranes.

Proliferation of the nucleus in a minor degree is common in association with chronic irritative affections of the vascular coats—e. g., chronic glaucoma and the late stages of posterior staphyloma, in which we find the cells larger than normal, but still retaining their simple forms, and containing two, three, or several nascent cells, instead of a single nucleus. But it is in supuration that proliferation is carried to its highest development. Advanced cases, where the entire corpus vitreum is changed into a tough yellowish substance, are not suitable for the demonstration of this; but, before its metamorphosis is complete, at an earlier stage, in which the opacity due to the presence of pus diminishes from the exterior towards the still transparent centre of the organ, all the intermediate phases between the simple mononucleated embryonal cell and perfect pus are easily traceable. (Fig. 7.) The enlargement of the

nucleus and cell; the segmentation of the former; the endogenous evolution of a brood of young cells; the distension of the parent cell by an ever increasing progeny; and the escape of this by the disappearance of the primary cell-wall or capsule, in the form of corpuscles undistinguishable from pus,—may all be observed. I have not yet traced out completely the development of cancer and allied neoplasms in this organ; but I have very little doubt that the process is essentially similar to suppuration.

NOTES ON ECZEMA.

By H. S. PURDON, M.D.,

Physician to the Belfast Dispensary for Diseases of the Skin, etc.

UPON the subject of eczema, much has already been written; and, although I may not be able to bring forward anything new, still I hope to record in the following remarks some of the peculiarities that have been observed in this disease when occurring in the aged. The notes that I have made are derived from two principal sources, viz.:—The Belfast Dispensary for Diseases of the Skin, and the Belfast Charitable Institution, the latter of which has an annual number of upwards of one hundred *aged* inmates, being all above fifty years, and who, being admitted for life, are consequently under observation for several years. Amongst these individuals (especially females) eczema is a common complaint. Now, in old age, the epidermis is rough, dry, and impermeable. As remarked by Dr. Day, "it almost acts as a foreign body and keeps up a perpetual irritation on the subjacent papillæ in the true skin." In these cases, the application to the skin of a common pitch-plaster, or a stimulating ointment, is frequently sufficient to occasion an amount of local irritation which rapidly ends in an eczema.

In the young as well as in the aged, the eruptive lesions of eczematous inflammations select the orifices of hair-follicles, or gland-ducts, or other vascular spots. Crusts, which may be either plastic or purulent, also form on the external surface. In the aged, the inflammation usually ends in subcutaneous infiltration and becomes chronic, and the discharge from the affected part tends also to increase the extent of the disease; as remarked by Hebra, "the eczematous group is distinguished by more or less profuse excretion, which oozes from the skin-surface." Itching is likewise a constant symptom.

When eczema attacks the legs, usually their anterior surfaces, which in many cases is occasioned by the common practice of old people—viz., constantly sitting close to the fire—the legs become inflamed, stiff, and itching, the skin is usually red and glazed-looking, the cuticle also exfoliates; finally, an exudation takes place into the subcutaneous tissue, this latter state arising from the cells in the cutis, which have become enlarged and swollen from inflammation, pouring out an exudation from their walls, or, according to other pathologists, owing to direct transudation from the capillary vessels. In such cases, the primary eruption may be either vesicles or pustules, or both combined, having a tendency to end in superficial ulceration. On this point, Mr. Milton thinks "that we might include under the head eczema, an exceedingly obstinate affection, attacking the legs and running into ulceration, a complaint generally seen in persons of advanced life. On as good grounds as any often urged for giving a name, this variety might be called ulcerative eczema." I described two cases in the *Medical Circular* for April 12th, 1864, under the name *eczema ulceratum*; since which date, I have constantly met with this affection in elderly people, usually of the poorer class. Eczematous ulcers of the lower extremities are, as a rule, only met with in those of advanced years, usually women who have borne many children, accompanied by a varicose state of the superficial veins, which gives rise to stagnation of the contained blood and congestion in the affected part. Mr. Paget, in Holmes's *System of Surgery*, thus describes their origin, as commencing in a slight injury: "The surrounding inflammation assuming an eczematous, instead of a common character, the skin becoming punctate or vesicular, or cracking, and exuding an adhesive ichor, with constant itching; but they are often spontaneous, the ulcer taking place in the middle of a patch of acute eczema." In the treatment of this form of ulceration, water-dressings, or a weak solution of nitrate of silver, are the applications recommended by Mr. Paget. Ointments are seldom tolerated.

A chronic eczema of the leg presents the following characters. The affected skin is infiltrated, hard, and thickened to the touch; and, in neglected cases, tubercular, being what is called by Mr. Hutchinson "elephantoid (papillary) hypertrophy." Itching is also a constant symptom, which occasions the patient to tear and scratch himself, thus causing excoriations. The skin of the affected part eventually becomes darker than natural. The bowels are generally costive; and,

finally, after a certain time, the constitution may be affected; the digestive organs become deranged, and general debility ensues. The following cases are abbreviated.

CASE I.—Mrs. F., aged 53 years, of a full plethoric habit, consulted me on December 27th, 1866, suffering under eczema of the right leg, complicated with ulcer of two years' duration. No varicose veins were apparent; she had always enjoyed good health; and could not attribute the present disease to any cause. The affected skin was red and glazed-looking; and, to use her own words, "watered"; bowels costive; appetite bad; and she was troubled with pyrosis. In this case, I considered the eczema to be due to plethora and mal-assimilation. The treatment adopted was as follows. Infusion of gentian, soda, and hydrocyanic acid were given internally; with a pill, containing podophyllin and compound aloes pill, at night, which acted both on the liver and rectum; locally, a mixture of olive oil and oxide of zinc was applied with the best results. After the eczema and ulcer were cured, the latter, after the inflammation was subdued, being treated by strapping, an extensive eruption of lichen appeared, which, for a long time, proved obstinate to treatment.

CASE II.—M. S., aged 60 years, an inmate of the Belfast Charitable Institution, was first seen by me on September 9th, 1867, suffering under acute eczema of the left leg, complicated with ulcer. The leg was greatly swollen and painful; the disease extended from the knee to the ankle; the ulcer was very irritable, causing loss of sleep at night. The treatment adopted consisted in the local application of soothing remedies, as poppy fomentations, followed by "Carron oil." Internally, the patient was ordered a mixture, consisting of infusion of calumba, sulphate of magnesia, sulphate of iron, and sulphate of quinia, with a grain of opium at night, to procure sleep. This latter drug is of the greatest value in various forms of ulceration.

Occasionally, when the disease is verging towards a cure, an eruption of furunculi make their appearance, usually around the margins of the diseased part. The patients generally look on this in the light of carrying off some peccant matter from the blood; an opinion, I believe, held formerly by the humoral pathologists. Rayer has remarked that, in "infancy and youth, eczema appears more particularly on the head; in riper years, on the breast and belly, but especially on the genital organs; and in advanced life, on the lower extremities and about the margin of the anus." This latter affection first attracts attention by the itching it occasions, being frequently accompanied by constipation and hæmorrhoids, due to derangement of the liver and congestion of the portal system. Those who "live well" and indulge freely at the table, are the usual sufferers from this complaint. I may remark, in passing, that I have derived benefit from the administration of the confection of black pepper, and the local application of dilute citrine ointment in this form of the disease. Old men are subject to eczema intertrigo of the inside of the thighs and scrotum, accompanied by incontinence of urine. In these cases an absorbent powder dusted on the affected part is necessary; and one consisting of powdered starch and oxide of zinc, as recommended by Hebra, answers very well. Eczema capitis is occasionally met with in elderly people; it usually commences by the formation of scurf and itching, the hairs eventually falling out. From a state of alcoholism, the subjects of which appear prematurely old, a cutaneous eruption usually appears on the most exposed parts of the body, as the face; and Mr. Erasmus Wilson considers "gutta rosacea" to be a form of eczematous inflammation. These individuals are liable to constant tremor of the hands and loss of appetite. For the former affection, the oxide of zinc has been recommended by Dr. Marcet.

As is well known, old people are frequently asthmatic, the lung-tissue being usually emphysematous; such individuals occasionally suffer from eczematous eruptions, probably arising from improper aëration of the blood. The following case occurred about two years since.

J. S., aged 70 years, for a considerable time an inmate of the Belfast Charitable Institution, formerly by occupation a gardener, since his admission, suffered more or less from asthma; when he was free from this, an eczematous eruption appeared on the extremities, and continued till the next attack. A few months before his death, herpes zoster took the place of the eczema, appearing on the left side of his thorax.

According to Trousseau, in his *Clinical Lectures*, translated by Dr. Victor Bazire, old people, who are asthmatic, exhibit in their youth eruptions of an eczematous nature. "Indeed, nothing is more common than to find herpetic, rheumatic, gouty, and hæmorrhoidal affections transform themselves into asthma..... Thus eczematous eruptions, rheumatism, and gout, are complaints which may be replaced by asthma, and may replace it in turn." Eczema seems occasionally to depend upon a rheumatic diathesis. Lumbago is also sometimes present; and I have derived considerable benefit from the administration of the tincture of *actea racemosa*, combined with Fowler's solution, in this form of eczema. The popular remedy known as the "Chelsea Pensioner," is