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Ehrlich's Slogan

In his obituary of the Japanese bacteriologist Kiyoshi Shiga (1), Oscar Felsenfeld mentions Shiga's association with Paul Ehrlich and writes that he "picked up a slogan, which he attributed to Ehrlich, as the motto of his life: *Geld, Geduld, Geschick, und Glück* (money, patience, fate, and luck). He kept repeating this saying of Ehrlich's and insisted that it governed all his decisions. Shiga, however, was not a money hunter."

I can claim a degree of familiarity with the work and life of Ehrlich, my father, Felix Pinkus, having been one of his pupils (2) and later his friend (3), who at the time of his death in 1947 was engaged in writing Ehrlich's biography. I feel that the sentences quoted contain some errors of interpretation and do not do full justice to either Shiga or Ehrlich.

The slogan is authentic (4, p. 48). My father told me that Ehrlich often said these "four G's" were essential for successful research. However, that the word *Geld* (money) is put first in certainly no indication that Ehrlich was a money hunter. Although his discoveries brought him wealth late in life, only a few of his worst enemies accused him of seeking it (5, p. 216). Whoever knew him well testified that he handled his own affairs rather poorly, that he often spent beyond his means for books and scientific implements, and that he loaned and gave money freely to friends and even to relative strangers who sought his help (4, pp. 50-53; 5, p. 65).

There are three plausible explanations for money being mentioned first by Ehrlich. Foremost, the entire slogan is a paraphrase of the much older one that three G's are needed for waging war: *Geld, Geld, und nochmals Geld* (money, money, and once more money) (6). Second, even modern scientists are painfully aware of the fact that funds are prerequisite to practically all experimental work. Third, a man who, like Ehrlich, had had to work under restricted circumstances for many years and who was not a good businessman is apt to put first what he is least able to provide.

The second word, *Geduld* (patience), needs no explanation. The German word *Geschick*, however, has two quite different meanings (7). It is a synonym either of *Schicksal* (fate) or of *Geschicklich-*

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keit (skill, dexterity, aptitude). It is well documented (4, p. 80) that Ehrlich frequently expressed his ire against the "ungeschickte Taperkerle" (inept totterers) who did not comprehend his theories or could not verify his experimental results. Doubtless, *Geschick* is used here in its second sense of mental aptitude and manual skill.

Interpreted in this fashion, the slogan has valid significance, not so much as a motto for life but as a statement of the requisites of fruitful work, which can well be used to govern a man's decisions. The two central G's, *Geduld* and *Geschick*, have to be brought by the researcher himself. To apply them, he needs Geld, and who doubts that, to be really successful, he also needs Glück (good luck, "breaks")?

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6. G. Büchmann in *Geflügelte Worte* [popular edition based on the 26th edition of the *Hauptwerks*, adopted by B. Krieger (Haude & Spensersche, Berlin, Germany, 1919), p. 288] attributes the first Italian version of this saying to Gian-Jacopo Trivulzio (1448-1518), marshal of King Louis XII of France.
7. *Langenscheidts Taschenwörterbuch der englischen und deutschen Sprache*, ed. 7, 1929. Other dictionaries concur.

Oscar Felsenfeld's interesting and dignified obituary on Kiyoshi Shiga [*Science* 126, 113 (1957)] mentions that Shiga adopted Paul Ehrlich's motto of life: *Geld, Geduld, Geschick, und Glück*. Felsenfeld translates the last three words as "fate and luck." I have doubts whether a man of Ehrlich's ability, not only for research but also for verbal expression, would have—in his motto—used two items which are practically synonyms, as fate and luck are. While the German word *Geschick* indeed means "fate," it has another quite different meaning, and it is used in this second sense very frequently in the part of Germany from which Ehrlich originated (Silesia). It is the abbreviated form of *Geschicklichkeit*, meaning manual (and also intellectual) dexterity, handiness, the ability to handle a given task appropriately and smartly.

It is well known that Ehrlich (as well as his pupils, his *Schule*) was very proud and fond of manual dexterity in his histopathological and bacteriological work, especially staining. Ehrlich is reported as having, especially as a young man, dye stains on his fingers. It is this ability for manual tasks which Ehrlich and Shiga

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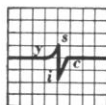
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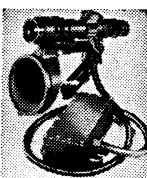
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and their followers valued very highly that—I am quite sure—was expressed by the word *Geschick* in their motto. Shiga, the discoverer of trypan red, was, in Paul Ehrlich's judgment, certainly a *geschickter* collaborator and was probably proud of it.

WILFRED C. HULSE

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Science and the High-School Student

There seems to be some likelihood that the definitive results of Mead and Métraux's study of the "Image of the Scientist among High-School Students" [*Science* 126, 384 (1957)] will be considered as applying only to high-school students and scientists. Since almost all of the appropriate age group attends high school these days, Mead and Métraux's sample is essentially a sample of that age group of the whole population. It is unlikely that this image of the scientist changes much with age. Hence, one concludes that the man in the street has very much the same image. Let us not censure high-school students, even by implication only, for sharing public opinion. The high-schooler who plans to become a scientist has about the same relation to his fellow students as the adult scientist has to his fellow citizens. He may as well get used to it while he is young.

It is likely that the same sort of results would have been obtained regarding physicians, ministers, nurses, or any other dedicated group of people. This not-for-me attitude is directed at the dedication, not at the profession. In view of the fact that about 90 percent of the population has an IQ of less than 120, the not-for-me attitude is common-sense realism, and the high-schoolers are to be congratulated on their good sense.

I suggest an unscientific generalization of the title to "Image of the Dedicated Minority as Seen by the Undedicated Majority."

M. J. WALKER

Storrs, Connecticut

In his comment on our article, M. J. Walker has combined three themes—the rejection of dedication, the extent to which the high-school student's attitude coincides with that of the man in the street, and the reasonableness of students with an IQ of less than 120 rejecting science as a career. As we pointed out, rejection of dedication in all fields of science is a characteristic of the attitude of post-World War II youth; it would extend to any profession which was seen as requiring an extreme degree of commitment. We know of no material that suggests that rejection of dedication and low IQ are systematically related and



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