

Zoology Days 2010

Czech life sciences research can improve its international competitiveness

English Editorial Services was again a sponsor of Zoology Days 2010, held this year at the Czech University of Life Sciences in Prague. Gale A. Kirking, Editor-in-Chief at English Editorial Services, addressed participants at the 2-day annual conference organized by the Institute of Vertebrate Biology (Academy of Sciences of the Czech Republic), the Faculty of Environmental Sciences at the Czech University of Life Sciences, and the Czech Zoological Society. Mr. Kirking presented his views on how Czech scientists can improve their international competitiveness.

I. Introduction

I would like to speak briefly today about something that I think is extremely important to everybody in this room. I am going to talk about the international competitiveness of Czech science.

We have a saying in the United States, where I'm from, that a rising tide lifts all the boats. I think that is an appropriate metaphor regarding the competitiveness of Czech science, because when Czech scientists are successful in their fields this improves the reputation of Czech science generally. And when that happens, all of Czech science benefits. As a Czech company that earns a not unsubstantial part of its revenues from editing scientific papers, we at English Editorial Services naturally also are interested in seeing Czech scientists succeed. (We want our boat to rise, too!)

For our part, we at English Editorial Services are providing high-quality editing of scientific articles so that 1) they are more likely to be accepted for publication in international journals, and 2) the quality of the written texts will be at a high level that contributes to a good and growing reputation for individual authors, their institutions, and Czech science as a whole.

Nevertheless, of course, most of the hard work of producing world class science here in the Czech Republic falls on you, the scientists.

Competing in the scientific world can easily be described in Darwinian terms. It's a kind of natural selection, and nobody should understand better about survival of the fittest than do biological scientists like you. You already know the expression "publish or perish," of course. I'm not sure how that sounds to Czech ears in the Czech language, but in English it sounds pretty brutal.

Whether we speak of an individual scientist struggling to establish a place for himself or herself in a specific field or of a country as a whole working to build a strong reputation internationally, it's all about fitness to compete.

It seems to me that fitness to compete has three aspects: 1) The advantages individuals are given by God or nature, 2) the environment within which we operate, and 3) because we are human, the decisions that we make on the basis of our free will.

With reference to aspect #1, I'm pretty sure that the scientists here in the Czech Republic are naturally just as well endowed with intelligence and creativity as are scientists anywhere.

Regarding #2, the environment in which Czech scientists work has its pluses and minuses, but I would argue that the relative advantages are substantial.

As to #3, the determination to do good research, to publish and to have an impact is strong and, I believe, getting stronger among Czech scientists.

If what I'm saying is true, then Czech science must be in a relatively good fitness to compete.

Let me return to point #2 and say a bit more about the environment for scientific research. You know better than I do that this environment can generally be described in terms of resources: How well equipped are the laboratories? How much grant money is available? How good are the libraries? To which journals do the scientists have access? How much are the universities, institutions and companies willing or able to pay to scientists? In other words, it's largely a question of money.

Although you may be particularly sensitive to their shortcomings, the resources available to Czech scientists are in fact better than in many other countries. As measured, for example, by public grant funding available to support scientific research, our own observations (obtained as we endeavor to sell our services in various countries) indicate that the Czech Republic is far ahead of neighboring "new-EU" countries and other former Soviet bloc countries.

To draw a picture for you in numbers, let's look at the table on the next page. It compares 40 countries making substantial contributions to research in the world and that are tracked by *R&D* magazine. According to the *2010 Global R&D Funding Forecast*, the Czech Republic will rank number 28 this year in the money it invests into science and engineering, including from both public and private sources.

Because of its small size, the Czech Republic clearly has no potential ever to catch up with the research powerhouses at the top of the rankings in terms of overall spending. When viewed relative to its neighbors, like Poland, Hungary, and Slovakia, however, the Czech Republic's investment into research appears very favorable. Although the Czech Republic's economy is less than half the size of Poland's and its population is only about one-quarter the size, for example, the two countries invest about the same total amount in scientific research.

When its research investment is viewed as a proportion of national GDP, at 1.44%, the Czech Republic rank rises to 23 and the country compares quite favorably with the European average of 1.69%. Other than Slovenia, at 1.38% of GDP, no other of the formerly communist countries in the region comes close to the Czech Republic in its GDP-relative investment in research.

Of course, how the Czech Republic looks in a relative comparison, depends upon with whom the comparison is made. Czech science's resources are not nearly so good as are those in such leading research countries as Sweden, Japan, Israel, the United States and others.

Realistically, then, and even as you seek greater investment by political and other means, the most important element of competitive fitness for Czech science is to make the best possible use of the talent and resources you have available.

In our work at English Editorial Services, we see promising signs that Czech scientists are doing exactly that. In 2009, I personally edited more than 125 scientific papers by Czech scientists for submission to international journals (almost all in the biological and "life sciences" fields, where I specialize). Based upon this sample, three things strike me as significant:

- 1) In almost every case, the authors were able to use grant funds to pay for our editing services.**
- 2) In most cases, the quality of the science behind the paper was good – and sometimes excellent.**
- 3) Based upon feedback from our clients, I can say that in most cases those papers were accepted by international journals. They were not always accepted by the first journal they were sent to, but most were ultimately accepted.**

This tells us that grant funding sources are available in this country for high quality research and that Czech science is having an influence internationally. Another thing that is clear is that granting agencies are increasingly insistent that any project they fund should lead to English-language publications in international journals. To obtain these funds, therefore, scientists must demonstrate a strong potential to publish.

**Gross Domestic Expenditure on Research and Development (GERD)
Investment by Country (total and relative to size of economy)**

Country	2010 GDP PPP Billions, USD	2010 R&D as % GDP	2010 GERD PPP Billions, USD	Rank by total GERD	Rank by R&D as % of GDP
United States	14,083	2.85	401.9	1	6
Japan	4,165	3.41	142.0	2	3
China	9,429	1.50	141.4	3	21
Germany	2,772	2.46	68.2	4	10
South Korea	1,369	3.13	42.9	5	5
France	2,096	1.98	41.5	6	14
United Kingdom	2,147	1.75	37.6	7	18
India	3,697	0.90	33.3	8	32
Canada	1,294	1.83	23.7	9	16
Russia	2,127	1.04	22.1	10	29
Italy	1,733	1.08	18.7	11	28
Brazil	2,048	0.91	18.6	12	31
Taiwan	708	2.57	18.2	13	8
Spain	1,340	1.28	17.2	14	25
Australia	822	1.86	15.3	15	15
Sweden	331	3.51	11.6	16	2
Netherlands	648	1.63	10.6	17	19
Israel	206	4.40	9.1	18	1
Austria	318	2.58	8.2	19	7
Switzerland	312	2.36	7.4	20	13
Belgium	376	1.81	6.8	21	17
Turkey	876	0.76	6.7	22	33
Finland	183	3.36	6.1	23	4
Singapore	239	2.51	6.0	24	9
Mexico	1,497	0.40	6.0	25	40
Denmark	202	2.45	4.9	26	11
Norway	274	1.50	4.1	27	22
Czech Republic	257	1.44	3.7	28	23
South Africa	488	0.74	3.6	29	34
Poland	690	0.52	3.6	30	37
Portugal	3,697	1.21	2.8	31	26
Argentina	568	0.46	2.6	32	38
Ireland	170	1.52	2.6	33	20
Greece	340	0.53	1.8	34	35
Hungary	182	0.93	1.7	35	30
New Zealand	117	1.18	1.3	36	27
Romania	249	0.53	1.3	37	36
Slovenia	57	1.38	0.8	38	24
Slovak Republic	119	0.42	0.5	39	39
Iceland	12	2.45	0.3	40	12

GDP = gross domestic product, GERD = gross domestic expenditure on research and development. PPP = purchasing power parity, R&D = research and development.

Source: R&D Magazine, Battelle. 2010 Global R&D Funding Forecast.

II. How to be more competitive

So, what can you do as scientists to make Czech science more competitive generally, to build your own reputations and that of the country as a whole? I would like to offer several suggestions.

Do groundbreaking research – When choosing which research questions to pursue, bear in mind that your findings will be read only if there is a sufficiently large audience interested to know about them. Extremely esoteric research does not generally attract a broad audience. You should be able to show that your research matters, that it has practical implications, and that it significantly advances knowledge in your field.

Do cross-disciplinary work – I believe this is extremely important and that Czech scientists don't do nearly enough of it. Collaborating with scientists in other fields and from other institutions has several important advantages: 1) It increases the range and pool of resources available to you; 2) it can make your research more relevant, particularly as some complex issues cannot be addressed properly only from the perspective of one scientific discipline; 3) it expands the potential audience for your research findings; and 4) creative thinking and division of labor between various specialists can increase the probability of achieving innovative results.

Seek to collaborate abroad – Czech scientists on the whole need to work more with their colleagues elsewhere. Based upon papers that I am editing, I see the most progress toward international collaboration in the area of medical research. I see rather little of it in most other areas. Also, when seeking to work with a foreign colleague, you must be sure you're bringing something substantial to the relationship. (Asking somebody you met at an international conference to correct the English in a paper you'd like to submit to an international journal does not count as collaboration.)

Produce high-quality articles – Although most reputable journals will not accept papers that are not well written and in good English or that contain typographical and other errors, we are nevertheless surprised about what we see slip through into publication sometimes. If you manage to get a paper published in spite of the fact that it is in a bad state, are you really doing your reputation a favor? If English is not your native language, your papers simply must be reviewed and edited by a competent native speaker of English. Generally, this involves using a professional editing service (either before you submit the paper the first time or after they send it back to you for correction).

Take advantage of the new open access channels – While open access publishing has both advantages and disadvantages for science as a whole, it is, on balance, a substantial advantage – an equalizer, if you will – for countries, institutions and scientists with limited resources. Used effectively, it can improve your opportunities to publish, increase your citations by other scientists, and provide you improved access to the work of others. Be careful though: Not all journals are created equal. Strong peer review, impact factor and professional quality of the final product still matter. Also, be disciplined about how you use abstracts that are freely available. Don't get caught with your facts wrong because you only read the abstract but then cited the article.

Improve your English – The international language of science is English. You don't need to be able to quote passages from Shakespeare or to speak like a native, but, to be successful in scientific research today, you do need to be able to read the literature in your field, communicate with your international colleagues at conferences and via email, and to write your research papers in English. A number of our Czech clients who are publishing extensively communicate very impressively in English.

Take a broad view as to possible funding sources – Don't feel that just because you get turned down for one grant somewhere that the situation is hopeless. There are various sources in the Czech Republic, European Union sources, international environmental organizations, and elsewhere. For professional scientists, the search for funding is a never-ending part of the job.