

## Mortality in Fowls due to *Aegyptianella pullorum*.

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THE purpose of this article is to record three outbreaks of Aegyptianellosis accompanied by mortality. Although the literature contains several references to the parasite, it is still uncertain to what extent it may cause death. Each outbreak will be described separately.

The first outbreak was reported on 24.8.32 at Pretoria North, near Onderstepoort. The poultryman on 10.8.32 had bought two hundred day-old chicks and placed them under a cold brooder in a small corrugated iron shed. On 23.8.32 he found three dead chicks, and others which were slightly weak, not eating and showing a marked bright green diarrhoea. On 24.8.32 five died and two were sent for examination. At autopsy each showed marked anaemia, intense icterus, atony of the crop, intestinal catarrh (the intestines were full of green slimy material), yellowish and slightly enlarged liver, and marked tumor splenis; the kidneys had a very pronounced yellowish green colour, and the blood and spleen smears showed anaemic changes and numerous *A. pullorum*.

On 25.8.32 there were twelve chicks dead. The lesions and blood smears resembled those of the day before, but one blood smear showed *Spirochaeta anserina* as well as *A. pullorum*. This day the author visited the farm and found the brooder and shed fairly badly infested with *Argas persicus* (Oken). Several of the chicks were ailing, not eating and manifesting markedly greenish diarrhoea. The owner was advised to destroy all *A. persicus*, and this he did immediately. On 26.8.32 nine more chicks were dead. All smears showed *A. pullorum*. On 27.8.32 six died; on 28.8.32 fourteen; on 29.8.32 fifteen; on 30.8.32 nineteen; on 31.8.32 again nineteen; on 1.9.32 five; on 2.9.32 five, and on 3.9.32 one died. No further cases occurred. During this time a number of chicks were examined. All showed the post-mortem lesions described, together with *A. pullorum*. Apart from *A. persicus*, no other ectoparasites were ever found. *Argas* larvae were never found on the chicks. Occasionally live sick chickens were examined and the blood showed *A. pullorum*, but never *S. anserina*. In this outbreak one hundred and thirteen chickens out of two hundred died within the first twenty-five days of life and within twenty-four days of being exposed to *A. persicus*. The first deaths occurred thirteen days after exposure to *A. persicus*. The mortality stopped nine days after the eradication of the ticks; this fact has some significance because mortality might reasonably have been expected for at least another four days (*vide* article in this Report by Bedford and Coles). This discrepancy, too, would seem to support an idea founded purely on circumstantial evidence that the fowl is most susceptible to Aegyptianellosis when infected during the first week of life. All the chickens showed the same symptoms and, except in the one case where spirochaetes also were seen, every chick examined

showed a pure infection of *A. pullorum*. If *A. pullorum* represented a stage in the life cycle of *S. anserina*, it is extremely difficult to understand why spirochaetes were encountered only once, specially as the incubation period of *S. anserina* is approximately only half that of *A. pullorum*, and several chicks were examined immediately symptoms were noted and presumably before a crisis could have occurred. Moreover, as will be seen in the article of Bedford and Coles referred to, clean *A. persicus* adults were fed on some of these chickens and subsequently transmitted only *A. pullorum* to healthy clean chickens. It seems safe to assert that *A. pullorum* was responsible for the heavy mortality in these chickens.

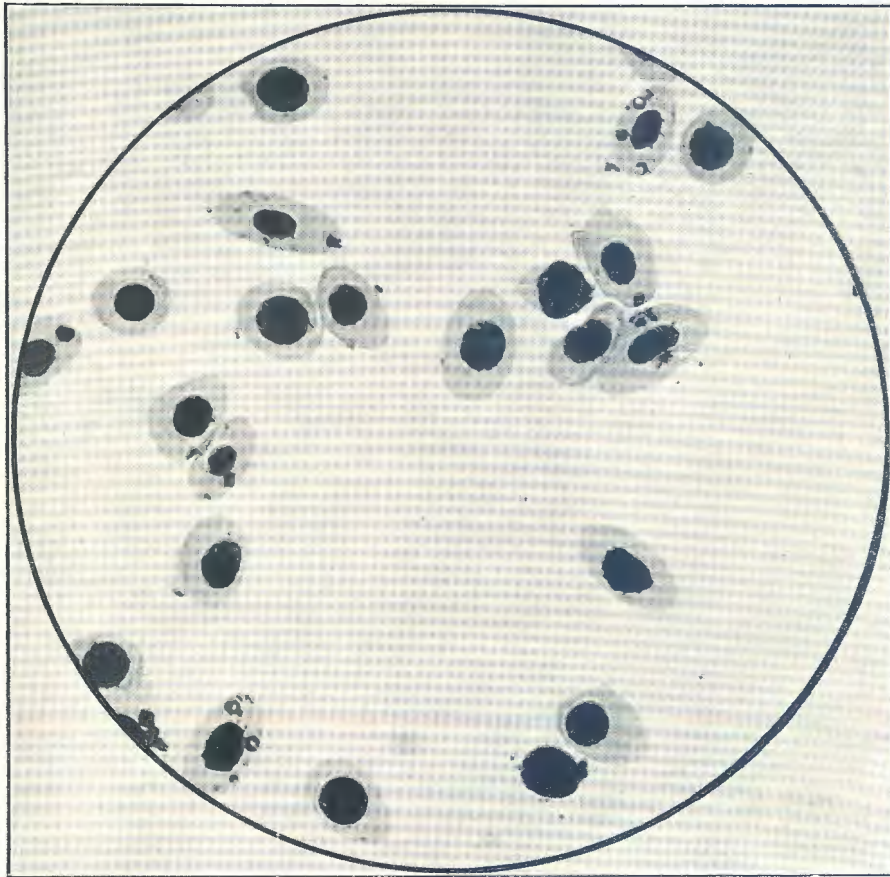


Fig. 1. 1000 $\times$ . Infected red blood corpuscles. The very small specks in the cells are the "merozoites" liberated by the breaking down of schizonts.

The second outbreak occurred at the beginning of November, 1932, in Pretoria. A poultryman brought one dead chick, and one live one about eight weeks old, for examination as he had been experiencing heavy mortality. The dead chick was very anaemic, had an enlarged spleen and an enlarged greenish brown and mottled liver, and the blood smear showed anaemia and a few *A. pullorum*.



The live chick showed a marked orange yellow comb, and the iris had a jaundiced appearance; the blood smear showed marked anaemia and fairly numerous *A. pullorum*. This chick died shortly after arrival and showed icterus, tumor splenis, anaemia and slightly yellowish liver, slightly enlarged and pale kidneys and intestinal catarrh. Two days later the owner brought twenty-six supposedly sick chickens for examination. Of these, five showed *A. pullorum* and seven showed *S. anserina* in blood smears. During the next two days six of these chickens died, all from Spirochaetosis. The others

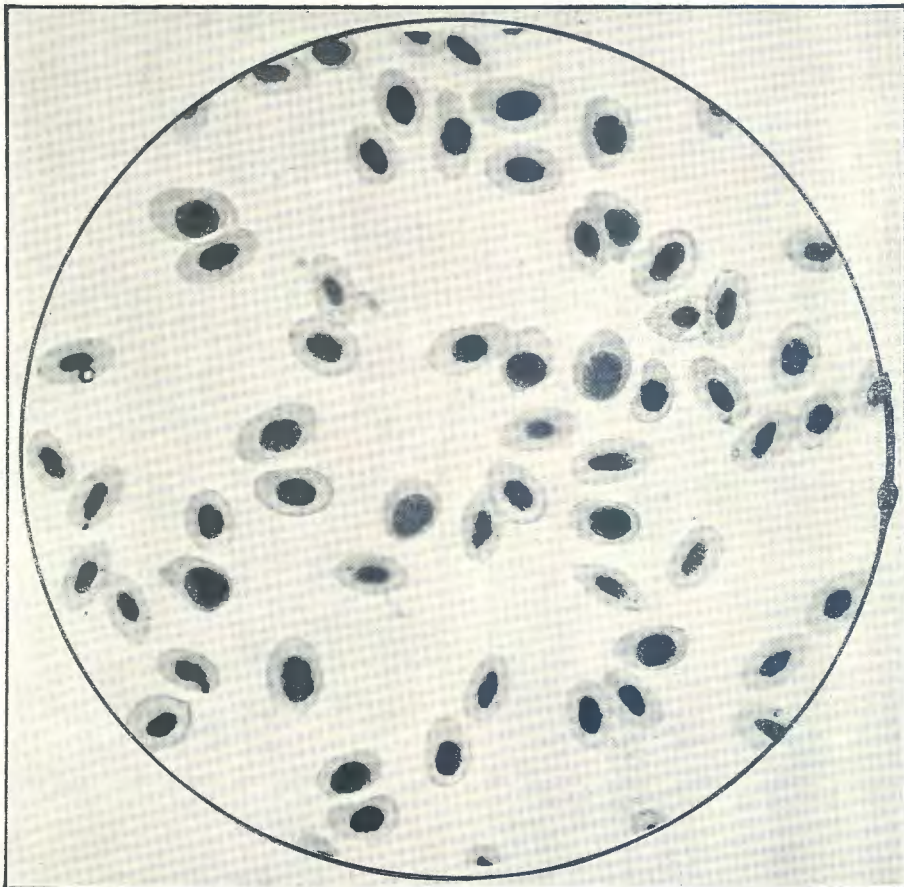


Fig. 2. 1000 $\times$ . Cells showing fairly numerous "merozoites", the arrangement of which round the periphery is very characteristic. Some blood smears show practically nothing but these "merozoites".

all recovered. The owner admitted his premises were not free of *A. persicus*. Undoubtedly most of the deaths in these chickens one to two months old were due to Spirochaetosis. It is possible that the two supposed to have died from Aegyptianellosis had really succumbed to Spirochaetosis, the spirochaetes having already disappeared.

The third outbreak occurred at Pietersburg in the Northern Transvaal. On 6.12.32 a farmer sent a live Rhode Island Red cockerel about five months old for examination. The bird had been ill for a few days. On arrival it had a temperature of 108° F.; it was listless, slightly emaciated, had a pale yellowish comb and fairly marked greenish diarrhoea; the blood smear showed *A. pullorum* numerous. Four days later the bird died and at autopsy was noted a fairly marked tumor splenis, anaemia, slight icterus and slight enlargement of the liver; the intestines contained greenish slimy material. The owner said only three out of two hundred birds on free range became affected and the other two died. Here again it may be argued that *Spirochaetosis* was really the cause of death, although no spirochaetes were found. The author prefers to regard the deaths as being due to *Aegyptianellosis*, as it is most unusual to find only two or three isolated deaths due to *Spirochaetosis*. A pure strain of *A. pullorum* was obtained by feeding clean adults of *A. persicus* on this fowl.

#### SUMMARY AND CONCLUSIONS.

Three outbreaks of *Aegyptianellosis* have been described, in the first of which there can be no reasonable doubt that the disease caused very heavy mortality in very young chicks. In the other outbreaks there is evidence to show that *A. pullorum* may kill older fowls, but apparently not to the same extent as *S. anserina*. It is interesting to note that under laboratory conditions the disease transmitted by

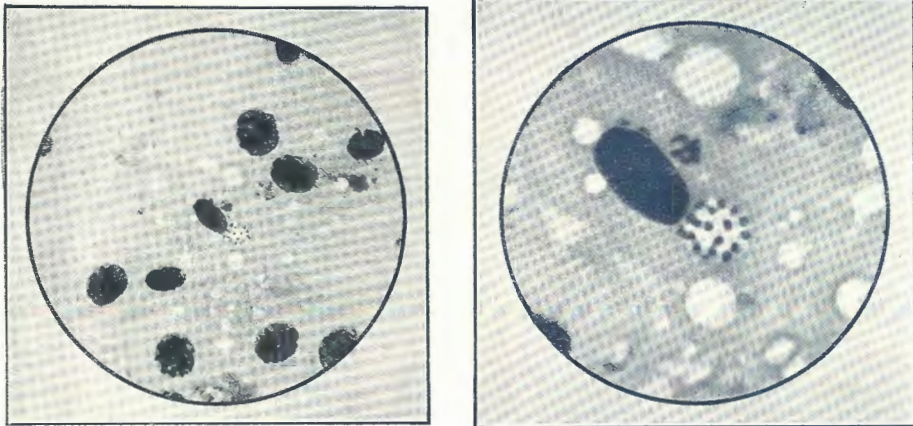


Fig. 3. 1000×. Red corpuscle containing a schizont.  
Fig. 4. 2700×. No. 3 magnified.

infected *A. persicus* to chickens three to eight weeks old apparently does very little harm. The factors affecting the virulence of *A. pullorum* are still obscure, but the age of the bird appears to be of some importance. The main symptoms in chickens are loss of appetite, dejection and diarrhoea. Sometimes icterus may be noted. At autopsy very young chicks show intense icterus and anaemia,



marked tumor splenis, fatty degeneration of the liver, intestinal catarrh, and a characteristic pronounced pale greenish yellow colour of the kidneys. The risk of mortality seems to decrease with age, and then the symptoms and gross post-mortem findings are apparently indistinguishable from those of spirochaetosis.

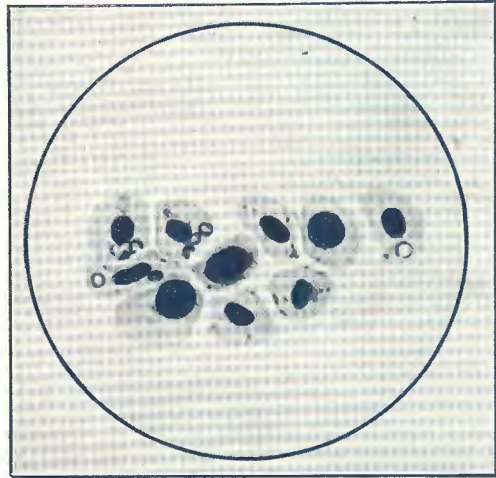
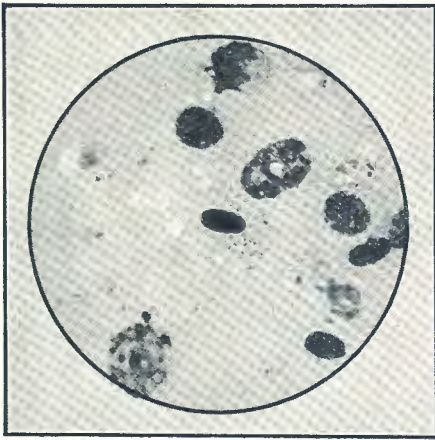


Fig. 5. 1000 $\times$ . Red cell packed with "merozoites" formed by the breaking up of a schizont.

Fig. 6. 1000 $\times$ . Infected red cells. The numerous "merozoites" are very noticeable.

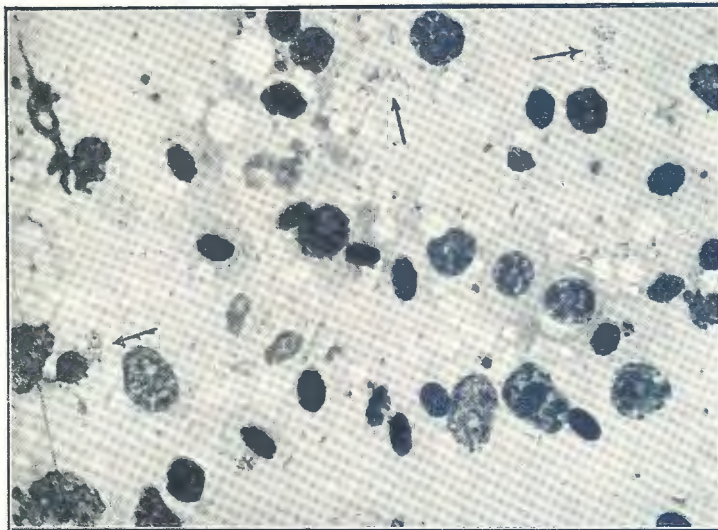


Fig. 7. 1000 $\times$ . This is a spleen smear. The arrows indicate masses of "merozoites". A cell containing a schizont is shown.

ACKNOWLEDGMENT.

The author wishes to thank Mr. T. Meyer for the preparation of the photo-micrographs, which give an excellent idea of the different forms in which *A. pullorum* manifests itself in the blood of fowls.

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REFERENCE.

- BEDFORD, G. A. H., AND COLES, J. D. W. A. (1933). The Transmission of *Aegyptianella pullorum*, Carpano, to Fowls by means of Ticks belonging to the Genus *Argas*. This Journal.