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Information for Contributors appears on pages 40–42 of the 1 January 1993 issue. Editorial correspondence, including requests for permission to reprint and reprint orders, should be sent to 1333 H Street, NW, Washington, DC 20005. **Science Telephone:** 202-326-6500, TDD 202-408-7770. **Other AAAS Programs:** 202-326-6400.

LETTERS

Business and Science

As the discoverer of *Thermus aquaticus* (*1*), the organism that is the source of Taq polymerase, I continue to be amazed at what has happened to our science as the result of the "biotechnology" revolution. I refer specifically to the 4 December News & Comment article by Peter Aldhous (p. 1572) stating that Hoffmann–La Roche is taking to court companies who produce and sell this enzyme for use in the polymerase chain reaction (PCR). As I understand it, Cetus took an organism that I freely deposited in the American Type Culture Collection, isolated an enzyme from this organism, and sold the patent to Roche, who now claims a royalty on every use of this enzyme for a particular laboratory procedure. I am not concerned about the money involved, but with how such practices (legitimate or not), stifle the development of scientific research. Where would biology and medicine be today if Walther and Fannie Hesse had patented the use of agar in the plate culture technique that Robert Koch developed in 1882? Agar is a natural product, like Taq polymerase, and the plate culture technique is a laboratory procedure, like PCR. The agar plate technique revolutionized medicine in a manner analogous to the PCR method.

Who do these business types who have sneaked into our scientific research community think they are?

Thomas D. Brock
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1. T. D. Brock and H. Freeze, *J. Bacteriol.* **98**, 289 (1969).

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Measles Vaccine: Titre and Safety

The article "Measles battle loses potent weapon" by Rick Weiss (Research News, 23 Oct., p. 546) discusses the Edmonston-Zagreb (E-Z) measles vaccine, developed by the Institute of Immunology in Zagreb. I would like to comment on some points that may not have been clear. First, the E-Z high-titer vaccine (which contains 10 to 100 times the usual concentration of virus) has been successfully given to Mexican infants (*1*) with no reported death rate that was higher than expected. This contrasts with the puzzling observation that an unusually large percentage of infants given the high-titer E-Z vaccine in Guinea-Bissau died from diseases *other than* measles. Second, Weiss does not mention that another high-titer measles vaccine (Schwarz) has been used with delayed effects similar to those of the high-titer E-Z vaccine used in Guinea-Bissau; thus the problem may be with high titers, not with the E-Z vaccine itself.

Finally, it should be emphasized that the E-Z vaccine has been used in many countries in Europe, Asia, Africa, and Latin America. Millions of vaccinated children have been protected and have not shown side effects. The E-Z vaccine, given in a standard dose, has been approved by the World Health Organization. A recent conference report stated (*2*)

> The evidence examined at this meeting supported the continued use of standard measles vaccinee for all infants in immunization programmes. Standard measles vaccines have been shown to be safe and highly effective and have resulted in significant reduction in morbidity and mortality in numerous countries throughout the world. Measles immunization is generally considered the most cost-effective public health intervention available.

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1. L. E. Markowitz *et al.*, *N. Engl. J. Med.* **332**, 580 (1990).
2. *WHO Wkly. Epidemiol. Rec.* **67**, 357 (1992).

My colleagues and I spent 4 years studying the Edmonston-Zagreb (E-Z) vaccine while doing field research in a rural area of Senegal. Our conclusions with respect to the safety, immunogenicity, and efficacy of this vaccine given at high titer early in life were different from the results of previous studies. In a clinical efficacy trial (*1*), we found a much higher rate of vaccine failure when the high-titer E-Z live measles vaccine was given to infants 4 to 6 months old than when the standard measles vaccine was given to infants 9 to 10 months old (which was the strategy recommended by the World Health Organization for Africa).

The rationale for the recommended use of the high-titer E-Z vaccine was the higher immunogenicity it provides when given to infants 4 to 6 months old and the hope that it would "pass the barrier of maternal antibodies." However, the study done in Mex-