10μ thick were cut with an ice microtome and dried with an electric fan on object glasses. For the fluorescent antibody investigation the section was washed in physiological saline for 4–5 min to remove soluble fibrinogen from the tissue and the haemorrhage (since the antibody also is fixed in fibrinogen). The washed sections were covered with conjugate in a moist chamber and left for 30 min, after which the conjugate was rinsed off and the section was washed for 1 h in moving Coons's saline solution. The section was then covered with buffered glycerine and a cover glass, and examined under Reichert's 'Binolux' microscope, with a mercury high pressure lamp as a source of ultra-violet light.

Sections were made from the same block, following the fluorescence section, and were stained by the following methods: Mallory's phosphotungstic acid-haematoxylin (PTAH)[6], Lendrum's 44/41 Masson and Martius scarlet blue (MSB)[3], and Glenner's Rosindole[7]. The frozen sections were first fixed on object glasses with formalin, formalin plus 5 per cent sublimate, and Carnoy's fixative, respectively. Specimens mounted in paraffin were also made from the tissue haemorrhage examined by the fluorescence method, and were stained by the above techniques. A few *in vitro* blood clots were examined by the same methods.

By the fluorescent antibody technique a clearly visible network of fibrin was demonstrated in all the *in vitro* coagula and in most of the tissue haemorrhages that had clearly occurred *in vivo* and shortly after death.

With the histological staining methods fibrin was demonstrated in only about 50 per cent of the haemorrhages in which it was seen by the fluorescent antibody technique. Of these staining techniques, PTAH and 44/41 Masson were the best, after the fluorescence technique. The fibrin network was usually visible more clearly and in more cases in frozen sections than in the corresponding paraffin sections. In the latter the fibrin networks evidently tend to be masked by fixed blood cells and blood proteins. The fibrin network is better revealed in frozen sections that have been fixed after slicing, because the cells and soluble proteins have been washed from the surface of the sections.

Further investigations of the significance of fibrin in tissue haemorrhages as a sign of a vital reaction are in progress.

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BIOLOGY

Polyploidy and Nuclear Fusion

THE idea that chromosomes can double repeatedly by "internal growth" without mitosis was put forward by G. Hertwig[1] and others to account for the giant (polytene) chromosomes in the salivary glands of Diptera. Berger[2] showed that in larvae of *Culex* ($2n=6$) the epithelial nuclei of the ileum undergo a succession of such internal divisions with a multiplication of separated chromosomes up to a maximum of forty-eight or ninety-six (thirty-two-ploid). Geitler[3] described even higher grades of polyploidy in many tissues of *Gerris* (Hemiptera). He was at first inclined to attribute this to nuclear fusion; but following Berger's observations and his own further work, Geitler adopted the same explanation and has greatly extended the general theory of "endomitosis"[4–6].

There is no reason to question the occurrence of endomitosis, which is described in the nurse cells of the ovary in *Drosophila*[7] and in many other tissues[4–6]. It has recently been invoked to explain polyploidy in the honey bee[8]. The purpose of this note, however, is to call attention to the fact that polyploidy in insects can also arise through nuclear fusion[9].

I have recently reported that in the bug *Rhodnius* in extreme starvation (30–40 weeks), when virtually all reserves have been consumed and most of the mitochondria in the fat-body cells have degenerated into "cytolysomes", some of these cells break down; others fuse with their neighbours to produce cells with two or three nuclei, and in many of these multinuclear cells the nuclei themselves fuse to form bizarre structures in which the component elements can often be distinguished even when the intervening membranes have disappeared[10].

During the renewed growth and cell division, which commence 4 or 5 days after a single meal of blood in such insects, the highly polyploid nuclei undergo mitosis; sometimes normal mitosis; sometimes abnormal, with triradiate or irregular metaphase plates. Up to about 500 mitochondria have been estimated at metaphase (probable diploid number, sixteen).

It seems likely that the enormous polyploid nuclei with multipolar mitotic figures, reported during delayed wound healing in *Rhodnius*[11], are likewise the result of nuclear fusion. Polyploid nuclei are far more plentiful in the fat body of *Rhodnius* after extreme starvation, but binucleate cells and polyploid nuclei with a patchy distribution occur also in insects that have not been starved for long periods. It is probable that this occasional polyploidy also is due to nuclear fusion. Endomitosis, however, occurs regularly in the fat body of *Rhodnius* as in other Hemiptera, for diploid nuclei are absent during the larval stages; most nuclei are tetraploid from the time of hatching.

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Effect of Host Pregnancy on Pupal Production by the Tsetse Fly

THE rabbit flea, *Spilopsyllus cuniculi*, is entirely dependent for its own reproduction on its host becoming pregnant; it has been postulated that a factor, required by the flea for ovarian development, is only present during the last week of host pregnancy[1,2]. It has also been shown that the corticosteroids and oestradiol stimulate maturation of the ovaries and accelerate the rate of defecation[3]. These findings suggested the possibility that reproductivity might