

Letters

Poliomyelitis Vaccines

There are a number of interesting and useful points brought out by David Bodian's article on "Poliomyelitis immunization" [*Science* 134, 819 (1961)], but the value of his article is seriously vitiated by a number of misinterpretations and oversights.

The article castigates the AMA Council on Drugs for its report to the AMA Trustees on the "Present Status of Poliomyelitis Vaccination in the United States." It is difficult to understand how Bodian was led to believe that the AMA Council had recommended the mass use of oral poliomyelitis vaccine "at this time" when a careful reading of the AMA summary statement would indicate that no such recommendation had been made. Yet Bodian clearly implies that the AMA Council made such a recommendation.

Further on, Bodian misinterprets the Council statement that oral poliomyelitis vaccination "renders [persons vaccinated] relatively incapable of spreading the virus to contacts." The context of the statement which he quotes shows clearly that the reference is to the *subsequent* resistance of the vaccinated individual to the spread of virus acquired as a result of a later contact, but Bodian's interpretation carries the ludicrous implication that the AMA Council purportedly indicated that infection of such an individual with a vaccine rendered him incapable of spreading that very infection.

Bodian cites several interesting and useful references to make his point, but some of his statements are contradicted by more recent findings. One example relates to Bodian's statement that vaccination with the Salk vaccine has had a "higher than 90 percent efficacy." Yet one of the individuals whom Bodian quotes on that point has published a subsequent paper [E. R. Alexander, *J. Am. Med. Assoc.* 175, 837 (1961)] indicating that the 90-percent estimate was too high, and that a more accurate

figure is "greater than 80% for three or more doses, and significantly greater for four or more doses." The Council statement that Salk vaccine provided "80 percent or more" effectiveness is thus based on the latest available data.

Furthermore, Bodian indicates that there are no data available to indicate the extent to which a program for mass immunization with oral vaccine has reached individuals who have not been previously reached by a program for immunization with Salk vaccine. May I call attention to the paper by Porter and Wehr [*Public Health Repts. U.S.* 76, 369 (1961)] which points out that, in the city-wide oral vaccine program in Cincinnati, 46 percent of children in all clinics except the Cincinnati Health Department and 66 percent of children in clinics in the lower socioeconomic neighborhoods had not previously received three doses of Salk vaccine. Granted that the Cincinnati study had the special advantage of Sabin's personal presence and reputation, it would nevertheless appear that a mass immunization program of this type in a community *has* been able to do what no previous approach had accomplished. This alone would appear to justify the recommendation of mass immunization programs with the oral vaccine, when it is generally available.

This is not the place to answer Bodian's assault on the AMA Council on Drugs' interpretation of the data on the efficacy and safety of the poliomyelitis vaccines. Knowledgeable readers of *Science* have but to note his "References" to recognize that he has passed over nearly all of the work of investigators whose results do not support his position.

Finally, I am at a loss to understand Bodian's view that the introduction of a new vaccine, even of one that may have certain advantages, should not be permitted to interfere with the evaluation of a previously introduced vaccine. Bodian states that the introduction of a new vaccine under these circumstances

would be unscientific. I am not sure of the exact definition of "scientific" in this case, but I am certain that the withholding of such a new vaccine, were it considered acceptable and in all probability more effective, would be inhumane.

The latest *Polio Surveillance Report* (No. 245) (3 November 1961) indicates that 33 of the 79 individuals who contracted polio in one local outbreak this past summer (in the Syracuse-Onondaga-Oneida County, N.Y., area) had received three or more doses of Salk vaccine. I cannot help contrasting these results—seen in only one outbreak—with the fact that Sweden has not had a single case of polio in an adequately vaccinated person since its program was established.

In view of findings such as these, I wonder how much longer we are justified in continuing the "experiment" which Salk and Bodian have defended—in the press and in *Science*, respectively.

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Edsall has chosen to dissect certain details of my criticism of the AMA proposal for nation-wide mass immunization programs with oral poliovirus vaccine without really confronting the principal issues.

In taking me to task for implying that the AMA Council recommended immediate mass use of oral poliomyelitis vaccine, he has quoted my phrase "at this time" out of context. I stated that "the Council also appears to have overlooked the fact that there is not available enough oral attenuated poliovaccine of all three types to back up this proposal of the AMA at this time, and that the proposal thus contains the seed of futility and embarrassment." Obviously the issue is the premature awakening of public expectation, which the AMA has properly fought against in other instances, and not the implication which was read into my statement.

Edsall has also overreacted to my emphasizing that oral poliovirus vaccination results in virus spread to contacts, in a context which tried to balance the Council's limited consideration of the effects of oral vaccine on poliovirus carriers. In fairness to him, it should be said that the inadvertent omission of the word *virulent* from the sentence in question weakened my point. The sentence should have read, "It is, however, well known that persons vac-

inated with oral vaccine do spread virulent virus to contacts soon thereafter." Since this was the only place in my article where the consequences of spread to contacts could have been appropriately discussed, I should have explained more forcibly the significance of the fact that vaccinated persons do not spread vaccine virus to contacts but spread progeny virus which may be virulent, especially as shown for type III. On the occasion of the 5th International Poliomyelitis Congress in Copenhagen in July 1960, Gard expressed the feelings of many at the Congress in the following words: "The unquestionable capacity of live vaccine virus to spread in the community by contact infection is considered by some to be advantageous as a means of immunizing a larger fraction of the population than was actually vaccinated. To others, including myself, it represents a hazard, as Dr. Francis [Thomas Francis, Jr.] has just pointed out, as do all procedures over which we cannot exercise full control."

Edsall's comments on efficacy seem to me to support my contention that the Council report repeatedly understated the capabilities of the formalized vaccine while presenting the most optimistic view of the oral vaccine. I must especially object to the implication that three doses of formalized vaccine represent the accepted schedule, since four doses have been recommended for several years and this course is accepted as standard. He also omits mention of the fact that the two types of vaccine cannot be compared as to efficacy until good field data on live poliovirus vaccine are available.

His comments on the acceptance of oral vaccine in community-wide programs indicate that he has missed this crucial point altogether. The data needed before one could reasonably expect a successful result in a nationwide mass immunization program would indicate the proportion of nonimmunized individuals in a community who fail to respond to the program. A sweeping proposal such as that of the AMA should have awaited the results of surveys such as that now in progress in Harrisburg.

Edsall's final comments are puzzling, unless they are interpreted as evidence of pique on the part of a member of the Council on Drugs, rather than considered opinion. It seems obvious that my article was not intended to be a review of the extensive literature on formalized or live poliovirus vaccines,

but rather a clarification of issues and literature overlooked in the Council's report. He continues with the wholly unwarranted comment: "Bodian states that the introduction of a new vaccine under these circumstances would be unscientific." On the contrary, my criticism was of the premature call for a "change-over," of poorly presented comparisons of the properties of the two types of vaccine, and of the course of action proposed. My statement clearly focuses on the manner of introduction of the new vaccine: "the proposal

to introduce live oral poliovirus vaccine by means of country-wide mass immunization programs is irresponsible in the sense that such a procedure would eliminate the possibility of a definitive evaluation of either vaccine in this country, and moreover is unlikely to accomplish more than can be accomplished by a more conservative approach."

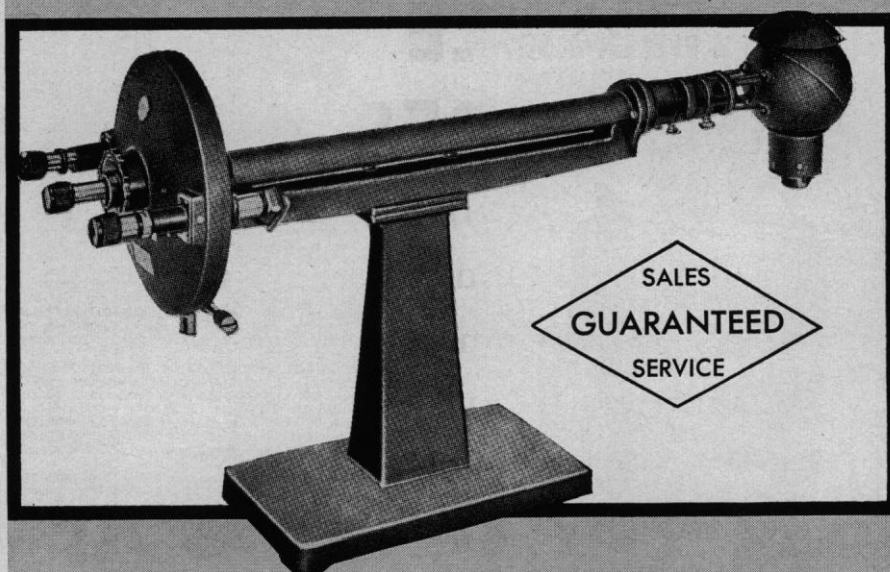
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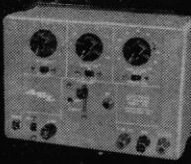
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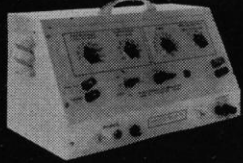
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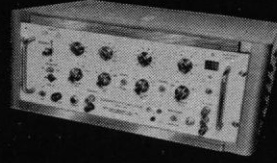
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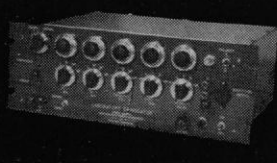
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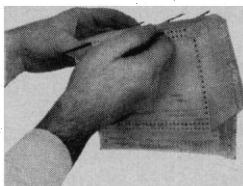
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General of the U.S. Public Health Service. I did not recommend the licensing of Sabin's type II vaccine, which fulfilled all the purely technical requirements, because of doubts about the effects of uncontrolled widespread use of type II on the efficacy of the type I strain. Since I have devoted as much committee effort on behalf of the live poliovirus vaccine as I have on behalf of the formalinized vaccine, I cannot take seriously an implied charge relating to the "inhumane" aspects of "withholding" a new vaccine. My article did not plead for inaction but for more considered action, which would make possible a continued attack on paralytic poliomyelitis. The existing evidence clearly indicates that the residual poliomyelitis problem in this country will be solved not by reimmunizing the adequately immunized, which is obviously going to be the major effect of mass programs sponsored by local medical societies, but by directing an equivalent effort to immunizing the nonimmunized. The particular vaccine used is a secondary issue, perhaps, but the energetic use of the formalinized vaccine would have made possible a better evaluation than will be possible with the now inevitable use of both vaccines. Edsall's experience with typhoid vaccine should convince him of the practical as well as the scientific importance of adequate evaluation of public health procedures.

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Inheritance in Soviet Medicine, Psychology, and Education

In a recent letter entitled "Soviet commitment to Lysenkoism" (1), Lincoln Pettit, discussing the influence of Lysenko on "other areas of knowledge" in the U.S.S.R., writes: "in the fields of education, psychology, and medicine, inheritance is ignored. Aptitude tests are unusable; deafness, mental disorders, and low intellectual capacity are attributed, respectively, to accidents, birth trauma, and laziness." This statement is so sweeping and so much at variance with my own information that a documented perusal of the topic would seem to be in order.

1) No mention at all is made of Lysenko or of inheritance of acquired characteristics in the closely documented and well illustrated 56-column ar-