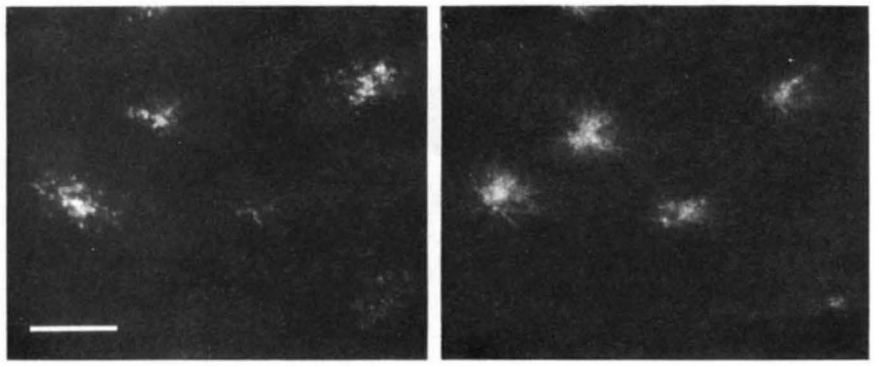
Parasites in *Drosophila* embryos

SIR—We wish to alert people studying early embryonic development in the fruitfly *Drosophila melanogaster* of the possible presence of commensal parasites in some stocks similar to those described in *D. simulans* by S.L.O'N. and T.L.K. on page 178 of this issue[1]. Although these stocks appear to grow normally, clusters of DAPI-stainable spots can be seen in their early embryos. We have observed these organisms in some wild-type *D. melanogaster* embryos when centrosomes have dissociated from nuclei following the inhibition of DNA replication with aphidicolin[2]. In such cases, they are clustered around the centrosomes with a 'starburst'-like appearance (J.R. and D.M.G., unpublished data). Such starbursts can also be seen around free centrosomes and asters in some stocks in which nuclear division is blocked by mutation[6] (H.L. and M.F.W., unpublished data; see figure). The starbursts can also cluster around the poles of mitotic spindles. This apparent association of starbursts with the mitotic apparatus is intriguing, and suggests an adaptation that would assist their transmission.



Commensal parasites associated with asters in a *D. melanogaster* embryo. The left-hand panel (DNA) is DAPI-stained. The parasites are visible as dots clustered around the positions of asters (right-hand panel, stained with anti-tubulin antibodies; ref. 6 and references therein) and centrosomes (data not shown). The photograph shows a portion of a 0–2-hour-old embryo produced by a *fs (1) Ya*^{2} mother[4,6] and an *ms (3) k8l* father[5]. The embryo is arrested at pro-nuclear fusion, but the pronuclei are not located in the portion of the embryo shown in this photograph. Scale bar, 10 μm.

Commensal parasites can be eliminated by growing flies for one generation on 0.025% tetracycline followed by growth on tetracycline-free medium for a further generation to allow the flies to recover full fertility[1] or for one generation on 0.25 μg per ml tetracycline followed by 5 days on 1 mg per ml tetracycline[6]. Care should be taken as these treatments may not permanently remove the parasites from the stock (T.L.K. and S.L.O'N.; M. Turelli, personal communication).

The commensal microorganisms may correspond to the maternally inherited commensal parasites reported by Wolstenholme[3]. We suspect that they have not been previously observed in DAPI-stained embryos because they can be seen easily only in very early or in growth-arrested embryos. Most previous studies of embryogenesis have focused on syncytial or later stages, in which the many *Drosophila* nuclei make the much fainter fluorescence of the parasites hard to see. By the blastoderm stage the parasites are no longer easily detectable in the somatic portion of embryos, although they can still be seen in pole cells[1]. Endosymbionts can have profound effects on early development in certain crosses of *D. simulans* or of other insects (see ref. 1), but we do not know whether the parasites we have observed would cause similar effects in *D. melanogaster*. In addition to their interference with phenotypic analysis, the possibility that the parasites may exert other effects should be kept in mind.

D.M. GLOVER
J. RAFF

CRC Cell Cycle Research Group,
Department of Biochemistry,
The University,
Dundee DD1 4HN, UK

T.L. KARR

Department of Biochemistry and
S.L.O'NEILL

Department of Entomology,
University of Illinois,
Urbana,
Illinois 61801, USA

H. LIN
M.F. WOLFNER

Section of Genetics and Development,
Cornell University, Ithaca,
New York 14853-2703, USA

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Unique historical serendipity

SIR—Solomon H. Snyder in his News and Views article[1] *Planning for Serendipity* says "By the late 1930s, the chemical structure of Δ^9-THC was sufficiently well known for drug companies to be able to synthesize analogues. . .".

In our paper[2], published in 1940, we reported the first isolation of an active molecule from the marijuana plant. Only in the late 1940s did R. Adams in the United States and A. Todd in Britain identify the psychomimetic molecule in marijuana as tetrahydrocannabinol (THC). Adams' synthetic Δ^3-THC was found not to be the active agent during the 1960s. Synthesis of the active ingredient did not occur until 1967.

It would indeed have been a rude awakening for my colleagues and I at Caltech to find, after one year's research, that the active component had not only been isolated but synthesized, a unique historical case of serendipity.

C. Z. WAWRA

Le Pont Neuf,
22420 Tregrom, France

SNYDER REPLIES—Wawra is correct that Δ^9-THC was not known in those days. My statement was that the general THC structure had been reasonably clarified by 1940. Indeed, Roger Adams had isolated a mixture of tetrahydrocannabinols in sufficient purity to administer them in a controlled study to prison volunteers on New York's Welfare Island, obtaining clear-cut psychoactive effects[3], as part of Mayor LaGuardia's marijuana commission.

SOLOMON H. SNYDER

Department of Neuroscience,
Johns Hopkins University, School of Medicine, Baltimore,
Maryland 21205, USA

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Alzheimer's *et al.*

SIR—We applaud St George Hyslop *et al.* (*Nature* **347**, 194–197; 1990) for publishing their extensive data, disappointing as they may be for those who had hoped that Alzheimer's disease might turn out to be genetically homogeneous. But we wonder if 56 authors are warranted. With the human genome project under way as a collaborative endeavour, it seems to us reasonable that a single article should not have more authors than we, as a species, have chromosomes.

FREDERICK HECHT
BARBARA K. HECHT
ET AL.

Children's Mercy Hospital,
Kansas City, Missouri 64108, USA