

WE INVEST MORE IN BUILDINGS THAN IN SCIENTISTS

Why does Poland struggle to build a world-class research system? According to **Prof. Andrzej Jajszczyk** of AGH University of Kraków, former Director of the National Science Centre and former Vice-Chair of the European Research Council Scientific Council, the problem is not simply a lack of money. It is also a system that spreads resources too thinly, sustains too many mediocre institutions and rewards survival more often than excellence.

What is the biggest problem facing Polish science today?

ANDRZEJ JAJSZCZYK: Above all, it is a system that does not function well. Of course, funding is insufficient, and I have no doubt about that. At the same time, a large share of the resources that are already available is spent very poorly. That is why I have mixed feelings about protests built around slogans such as “3 per cent for science.”

On the one hand, I completely understand young researchers who say they lack funding for research and are paid too little. I agree that some parts of the system deserve significantly more support. The National Science Centre is a good example because, in general, its funding is distributed according to transparent rules and through a sensible evaluation process.

At the same time, money continues to be spent on things that are of secondary importance. I recently learned that the ministry still maintains a special funding programme for new university and institute buildings. Frankly, I find that difficult to understand. Poland’s academic infrastructure already looks very good. I was recently in Oxford and Cambridge. Nobel Prize winners there often work in small, rather modest

offices. In Poland, we build impressive representative spaces and sometimes invest in marble or exotic wood. None of that produces better science.

I sometimes get the impression that we invest more in the appearance of institutions than in the people and research teams working inside them. Yet many major discoveries have emerged from environments that were far from luxurious. What mattered were good ideas, strong intellectual communities and the ability to focus on research.

The slogan of “3 per cent” can also be somewhat misleading. If you look at OECD countries, their total spending on research often exceeds 3 per cent of GDP, but a substantial share comes from industry and private-sector investment. Direct government funding is usually much lower. In Poland, one of the structural problems is that businesses invest relatively little in research and development.

So before asking for more money, we should learn how to spend existing resources more effectively?

Yes, but politically that would be extremely difficult. It would require closing or substantially downsizing some universities and research institutes, including



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institutes within the Polish Academy of Sciences and government research institutes.

Several years ago, when I served on the Science Policy Committee, we developed proposals for reforming PAS institutes. We drew some inspiration from the Max Planck model in Germany. The idea was that research institutes should not exist indefinitely simply to preserve themselves. They should be organisations created to address specific scientific challenges.

A new and important research area emerges. An institute is established, receives adequate funding and builds a strong team. After a number of years, it is evaluated. If the research has led nowhere, the institute should be dissolved. Science sometimes reaches dead ends. Graphene is one example. Enormous hopes were attached to it, many of which ultimately proved exaggerated.

Even successful institutes do not necessarily need to exist forever. If a research area proves genuinely important, universities eventually absorb it. New research groups emerge, new academic programmes are created and the field becomes part of mainstream science. At that point, the institute either becomes unnecessary or must reinvent itself around new challenges.

In Poland, however, there is a tendency to preserve institutions indefinitely. Over time, many become more focused on their own survival than on pursuing ambitious scientific goals.

That would require a fundamental restructuring of the entire system.

Absolutely, and that is precisely why every attempt to introduce such reforms encounters enormous resistance.

The problem is not limited to PAS institutes. It also affects universities. Poland has too many institutions trying to present themselves as world-class research universities. We spread resources too thinly, disperse talent and create a system that is expensive but not particularly effective.

This does not mean smaller cities should not have higher education institutions. On the contrary, they play an important role as regional centres of education and culture. But not every institution needs to be a full-scale research university competing with the best universities in the world.

At one point I proposed a model based on academic colleges that would serve precisely this regional function. Students could complete undergraduate studies there and then move to major research universities for graduate education. The problem is that almost every institution in Poland wants to be the next Harvard or Stanford.

The reality is that even countries with far larger research budgets maintain a clear hierarchy of institutions. Not every university conducts

world-class research in every discipline. In Poland, we often try to maintain the fiction that everyone can do everything.

We often hear that Poland has too few scientists.

I am not convinced that this is our biggest problem. I would say that we have too much mediocrity.

Of course, science also needs second-line researchers. Not everyone is expected to make groundbreaking discoveries. Someone has to carry out the steady, day-to-day work on which research depends. The problem is that our proportions are badly distorted. The best researchers are diluted within a very large population of average performers.

You can see this in the way universities operate. At one point, I compared the Faculty of History at the University of Warsaw with a comparable faculty at Harvard. I counted the number of people holding positions roughly equivalent to the American rank of professor. The University of Warsaw had about ten times as many. That gives some sense of how inflated parts of the system have become. And the problem is not limited to the humanities. Similar patterns can be found in other disciplines.

Part of this stems from the educational model itself. Polish universities still rely heavily on lectures. Students spend much of their time listening. At many Western universities, students are expected to study independently. They spend time in libraries, prepare extensively, engage in discussions and work on projects. Lectures are only one component of the educational process.

I have worked at universities in Australia, Canada and France, and the difference is striking. Students are expected to take much greater intellectual responsibility for their own education.

If Poland genuinely wanted to increase its chances of producing Nobel-level discoveries, where should it invest most heavily?

First and foremost, in the best people and the best research teams. You cannot build world-class science by distributing resources evenly across the entire system.

The problem is that Poland does not really have a coherent scientific strategy. Various strategic documents are produced, but they are usually so broad that they encompass everything. Every scientific community manages to designate its own discipline as a national priority. The result is a catalogue of wishes rather than a genuine strategy.

That is why a strong grant system is so important. Funding for the National Science Centre should be increased substantially. I say this as one of the architects of the institution, so people may accuse me of bias. Nevertheless, I genuinely believe it is one of the best-functioning parts of the entire system.

Today, grant success rates have become so low that the process increasingly resembles a lottery. The principle should be straightforward: funding should go to the strongest teams through a rigorous and internationally oriented evaluation process. That is how strong research groups are built.

If you look at most Nobel Prize-winning discoveries, they are rarely the work of a lone genius operating in isolation. More often, they emerge from teams that have reached a certain critical mass intellectually, organisationally and financially. There are exceptions, of course. Occasionally, someone comes up with a brilliant idea in a small and relatively unknown group. But those cases are uncommon.

You mentioned strong research teams. What is the biggest obstacle to creating them today?

Academic inbreeding. It is one of the biggest problems in Polish science.

A typical career path often looks like this: someone completes their degree, doctorate, habilitation and professorship at the same university. They then become rector because they are considered “one of our own.” In countries with truly strong research systems, that would be difficult to imagine.

Science depends on movement. It depends on intellectual cross-fertilisation. Researchers need to change environments, work with different teams and spend time abroad.

Germany addressed this administratively. For a number of years after completing a doctorate, researchers cannot apply for a professorship at the same university where they earned their PhD. In Poland, any discussion of similar solutions immediately provokes resistance. I hear arguments about families, children and mortgages.

When I worked in Australia, Canada and France, each move was both an intellectual adventure and a fascinating life experience. Young researchers should see mobility as an opportunity rather than simply a risk.

Mobility works in both directions. It attracts talented people from elsewhere while also encouraging institutions to send their own graduates out into the wider academic world. If people cannot remain immediately at their home institution, they must look elsewhere. That is when genuine intellectual exchange begins.

Is this also a question of academic culture?

If someone believes that an academic career consists mainly of giving lectures and waiting comfortably for retirement, they have chosen the wrong profession.

Some people imagine that research is simply a more relaxed version of office work. In reality, good science requires enormous amounts of time, concentration

and determination. It is an intensely competitive profession, especially for those who want to operate at an international level.

According to World Bank data, Poland produced more scientific publications than South Korea in the 1990s. Today South Korea publishes more than twice as much, while China produces nearly twenty times more. What went wrong?

The sheer number of publications is not the most important measure. Personally, I would prefer fewer researchers and better ones.

As I mentioned earlier, our strongest scientists are diluted within a very large population of average performers. On top of that, we have seen an explosion of publishing in predatory journals.

I still hear people argue that only the quality of the article matters, not where it is published. That is simply nonsense. Publishing in *Nature* is not equivalent to publishing in a local journal that nobody outside a narrow circle reads. The internet does not change that reality.

Some people also claim that automatic translation makes language and journal prestige irrelevant. That is another misunderstanding. Science depends on visibility, reputation and the quality of peer review. Ultimately, the answer is simple: you have to do good science and work hard.

There is a great deal of discussion about young researchers leaving Poland. But perhaps a bigger problem is how many talented people never enter science in the first place.

That is true. Science has a public relations problem today, and it is not only about salaries. It is also about how the salary system itself is structured. In Poland, a professor working in artificial intelligence may earn almost the same salary as someone in a field that is far less valuable in the labour market.

The result is predictable. Industry attracts many of the best specialists from the most promising areas. In Western countries, salary differences are often much larger, and nobody finds that surprising. Markets function according to certain rules, and science is not entirely insulated from them.

If we want strong research in strategically important fields, we must create conditions that allow us to retain the most talented people. That involves funding, but it also means providing opportunities to pursue ambitious research and work in excellent teams.

Finally, if you could make one decision that would increase Poland's chances of producing a Nobel Prize within the next ten years, what would it be?

I would double the budget of the National Science Centre. ■