ing tissue cultures for much cancer research are obvious; their disadvantages, once much discussed, are ignored. The loss is, of course, of our ability to understand the dynamic course of the neoplastic process. In the whole animal system there is a progressive development of a series of lesions—well recorded in many organs. These neoplastic lesions have many end points, including regression (more and more commonly perceived), a benign state, invasiveness, and metastasis. Changing carcinogenic stimuli quantitatively or qualitatively can entirely alter the outcome. It is possible to induce lesions that mainly regress, are primarily benign, or predominantly malignant at will. This is not an all-or-nothing phenomenon; it is a pathological response to intracellular injury and clearly, from the range of well-known inciting agents, relatively nonspecific. The complexities of experiments in which many tumors regress are conveniently ignored as unorthodox happenings that must not be allowed to confuse established views.

I have previously suggested that the facts before us suggest that neoplasia may be the intracellular counterpart of inflammation that is predominantly extracellular (*1*). More and more facts have accumulated that are consistent with this hypothesis. It is essential that the incredible advances in molecular biology be used in a broader and more imaginative fashion and that there be a greater willingness to interpret findings in more ways than one.

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Evaluating Clinch River

In his Briefing of 13 May (News and Comment, p. 698), Eliot Marshall describes the expected abundance of electric generating capacity in the southeastern United States into the forseeable future, which has the consequence that the region's electric utilities are not eager to purchase the future production of power from the Clinch River Breeder Reactor (CRBR). The thrust of this description is that the power will not be needed and that it would be expensive in any event. In reality the economics of the project have always been expected to be unfavorable and are irrelevant to its basic justification—which is as an experiment necessary for the ultimate development of a commercial breeder reactor technology. At one time the advocates of the project used its expected near-favorable economics as a sweetening argument for its advancement, and detractors of the project have similarly used its escalating costs as a basis of opposition.

The proper context for evaluation of the CRBR is that of the U.S. breeder reactor program. The proper questions to be asked are whether such a program is needed and, if so, whether the CRBR represents an efficient use of resources for its advancement.

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Game Ranching

M. L. Oldfield (Letters, 7 Jan., p. 8) correctly points out the absence of genetically improved trypanotolerant cattle for use in African tsetse zones. However, her suggestion that wild game ranching provides an alternative to the introduction of cattle should be treated with caution. There are several reasons for this.

1) The economic, cultural, health, and administrative barriers to game ranching and cropping operations are great and have limited their success to anomolous high-income European enclaves in Africa. As a former employee of the Tanzanian Game Division, I am personally aware of the difference between the optimism of the theory and the failure of the practice. Marks (*1*) has provided a review of such issues.

2) Many locations likely to benefit from the spread of trypanotolerant cattle are not suitable game ranching targets. Areas with extensive human settlement claims are unlikely to be amenable to such extensive land uses. The rainforest zone does not share the abundance of large game animals observed in the savanna environments, and its people have heretofore been largely unable to take advantage of mixed farming regimens with a cattle component. Their diets are often deficient in protein, and their crops lack the benefits of manure.

3) Even if game ranching is successful, it does not fully address the range of benefits that are derived from the addition of cattle to a farming system. Of the big four—milk, meat, manure, and motive power—game ranching is designed to provide only meat. Trypanotolerant cattle have a greater potential for providing these other development benefits to subsistence farming systems that lack them today.

4) Organized ranching schemes are likely to divert bushmeat consumption from the diets of the poor to the diets of the rich. Many African people in sparsely populated areas obtain substantial amounts of protein through informal harvesting arrangements; the intrusion of managed ranching would be likely to prevent effective access to protein resources because traditional activities would be labeled poaching and a price tag would be attached to commercial bushmeat.

5) The fear of overgrazing, developed from the very real consequences of cattle population expansion in the wake of tsetse control, need not be automatically transferred to the case of trypanotolerant cattle development. The social structure of traditional herding societies is entirely different from that of societies in the cattle-free tsetse zone. The problem of very low rates of stock slaughter, fostered by the complex social role of cattle in herding societies, is likely to be reversed in societies where cattle are not kept. Here, they are likely to be slaughtered or sold at a rate greater than that of reproduction, as people have little experience with the discipline of herd management. Many attempts to introduce draft animals in tsetse zones have been cut short by a feast. In short, one cannot infer the same consequences from introducing trypanotolerant cattle into tsetse zones as have been observed from the expansion of pastoralists' herds after the removal of tsetse along the margins of traditional rangelands.

There are many reasons to continue work with game ranching, cropping, and domestication schemes. There is a possibility they will find a place in the mix of development strategies for Africa. For the near future, bushmeat will be in diets largely as a result of hunting activities. Likewise, the work with trypanotolerant cattle must proceed so that the potential benefits of such undertakings can be explored as well (*2*). Trypanotolerant cattle are no panacea, but neither is game ranching.

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