Another cell occasionally observed in the exudation impressed me strongly as a leucocyte in process of division. One or two such are represented in the illustration considerably above their relative size.

Outside the microscopical appearances there are one or two points of importance calling for comment in this case. The fresh and fatal outburst of the disease in the membranes of the brain four weeks after the temperature had fallen to the normal is noteworthy, and may be advantageously considered alongside the experimental research of the Messrs. Klemperer,⁹ in which it is alleged that the injection of any nutrient medium in which the pneumococcus has been cultivated renders animals immune against pneumonic septicæmia, and that the injection of the serum of pneumonic patients after the crisis cures pneumonia in rabbits. Regarding the local condition, it is to be concluded that the chronic bronchial catarrh had led to injury and choking of the lymphatics which travel along the septa, causing tardy absorption of the products of the pneumonia; also, it is not improbable that the alveolar walls themselves had in places sustained some damage. The existence, therefore, of a previous bronchial affection should be kept in view in estimating the prognosis of a pneumonia. When no bronchial affection has existed, impaired resolution must be attributed to a sluggish state of the lymphatics induced by cachexia. I think this case also teaches that there is a possibility of the condition terminating in abscess, the groups of lymph cells depicted acting as foci for such. However, a favourable prognosis is the rule, and, judging from the condition of the lung generally in the present instance, there is, I think, little doubt that recovery would ultimately be brought about had the pneumonic virus not attacked the meninges of the unfortunate subject.

REFERENCES.

- ¹ *The Pathology of Bronchial Affections and Pneumonia*, London, 1891.
² *Berl. klin. Woch.*, 1879, p. 304. ³ *Clin. Med.*, 1, p. 574. ⁴ *De la Pneumonie Chronique*, Thèse, 1860. ⁵ *Deut. Arch. f. klin. Med.*, vol. xxxiii. ⁶ *Gas. Beltrige*, II, p. 716. ⁷ *Manual path. Hist.*, Art. Pneumonie. ⁸ *Pneumonia*, p. 125. ⁹ *Berlin. klin. Woch.*, August 24th and 31st, 1891.

CLINICAL OBSERVATIONS ON TROPACOCAINE
IN OPHTHALMIC PRACTICE.

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AFTER reading Dr. Chadbourne's valuable and concise paper¹ on the synthetical hydrochlorate of tropacocaine, I obtained, with some difficulty, a small sample. The following brief clinical observations were noted by me during a period of six months. Solutions of various strengths were used, thus—1, 2, 3, 5, and 10 per cent. The installation of one drop of a 2 or 3 per cent. solution (there being not much difference between the two) caused complete anæsthesia of the cornea in two minutes. But, for the removal of small foreign bodies, the cornea was always sufficiently insensible in about thirty seconds. Hardly any smarting or discomfort was felt, and that only momentarily. There was no hyperæmia. The conjunctiva, especially the palpebral portion, was slower in becoming anæsthetised, but it appeared to retain its insensibility for a longer period. Sensation gradually returned in from ten to fifteen minutes. This depended, no doubt, on the size of the drop instilled into the eye and the amount that escaped from it. A 1 per cent. solution within a few minutes gave sufficient anæsthesia to remove foreign bodies, but sensation returned early; and although repeated instillations completely anæsthetised the cornea and conjunctiva, the solution was discarded as unsuitable. A single instillation of the 5 per cent. solution rendered the cornea and conjunctiva completely insensible in a minute and a-half, but superficial anæsthesia of the cornea was produced so rapidly that in five seconds it was insensible to the touch of a camel's hair brush. The anæsthesia lasted from fifteen to twenty minutes. A drop of the 10 per cent. solution caused insensibility of the cornea within a few seconds, but it also gave rise to considerable injection, which remained for a few hours. At the end of the half-hour during which the patient was under observation, the anæsthesia still remained complete; unfortunately its full duration could not be recorded. Next day the patient stated

that an hour after he left a pain set up in the eye, which kept him awake the whole night. He described it as acute and extending to the back of the head, and frequently darting up to the brow. These statements made me chary of using the strong solution any further. Besides, there was no need for so concentrated a solution, as the 5 per cent. gave every satisfaction whenever rapid anæsthesia of the deep-seated parts was desired. The 3 per cent. solution was most frequently employed. Below are a few instances in which tropacocaine was used.

Eye-lids and Conjunctiva.—Meibomian cysts were painlessly incised and scraped. In cases of muco-purulent ophthalmia requiring the application of a strong solution of nitrate of silver a drop of tropacocaine prevented the after-smarting which usually follows that operation. Cocaine, as a rule, is less effective when the conjunctiva is inflamed. But tropacocaine does not appear to fail in this respect, neither did its continual use produce that sodden appearance of the conjunctiva which is frequently the case with cocaine. In entropion of the lower lid requiring the removal of a piece of skin, and in other operations about the lids, three drops of a 3 per cent. solution injected subcutaneously at the spot made the operations painless.

Cornea.—Ulcers were painlessly cauterised. Needlings were also satisfactorily accomplished without pain. In cataract operations, with and without iridectomy, no pain was felt, three instillations of a 3 per cent. solution being used. A single drop of a 5 per cent. solution rendered the excision of a portion of prolapsed iris painless. The same solution gave satisfaction in an iridectomy for glaucoma.

Nasal Duct.—Canaliculi were slit up without pain, and the injection of a few drops of a 3 per cent. solution down the duct rendered otherwise painful probing tolerable.

Strabismus.—A single drop of a 5 per cent. solution produced sufficient anæsthesia of the muscle. Some minutes were usually allowed to elapse between the instillation and the operation. The 3 per cent. solution required several instillations.

CONCLUSIONS.

1. Tropacocaine is more reliable and deeper in its action than cocaine, and the anæsthesia it produces lasts a little longer. Unlike cocaine, it anæsthetises inflamed tissue—at least, more deeply than does that salt. There is complete absence of the haze over the cornea which is so characteristic of cocaine anæsthesia. This was specially appreciated when needling. The strength of the solution depends on the requirement. For general use 2 or 3 per cent. is sufficient and a 5 per cent. solution may be used with safety when anæsthesia of the deep-seated parts is required.

2. Solutions of tropacocaine made with distilled water keep well and retain their strength for months. One solution (3 per cent.), prepared in January last, although now a little cloudy, has not lost its activity. So far no fungus has been noticed growing in the solutions.

3. With the exception of the one case mentioned in which the 10 per cent. solution was used, tropacocaine gave rise to no disagreeable symptoms. It practically has no mydriatic action; neither is it hæmostatic. But it certainly did not give rise to "intense hæmorrhage," as was the experience of Seifert.²

I am inclined to think that cocaine will eventually be replaced by tropacocaine when its advantages are fully understood. Even if it were only for its antiseptic properties, the new anæsthetic should be given the preference. The price is not prohibitive, and increased demand will place it within the reach of all.

THE PHYSIOLOGICAL EFFECTS OF ELECTRICAL
CURRENTS OF HIGH FREQUENCY.

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THE application to medicine of electrical currents of great rapidity of alternation, or high frequency currents, as they are commonly called, has occupied the minds of medical men to a great extent during the past twelve months. In France

¹ BRITISH MEDICAL JOURNAL, August 20th, 1892, p. 402.

² *Internat. klin. Rundschau*, No. 8, 1893.