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LETTERS

Science in the Former Soviet Union

Having co-authored several papers in visual psychophysics as an undergraduate, I still feel some residual understanding of statistical and quantitative methods in science, in spite of my subsequent career change. So I was bemused by the statements in both the editorial and the lead article of the Science in Europe issue (27 May, pp. 1235 and 1259) regarding the leading role of Russia in post-Soviet science, as reflected by the bar graph (p. 1260) showing the number of International Science Foundation grant recipients by country. What the graph *does show* is that countries with larger populations—and hence more scientists—get more grants. If, however, one uses number of science grants awarded as a measure of strength or quality of scientific research, then surely one should take into account the size of the population. How else to draw conclusions about, let alone compare the quality of, science in Estonia and Russia when the latter has a population roughly 100 times the size of the former? This applies both to the graph's rank-ordering by country the number of grants awarded, as well as to the rank-ordering in the table on page 1261 of scientific institutions by the number of grants received. Just as countries considered part of the former Soviet Union vary in population, so too the size of respective institutions and the number of different projects for which they can apply to receive funding is a function of the size of a country and of a country's community of scientists.

A country such as Israel, for example, is considered a scientific powerhouse because of the quality of its science, measured, among other methods, by the number of grants received by Israeli scientists for a population of its size. No one would say that a much larger country is doing better science simply because it has many times the number of scientists applying for and receiving funding. The same holds for the countries listed in the Science in Europe '94: Russia article.

Similarly, a country's GNP (gross national product) merely describes the size of its economy, not its strength or level of development. Per capita GNP is the measure that indicates whether a country is poor or rich.

A tabulation of grants received per million population (Fig. 1) yields somewhat different conclusions from those presented in the article regarding who "dominates" in science. One would hope that among the conclusions derived from such a statistical analysis, it is also concluded that, as in economic development, so also in scientific research, with a range of grants per population stretching over two orders of magnitude, the lumping together of very different countries under the rubric "the former Soviet Union" does rational analysis and science a grave disservice.

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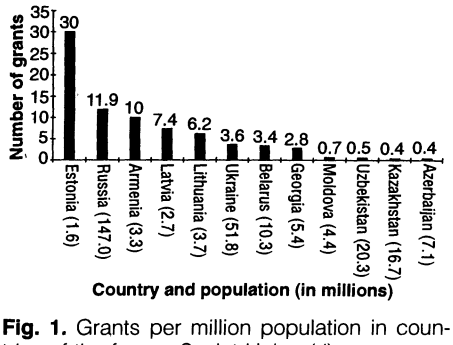

Fig. 1. Grants per million population in countries of the former Soviet Union (*1*).

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1. *Statesman's Yearbook 1992–93* (St. Martin's, New York, 1992); *1993 Annual Report* (International Science Foundation, Washington, DC, 1994).

Having spent 3 months last summer in a Moscow scientific institute, where, for instance, researchers were working in semi-darkness to cut electricity bills, I have to say that *Science's* extensive feature on the desperate state of Russian science was timely and important. One important point, however, was not stressed: science in Russia is being suffocated, not only by a chronic shortage of hard currency, but by an ungainly infrastructure and hostile bureaucrats in other government departments. Here are two examples. (i) Almost all the Russian scientists I knew lamented the fact that, while research funding had dried up completely, many institutes were still retaining large numbers of administrative and support staff who now have almost no work to do. Most workers felt that cuts were being made in the wrong areas. (ii) It is now very difficult to borrow material from Russia for study in the West, which severely impedes collaboration. For instance, new regula-

tions introduced only last year mean that, in order to borrow geological specimens, it is now necessary to obtain documents sequentially from four different departments scattered throughout Moscow, a process which takes a *minimum* of a month. These measures were, of course, introduced to help stem the flow of valuables out of the country, but all the foreign scientists I spoke to complained of the dire consequences for collaborative work. Even when official permission is finally obtained, hostile customs officers, hoping for bribes, will often stop export of specimens if they spot minor grammatical mistakes in the documentation. This happened to me twice. Regrettably, these problems will only disappear when the country as a whole recovers.

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Institute of Human Origins: Separation Issues

The 27 May News article by Ann Gibbons about the Institute of Human Origins (IHO) (p. 1247) reports a number of statements by IHO's critics that are inaccurate, out of context, or incomplete, providing readers with a distorted picture of the issues confronting our organization at present. It also reports unsubstantiated and erroneous assertions about IHO founder and president Donald Johanson's job performance that cannot go unchallenged.

Gibbons writes, "When the motion [to force founder Donald Johanson out of IHO] was defeated, Getty withdrew his support of the IHO. . . ." Actually, Gordon Getty, a member of IHO's Board of Directors since 1981, sent written notice to IHO on 29 April—5 days *before* the board meeting—rescinding the balance of his 5-year pledge effective immediately. It is crucial to an understanding of subsequent actions that the reader know that Getty's unrestricted funding was withdrawn without warning or stated cause.

The board met on 3 May with the hope that Getty might reinstate his pledge, or at least provide transitional funding so that IHO could continue to operate normally through 1994. These hopes were dashed when Getty made the motion that two IHO staff members, Johanson and a respected geochronologist, be removed summarily, and that the board chairman step down.

The motion to cease operating the geochronology division (which had been part of IHO since 1985, not 1989, as reported by Gibbons) came only after repeated statements to Getty that the loss of such substantial funding without adequate time to seek alternative funding would make a reduction in staffing an economic necessity, and after he refused to continue his funding of IHO on an interim basis.

Getty's attorney, William Coblentz, is quoted as saying, "Instead, we have more photo opportunities and NOVA interviews than pure research." As founder and president of IHO, two of Johanson's important functions are fund raising and public education. The NOVA film "In Search of Human Origins," which was co-produced by IHO, was fully consistent with this role. The 1991 board meeting at which the NOVA project was first discussed featured discussion about the time commitment Johanson would need to make to the project; both Getty and Garniss Curtis were present, and no objections were raised by them then, or at any subsequent time. We are incredulous at the suggestion made by Coblentz that IHO, which is a recipient of American taxpayers' dollars through NSF grants and operates for the public good with a tax-exempt status, should not be involved in educating the public about human evolution, especially through such important vehicles as public television. We wonder how many scientists and educators would agree with such sentiments in light of continuing attacks by creationists on the teaching of evolution in American public school science classes.

Furthermore, allegations of critics that Johanson was not involved enough in "pure research" are erroneous. He has co-led each of three IHO field expeditions to the Hadar fossil site in Ethiopia since 1990, co-authored a recent *Nature* paper on new hominid discoveries (*1*), and delivered a paper on these finds at a meeting of the American Association of Physical Anthropologists this past April. In fact, a research trip to Ethiopia scheduled for this month was postponed because of the withdrawal of Getty's pledge and the need for Johanson to turn his immediate attention to fund raising. We leave it to the readers to judge whether it is Johanson's record of research, or Getty's interpretation of that record, that is wanting.

Gibbons' article notes that "This should have been a banner year for the Institute of Human Origins. . . ." In fact, 1994 *has* been a banner year for IHO. We are confident that when we resolve these separation issues, IHO's scientists and staff will be able to proceed with their work, and the achievements of the first half of 1994 will continue to provide the momentum that has brought so much good science to fruition.

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