With commendable discretion the authors recognize that only time and use will tell how helpful their interviews with scientists will be for historians; but, in fact, neither the authors nor others now working in this area question the general value of such oral histories. As for the manuscript materials (of which over 10,000 items are listed), professional historians of science with interest in the history of the physical sciences from about 1875 to 1935 will recognize the value of having this extraordinary source guide within arm's length.

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Ph.D.'s: Pesky Foreign Languages

Feininger's opinions (Letters, 2 June) concerning the value of Ph.D. foreign language requirements lead me to express some observations of my own, gathered from years of teaching language reading courses to Ph.D. candidates. The old arguments for studying foreign languages (notably German and French for "scientific" reasons) are no longer viable. English is strongly entrenched as the medium through which contemporary scientific research is made known internationally. The English-speaking scientist is under no special constraint to write in any other language, while his non-English-speaking colleague may feel a very strong compulsion to use English if he wishes to advertise his work beyond the boundaries of his own country or language community. This state of affairs underlies the sentiment that the foreign language requirement is "something extra" in our Ph.D. curricula. Little progress has been made toward changing the archaic and sometimes informal method of testing via written translation of selections chosen for their special difficulty. I have yet to find proof that the skill to translate is a proper measure of fluency and I suspect that few Ph.D. candidates in the so-called "hard" sciences are willing to use the foreign language actively once they have passed that pesky translation exam. The candidate in the non-English speaking country, by contrast, remains ever aware of the lasting importance of English to his career.

While I approve Feininger's plea for better style and expression in the scientist's native language, I am not ready to sacrifice foreign languages. Why should our scientists be deprived of the intellectual pursuit of learning another man's way of expression and his different cultural values? For one who must always be concerned with logical processes, what justification is there for disallowing the stimulating mental activity of having to reformulate and validate his thinking in another language? Many a physicist or chemist participating in an international convention or doing foreign research has felt the need to converse in any number of languages. Learning to speak or write a foreign language admittedly takes valuable time. Therefore let us make certain that our fledgling scientists get their language training early in the undergraduate years and let us give them greater latitude in selecting the language they wish to study.

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As a technical editor I am aware that many a keen scientific mind has not been trained to put together a concise and logically organized paragraph or even a grammatically correct sentence. It's a pity that our age of specialization should permit—even condone—such ill-balanced development. I would not, however, want English composition to be stressed at the expense of a foreign language requirement. Having observed members of the European scientific community speaking (not only reading) three or four different languages, I have become vividly aware of the language shortcomings of our U.S. education. I should like to see the pendulum swing toward true command of both English and some other language.

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Measles Vaccines: Assured Safety

In Albrecht's letter (26 May) "Can measles be eradicated?" he states that "to the best of my knowledge" the duration of the controlled field trials of live attenuated measles virus vaccines have been for only one month's duration. Obviously, he is not familiar with the large amount of data on controlled studies now available (*1–6*). The controlled field trials of the new live

attenuated mumps virus vaccine stated by Albrecht to have lasted for only 2 weeks were initially reported for a 7-month period (*7–9*). These data have now been extended over a 21-month period covering two mumps epidemic seasons.

The protective efficacy of Enders' live attenuated measles virus vaccine is in excess of 90 percent. This high level of protective efficacy has been demonstrated to persist for at least 4 years. The pattern of neutralizing antibody following Enders' vaccine parallels that for natural measles and has been demonstrated to remain essentially unchanged for at least 8 years, the longest period of observation, indicating that immunity will be lasting. Similar high level efficacy has been shown in the extensive measles vaccine trials carried out in West Africa, Chile, and other parts of the world. The savings in lives, to date, have numbered in the hundreds of thousands.

Once a live attenuated measles virus has produced a mild or inapparent infection with a clear-cut elevation of neutralizing antibodies, it would appear probable that natural, unmodified measles would not again occur, but that exposure to measles would either produce no symptoms or a highly modified infection. There would appear to be no justification for Albrecht's fears in this respect.

He also voices fears concerning extraneous agents of disease in the vaccines. In the production of vaccines under the strict procedures required by the U.S. Public Health Service (*10*), chick embryo cell cultures have been used which are prepared from eggs obtained from leukosis-free chickens. Had chick tissue been potentially dangerous, this should have been demonstrated in some of the millions of persons injected, starting in the 1930's, with the live attenutated yellow fever virus vaccine from chick tissue. Such vaccine was used long prior to demonstration of leukosis in chickens and in all probability contained this viral agent which apparently has been harmless to man in the intervening years. At present, no known extraneous viral agent has been found in chick tissue cultures used for vaccines. Also there is no known tumor virus pathogenic for chickens that has also been demonstrated as pathogenic for man.

Fears, such as Albrecht's, that needlessly have been raised concerning carefully controlled and licensed live attenuated viral vaccines have been proved to be unfounded. The USPHS is fully cognizant of the prevention of thousands of deaths and of mental crippling by means of the live attenuated measles virus vaccine and should be fully supported in its urgent program to eradicate the natural disease. When a virus is of a single antigenic type, such as measles, a balance of nature can best be established by a live attenuated virus vaccine which produces an antibody curve, slightly lower but closely paralleling that of the natural disease.

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Who Pays for Pollution?

In Wolfle's editorial "Industry and environment" (16 June, p. 1441), he suggests industry should play a role in controlling our environment and then inadvertently (I suppose) gives the reason why it will not: " . . . most of the cost of polluting land, air, and water . . . are passed on to others. . . ." He also suggests government agencies and universities could help by "conducting studies" and "conducting necessary research."

I contend that conducting studies and necessary research will not *remedy* the problems. In fact, studies and research have been done and will continue to be done without further prodding. What we need is a way to put the cost of polluting back where it belongs—on