Of the three variables which have been tested so far, the change in the size of the pattern has most effect, and the change in the illumination has least effect on the colours seen.

The explanation of the disappearances of the colours appears to be as follows:

Both the blue and yellow pigments are greatly diluted with white light. Owing to the chromatic aberration of the eye, blue and yellow rays cannot be focused simultaneously. Therefore, if yellow images be sharp the blue images form wide diffusion circles; and vice versa. If the yellow images be sharp they fall on areas of retina which are already being illuminated by blue rays, and since these are complementary in colour to the yellow rays, the yellow is greatly diluted with white light, and this dilution increases as the pattern becomes smaller. If the blue images be sharp, it is these which suffer dilution with white light. If the eye be focused at an intermediate position, both blue and yellow images are slightly out of focus and each dilutes the other with white light. This dilution increases as the pattern becomes smaller.

The normal adjustment of the eye is that which produces sharply focused yellow images, and it is, therefore, these which become diluted with white light. In consequence, as the distance between the observer and a given pattern of blue and yellow increases, it is the yellow which first becomes confused with white. The blue images remain undiluted, but they suffer greatly in intensity, as Table 4 shows. It will be seen that down to the visual angle of 12 min. of arc, the fall in intensity of the blue is relatively slight, but that as the visual angle decreases to 3 min. of arc, there is a sudden fall in intensity. It is usually somewhere within this range that the blue is replaced by black.

TABLE 4. EFFECT OF VISUAL ANGLE ON LOSS OF INTENSITY OF GREEN, BLUE AND VIOLET RAYS.

Visual angle (min. of arc)	Percentage loss of intensity for: 5000 A.	4500 A.	4000 A.
24	3	5	9
12	6	10	18
6	12	20	36
3	24	40	62
1·5	48	63	78

The reason for considering the case for rays of 5000 A. is that blue pigments reflect or transmit these almost as much as they do the blue rays and the violet rays.

An increase in the aperture from 1 mm. to 3 mm. adds to the colours of the pigments the colours which are produced by the chromatic aberration of the eye. Consequently both blue and yellow become more visible; as shown in Table 2.

A decrease in illumination from 3,000 to 1 ft. c. decreases the visibility of the colours, because the amount of colour which is above the threshold of the foveal cones at a high intensity of illumination falls below that threshold at a low intensity, as shown in Table 3.

H. HARTRIDGE.

Physiological Department,
Medical College of
St. Bartholomew's Hospital,
c/o Zoological Department,
Downing Street,
Cambridge.
May 16.

Reproduction of the Woodlouse *Armadillidium vulgare* (Latr.)

DR. H. W. HOWARD, in his valuable studies on this isopod, has shown[1] that the sperms can be stored in the females for at least a year and still remain viable. Further, he records that "Eight virgin females have been isolated from any males for more than two years. In their second year three of these animals produced brood pouches in which eggs could be seen. The eggs, however, in all three cases failed to develop."

On June 29, 1943, I received from Dr. Hamilton E. Quick a number of specimens of this species referable to the variety *rufobrunneus* Cllge. All were adults and females.

One specimen was isolated and kept in a Petri dish. Although examined daily no change was observed until April 2, 1944, when it was noticed that it had developed brood pouches, and on April 22 ova could be distinctly seen with the aid of a lens (× 20). These ova hatched and were liberated on April 27. There were about fifty individuals. The smallest specimens were 1 mm. in length and the largest 1·5 mm. After the first moult, the measurements were 1·10 mm. and 1·15 mm., respectively, and at the end of seven days 1·20 mm. and 1·35 mm.

On April 30 the parent moulted and the progeny took possession of the exuviæ. All are still alive.

Examined on May 23, when just over three weeks old and after the second moult, no sign of red or brown coloration was apparent, and had I not known their history I should have identified them as young specimens of the variety *plumbeus* Lereboullet.

WALTER E. COLLINGE.

The Hollies,
141 Fulford Road,
York.
May 25.

[1] *J. Genet.*, 85 (1940); 143 (1944). NATURE, **152**, 331 (1943).

Reaction of Wheat Varieties Grown in Britain to Erysiphe

IN May 1944 a moderately heavy attack of mildew (*Erysiphe graminis*) developed in my wheat yield trial near Maldon, Essex. This trial consisted mainly of experimental breeding material, but since it also contained twenty rod-row plots of each of fifteen important commercial varieties of wheat, an opportunity arose of evaluating these varieties according to their susceptibility or resistance to mildew. Individual rows were classified on a scale of marks according to intensity of infection and the data subjected to an analysis of variance. These data are summarized in the accompanying table, a negative value indicating an attack of less than average severity and a positive value of more than average. Levels of significance are indicated where $P < 0{\cdot}05$.

Certain other commercial varieties were present in the trial in six replications only. Of these, the variety Picardie showed highly significant resistance (score $-6{\cdot}5$, $P < 0{\cdot}001$), but no other departure from the average was significant. There was, however, some indication ($P < 0{\cdot}10$) that the varieties Setter, Steel, Benoist 40, Red Drottning and Squarehead II were resistant, while Robusta, Redman and Vilmorin 29 were susceptible. No variety showed complete immunity to the disease.