Die Chromosomenzahlen der ausgewerteten Knochenmarkzellen aller untersuchten Weibchen sind in der Tabelle aufgeführt. Das Ergebnis der Analysen an Tier Nr. 5 geht ebenfalls aus der Tabelle und den Figuren 1, 2 und 3 hervor: Der diploide Chromosomensatz in allen vollständigen Metaphaseplatten enthält nur 41 Chromosomen gegenüber der modalen Zahl von 42. Bei näherer Betrachtung fällt in allen untersuchten Zellen das neue submetazentrische Chromosom auf, das aus der zentrischen Fusion zweier akrozentrischer Chromosomen entstanden ist. Die Zellen dieses Tieres wurden auf 2 Filmen photographiert. An Vergrösserungen der Aufnahmen

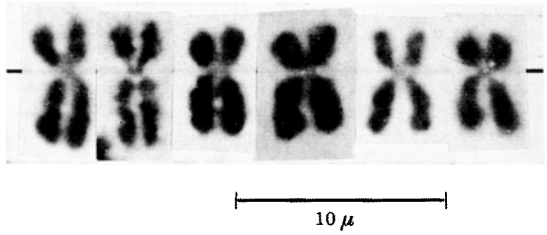

Fig. 3. Neue, submetazentrische Chromosomen aus 6 verschiedenen Zellen des gleichen Tieres wie in Figur 1.

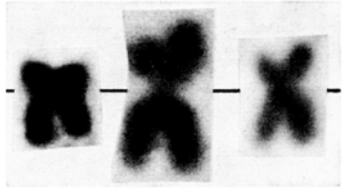

Fig. 4. Neue, submetazentrische Chromosomen anderer weiblicher Laborratten des gleichen Stammes, in deren Knochenmark nur selten diese Zentrenfusion zu beobachten war. Der Abbildungsmaßstab ist verschieden.

haben 2 Beobachter den Armindex des neuen Chromosoms bestimmt: Film A: 1,44 ± 0,28 und 1,45 ± 0,20; Film B: 1,47 ± 0,23 und 1,46 ± 0,16. Besonders zu beachten ist, dass die nach Photographien und mikroskopischer Kontrolle ausgewerteten Metaphaseplatten bei 4 von den 7 anderen Tieren auch vereinzelt 41 Chromosomen enthalten (Tabelle). Diese hier vorhandenen neuen Chromosomen sind ebenfalls submetazentrisch (Figur 4).

Damit liegt ein weiterer Fall einer individuellen Zentrenfusion bei einem normalen Phänotyp vor. Leider konnten keine anderen Gewebe als das Knochenmark untersucht werden, so dass die Frage nach einem Chromosomenmosaik nicht beantwortet werden kann. Da das betreffende Tier nicht zur Zucht verwendet worden war, sind auch keine Aussagen über den Genotyp möglich. Auch die Eltern sind unbekannt. Über die Möglichkeiten der Entstehung der Fusion soll daher in diesem Fall nicht spekuliert werden (siehe dazu HERSCHLER und FECHHEIMER[12]). Die Tendenz zur Fusion der möglicherweise gleichen akrozentrischen Chromosomen ist anscheinend in diesem Stamm bei den meisten Tieren vorhanden gewesen. Aber nur in einem Tier war die Fusion allgemein aufgetreten[18].

Summary. A centric fusion of 2 acrocentric chromosomes in a female laboratory rat is described. The phenotype was normal. The new chromosome is submetacentric. Other animals of the same group showed such new chromosomes only sporadically. No information is available of chromosome mosaic, fertility or genetics of this animal.

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Thymidine-Teratogenesis in Different Species of the Genus *Drosophila*

In a recent publication[1], the author reported on the teratogenic effect of thymidine in *Drosophila melanogaster*. The morphological abnormalities observed were (1) increase in the number of the scutellar bristles (2) anomalies of the wing-veins (3) clipping of the wings (4) irregularities of the abdominal bands and (5) malformation of the legs. The number of flies affected varied from 30–75% in various repeats.

As is well known from medical studies, the biological effects of a chemical compound not only depend on its chemical structure and other physical properties, but the genetical constitution of the organism itself plays an equally important role regarding the uptake and assimilation of the chemical under investigation. With this in mind, the following investigation was planned to study the effect of genetic diversity.

The experiment was performed under exactly similar conditions as reported previously. Different species of the genus *Drosophila* (*D. funebris, D. mercatorum, D. simulans, D. hydei and D. subobscura*) and the Phorid fly *Megaselia scalaris* were reared on thymidine-containing medium (at 2% concentration) and the progeny F1 checked for visible morphological abnormalities. Along with the test cultures, control cultures were started on the normal medium.

In various repeats with *D. simulans, D. mercatorum* and *D. funebris*, only the morphological abnormalities as mentioned above for *D. melanogaster* were observed, the number of affected flies also being of the same order. In *D. hydei* the present concentration proved to be too toxic and the pupation was entirely suppressed. In *D. subobscura* and *Megaselia scalaris*, no teratogenic effect was observed at all. In control cultures, particularly for

[1] O. PARKASH, Experientia *23*, 859 (1967).

D. funebris, only about 1% of the flies showed an increased number of scutellar bristles and irregularities of the abdominal stripes, whereas in control cultures for other species, the percentage of affected flies was still smaller. Wing and vein anomalies were never observed.

The present simple experiment provides further evidence of the differential effect of the chemical compounds (thymidine) in organisms (different species of the genus *Drosophila*) with different genetical constitutions. The negative effect in *D. subobscura* and *Megaselia scalaris* may be due to either (a) thymidine not being taken up at all or (b) if taken up, acting as a normal constituent. Autoradiographic studies are needed to decide various points[2].

Zusammenfassung. Der Autor hat bereits früher über den teratogenen Effekt von Thymidin bei *D. melanogaster* berichtet. Die vorliegende Arbeit befasst sich mit demselben Phänomen bei anderen *Drosophila*-Arten und *Megaselia scalaris* (Phoridae). Während der teratogene Effekt bei *D. simulans*, *D. mercatorum* und *D. funebris* der gleiche wie bei *D. melanogaster* ist, tritt bei *D. subobscura* and *Megaselia scalaris* keine teratogene Wirkung auf. Die für die genannten Arten verwendete Thymidinkonzentration erweist sich für *D. hydei* als stark toxisch und verhindert die Verpuppung vollkommen. Das Ergebnis zeigt, dass verschiedene genetische Systeme sehr unterschiedlich auf ein und dieselbe chemische Substanz reagieren können.

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[2] This work was done in the Institute of Biology of the University of Vienna (Head: Prof. Dr. F. Mainx) and the author is thankful for guidance and laboratory facilities.

Polymorphism in Natural Populations of *Drosophila* for the Ability to Withstand Temperature Shocks

Single inseminated founder females of *Drosophila melanogaster* derived from the same population have been shown to lead to strains which differ genetically for several quantitative traits. Three are morphological (scutellar and sternopleural chaeta numbers, and egg length) and 2 are behavioural (mating speed and duration of copulation)[1-3]. It is likely that the differences between the strains are genetic in origin, arising from genetic differences between the founder females. This is direct evidence that the wild populations are polymorphic for genes (or polygenes) controlling these traits[4]. Even though it has been argued for many years[5] that polymorphism for polygenes is expected in outbreeding species, these results form its most general demonstration so far. The polymorphism for scutellar chaeta number has been exploited by Hosgood, MacBean and Parsons[6,7], who found that when directional selection for high chaeta number was based on those strains which had a high scutellar chaeta number, extremely rapid responses were obtained.

In this paper we extend our observations to a more physiological trait, namely the effect of a high temperature shock (33.5 °C for 24 h on flies 7 days of age) on survival at 7 days after the completion of the shock. Three strains which have been scored for the other traits mentioned above, and which were derived from single inseminated females collected at Leslie Manor, Victoria in December 1964 were used. Testing was carried out at the 7th, 18th, 30th and 40th generations in the laboratory by exposing 2 replicates of 25 flies of each sex to the temperature shock. Two further replicates were kept at 25 °C continuously for controls. Flies were cultured and stored as virgins on standard medium seeded with yeast at 25 °C for the 7 days prior to the temperature shock, and returned to 25 °C after the shock. Percentage mortalities at 7 days after the shock were calculated.

Mean percentage mortalities of control and temperature shocked males and females are given in Table I, and an analysis of variance of the data in Table II. In both sexes

Table I. Percentage mortality of control and temperature shocked flies at 7 days after the shock

Strain		Control 1	Control 2	Control 3	Temperature shocked 1	Temperature shocked 2	Temperature shocked 3
Generation	7 ♀	8	4	2	4	8	2
	♂	2	14	2	2	10	12
	18 ♀	0	0	4	4	0	10
	♂	10	4	0	4	16	8
	30 ♀	4	6	4	6	20	30
	♂	12	2	2	14	20	26
	40 ♀	4	4	2	50	76	2
	♂	4	4	8	42	98	12
Mean	♀	4.0	3.5	3.0	16.0	26.0	11.0
	♂	7.0	6.0	3.0	15.5	36.0	14.5

Each entry is the mean of 2 replicates of 25 flies.

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[2] S. M. W. Hosgood and P. A. Parsons, Aust. J. biol. Sci. *20*, 1193 (1967).
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[7] S. M. W. Hosgood, I. T. Macbean and P. A. Parsons, Molec. Gen. Genet. in press (1968).