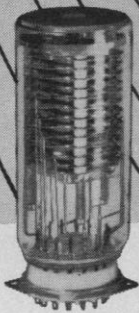


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are not consistent with realistic research economics. Such a special technical need of a significant section of the biological and biomedical research community could be more effectively accomplished by establishing a central laboratory within or sponsored by the National Institutes of Health or an appropriate institute or foundation. The establishment of such a center for both the detection and elimination of the virus would provide greater assurance that costly research studies in which mice are used would not be subject to misinterpretation as a consequence of the presence of an uncontrolled agent that alters immunological and other basic physiological parameters.

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References

1. V. Riley, *Prog. Med. Virol.* **18**, 198 (1974).
2. ———, in *Busch Methods in Cancer Research* (Academic Press, New York, 1968), vol. 4, pp. 493–618.
3. ———, F. Lilly, E. Huerto, D. Bardell, *Science* **132**, 545 (1960); A. L. Notkins, *Bacteriol. Rev.* **29**, 143 (1965).
4. K. E. D. Rowson and B. W. J. Mahy, in *Lactic Dehydrogenase Virus*, S. Gard and C. Hallaver, Eds. (Virology Monograph 13, Springer-Verlag, New York, 1975).
5. M. B. A. Oldstone and F. J. Dixon, *J. Immunol.* **106**, 1260 (1971); A. L. Notkins, S. Mahar, C. Scheele, J. Goffman, *J. Exp. Med.* **124**, 81 (1966); S. E. Mergenhagen, A. L. Notkins, S. F. Dougherty, *J. Immunol.* **99**, 578 (1967); K. E. K. Rowson and B. W. J. Mahy, *J. Gen. Microbiol.* **39**, xi (1965); M. J. Snodgrass and M. G. Hanna, Jr., *J. Nat. Cancer Inst.* **45**, 741 (1970); R. J. Howard, A. L. Notkins, S. E. Mergenhagen, *Nature (London)* **221**, 873 (1967); V. Riley, W. Braun, M. Ishizuka, D. Spackman, *Proc. Natl. Acad. Sci. U.S.A.* **73**, 1707 (1976).
6. V. Riley and D. Spackman, in *Modulation of Host Immune Resistance in the Prevention or Treatment of Induced Neoplasias*, M. A. Chirigos, Ed. (Government Printing Office, Washington, D.C., 1977), pp. 319–336.
7. D. Spackman and V. Riley, *Proc. Am. Assoc. Cancer Res.* **16**, 170 (1975); G. A. Santisteban, V. Riley, M. A. Fitzmaurice, *Proc. Soc. Exp. Biol. Med.* **139**, 202 (1972).
8. V. Riley, *Nature (London)* **220**, 1245 (1969); D. Spackman and V. Riley, *Proc. Am. Assoc. Cancer Res.* **14**, 113 (1973); V. Riley, *Pathol. Biol.* **18**, 757 (1970); ———, D. Spackman, M. A. Fitzmaurice, J. Roberts, J. S. Holcenberg, W. C. Dolowy, *Cancer Res.* **34**, 429 (1974); V. Riley, H. A. Campbell, C. C. Stock, *Proc. Soc. Exp. Biol. Med.* **133**, 38 (1970).
9. V. Riley, J. D. Loveless, M. A. Fitzmaurice, W. M. Siler, *Life Sci.* **4**, 487 (1965); A. L. Notkins and C. Scheele, *J. Nat. Cancer Inst.* **33**, 741 (1964).
10. V. Riley and D. Spackman, in *The Pigment Cell; Melanomas: Basic Properties and Clinical Behavior*, V. Riley, Ed. (Karger, Basel, 1976), pp. 163–173.
11. W. Turner, P. S. Ebert, R. Bassin, G. Spahn, M. A. Chirigos, *Proc. Soc. Exp. Biol. Med.* **136**, 1314 (1971); R. Evans and V. Riley, *J. Gen. Virol.* **3**, 449 (1968).
12. V. Riley, *Science* **153**, 1657 (1966).
13. ——— and D. Spackman, *Lab. Anim.* **6**, 16 (1977).

Xeroxing Life

Barbara J. Culliton's excellent summary of the burgeoning controversy over human cloning (News and Comment, 24 Mar., p. 1314) suggests that once it is full-blown, this one will be dominated by arguments even more specious than those advanced (on both sides) by recombinant DNA research extremists. I am concerned here with only one of the possibilities: doubtless there will be opportunity in the future for ventilation of the others. At issue is the false notion, thus far undisputed by scientists responding to the press, that the product of a single successful nuclear transplantation is a "clone," that is, an *identical copy* (I avoid Jeremy Rifkin's plug for Xerox) of the individual donating the transplanted nucleus. My concern with this specific point is that, more than any other, the idea of mass production of identical persons is repugnant to the laity, perhaps because it is so obvious a departure from the organic way of doing things.

There is, however, no possibility in principle of making copies identical to an individual donor by the method being discussed. All animal ova studied so far, including those of mammals, contain a population of "maternal" messenger RNA molecules, laid down in the egg cytoplasm during oogenesis, and functioning in protein synthesis during development proper (1, 2). Protein synthesis is indispensable for development, and a



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very large fraction of it—perhaps all in some species—is directed during the critical early stages by maternal RNA templates. The maternal messages are not genes, to be sure, but they are immediate products of genes, and they carry an enormous amount of genetic information. A conservative average might be the equivalent of 10,000 structural genes. The DNA from which these templates are copies is that of the *mother's* genome, and in the particular cases most likely to be of interest here, it is specifically DNA of the oocyte that is transcribed into RNA during the period of growth in the ovary (2, 3).

The force of this is that an ovum is *not* a genetic tabula rasa; it is not the indifferent branch upon which a foreign shoot is grafted, nor yet the single somatic plant cell induced by a surrogate ovular fluid to produce an entire plantlet. The animal egg is a highly specialized and comparatively huge cell that contains not only a nuclear genome but also a complex (approximately 10^7 nucleotides) derivative genome in the form of very stable messenger RNA, the function of which is to direct the protein synthesis by which divergences of cell type, central to morphogenesis, eventually appear (3). This derivative genetic information is specifically the mother's, *not* the father's nor, obviously, that of a donor cell selected in the laboratory.

It is still too early to say what identifiable features of the adult phenotype are regularly the unique products of maternal messages, but it is certain that they are not trivial features (2); in addition to the universal processes of cleavage, germ-layer formation, and morphogenetic movements in early development, there are certain to be maternally determined external adult characteristics, for example, the equivalent of left-versus right-handed spiraling in some molluscan shells. The mother's genes therefore make in oogenesis a critical and individual contribution to the outcome of animal development, and must do so even if the zygotic nucleus is removed from the fertilized egg.

There is therefore no possibility that a *literal* copy of the donor individual can be produced by the insertion of a somatic nucleus into recipient cytoplasm of a conveniently available egg. A roughly similar individual, yes; but a carbon copy, no. Only the nuclear genes are likely to be pretty accurate copies of the transplanted set. Yet it will be, I predict, the symbolic and emotional content of the carbon copy idea that most excites the popular imagination.

None of this is meant to cast doubt upon the possibility nor the inherent inter-

est of animal cloning. There are other methods than the one about to be sprung on an unsuspecting world by Rorvik's *oeuvre*. Some of those can work in principle, but nobody has come close to succeeding with them, and there isn't much serious effort anyway. None of the alternatives has been mentioned in the press as yet. There are also variations of the nuclear insertion method, involving more than one generation of recipients, that can work in principle, but they are nearly as remote in practical terms. It takes exquisite skill and knowing how to deal with a preponderance of failures to apply such methods even to amphibian eggs. The mammalian egg is an order of magnitude smaller and more fastidious about its environment; its development is an order of magnitude more complex, and each generation requires gestation in utero.

We have, therefore, a long way to go. It is, however, a way that should not be blocked nor impeded by hysterical appeals to Stop Xeroxing People. Besides, the Xerox Corporation is having enough trouble as it is with its common stock.

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References

1. P. R. Gross, *Curr. Top. Dev. Biol.* 2, 1 (1967); —, K. W. Gross, A. I. Skoultschi, J. V. Ruderman, *Karolinska Symp. Res. Methods Reprod. Endocrinol.* 6, 244 (1973).
2. E. Davidson, *Gene Activity in Early Development* (Academic Press, New York, ed. 2, 1976).
3. W. H. Rodgers and P. R. Gross, *Cell*, in press.

Geological Survey Director

Deborah Shapley (News and Comment, 10 Mar., p. 1054) has cast an unwarranted slur on the selection of Henry W. Menard as Director of the U.S. Geological Survey.

The headline of her article ("Old boy system produces Geologic Survey chief") implies that Menard was selected by the clandestine pick-up-the-phone-and-call-old-friends method of filling unadvertised positions that is so rightly decried today for shutting out qualified candidates.

Nothing in the article supports this implication. Menard is described as being "one of the boys," and it is noted that his name was not on the original list of five candidates. But isn't there a difference between being one of the boys and being selected for a position through an unjust old-boy network?

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