genomic library of human Burkitt's lymphoma DNA[9]. One of these clones induced transformation of NIH 3T3 cells and was designated human *Blym-1*[9]. Human *Blym-1* has also been found to transform primary human foreskin fibroblasts to anchorage-independence[10] and to induce growth of BALB/c 3T3 cells in PDGF-free medium (Fig.1) using a modification of the co-selection assay described by Armelin *et al.*[11]. Human *Blym-1* was also transferred to NIH cells transformed by genomic DNAs of Burkitt lymphoma cell lines[9]. Under stringent conditions, human *Blym-1* hybridizes to a unique sequence in human DNA[9] and has been mapped to a unique sequence in human DNA[9] and has been mapped to a unique chromosomal locus by *in situ* hybridization[12]. The nucleotide sequence of human *Blym-1* indicated that it was overall 50–60% homologous to mouse LINES-TE and thus represented a related but divergent human gene which also shared partial homology to transferrin[13]. Consistent with the hybridization data, the nucleotide sequence of human *Blym-1* does not show significant homology to human LINES.

The LINES elements have been conserved throughout mammalian evolution and contain open reading frames which appear to have evolved under selection for protein function[4,14]. It is thus of interest that a portion of mouse LINES element (LINES-TE) can induce transformation and that a human transforming gene (*Blym-1*) is distantly related to the LINES family.

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1. Goubin, G., Goldman, D.S., Luce, J., Neiman, P.E. & Cooper, G.M. *Nature* **302**, 114-119 (1983).
2. Cooper, G.M., Okenquist, S. & Silverman, L. *Nature* **284**, 418-421 (1980).
3. Hattori, M., Hidaka, S. & Sakaki, Y. *Nucleic Acids Res.* **13**, 7813-7827 (1985).
4. Loeb, D.D. *et al. Molec. cell. Biol.* **6**, 168-182 (1986).
5. Muller, R. & Muller, D. *EMBO J.* **3**, 1121-1127 (1984).
6. Molders, H., Defesche, D., Muller, T.I., Bonner, U.R. & Muller, R. *EMBO J.* **4**, 693-698 (1985).
7. Takahashi, M. Ritz, J. & Cooper G.M. *Cell* **42**, 581-588 (1985).
8. Cooper, G.M. & Neiman, P.E. *Nature* **287**, 656-659 (1980).
9. Diamond, A., Cooper, G.M., Ritz, J. & Lane, M.-A *Nature* **305**, 112-116 (1983).
10. Sutherland, B.M., Bennett, P.V., Freeman, A.G., Moore, S.P. & Strickland, P.T. *Proc. Natn. Acad. Sci. U.S.A.* **82**, 2399-2403 (1985).

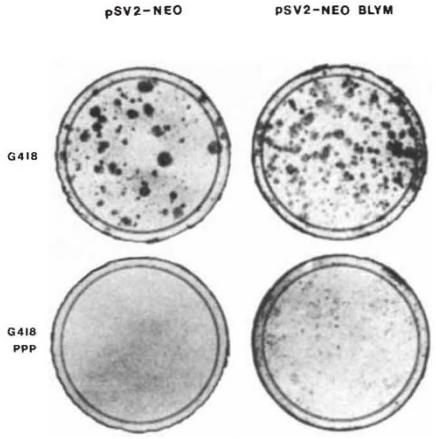

Fig.1 Transformation of BALB 3T3 cells by human *Blym-1*. BALB/c 3T3 cells were transfected with 10 μ of pSV2neo (ref.15) or pSV2neoBlym, which contains the 1-kilobase *Eco*RI fragment of pttuBlym-1 (ref.13) inserted into the *Eco*RI site of pSV2neo. Recipient cells were subcultured 3 days after transfection into medium containing G418 (500 μg ml^{-1}) and either 10% calf serum (designated G418) or 10% platelet-poor plasma (designated G418 PPP)[11]. Plates were stained and photographed 14 days after transfection.

11. Armelin, H.A. *et al. Nature* **310**, 655-660 (1984).
12. Morton, C.C. *et al. Science* **223**, 173-175 (1984).
13. Diamond, A., Devine, J. & Cooper, G.M. *Science* **225**, 516-519 (1984).
14. Singer, M.F. & Skowronski, J. *Trends biochem. Sci.* **10**, 119-122 (1985).
15. Southern, P.J. & Berg, P. *J. molec. appl. Genet.* **1**, 327-341 (1982).

Imanishi and Halstead: intraspecific competition?

SIR—Halstead has done a service to readers of *Nature* by bringing to their attention[1] the work of Imanishi, the Japanese evolutionist. His treatment of the scientific basis of Imanishi's theory is, however, unbalanced and, perhaps unconsciously, a tad culturally biased. He states, for example:

> Imanishi's evolutionary theory is a poetic vision, it is beautiful to contemplate but it is a dream and it is Japanese in its unreality . . . unhappily it has no place in the scientific understanding of the real world.

Halstead implies that there is a particular unreality peculiar to the Japanese culture, but it is the second half of the quotation on which I wish to comment. What is the essence of Imanishi's "poetic vision", and does it deserve such harsh criticism? Halstead informs us that the theory minimizes the role of competition in community dynamics (based in Imanishi's field work on "habitat segregation") as well as in speciation. The group receives greater emphasis than the individual; harmony is emphasized relative to struggle.

In rebutting the scientific basis of Imanishi's theory Halstead deals briefly with two aspects of the theory: (1) the role of co-operation in evolution; and (2) the accumulated evidence on the role of interspecific competition in community dynamics. Both treatments are superficial at best and do not reflect the current turmoil in the scientific literature on both the role of interspecific competition in habitat partitioning and that of natural selection in speciation. For example, Halstead, in relation to evidence for the importance of competition at the community level, cites Schoener[2] but fails to indicate that a subsequent issue of *American Naturalist* was devoted to a contentious debate on this very question. Imanishi no doubt would not deny that interspecific competition exists (as Schoener documents), but the real issue is whether this process is critical to community dynamics or speciation. Even a cursory glance at the recent ecological literature is sufficient to conclude that there is far from a concensus.

More crtitically, perhaps, Halstead appears to have confused the roles of intraspecific and interspecific competition in the evolutionary synthesis. His confusion leads to unjustified characterization of Imanishi's theory. Halstead states, without substantiation, that many other evolutionary theories reject the role of intraspecific competition. He then states that the novelty of Imanishi's theory is the rejection of interspecific competition as well. As August Weismann[3], the architect of neo-darwinism, so clearly states in the centenary volume of Darwin's birth:

> The 'struggle for existence', which Darwin regarded as taking the place of the human breeder in free nature, is not a direct struggle between carnivores and their prey, but is the assumed competition for survival between individuals *of the same* species . . . (emphasis in original)

Natural selection within darwinism and neo-darwinism required intraspecific competition. Surely not just Imanishi's but any theory (I wish Halstead had been more specific on these other theories) that rejects the role of such competition in evolution is non-darwinian.

In sum, Halstead's evaluation of the role of competition in speciation in relation to both Imanishi's theory of evolution and the evolutionary synthesis is misleading. It is unfortunate that his more-detailed critique of Imanishi's work is in Japanese and thus will have restricted critical review. Given the contents of the *Nature* article, however, the Japanese research community should not consider Halstead's position as necessarily being representative of the present literature on ecology and evolutionary biology.

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1. Halstead, B. *Nature* **317**, 587-589 (1985).
2. Schoener, T.W. *Am. Nat.* **122**, 240-285 (1983).
3. Weismann, A. in *Darwin and Modern Science* (ed. Seward, A.C.) 18-65 (Cambridge University Press, 1909).