NOTES ON B. WELCHII INFECTION OF THE GLOBE

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IN view of the interest aroused by two recently reported cases of *B. Welchii* infection of the eye, the following is a report of two further cases.

Heath, in the November 1929 issue of this journal, dealt with a case of perforation of the globe with resulting pure *B. Welchii* infection, and he quoted from the literature. I was fortunate enough to see his case throughout, and intend after describing my own two cases, to offer, with Mr. Heath's kind permission, observations on the three cases I have seen.

Case 1.—On October 12, 1929, J. B., male, aged 16 years, was admitted to the Royal London Ophthalmic Hospital at 8 p.m. with a history of a piece of steel entering his right eye at 10 o'clock that morning. On examination the steel was seen lying in the vitreous to the nasal side of the disc and attached to the foreign body above was a large air bubble about twice the size of the foreign body itself and a little larger than the disc. At 9 p.m. the steel was removed from the globe by magnet through a keratome section in the cornea. Next morning at 10 o'clock there was some chemosis and a small hypopyon. Appropriate treatment was ordered, but by 9 p.m. the chemosis was protruding between the lids and the hypopyon almost filled the anterior chamber. Also the patient's face was flushed, his temperature 101° F., his pulse rapid, his skin warm and moist. At 9.30 the eye was eviscerated and the vitreous found to be full of pus. The patient's recovery was uneventful and he left hospital in 12 days.

A slope and stab culture of the vitreous pus was taken. The former grew *Staph. Albus* and the latter *B. Welchii*. Dr. S. H. Browning kindly did the bacteriological examination; he considered that, in view of the virulence of *B. Welchii*, the air bubble in the vitreous seen 10 hours after the entry of the foreign body was generated by that organism. That an air bubble of this size could remain in contact with the foreign body while it cut a track through the cornea, iris, lens and vitreous is quite impossible.

Case 2.—On May 2, 1930, H. D., aged 44 years, was chiselling wood in his own garden, when at 5.30 p.m. a piece of steel struck his left eye. During the night his eye became unbearably painful and when a colleague told me at 8 a.m. on May 3, 1930, that he wished to admit a male with an intra-ocular foreign body and that the man was in agony, I predicted that the infecting

organism would be *B. Welchii*. Shortly after 9 a.m. I made a routine examination and then found that his face was pale, his expression anxious, and his skin cold and moist.

Examination revealed :—

Right eye normal.

Left eye injected slightly; much conjunctival discharge; small perforation of the cornea down and out; much corneal haze; shallow anterior chamber; pupil one-third dilated; no hypopyon, gas or exudate in anterior chamber; no fundus reflex. Left vision—shadows. Defective projection.

At 10.30 he was seen by Mr. Foster Moore, when chemosis was present and some exudate had appeared in the anterior chamber; further, at that time the pain in his eye was so intense that morphia had to be administered. At noon the metallic foreign body was drawn into the anterior chamber by the Haab magnet, and on making a keratome section there escaped several bubbles of gas and some exudate with a fetid odour very closely resembling that smelt on opening an acute abdomen.

The foreign body was removed by hand magnet and the anterior chamber washed out with saline. The patient was returned to the ward and 50 c.c. of anti-gas gangrene serum was given intramuscularly. By 3 p.m. there was much exudate in the anterior chamber again and at 4 p.m., *i.e.*, 22½ hours after the injury—the eye was eviscerated under general anaesthesia and a pure culture of *B. Welchii* was obtained from the vitreous. The patient made an uneventful recovery and left hospital on the 10th day. On only one occasion was his temperature above 99° F., and that on the 4th day when it rose to 99·8° F.

Notes on :—

Aetiology.—In the great war it was found that gas gangrene followed two types of wounds :—

(1) Deeply perforating with a small point of entrance and retention of the projectile.

(2) Extensive wounds with widespread tissue destruction.

To the former type perforating injuries of the eye with retained foreign body exactly correspond and such a wound produces a suitable anaerobic medium. Further, it was found that all cases were earth contaminated, as these three cases also were.

Signs, symptoms and diagnosis.—From the three cases observed by me it appears that *B. Welchii* infection of the eye may be divided into two groups :—

(a) A mixed infection of *B. Welchii* and some pus-forming organism to which my first case belongs.

(b) Pure infection of *B. Welchii* to which Heath's and my second case belong.

Each group has such definite features that I think their salient points may be best illustrated in tabular form :—

	GROUP (a)	GROUP (b)
Symptoms ...	<ol style="list-style-type: none"> 1. Rapid onset 2. Not much pain 	<ol style="list-style-type: none"> 1. Very rapid onset 2. Intense pain requiring morphia
General signs ...	<ol style="list-style-type: none"> 1. Drowsy 2. Flushed face 3. Warm, moist skin 4. Marked pyrexia 5. Marked increase in pulse rate 	<ol style="list-style-type: none"> 1. Very restless 2. Ashen complexion, and facies resembling that of acute abdominal crisis 3. Cold, moist skin 4. Little or no pyrexia 5. Very slight increase in pulse rate
Local signs ...	<ol style="list-style-type: none"> 1. Red eye 2. Cornea bright 3. Hypopyon 	<ol style="list-style-type: none"> 1. White or slightly injected 2. Marked corneal haze 3. Stringy exudate in anterior chamber

Briefly, the general appearance of (a) is that of an ordinary panophthalmitis, while the general appearance of (b) is that of an abdominal crisis.

Prognosis.—For life, it is remarkably good in both groups. This is in contradistinction to the war injuries, in which the outlook was so grave and death so rapid. It has been found that *B. Welchii* will proliferate much more rapidly if combined with an aerobe, for the latter extracts all the oxygen from the media and makes a perfect anaerobic medium for *B. Welchii*, but in case 1 there was a mixed infection and no serum was given, as an anaerobe was not suspected and yet the case did remarkably well.

Treatment.—Perhaps the favourable prognosis is due to the treatment. It was found in the late war before serum was administered as routine, that wide excision of infected tissue gave the best results. What more perfect excision of infected tissues can be imagined than a simple evisceration? But I would still advocate the administration of serum if it is available, as its potency was clearly shown on the battlefield, and later in London by Williams in his treatment of acute intestinal obstruction, the toxæmia of which he showed to be mainly due to *B. Welchii*.

Bacteriology.—Fortunately *B. Welchii* is not a strict anaerobe, and therefore its culture is a matter of ease. On each occasion all I had at my disposal were two blood agar slopes; on the first, I made a slope culture, and in the second a stab culture with a platinum loop, taking my material from the vitreous without contamination from the conjunctival sac. Heath in a similar manner was able to cultivate his anaerobe.

I wish to thank Mr. Juler and Mr. Foster Moore for their kind permission to report these cases, also Dr. S. H. Browning for the bacteriological examinations and Mr. Heath for permission to discuss his case in conjunction with my own.

REFERENCES

- Chaillous.—*Recueil d'Ophtal.*, p. 678, 1904.
 ———— *Ann. d'Ocul.*, p. 115, 1905.
 Darier.—*La Clin. Ophtal.*, p. 266, 1905.
 ———— *La Clin. Ophtal.*, p. 227, 1906.
 Heath.—*Brit. Jl. of Ophtal.*, p. 574, 1929.
 James.—*Ophthal. Rev.*, p. 161, 1910.
 ———— *Trans. Ophthal. Soc. U.K.*, p. 179, 1910.
 Lutz.—*Klin. Monatsbl. f. Augenheilk.*, p. 31, 1910.
 Medical Research Committee.—Report upon anaerobic bacteria and infections.
 Oreste.—*Ann. d'Ocul.*, p. 35, 1910.
 Ridley.—*Trans. Ophthal. Soc. U.K.*, p. 221, 1929.
 Schumacher.—*Ann. d'Ocul.*, p. 303, 1908.
 Williams.—*Brit. Jl. of Surgery*, Vol. XIV, p. 295, 1926-27.

ON LOOKING FOR HOLES IN DETACHED RETINA

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ONE evening after a colleague and I had spent much time searching for a possible hole in a detached retina and had failed, he uttered the following aphorism: "There is only one thing more tedious than looking for a hole oneself, and that is watching someone else looking for it."

It had been my fortune—good or bad—during the past eight months to search for holes in well over sixty detachments that have entered Moorfields Eye Hospital for ignipuncture, and as the detection of holes has apparently come to be an essential investigation in the art of the modern ophthalmic surgeon, I feel, after my experiences, that I might offer a little help and advice.

The finding of a hole is the *sine qua non* of Professor Gonin's operation of ignipuncture, and I believe that he and his assistants are prepared to spend an hour daily for many days engaged in the search. It is impossible for a busy British oculist to spend so