

Comments and Communications

The Payment of the Learned Man

Dr. E. Bodewig, a German mathematician now living in Holland, has been reviewing papers for *Mathematical Reviews* for several years. Recently he resigned as a reviewer, and in reply to my letter of regret he sent the enclosed letter of explanation.

The letter was written in German, and I have translated it rather freely. Dr. Bodewig has given me permission to have it published and suggests that it should be introduced by the following quotation from Wagner's *Siegfried*: "After vain distant things you sought, but what was found close at hand, what you needed, that did not enter your head."

R. P. BOAS, JR.

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DEAR PROFESSOR BOAS:

After long consideration and many years of observation, I have made up my mind to withdraw from scientific activity. I have cut one thread after another and, like Gulliver, I am abandoning the island of the mathematicians. Consequently, I must give up my collaboration with *Mathematical Reviews*. When one has devoted so many years to mathematics, one does not lightly abandon it. Let me briefly explain my reasons.

Nowhere in the world do the scholar and the learned man understand how to secure the position and the pay that they deserve. This has surprised me for many years, all the more because, on account of my financial independence, I could to a certain extent observe the situation from the outside and, in addition, because I am one of the few mathematicians who have carried out and published theoretical work in psychology and finance and have had the necessary practical experience on the stock exchange. And I must say that I am astonished that the low pay of the learned man has never yet been the subject of an investigation. It should be a task for the United Nations to look into it sometime, just as they have done, with endless discussions, with the problem of labor and the problem of colonial peoples.

What lawyer would be satisfied with the pay of a scholar? For a simple routine letter requiring no technical knowledge he demands 25-50 gulden in Holland (in Germany, as many marks, and in the U.S.A., I suppose, as many dollars). For a routine petition to the authorities he demands 120-250 gulden (marks, dollars), and that is a quarter of an hour's work. For small jobs he demands 200 gulden in advance before he begins to work at all. Later on he gets easily 500 gulden. If a lawyer had to do as much work and as much preliminary study as I (or anyone else) had to do, for example, in reviewing the papers of von Neumann or Reicheneder, he would demand 1,000 gulden and get it and be upheld by any court. What do I or anyone else get for this? Nothing.

If I had received for each review the fee that a lawyer would have received for the same time and mental effort, I would have received 100-1,000 gulden for each review, and altogether about 30,000 gulden. What did I get? Nothing.

Let us take another profession, chemistry, for example. An acquaintance of mine gets 1,500 gulden for an extensive chemical analysis, and nobody has ever considered this excessive. If I had received only 500 gulden for each of my 150 reviews, this would have come to 75,000 gulden. What did I get? Nothing.

Let us take the chief physician in a hospital. In the morning he goes through his clinic where there are 100 patients. He speaks a few words to some of them but says nothing at all to most. The whole thing takes a quarter of an hour. But each patient pays him 1-10 gulden. That amounts altogether to at least 150 gulden, probably more. If I had received 150 gulden for each quarter of an hour's work on my 150 reviews . . . (I don't want to count it up).

Let us take an ordinary doctor. For each appointment he gets 3-10 gulden. A prominent doctor gets many times as much. That amounts to an income of some 500 gulden a day.

I heard of a camp for German prisoners of war in Australia. The prisoners were allowed to work and were all paid. Well paid! But there were also teachers and professors there, who were giving valuable instruction to the other prisoners. These teachers were the only ones who were not paid for their work. In fact, at the end of the class they had to sweep out the classroom, since the students didn't do it.

Do I have to remind you of the disgraceful fact that a bookseller gets 30% commission, often 40%, for each book he sells, he who often cannot read a single line of the book? While the learned man who wrote the book gets 10%? (Of course I am aware that a bookseller has certain expenses.) Do I have to remind you of the disgraceful fact that the compositor often gets more pay for setting up a book than the author gets for writing it? Do I have to remind you that the compositor gets his pay at once, whereas the author has to wait for an annual accounting?

I wrote a book on *Numerical Methods* in a year and a half, working 5-10 hours a day. It was translated in the U. S. When the contract was drawn up, it turned out that I was to get about \$350 (and the translator the same amount). And this in a field where one can say that no book at all existed before. Afterwards the publishers wanted to make even these conditions worse in underhanded ways. Then I canceled the whole contract on the ground of violations of its terms. What lawyer, doctor, or chemist would work for a year and a half or two years for \$350? Are we scholars only for philanthropic purposes?

Mathematical Reviews can pay the compositor, printer, paper manufacturer, paper dealer, etc. Only the scholars who write the reviews get nothing. Nobody in the world would think of asking a compositor, printer, etc., to work for nothing. Only among scholars is this taken for granted. After all, why?

I have mentioned only the professions which are closest to us: medicine, chemistry, law, etc. I have not said anything about businessmen, who frequently make 6 million gulden in a single morning by making two or three telephone calls (I have a perfectly definite case in mind).

But for their poor pay the scholars have to thank not only the "world" and not only their own awkwardness, but also their colleagues. For example, Professor X invited me to take a position at the Mathematical Center at Amsterdam—for 300 gulden a month. I wrote to him that for that he could get a plumber. It is too bad that at the time I had not seen a newspaper advertisement for nurses in an insane asylum at 3,300 gulden a year with half room and board. Otherwise I would have recommended a nurse from the insane asylum to my "colleague," (even though she would have received rather less pay at the Mathematical Center). It is also too bad that I had not seen my twelve-year-old son's arithmetic problem, where ten bricklayers got 10 gulden per man per day. Otherwise I would have recommended a bricklayer to my "colleague" for the Mathematical Center. Another professor wanted me to give lectures (free, naturally). I answered him similarly.

A German professor invited me to give a lecture at his university. I did it but discovered afterwards, to my great surprise, that with childlike innocence he had never thought of an honorarium. I had to pay all the expenses of the long trip out of my own pocket. No plumber in the world would have expected as much from me as this "colleague."

A scholar in the U. S. asked me, in the name of his institution, three or four questions about a problem with which his institution expected to be seriously concerned in the next few years. Instead of answering the questions, I asked him for a guarantee of \$2,000 (a lawyer would have asked much more). After that he didn't seem to need the answers.

A German professor asked me to take over a course of lectures, in one of the most difficult of all subjects, for a semester. He added that he did not have any idea of how much I would be paid, since he was "not fully informed." (Now, in that case, he should become better informed and then ask again.) What workman in the world would take on a helper without telling him his wages?

I must decline to go into the psychological reasons why the "world" pays the scholars so poorly, and why the scholars themselves are satisfied with this poor pay, and why, finally, the scholars treat each other so badly. Briefly, it comes down to this, that every intelligence is only partial; that the highest form of individuality—i.e., the highest development of the mind—is possible only in a limited domain, and that everything that lies outside this domain is judged with decreased ability. If I were not educated otherwise through years of study of the stock exchange, I should be as unworldly as the others.

"Naturally" one does not use his science for making money. (It would be terrible if a scholar did what everybody else takes for granted.) But the exploitation of the scholar is one of the worst in the world. It is the modern social problem! Nobody bothers about it, not even the scholars themselves. It would be a job for the United Nations, but they don't do anything either.

One will hardly be able to influence the scholars to look after their own material interests. Under the circumstances I can only act for myself. I don't like the rules of the game and I won't play any more. I want my work to be well paid, like that of a doctor, a chemist, or a lawyer. If the world won't do that, I shall not work any more for the "Society of Mankind." I strike. (But sometime the U. N. should take up the rate of pay of the rest of the scholars who are still working. The scholars would agree with me there.)

Sincerely yours,

E. BODEWIG

Sphagnum Moss and Egg Yolk as Food for Anuran Tadpoles

Different kinds of food have been used by various investigators to rear anuran tadpoles in the laboratory. Algae, liverworts, lettuce, or spinach, supplemented by beef liver, powdered egg yolk, or a dry pulverized mixture of whole-wheat flour and bacto-beef extract, have been tried (Rugh, R. *Experimental Embryology*. Minneapolis: Burgess Publ., 1948). When fresh liver is used, putrefaction occurs quickly. Unless the water is changed frequently and the decayed liver removed, the tadpoles will die as a result of pollution of the water. Briggs and Davidson (*J. Exp. Zool.*, 90, 401 [1940]) found that spinach-fed tadpoles developed most rapidly but produced kidney stones. Although boiled lettuce is better food than spinach, it also decays in a short time, especially at warm room temperatures.

For the past two years, sphagnum moss¹ supplemented by egg yolk has been used by the writer to rear different species of anuran tadpoles in his laboratory. The result has been satisfactory. Under laboratory conditions metamorphosis took place about 70 days after insemination. No stones were found in the kidneys of either the tadpoles or the metamorphosed young. The sphagnum moss can be stored dry in the laboratory to be used as needed. The egg yolk is prepared by hard boiling the eggs, separating the yolk from the white, and then crushing it into small lumps and drying it. A few small lumps of egg yolk are fed at a time, as too much left in the medium will also pollute the water. In the summer, the water needs to be changed twice a week, whereas in the winter once every 5 to 7 days is sufficient.

Sphagnum moss decomposes slowly, forming acid, and the acidity of the water in turn reduces the growth of bacteria. The pH of tap water in our laboratory has been found as high as 10. If a large amount of sphagnum moss is soaked in it for a day, the pH will be low-

¹ Dry sphagnum moss can be purchased from seed stores, or from E. G. Steinhilber Co., Oshkosh, Wis., at about 50 cents per pound.