

characterized by Lustgarten as pseudo-gonococci. They found a number of bacilli, micrococci, and sarcinæ, which they believe are saprophytes—that is, are accidental hosts, and which vary in accordance with the nature of the soil in which they grow. In 1000 examinations they failed to find pseudo-gonococci. Frequently, however, they observed sarcinæ, which on superficial examination might well be taken for gonococci. These, however, are not decolorized by Gram's method; there are also certain sarcinæ which are readily decolorized by Gram's method, but they are so much larger than the gonococci that they cannot readily be confounded with the latter.

Steinschneider has long since shown that it is not alone upon one feature that the gonococcus is to be recognized, but upon the facts that these organisms are grouped around nuclei in the interior cells, are decolorized by Gram's method as formulated by Roux, and are recolored by Bismarck brown or by Loeffler's blue.

In summing up the results of their experimental investigation, the authors state that the normal urethra is always inhabited by various organisms; that the same varieties are not found in different urethræ; that different varieties are found in the meatus and in deeper parts of the canal; that none of the varieties found in the healthy urethra are pathogenic, and that the greater number of microorganisms of the normal urethra decompose urea.

OPHTHALMOLOGY.

UNDER THE CHARGE OF

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AN EXPERIMENTAL STUDY OF THE INFLUENCE OF THE RETINAL AND CHOROIDAL CIRCULATION ON THE NUTRITION OF THE EYE, PARTICULARLY THAT OF THE RETINA, AND OF THE CONSEQUENCES OF SECTION OF THE OPTIC NERVE.

Under the above title DR. WAGENMANN contributes a long paper which occupies 120 pages of the last number of the *Archiv für Ophthalmologie*, xxxvi. H. 4. The investigation was undertaken at the instigation of Prof. Leber.

The experiments, which were made on rabbits, gave the following results:

1. Section of the optic nerve above the entrance of the central artery produced at first practically no alteration in the ophthalmoscopic image. Afterward a pallor of the disc became visible, and in the course of some weeks atrophy of the nerve bundles. After this lesion the circulation in the retina remains unchanged, but the retina shows a slight grayish veiling owing to

loss of transparency. The degeneration and disappearance of the nerve fibres can be followed anatomically. The degeneration spreads to the ganglion cells, but so slowly that well-preserved cells are to be found even after six months.

2. Section of the optic nerve with its vessels produces an immediate pallor of the papilla, a narrowing of the vessels, and disappearance of their blood-column. Generally, after the lapse of a week or two, there is an imperfect restitution of the circulation in the retina. This is effected by means of newly formed vessels springing from the choroidal ring, from the nerve-sheath, and from the episcleral ciliary vessels. The section of the retinal vessels is not followed by any opacity of the retina. The subsequent changes in the nerve are in no way distinguishable from those which take place after section of the trunk above the point of entrance of the central vessels.

3. Section of the long and short posterior ciliary arteries on the one side produces a rapid degeneration of all the corresponding layers of the retina. This shows itself at first ophthalmoscopically, and a few hours after the lesion, as a grayish retinal opacity. The nerve fibres above are relatively but little involved. Owing to the reëstablishment in a few days of the choroidal circulation a complete degeneration of the one side does not take place. Thus, on microscopic examination, the most varying degrees of degeneration are found in close proximity to each other. The outer layers suffer most severely. A subsequent migration of pigment takes place into the degenerated portion of the retina.

4. Section of the optic nerve and its vessels, and at the same time of the ciliary vessels of one side, leads to a rapid degeneration of the nerve-layer of the retina on that side, the same layer on the other side only atrophying slowly.

5. Section of the optic nerve and vessels and all of the ciliary vessels causes a rapid degeneration of the whole eye.

The author admits that one cannot unreservedly apply the inferences as to the sources of the nutrition of the retina to which these experiments on rabbits must lead, to the case of man. He points out in particular that whilst the division of the retinal vessels alone did not cause any opacity of the rabbit's retina, the sudden removal of the blood supply caused by embolism of the central artery in man is invariably accompanied by a marked opacity. There is this difference, however, that the veins are not blocked in the latter case, and although no case of fresh embolism has as yet formed the subject of microscopical examination, it is highly probable that the opacity met with is merely an œdema. In other respects, viz., in recovery of transparency by the retina and in the absence of any subsequent pigmentation, the condition of embolism in man is in accord with the experimental result on section of the vessels in the rabbit. Anatomically, too, it has been found that as the result of embolism the nerve-fibres and ganglion-cells slowly disappear.

ON THE CORTICAL VISUAL CENTRE IN MONKEYS.

MAZZA has studied this question in the Physiological Laboratory at Genoa (*Annali di Ottalmologia*, xix. 6). He was struck by the fact that no previous experimenters had taken proper precautions to examine the field of vision.

After several attempts he succeeded in devising a plan which forced the animal to make use of direct fixation. This consisted in fixing a shell in the shape of an artificial eye, but perforated by a central aperture in the conjunctival sac in front of the eye. These shells were modelled from wax and caoutchouc. With such a shield, which had only a limited movement, in front of the eye, if the animal saw anything out of the direct line of vision one could feel sure that it did so with a peripheral portion of the retina. The experiments were made with a regular perimeter, the animal being fixed by means of a specially constructed apparatus. Removal of the cortex cerebri of the angular gyrus only produced a temporary concentric restriction of both fields of vision. Removal of the cortex of the occipital lobe produced a persistent hemianopia.

ON THE VALIDITY OF WEBER'S LAW IN THE CASE OF THE LIGHT-SENSE.

DR. SCHIRMER, by modifying the details of the usual method of testing the light-sense, has been able to show that Weber's law holds good with reference to this as well as to other senses. The light-sense referred to is what is now generally called the light-difference perception, or L. D.—*i. e.*, the extent of the power of distinguishing luminous impressions of different intensities. The statement of Weber's law is that "appreciation of the difference of two similar excitations of different magnitudes is not dependent upon their actual but upon their proportional differences." Former experimenters, and notably Aubert and Helmholtz, have denied the validity of this law in the case of the light-sense. Schirmer points out that the discrepancies between the results of these experiments and Weber's law are due to their not having taken into consideration the necessity for allowing for the adaptation of the eye for different light intensities. His own experiments, after providing for adaptation and performed with an ingenious modification of Masson's disc, led to the following results:

1. Weber's law is valid for the light-sense within a range of illumination of from one to one thousand standard candles at the distance of a metre from the illuminated surface. The eye must be allowed its full power of adaptation: so that the validity of the law is subject to the fulfilment of certain physiological conditions.
2. Physiological adaptation alone is capable of explaining why Weber's law should hold good, but Schirmer's experiments do not exclude the possibility of the participation of a certain psycho-physical process (such as Fechner assumed) in bringing about the result.
3. The adaptation of the normal eye does not all along keep pace with the diminution of daylight as dusk comes on.

AN EXPERIMENTAL STUDY OF THE NUTRITION OF THE CRYSTALLINE LENS AND THE DEVELOPMENT OF CATARACT.

By examining the first stages in the development of artificial cataract in the lenses of living rabbits, by the method of magnification with a strong glass lens behind the ophthalmoscope mirror, MAGNUS (*Archiv f. Ophthalmologie*, xxxvi. 4) has been able to throw some light on the process by which

the crystalline lens is nourished, and to make some valuable suggestions regarding the etiology of idiopathic cataract.

The artificial forms of cataract studied were those produced by the internal administration of naphthalin, sugar, and salt.

One dose of three to four grammes per kilometre of body weight given to not too young a rabbit is sufficient to give rise to changes in the lens after six hours. According as it was desired to produce a greater or less degree of opacity this was repeated more or less often. The lenticular changes made their appearance always before any visible changes occurred in the fundus. Although both lenses usually show the changes about the same time, they are occasionally to be found well marked in the one while the other remains perfectly normal. Two distinct phases are to be distinguished in these changes.

In the first there are to be seen a number of transparent bands, in the second well-marked and progressive opacities. They both begin at the equator of the lens, and apparently the very first traces are met with in two zones, the one lying immediately behind and the other immediately in front of the equator.

A characteristic feature of naphthalin cataract is that the opacities are capable of clearing up, and do so invariably if the naphthalin be stopped after only two doses have been given. Even a well-marked opacity of this nature occupying the whole extent of the superficial layers of the posterior cortex may entirely clear away. The clearing up always takes place in exactly the same manner, proceeding from the equator and posterior pole.

As the recovery of transparency can only well be supposed to be due to the return to its normal condition of the nutrient fluid of the lens, the nature of the clearing process affords, Magnus argues, important conclusions as to the places of entrance of these fluids into the lens. It is thus rendered very probable that the position of the posterior zone of opacity and the posterior pole are important in this respect.

Further experiments with salt and sugar led to precisely similar conclusions. Altogether, the experiments led to the following results with regard to the conditions of nutrient supply in the case of the normal lens:

1. The nutrition processes are effected more actively and more completely in the posterior section than in the anterior section of the lens.
2. A zone lying posterior to, and parallel with, the equator appears to be that through which the most extensive supply of nutriment passes.
3. A zone anterior to, and parallel with, the equator appears also to be active in this respect, though less so than the posterior zone.
4. The posterior pole of the lens also transmits a current of nutriment, though to a less extent than either the anterior or posterior or equatorial zones.
5. No current appears to pass at the anterior pole.
6. The equator is dependent for its nutriment on the currents passing by the zones in front and behind it, but does not itself give entrance to any current.

Magnus's experiments do not give any indication as to the parts at which the nutrient fluid leaves the lens.

With reference to the very interesting question as to how far such experiments throw light on the development of idiopathic cataract, Magnus in the

first place draws attention to the fact that in the great majority of cases (in 92.77 per cent. according to a previous investigation of his) senile cataract begins exactly in the same manner as the artificial cataract. This points to senile cataract being essentially a disturbance in the nutrient current, showing itself first at the places where the current enters the lens. While, however, in experimental artificial cataract, the opacity is the result of an altered chemical constitution of the nutrient fluid, this cannot well be assumed in the case of senile cataract. It is more likely that the disturbance is more of a circulatory nature, and probably, too, this is the consequence of the senile sclerosis which takes place in the lens fibres. Further, no doubt there is a diminished power of resistance in the lens fibres of old people which favors the opacity which a stasis in the lymph-current tends to give rise to. In diabetic cataract, of course, it is natural to suppose that the opacity is more directly caused by the altered chemical constitution of the nutrient fluid.

OBSTETRICS.

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THE PORRO OPERATION, WITH INVAGINATION OF THE STUMP.

FRANK'S method of performing the Porro operation has been adopted by BEAUCAMP, who describes five cases so treated (*Archiv für Gynäkologie*, Band xl. Heft 1). Three of the operations were done for contracted rachitic pelvis, with a history of previous confinements with death of the fœtus. Mothers and children recovered.

One case ended fatally from hemorrhage between the membranes and uterine wall. The fifth case was that of a woman, brought to the hospital in a dying condition with ruptured uterus; the operation consisted of the total extirpation of the uterus after it had been inverted through the vagina. A fatal result followed, but the post-mortem showed the operation to have been successful so far as union was concerned.

Beaucamp describes his method as follows: Patients with contracted pelvis are examined in the middle of pregnancy, and the chances afforded by induced labor and the Cæsarean and Porro operations are explained to them, the chances of the two latter being given as equally favorable. Labor is induced at the end of the thirty-third week. If the Porro operation is to be done, the patient enters the hospital in the thirty-ninth week, and is suitably prepared. The operation consists in opening the abdomen and the uterus, and removing the fœtus. The uterus is then inverted, and its attachments to the vagina are sutured. The abdomen is then closed, and the uterus and