headful mechanism was first proposed by Streisinger *et al.*[10] for phage T4, and has been shown to be a common mode of DNA packaging[5,11,12]. However, the molecular mechanism of headful packaging is unclear. In context with Mu packaging, A.I.B. *et al.*[3] discussed two alternative ways in which a small amount of host DNA can be packaged at the left end. In one mechanism, a specific site at the left end is recognized by a DNA cutting protein, the DNA is then cut to the left of the site randomly, and the cleaved DNA condensed into the heads being assembled. In the second mechanism, a packaging protein recognizes a specific sequence at the left end, the DNA is then folded and perhaps pushed into the heads being assembled, after which the DNA is cut at the left and right end.

It has been observed that the phage tail is attached at the right end of Mu[13,14]; presumably, the right end is the last to be packaged, and the first to be ejected, suggesting that the left and right ends are being cut in different time and space. However, the minimum size of the host DNA at the left end is ~56 bp. It is difficult to reconcile this observation with the first mechanism in which the first event is cutting of the left end by an enzyme behaving like a type I restriction enzyme. The enzyme would have to recognize a site on the left end but start cutting only after 56 bp. As a working hypothesis, we favour the idea that the DNA is rolled or packaged first, in such a way that the first 56 host base pairs at the left end are not available for cutting. This could either mean that the left end is condensed first, and cut, after which the rest of the DNA is packaged in, or that the whole genome is packaged, and then the left and right end cuts are made.

How can we explain the regular spacing of the cuts? Note that the distance from the beginning of one block of 6 bp to the beginning of the second block is ~11 bp, which is about one turn of the double helix. It seems that the DNA is being measured for packaging, in units of helical turns. This measurement could be brought about by proteins that bind at each turn of the helix. The proteins perhaps cover one half of the turn so that only the other half is available for cleavage.

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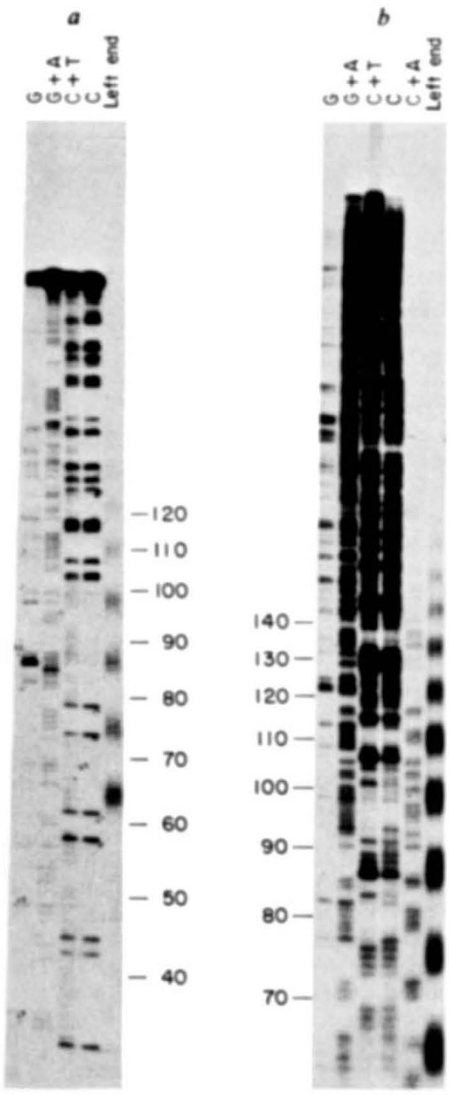

Fig. 2 Determination of the lengths of the left-end host sequences by electrophoresis in sequencing gels. Bacteriophage Mu particles were purified by a caesium chloride density gradient centrifugation. The DNA was extracted with phenol. To label the ends, the 5′ phosphates were first removed by treating the DNA with alkaline phosphatase[15]. The ends were labelled using [γ-^{32}P]ATP (>2,000 Ci mmol^{-1}) and polynucleotide kinase. The DNA was then cut with *Hin*dIII and the digest run on a 6% 1:40 acrylamide gel. The 1,000-bp left-end fragment was isolated[15] and cut with *Hinf*. The digest (left end) was run on 8% polyacrylamide gels containing 7 M urea, together with DNA samples that were being sequenced; *a* and *b* are autoradiograms of 8% sequencing gels run for different times. The xylene cyanol dye marker was three-quarters of the way down (*a*) or off (*b*) the gel. Portions of double-stranded DNA, labelled with ^{32}P at one 5′ end, were partially cleaved at guanines (G), guanines and adenines (G+A), cytosines and thymines (C+T), cytosines (C), and cytosines and adenines (C+A), respectively, using the method of Maxam and Gilbert[15]. The numbers indicate the size of the fragments as seen on the sequencing gels.

Errata

In the article 'IgG antibodies to phosphorylcholine exhibit more diversity than their IgM counterparts' by P. J. Gearhart *et al.*, *Nature* **291,** 29–34 (1981), Figures 1 and 2 were transposed.

In the letter 'Somatic and behavioural postnatal effects of fetal injections of nerve growth factor antibodies in the rat' by L. Aloe *et al.*, *Nature* **291,** 413 (1981), the received date was given as 7 November 1980. The paper was originally submitted on 7 November 1979; the date of receipt of the revised manuscript was 17 November 1980.

The cover caption for issue no. 5813 (28 May–4 June) of *Nature* was incorrect. The correct version from the authors is 'Homozygous (pigmented and unpigmented) progeny from heat-shocked eggs of heterozygous mothers'.