vessels were present on the surface of the iris. In both eyes some vitreous opacities were present. No obvious cause of sepsis was found until the bacillus coli was isolated in pure culture from the urine. She was at once given autogenous vaccines. In three weeks time there was no injection of the eyes; the keratitis punctata had practically disappeared and the vitreous seemed clear. I last saw her in November, 1915, i.e., two months after her first visit, and at that time her vision was R. 6/12, L. 6/9 (1). I understand she has remained well since.

I have had three or four other cases in which the bacillus coli has been found in pure culture from the urine, two of these were, I believe, in males, but I have not included those cases, as the investigation was not completed nor had special treatment been carried out.

There are just a few points with regard to the cases I have seen which I should like to dwell on.

Most of these cases have occurred in women and they have not uncommonly been associated with some constipation, though in the second and third cases this was not a prominent feature. But in view of the presence of constipation there is of course a flaw in the proof, for the infection may come from the alimentary tract primarily and not through the bladder, because of course the intestinal mucous membrane is more likely to be a good absorption area than that of the bladder. In view of that fact, I always prescribed daily doses of Epsom salts, but without influencing the disease until vaccines were given. The last case I quoted, however, is somewhat striking in the rapidity of the cure.

I have brought these cases forward, not because I think I have proved anything, but because it may possibly lead to other observations on the influence of unrecognized bladder infections as a cause of chronic inflammatory affections of the uveal tract. The colleague with whom I was working and who was doing the bacteriological work is at present in France, so that the work is now suspended, but I hope in happier days to come to resume this line of investigation.

A CASE OF "UVEO-PAROTITIS WITH IRIDO-CYCLOPLEGIA."*

BY

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ON March 10, 1916, Maggie R. (30), a tablemaid, was brought to me by her mistress. She looked well nourished, and there was

* A communication to the 1917 meeting of the Ophthalmological Society of the United Kingdom. The full text will appear in the Society's *Transactions*.

nothing exceptional to note in her general appearance, except that she was slightly anæmic and depressed and anxious about the condition of her eyesight. She had been in the same situation for eight or nine years and was a well conducted and highly-valued servant.

History.—At the age of seven or eight she had measles and since then had been liable to slight blepharitis marginalis, and on that account had sometimes to be kept from school in winter if the weather was cold. At the age of eleven, being a native of Montrose, she went into a factory for the making of yarn from flax, and worked there for ten years. Thinking that this rather dusty occupation was keeping up the lid weakness, she decided to leave the factory and engage in domestic service. She was in the habit of using boric lotion for her eyes and occasionally Singleton's ointment. In other respects she had no complaint about her eyes or eyesight until the onset of her present illness. She had never had mumps and, so far as she knew, prior to her present illness, had not been in contact with any persons suffering from mumps. At the age of 20 she had all her teeth removed. She had enjoyed good health until a fortnight before coming to me, when she had what she described as a "cold," with cough. There had been no sore throat nor any known contact with diphtheria. On further enquiry, it was admitted that there was not much catarrh in the head, but rather a feeling of malaise and pains about the stomach, with a certain degree of nausea, so that she feared to eat lest she should be sick. A day or two afterwards there was some swelling of her eyelids and soon thereafter a difficulty in reading small type in the newspaper. This became aggravated, so that a few days later she could not see even the larger headings of the paragraphs. There was an inclination to close the eyes, apparently due to photophobia.

Present State.—When I first saw her on March 10, 1916, there was a slight, diffuse, deep conjunctival and very moderate ciliary injection. The pupils were rather widely dilated (about 6 mm. in diameter) and immobile to light as well as on convergence of the visual axes, and though appearing almost circular, on closer inspection a few posterior synechiæ were found. These had apparently formed while the pupils were in a state of dilatation. They were sufficiently eccentric in position to suggest that a mydriatic had been applied previous to their formation. This seemed all the more probable since on further examination it was found that her accommodation was apparently paralysed. There were well-marked punctate deposits on the back of both corneæ, and haziness of the vitreous. Through this fog the details of the fundus were rendered somewhat obscure, but no gross changes were to be seen at the disc or elsewhere.

R.V. = 5/60 not improved by any lens.

L.V. = 6/60 " "

At 10 inches her vision was relatively worse. The right eye could

barely decipher J. 19. The left, J. 16, with + 4 D. sph. improvement was got to about J. 14. There was undoubtedly mydriasis, and there appeared to me to be certainly cycloplegia as well, though the turbid media made the precise degree difficult to determine. Despite most careful enquiry I could not elicit that she had been using any mydriatic drops or ointment nor handling any plaister or liniment or medicine which might have contained belladonna or any such cycloplegic. Her tongue was fairly clean, her appetite poor. The temperature did not appear to be raised. This association of irido-cyclitis with paralysis of the pupil and accommodation appeared to me so exceptional that I asked my friend, Dr. F. D. Boyd, the family physician, to see the patient. On March 13 she was admitted under his care to the Edinburgh Royal Infirmary. I requested that precautions should be taken to see that there was no possibility of her having access to any cycloplegic and that every possible means should be employed to ascertain by bacteriological examination whether the disease had a microbic origin. Two or three days after admission she developed bilateral swelling of the preauricular portions of her parotid glands. The cervical part of the parotids were less affected and no other glands in the neck were involved. The enlarged parotids were smooth, firm and only slightly painful on pressure or on yawning. Her temperature, which was 98.2° F. on admission and 99° the following morning, remained for the most part rather sub-normal, varying from 96.8° F. on several occasions in the morning to generally a degree more in the evening. The highest temperature recorded was 99.4° F. on the 19th—two days after having had a von Pirquet's cuti-reaction applied. On March 29, Dr. Fitzgerald, one of the pathologists to the Royal Infirmary, reported:—

- (1) That she was negative to Wassermann's test ;
- (2) That she was negative also to von Pirquet's cuti-reaction and that a subsequent injection of Koch's old tuberculin had also given a negative result ;
- (3) That no growth had been obtained from the blood culture ;
- (4) That the blood showed a leucocytosis ;
- (5) That a culture from the conjunctiva showed Gram positive cocci (*staphylococcus albus* and *citreus*).

The Hospital notes do not definitely state whether any swab was taken from her throat. If it was done, it was certainly found negative. Unfortunately, her admission coincided with a change in the period of office of resident physicians and, owing partly to the pressure of war-time demands, there was some divided responsibility in the recording or neglect to carry out this observation. I could elicit no history or symptoms pointing to any ulcerated condition of the throat ; and I can only add that having myself taken a swab from her throat on May 12, it was reported by the Laboratory of

the Royal College of Physicians to contain no diphtheria bacilli. This is perhaps a rather belated observation. At the same time, knowing that long after an acute attack of diphtheria has subsided, bacilli may still be found in the throat, I give it for what it is worth. By April 7 the patient said that her eyes were improving. She could tolerate light with less discomfort, and the parotid swellings, though still obvious, had considerably diminished in size. On the following day, April 8, the patient was dismissed from hospital, i.e., nearly a month after her first visit to me.

On April 24 (i.e., six weeks after her first visit) I saw her again at my house. The pupils were now rather more oval, with longer axes horizontal. The parotid glands still felt slightly indurated on palpation between the jaw and ear, though there was now no obvious swelling. I think I may safely assert that they were not normal for fully a month and a half in her case. There was apparently some deficiency in the salivary secretion at this time, for she complained that she had difficulty in masticating and swallowing dry food unless she took some fluid with it; but the act of deglutition was not impaired and her speech was not nasal. There was much deep punctate keratitis, the spots having then that tawny colour which usually indicates recession of the exudate. The vision was as previously recorded.

About May 12 (ninth week) the vision was at its worst. The right fundus could no longer be seen. R.V.=fingers at 3-4 metres. L.V.=6/36 with difficulty.

Thereafter improvement set in. On May 30 she expressed the opinion that her vision for objects in the street and for the furniture in my room was returning, but the actual response to test types was practically unchanged. There was still much punctate keratitis, with floating opacities in the vitreous. I did not see her in the course of the summer, though I heard that she was getting better, and I had no further opportunity of examining her until November 9, when I found :—

V.=6/36. Improved with + 0.5 D. sph. to 6/24 partly in each eye.

With an effort, J. 6 was read at 10 inches unaided by glasses, and there was a visible narrowing of the pupils during this act of accommodation. The relative improvement in near vision was remarkable, and strongly supports the view that there had been profound cycloplegia earlier. When at rest, facing the light and looking directly forward, the pupils were circular, 5 mm. in diameter, i.e., a little smaller than formerly. There was no evident contraction even on exposure to focussed light, so that the ciliary muscles, aided by voluntary impulse, appeared to be regaining their action somewhat in advance of the reflex activity of the sphincters of the pupils to the stimulus of light. There was still considerable brown

punctate keratitis and pigment spots on the anterior capsules of the lenses, with floating opacities in each vitreous, but the optic discs could now again be seen, the right rather more easily than the left. There was no evident choroiditis.

On February 1, 1917, the whole condition had further improved. R.V. = 6/18. L.V. = 6/12 partly; while with each eye unaided she could now decipher J. 1.

My last examination was on April 19, when I found that with the right eye she could read 6/12 (save one letter) and J. 1, and with the left eye, 6/12 and J. 1 more easily. The pupils were equal and almost if not quite circular, especially the left. Each appeared about 5 mm. in width in subdued light and responded very little, if at all, even to brightly focussed light, but definitely narrowed to about 3 mm. on convergence with accommodation. She still had some fine brown spots of deep punctate keratitis on both corneæ, and on the lower part of the R. cornea, one larger grey, greasy spot composed of a small chain of more recent confluent deposits forming an incomplete ring about 2 mm. in diameter, shaped like a C or one of Landolt's vision test figures. The vitreous was practically free from opacity in both eyes; the optic discs were well defined and there were no visible choroidal changes to be seen even in the periphery of the fundus. Nothing abnormal was to be felt about the parotid glands; salivation appeared to be quite natural; the ciliary muscles had practically regained their power. On the whole she seems in a fair way to make a complete recovery, but it is now more than a year since the onset of the disease. No mydriatic has been employed in treatment—only dark glasses and tonics.

Commentary.—I must confess that when this case first came under my observation prior to the development of the parotitis, I was at a loss to explain the concomitance of irido-cyclitis and irido-cycloplegia. The subsequent development of bilateral parotid swellings at once suggested that the case was one of mumps, but even if so, it is unusual for eye symptoms to *precede* the parotid trouble. They usually follow as later symptoms. Perhaps I should say here, that the case was quite unlike either Parinaud's or Mickulicz's diseases.

Ocular complications of parotitis epidemica have been frequently recorded in medical and ophthalmic literature. Thus:—swelling of the lids; swelling of the lacrymal glands (for which Hirschberg has suggested the term "lacrymal mumps"); lacrymation; conjunctivitis; some rather dubious cases of keratitis; several cases of irido-cyclitis with keratitis punctata profunda, generally with vitreous opacities; optic neuritis; optic atrophy; paralysis of extra-ocular muscles with associated diplopia and some degree of exophthalmus; facial palsy involving the eyelids; and, more rarely, mydriasis and paralysis of accommodation. From most of these

complications the recovery has been satisfactory after a variable length of time, but optic neuritis may go on to optic atrophy and total loss of vision. In one case at least (Schiess-Gemuseus¹), an irido-cyclitis took so unfavourable a course that enucleation was performed to lessen risk to the other eye, and this supplies the only pathological report which I have discovered. It is not very enlightening, but so brief that I can give it in eight words:—"Iris extraordinarily thickened, peculiar pulpy tissue, much vascularization." In addition to the ocular complications following mumps, which I have above mentioned, there are of course many other grave complications. Paralysis of various parts of the central nervous system, involving both motor and sensory functions, has been recorded. I am not at present concerned to discuss these and refer to them only as an indication of the fact that, though in the great majority of cases mumps is regarded as a harmless affection, it may be accompanied by complications which are, temporarily at any rate, of a serious nature. But, again, the question arises whether my case was truly one of mumps at all.

In that connection I should like to draw attention to a paper published in 1909 by Heerfordt in v. Graefe's *Archiv für Ophthalmologie*, Vol. LXX., p. 254, entitled "On a Sub-chronic Uveo-parotid Fever, localized in the Parotid Gland and the Uvea of the Eye and specially complicated with Paresis of Cerebro-spinal Nerves." Heerfordt records three separate cases which occurred under the care of different physicians in the Copenhagen Town Hospital in the years 1905-6. The first, a boy of eleven; the second, a boy of fourteen; and the third, a manservant of twenty-seven years.

They were all cases in which *without any known history of exposure to mumps*, but after experiencing for some weeks feelings of tiredness, drowsiness, loss of appetite and so forth, parotid swellings developed associated with irido-cyclitis and various pareses of nerves. In the first and youngest of the trio, there were symptoms of pyrexia sufficiently pronounced to justify the employment of the term "fever" to which Heerfordt gives prominence in his title. During his stay in hospital for four or five months, this boy's temperature varied from three to four degrees above normal. In each of the other two patients there was less fever—only a very slight but protracted tendency to pyrexia.

The circumstances which seemed to justify the grouping together of these three cases were that, whereas in mumps (1) the premonitory stage is usually brief (12 to 36 hours), in Heerfordt's cases it varied from a fortnight to many weeks; (2) the parotid swelling, which usually subsides in two to eight days and may exceptionally continue for two, three or even four weeks, was noted in his cases for more than two months; (3) the increased temperature, which

commonly varies with the severity of the attack, is not usually of long duration in mumps, and often falls suddenly by "crisis." In his cases it was not high, but more protracted. (4) In the first case, irido-cyclitis and optic neuritis *preceded* the parotid swelling by about a week. In the other two, the ocular and other nerve symptoms *followed* after parotitis. Thus in the second boy there was irido-cyclitis first in the right eye and later in the left, a transient right facial palsy, and for three weeks after admission difficulty in swallowing food.

The third patient (man of 27) complained of feeling out of condition and tired for some months before his admission to hospital. The parotid glands then became swollen, double irido-cyclitis developed and other nerve symptoms followed, difficulty in swallowing, right facial palsy and disturbances of sensation in the skin of the abdomen and hands, and diuresis. There is no record of cycloplegia in any of this trio. Nor is there any record of diphtheria in either of the boys, but the report on the man concludes with the remark that diphtheria bacilli were found in the fauces. On this point Heerfordt makes no further comment, but came to the conclusion that if his cases were due to mumps, they were very atypical and he raised a question whether they ought not to be assigned to some hitherto unrecognized category, constituting a separate clinical entity.

In his survey of the literature Heerfordt fixes on two cases which he considers should be grouped with his own. The first concerns a military musician, aged 22, seen in 1897 by Dairea^{ux}² and Péchin³ eleven days *after* a bilateral parotitis, diagnosed as mumps, though there was apparently no epidemic of that disease at the time. He developed right facial palsy and loss of taste on the right side. This cleared up in about a month, but a week or two later a double iritis with some keratitis followed. The other case published by Collomb⁴ appears to me to be of greater interest since ocular trouble *preceded* parotitis. An apparently healthy man of 29, after some digestive disturbance, developed redness of his right eye. When first seen by Collomb a few days later he had parotid swelling and irido-cyclitis combined with hyperæmia of the disc. This was followed by a slighter attack in the left eye. In this case, so far as known, there was no exposure to epidemic parotitis.

In 1916 Kuhlefeld⁵ reported "a case of sub-chronic uveo-parotid inflammation" in a Finnish journal published in the Swedish language at Helsingfors.* This is a case of a female clerk, aged 21, who consulted him on August 20, 1915. Her father died of tuberculosis. She had mumps as a child. In adolescence an affection of the fourth metacarpo-phalangeal joint of the right hand.

* I am indebted to Dr. Kuhlefeldt for kindly sending me a copy of his paper, and to Sir George Berry for a translation of its contents. The translation will be found on p. 621.

In July, had some swelling and tenderness in each parotid region followed by diminution of vision in the right eye. In the middle of August, complained of dimness of vision in the right eye and injected conjunctiva, Descemetitis, hyperæmia of the iris, media otherwise clear, but apparently neuro-retinitis with some turgid vessels, circumpapillary greyness and eccentric retinal hæmorrhages. V.=5/10. She evidently had irido-cyclitis with neuro-retinitis in the right eye, but no cycloplegia. Occasionally slight rise of temperature. She had apparently not been exposed to epidemic parotitis. The left eye was normal.

In the *Lancet* of January 6, 1917, p. 28, there is an editorial note on a paper by Leeksma, of Heukelum, published at Amsterdam last year, with reference to a married woman, aged 28, who after feelings of tiredness, some shivering and night sweats, developed pain in the left ear and then right facial paralysis. A week later, the left parotid gland became swollen. A fortnight later, the facial palsy cleared up, but was followed by herpes of the left cornea and that again by irido-cyclitis. There was apparently no cycloplegia. On enquiry Leeksma found that there were three typical cases of mumps in this patient's environment during the middle period of her illness (January to March), and he came to the conclusion that while his case resembled Heerfordt's, uveo-parotid fever is nothing more than atypical mumps and not a separate morbid entity.

I have myself made a fairly careful analysis of the papers referred to by Heerfordt in his communication of 1909, and have searched through the *Index Medicus* from that date up to the present time, and have found details of only six cases of dilated pupils and paralysed accommodation recorded in association with parotitis. In three of these, the irido-cycloplegia appeared to be a secondary consequence of optic neuritis or optic atrophy, or as part of a third nerve paralysis, namely, in cases published by Talon⁶ in 1883, Swan Burnett⁷ in 1886 and Blanchard⁸ in 1899. Of the remaining three cases the first, published by Baas⁹ in 1886, was a little girl, aged 7 years, who had cycloplegia three weeks after mumps. Diphtheria was excluded. The second, reported by Mandonnet¹⁰ in 1903, was a child of nine with complete paralysis of accommodation and of the soft palate after mumps. The third, recorded by Dopter¹¹ in 1904, was a guardsman, aged 31, who, two or three weeks after mumps, which quickly subsided, developed pyrexia, occipital headache and double orchitis, left facial palsy, paresis of left half of tongue and soft palate, left mydriasis and left cycloplegia. He had definite leucocytosis and made a good recovery. In none of these was there irido-cyclitis.

I have found no record of a case exactly reproducing either the group of symptoms or the order of their occurrence which characterised the one under my own observation.

One must not overlook the fact that inflammation of the parotid gland is a not very uncommon complication of various septic medical and surgical conditions, e.g., typhoid fever, appendicitis and abdominal operations. This gland is a channel for the excretion of deleterious material. Various drugs make their escape by the saliva, and abundant salivation is a common precursor and accompaniment of bilious vomiting. The ciliary body doubtless plays its part also in endeavouring to get rid of deleterious substances circulating in the blood stream. It appears to me not improbable that the obstinate and tedious character which iridocyclitis so often presents, is due to the fact that the morbid material passing from the ciliary gland into the aqueous fluid has no chance of being directly evacuated from the body like the saliva, but is necessarily reabsorbed into the circulation and sets out again in a vicious circle. It is commonly believed that in mumps the poison enters the parotid gland through the buccal orifice. If that be so, it is easy to understand how the parotid gland reaction precedes other signs and symptoms of remote or metastatic inflammation or nerve pareses, which are presumably due to an extension of the poison through the system, or are set up by toxins produced by the primary infecting agent. When remoter toxic effects precede the parotitis, I venture to suggest that the poison, whether due to mumps or not, may (or must) have entered by some portal other than Stenson's duct. The possibility of a mixed infection, e.g., with diphtheria, should not be put aside without further careful investigation.

Bearing all these problems in mind, there is undoubtedly some justification for Heerfordt's scepticism as to whether there may not be another ætiological factor than mumps for cases such as he and I have recorded, in which no association with mumps has been established. This problem cannot be correctly solved until pathological investigation has determined what is the precise cause of mumps as certainly as it has revealed the cause of anthrax or tetanus or diphtheria. Personally, I shall suspend judgment and, adopting the cautious procedure of our Scottish Courts, go no further than to say that the case for mumps as the sole cause for uveo-parotitis is as yet, "not proven."

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TRANSLATION

A CASE OF SUB-CHRONIC FEBRILE UVEO-PAROTID INFLAMMATION*

BY

Dr. E. KUHLEFELT

IN the *Ugeskrift for Læger* No. 16-17, 1909, Heerfordt gives an account of one case observed by Daireaux and Péchin, one by Collomb and three by himself of an affection which in many respects resembles epidemic parotitis. As these cases, however, show several important deviations from even atypical epidemic parotitis, Heerfordt considers that they should be relegated to a different group which he proposes to call "febris uveo-parotitis subchronica."

With one exception these cases occurred at times when there was no epidemic parotitis. All the patients were healthy and free from hereditary taint. The disease lasted from three to nine months, of which the prodromal stage occupied at the least some days, and at the most a few months. The symptoms of the prodromal stage resembled those which usually precede an attack of typhus (enteric?). The accompanying fever was, as a rule, slight, and not subject to much change, but in some cases there were exacerbations which did not always completely coincide with the outbreak of localized changes. These changes, of which the uveitides, which always occurred, deserve special notice, occurred primarily in the parotid in some, and in the uvea in others. No other glandular changes were observed. (In a case which Schou published later, there was a simultaneous swelling of the lacrymal gland.) Though varying somewhat in degree the parotitis was in all cases of a mild

*Taken from the *Finska Läkarsällskapets Handlingar*, redigerade af DR. RICHARD SIEVERS. Band LVIII, May, 1916, pp. 867-870.