ily available to wheat or barley in such media. Another feature observed was that related to the conditions necessary for grain production. Repeated failure to obtain grain from apparently normal plants was explained in the condition necessary for the fertilization process to function. It was found that the diurnal changes in temperature and humidity play very important rôles in the process. Rice plants require dew or a fairly saturated atmosphere for pollination to proceed properly, and the absence of dew on the plants, although grown in water in the greenhouse, was found to be the cause of the failure for rice to set grain in the case above mentioned.

W. F. GERICKE

LABORATORY OF PLANT NUTRITION,
UNIVERSITY OF CALIFORNIA

THE MORPHOLOGY OF HAEMOPROTEUS LOPHORTYX SP. NOV.

EXAMINATION of 312 native quail in California showed that 45 per cent. of the birds were parasitized with a sporozoan, the gametocyte stages of which were to be found in the red blood cells of the birds.

The parasite, which belongs to the genus *Haemoproteus,* differs from *Haemoproteus columbae* Celli and Sanfelice of the pigeon and all other described forms. It is found in *Lophortyx californica* Shaw and all other species and subspecies of the genus *Lophortyx* inhabiting California, including Santa Catalina Island. It is herewith described as *Haemoproteus lophortyx,* the description being based largely upon the morphological characters of the mature gametocytes as they appear when the dried films are fixed with methyl alcohol and stained with dilute Giemsa's azur-eosin.

The diagnostic characters are as follows: Mature male gametocytes: Form and size: halter-shaped, partially encircling nucleus of blood cell but not in close contact with its nuclear membrane. Along greater part of its length, parasite extends out to periphery of blood cell. Diameter one and one half to two and one half microns; length up to eighteen microns when curving is taken into consideration. Both ends uniformly rounded, but the end containing the nucleus slightly broader. Instances not rare of the parasite completely filling the space formerly occupied by the cytoplasm of the host cell, in which case both ends of the nucleus-encircling gametocyte in contact.

Nucleus: elongate, ovate, almost always nearer to one end of the gametocyte, its broader end being nearer to the end of blood cell. Staining reaction, pale pink. Average size, one and one half by four microns. Becomes more diffuse and much larger, filling three fourths of volume of cell just preceding gametogenesis. Karyosome usually visible.

Cytoplasm: pale, almost hyaline.

Vacuoles: indistinct and diffuse, often a large one near one end of gametocyte with ring of pigment granules around its periphery.

Pigment granules: minimum number, eleven; maximum, thirty-nine; average, nineteen, with tendency to be deposited in two more or less terminal groups with a few scattered granules in between. Shape, from spherical to oval or rod-shaped. Size, from two tenths to eight tenths microns in greatest diameter. In fresh diluted blood, of carbon black appearance; in stained preparations, brownish. All granules highly refractive.

Mature female gametocytes: Form and size: like male gametocytes, halter-shaped encircling nucleus but not closely applied to nuclear membrane. Greater tendency for both ends of gametocyte to come into contact around nucleus of blood cell than in case of male gametocyte, in which case parasite loses characteristic halter-shaped appearance and fills entire space between nucleus and periphery of erythrocyte. Measurements in general same as for male gametocyte but tendency to produce greater hypertrophy of blood cell, especially when more than one gametocyte present in cell.

Nucleus: spherical to oval, more centrally located than in male gametocyte, average size up to one and one half or two and one half microns in the greater diameter. Staining reaction dark pink to red. Karyosome distinct.

Cytoplasm: staining reaction much darker blue, reticular appearance apparent.

Vacuoles: usually present, from one the size of the nucleus to two or more smaller ones irregularly placed.

Pigment granules: minimum number, fifteen; maximum, fifty-two; average, twenty-four. Tendency to be grouped less pronounced than in the case of the male gametocyte.

Experimental work has demonstrated that *Lynchia hirsuta* Ferris, an ectoparasitic louse fly, is responsible for transmitting the parasite from quail to quail. Transmission is biological, the sexual cycle of the parasite taking place in the fly.

Ordinarily a parasitized quail seems to be little inconvenienced, but numerous cases have been observed where the infected bird was weak and thin. Five fatal cases have been studied, the death of the birds being preceded by marked anemia due to the destruction of the red blood cells by the parasites.

The study of this parasite and its effect on the host is of especial interest since the California Valley quail is California's most prized game bird.

EARL C. O'ROKE

UNIVERSITY OF MICHIGAN