From the foregoing account it is evident that in *Nauphoeta cinerea* there are intimate pairing and crossing-over segments in the homologues in each bivalent. The phenomenon of crossing-over, interstitial or distal, generally does bring about recombination of characters; but how conspicuous this phenomenon is, depends upon how much the segments involved are genetically active. JOHN and LEWIS have attached rather excessive importance to restriction of recombinations in *P. americana* and have taken it as strong evidence to rule out the phenomenon of crossing-over and hence the chiasmate meiosis in this and certain other roaches. But now having been convinced about the occurrence of chiasmata even in *P. americana*, the 'non-chiasmate meiosis' hypothesis of JOHN and LEWIS for *P. americana* and 'certain other roaches' has to be given up. In addition to *Nauphoeta cinerea*, I have material on hand to show that clear chiasmata do occur in some more genera of *Blattidae* like *Periplaneta*, *Blatta*, etc. However, before totally rejecting the 'non-chiasmate meiosis' hypothesis in roaches, it is necessary to study meiosis in many more genera and species of this insect group.

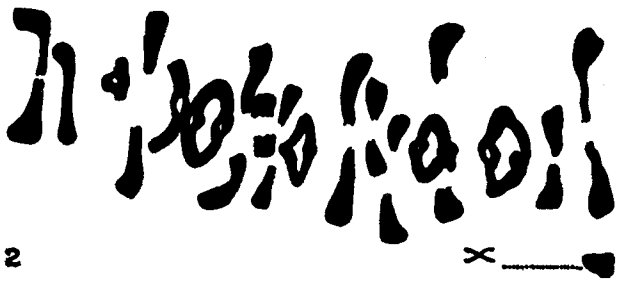

Fig. 2. Metaphase I configuration. × 2000.

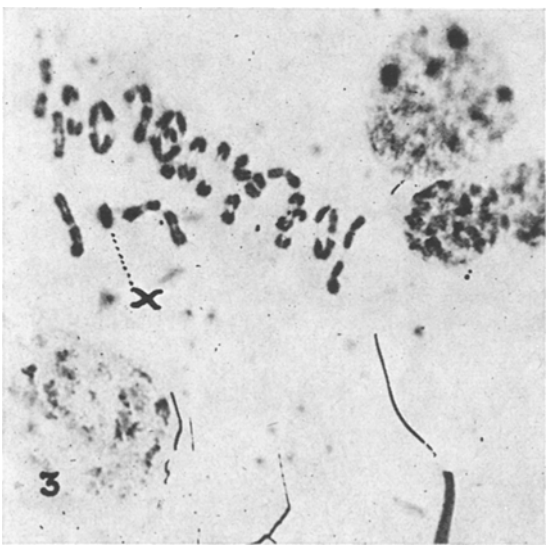

Fig. 3. Early anaphase I. × 2000.

Résumé. Nauphoeta cinerea est un des Cafards chez lesquels le chiasma de la méiose a été nettement observé. Ce cas vient à l'appui de l'assertion de SUOMALAINEN[2] selon laquelle des chiasmas se présenteraient sous une forme soit «cachée» soit «visible» chez tous les Cafards. La «méiose sans chiasma» que JOHN et LEWIS[3-5] supposent existes au moins chez *P. americana* n'est pas non plus confirmée par nos recherches.

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[8] I wish to thank one of the research scholars of the Department, Mr. V. L. KALLAPUR, for sparing readily some specimens of the roach for my work. Constructive criticisms by my colleague Dr. R. M. PATIL are also acknowledged.

The Local Protective Effect of Potassium Chloride on the Depilatory Action of X-Rays in Young Mice

The depilatory action of X-rays in young mice a few days old is a suitable method for testing the local radioprotective effects. Various substances were found to exert local radioprotection on the pilary system of 8-day-old C57 black mice. Among them cysteamin and vasoactive substances, like histamine, tryptamine and 5-hydroxytryptamine, were successfully tested[1-3]. Local radioprotective effects were demonstrated by the various polysaccharide compounds[4,5]. Furthermore, local traumatism, induced for example by an intracutaneous injection of distilled water, may increase the radioresistance of the pilary system[6,7]. During our experiments the local radioprotective effect of s.c. injection of isotonic potassium chloride solution was observed.

Eight-day-old mice of the C57 black strain, irradiated with a single whole-body exposure of 550 R (TUR apparatus, 180 kV, 15 mA, filtration 0.5 mm Cu and 0.5 mm Al, dose rate 79 R/min) were used. Under these conditions a complete depilation on the 8th day after irradiation is observed in control mice. The experimental mice were injected s.c. (a thin needle used) into the lumbo-sacral region with 0.07 ml of isotonic solutions (291 mOsm/l) of sodium chloride or potassium chloride in deionized water. Before being injected, the solutions were warmed to 37 °C. The pH values of the solutions varied between 6.4 and 6.7 with a slightly higher value for potassium chloride. As demonstrated in preliminary experiments, these small pH differences were not responsible for the radioprotective effects achieved. The solutions were injected either shortly before irradiation (up

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Table I. The local radioprotective effect of sodium and potassium chloride

		No. of animals	Protection	No protection
Shortly before irradiation	NaCl	29	2	27
	KCl	29	26	3
60 min before irradiation	NaCl	8	–	8
	KCl	10	–	10
Shortly after irradiation	NaCl	8	–	8
	KCl	10	–	10

the lumbo-sacral region under slight ether anaesthesia. After awaking the animals and stabilization of the electrode in the tissue, the tested solutions were injected around the tip of the electrode. The changes of oxygen tension were registered for 10 min after the injection of the solutions. As demonstrated in Table II, the potassium chloride induces, after a short-term increase, a marked drop of oxygen tension with the maximum in the 3rd min after injection. The protective effect of isotonic potassium chloride on the pilary system of young mice may be thus conditioned by the local hypoxic state.

Tabelle II. The mean values (± S.E.) of the oxygen tension in subcutaneous tissue expressed in percent of the initial value (100%) after the injection of sodium and potassium chloride

	Minutes after the injection									
	1	2	3	4	5	6	7	8	9	10
NaCl	90	94	101	99[a]	94	92	94	98	104	102
($n = 4$)	±5	±6	±8	±6	±7	±7	±7	±7	±7	±6
KCl	123	74	63	68[a]	74	77	82	82	85	89
($n = 5$)	±39	±41	±14	±5	±10	±18	±22	±23	±21	±18

[a] The values are significantly different (Wilcoxon's test of order, $P < 0.02$).

to 4 min) or 60 min before irradiation, or shortly after irradiation (up to 4 min). 8 days after irradiation the local radioprotective effects were evaluated. The complete absence of fur indicated no protection. Local protection was evidenced by the abundant fur present at the site of injection.

The results summarized in Table I indicate a highly significant protection of potassium chloride injected shortly before irradiation (when compared with sodium chloride effect, $\chi^2 = 36.5$, $P < 0.001$). Because of the known effects of potassium on the contractile state of the vascular smooth muscle[8], the mechanism of its radioprotective effect may be connected with the changes in the tissue oxygen supply. In order to test this possibility, the local oxygen tension was measured in the subcutaneous tissue. The mice were fixed and the needle of Beckman oxygen microelectrode was inserted s.c. into

Zusammenfassung. Wenn isotonische Kaliumchloridlösung vor einer Bestrahlung mit 550 R lokal eingespritzt wird, übt sie eine Schutzwirkung auf das Haarsystem der C_{57} acht Tage alten schwarzen Mäuse aus. Dieser Effekt kann durch die vasoaktive Wirkung des Kaliums und durch die resultierende lokale Hypoxie erklärt werden.

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Giant Histiocytes after Cyclophosphamide

The formation of enlarged or giant cells in quickly renewing tissues following treatment with cytostatic drugs has been commonly observed in experimental[1-3] and clinical studies[4-7]. Since the reticuloendothelial system (reticulum cells, histiocytes) seems capable of cell renewal in the steady state[8,9] and even more after a suitable stimulus (antigens, particles)[10,11], we supposed that also histiocytes can present patterns of nuclear and cytoplasmic enlargement or giantism after treatment with cytostatic drugs; if this is true, the giant cells thus formed may still demonstrate phagocytic activity. The purpose of this communication is to present evidence supporting this assumption.

Twenty Morini albino mice, random bred, males weight 25 g, were injected i.p. with 0.4 ml of a 1% solution of trypan blue (Merck) in saline. After 24 h, 15 of them were given an i.p. injection of 200 mg/kg of cyclophosphamide (Endoxan ®); this treatment was repeated in the following days with 24 h intervals. 5 mice injected only with trypan blue served as controls. Mice were killed under ether anaesthesia in groups of 3 animals every time at the 24th, 72nd and 96th h after the first administration of cyclophosphamide. Bone marrow smears were performed within 10 min after the beginning of ether narcosis, prepared with a fine brush, dried quickly and stained with May-Grünwald-Giemsa and neutral red.

Results. (1) Some reticuloendothelial cells of the bone marrow, that have phagocytized trypan blue, present patterns of nuclear and cytoplasmic giantism after treatment with cyclophosphamide (Figure); this is clearly