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# ACADEMIA

THE MAGAZINE OF THE POLISH ACADEMY OF SCIENCES

## Science for Science



**On the role of academies in the modern world:**

**DUSZYŃSKI FILIPOWICZ HOFMAN IZDEBSKI KARWOWSKI KOŁODZIEJCZAK  
LOPRIENO PLATER-ZYBERK PUŚCIAN ROWIŃSKI SZAHAJ ZASZTOWT**



## People for Science, Science for the People

The title of this issue of *Academia* magazine – “Science for Science” – might at first come across as excessively introspective, too deliberately inward-focused. And yet, what we discuss here are not only the broader values that underpin science and stem from it, but also the people who serve science and indeed the importance of science for the people – all delivered in an accessible form. The latter aspect is especially important in today’s world, of course, where the flood of information makes it difficult to find reliable sources and verified knowledge.

In this era of ignorance, disinformation, and populism, the role of science and scientists as guardians of what is true is described in this issue by as many as four authors, including Prof. Andrzej Szahaj, who raises some especially acute problems. Where does the aversion to getting vaccinated come from? Why do people generally no longer trust science? These are questions not only about interpersonal communication in the Internet era, but also about science itself and its proper role in the twenty-first century. Dr. Piotr Karwowski touches upon similar topics, showing how fake news spreads like a virus in social media and how the Polish Academy of Sciences strives hard to promote knowledge about the problems facing today’s world.

In 2022, the Polish Academy of Sciences celebrates its 70th anniversary. This offers an opportunity for some more profound reflection on the definition of science and the reasons why science and scientists need academies. Herein we propose answers to this question from different perspectives – as historians, lawyers, media scholars, neurobiologists, etc.

We examine what an “academy” once was, and what it is now, in the macro-perspective, including how it relates to the nationwide, Europe-wide, or indeed worldwide scholarly community (“academia” in modern English parlance). Prof. Antonio Loprieno, the President of European Federation of Academies of Sciences and Humanities (ALLEA), discusses in an interview how global processes – climate change and digital transformation – affect the goals of academies of sciences and their growing interdisciplinarity. In turn, Dr. Anna Plater-Zyberk overviews various aspects of the internationalization of the Polish Academy of Sciences. This issue thus highlights the social dimension of science and its ability to constantly transcend frameworks. At the same time, we remember that the goals and tasks of academies of sciences and those of university centers do not always converge.

In addition, we take a closer look at academies. Prof. Iwona Hofman stresses such concepts as community, identity, reputation, and the autonomy of science institutions in the context of the Polish Academy of Sciences. In turn, Dr. Alicja Puścian, a member of the Women in Science at Nencki initiative, draws attention to the social changes that have resulted in the growing number of women in academic centers and the impact that this fact has on the scientific research conducted there. In this polyphonic account, we strive to pinpoint what science is, and what it can be, in the globalized world.

In the broadest sense, what we do in this issue is to take a long, hard, critical look at ourselves. We also encourage people outside the PAS to reflect on this situation and to try to move beyond the walls of this complex institution called “the academy.”

**PROF. JERZY DUSZYŃSKI**  
PRESIDENT OF THE POLISH ACADEMY OF SCIENCES

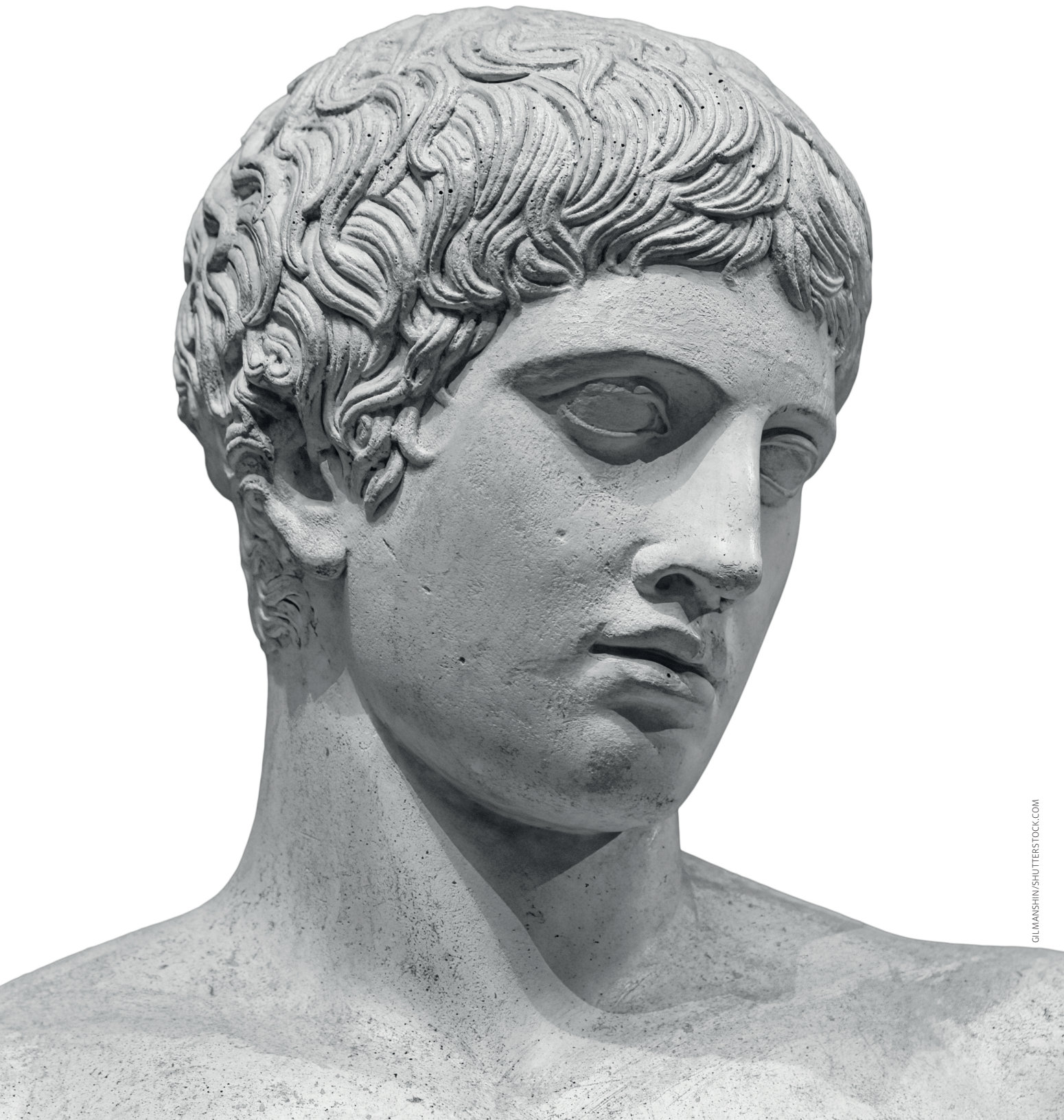
1952-2022

70

YEARS OF THE  
POLISH  
ACADEMY OF  
SCIENCES

PART I

# THE ACADEMY IDEAL



# WHEN WE SAY “ACADEMY”...

Plato's Academy  
in a mosaic from Pompeii  
(first century CE)



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Will intellectual dignity  
and the ideal of knowledge ever lose  
their importance as values?

## Stanisław Filipowicz

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The origins of the Academy founded by Plato are shrouded in trauma. The distinguished philosopher interrupted his stay in Sicily and came back to Athens. He was devastated: a return essentially meant a retreat. During his stay in Sicily, as a mentor to the ruler of Syracuse, Dionysius, Plato had attempted to pave the way for the reign of reason and virtue. His efforts were not exactly successful: he fell afoul of Dionysius and barely escaped with his life. Upon his return, he saw again the very thing he had escaped from – the misery of the city. Chaos, debauchery, senseless tussles. In the words of the translator of Plato's letters, Maria Maykowska, "In every manifestation of its life, Athens would show him evil and stupidity."<sup>1</sup> However, the Sicilian defeat did not dash all of Plato's hopes. He did not give up his dreams: he still wanted to change the world, albeit in a different way. That was how a grand project was born: the project of the Academy.

### Antiquity

Plato "had his Academy recognized as a community consecrated to the worship of the Muses and Apollo, the head of the Muses."<sup>2</sup> The philosopher turned his gaze away from the absurdities of politics. He wanted to influence reality by shaping human minds and filling Athens with the radiance of truth. The Academy was intended as a refuge for the partisans of wisdom, those who desired to step outside the circle of illusion, beyond the conventions of the city intoxicated by the impetus of public opinion – genuine allies of the truth, those who wanted to see things as they really were.

The Academy rejected the rules of apparent wisdom and decided to rise above the noise of the street – in his pursuit of truth, Plato wanted to rely on unshakable foundations. By creating a community of rational knowledge, he also wanted to influence the future of the city. The model formed in this way would stand the test of time and become a symbol of values that represented the pinnacle of the world of knowledge.

Over time, the idea would obviously evolve, but the underlying thought would never lose its significance. That thought was indeed simple: to do good, one must shake the world out of its inertia, overcome the resistance of ignorance. That was how Plato saw things.

Having adopted the creed of Socrates, he persisted in his conviction that the wisdom contained in authentic knowledge was always a manifestation of good.

Of course, not everything could assume the form of uninterrupted harmony – that was the case in the past, and this is the case now. In Athens, philosophers sometimes drew jeers, with the role of mentors to the crowd being played by Sophists, who – like Gorgias – argued that "there is no truth." Is the world capable of renouncing ignorance? Indeed, we should ask whether there is a *modus vivendi* that facilitates the coexistence of separate systems, one that allows the creed of the Academy to be reconciled with broader aspirations.

The Academy gave radiance to the idea of knowledge, and that may have been its most significant merit. It made demands, but it did not turn its back on the city: it cultivated the belief that authentic wisdom should go beyond the narrowly understood profession of truth. "[t]he ultimate aim of the Academy was not the pursuit of knowledge and science only in the abstract," as Giovanni Reale stresses, "but also their ethical and political applications in the concrete."<sup>3</sup>

It could be said that the Platonic Academy changed the direction of "the needle of the compass," thus guiding human ambitions out of the world of ignorance and into the world of knowledge. It also ultimately went beyond the narrow field of philosophy – as the Academy moved "[b]eyond the Socratic area of interest, arithmetic, geometry, and astronomy made a triumphal entry. (...) We have, in addition, testimony that proves the presence in the Academy of medical men from Sicily."<sup>4</sup>

After all, the allies of reason aimed high – the cult of truth established in the Academy would mean the merger of the idea of knowledge with the pursuit of excellence. Interestingly, even now the concept of scientific excellence plays a prominent role in the language of the scholarly world. The idea of excellence retained its meaning: it became an element of secular eschatology, acting as a focus for the farthest-reaching hopes that were pinned on the advancement of knowledge and the pursuit of truth. The stakes were high. Shedding the burden of ignorance, as Socrates would teach, should initiate a transformation – an awakening ending the misery of life in a half-sleep, in a fever of delusions.

### The Enlightenment

The Age of Enlightenment emphasized the *topos* of disillusionment, rooted in the philosophy of Plato, and construed the pursuit of rational knowledge as an act of purification – the beginning of regeneration. In tandem with the theme of disillusionment, the Enlightenment developed the symbolism of a new beginning – and brought forth its protagonist,



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<sup>1</sup>Maria Maykowska, introduction to Platon, *Listy* [Letters] (PWN, 1987).

<sup>2</sup>Giovanni Reale, *A History of Ancient Philosophy*, trans. John R. Catan, vol. 3 (SUNY, 1985).

<sup>3</sup>Reale, *A History of Ancient Philosophy*.

<sup>4</sup>Reale, *A History of Ancient Philosophy*.

## ACADEMIA PART I The Academy Ideal



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Henri Testelin,  
*Colbert Presenting  
the Members of the Royal  
Academy of Sciences  
to Louis XIV in 1667  
(around 1680)*

a New Adam. “The new man,” as the enthusiasts envisioned him, “sees the entire future as a space of perfection.”<sup>5</sup>

In keeping with this theme, in the seventeenth century, the academy archetype garnered renewed recognition and became imbued with great splendor. The year 1660 witnessed the establishment of a gathering of scholars in London, operating initially as an “invisible college,” and from 1663 onwards officially as the Royal Society of London for Improving Natural Knowledge – in effect, the very first academy of sciences in modern history.

The year 1666, in turn, saw the establishment of a French academy of sciences (*Académie Royale des Sciences*). Gradually and in parallel, academies of arts, architecture, and music also came to be established in both countries. Royal patronage, as can be seen clearly in France’s case, took the form of a Platonic parallel. Respectable bodies, infused with great prestige and dignity, were expected to foster the benefits of the advancement of scholarly knowledge and also to cultivate the principles of cultural refinement. The prestige of those scholarly bodies was linked to the symbolism of illumination. Louis XIV – *le Roi Soleil*, the Sun King – wanted his land to be awash with the radiance of wisdom. In seventeenth-century France,

however, inspiration was already becoming coupled with calculation, as the emerging modernity was imposing its own laws. The first academies were set up by Jean-Baptiste Colbert, France’s all-powerful Controller-General of Finances – a demiurge striding in the Sun King’s entourage whilst carrying an accounting ledger under his arm. Academies would become a powerful force consolidating the secrets of wisdom, so as to shape the future of the monarchy and contribute to its glory, fortune, and fame.

However, the whole story begins even earlier: with a group of dreamers and visionaries whom we call the utopists. But let us not rush to treat them with a condescending sense of superiority. The works of the utopists may contain some deeper truth – a depiction of historical transfigurations that allow us to see the similarities between epochs and the durability of archetypes. It would be difficult to find a better example than Francis’s Bacon *New Atlantis*, a work replete with intriguing themes. In it, the author successfully combined the cult of ancient wisdom with visionary panache and unwavering radicalism. The world can be, should be different! The descriptions in *New Atlantis* are filled with recurrent images of lost completeness. The greatest achievements of the ruler of this happy island include “the erection and institu-

<sup>5</sup> Mona Ozouf, “La Révolution française et l’idée de l’homme nouveau,” in *The French Revolution and the Creation of Modern Political Culture*, vol. 2, ed. C. Lucas (Pergamon, 1988).



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tion of an Order or Society which we call Salomon's House."<sup>6</sup> From this moment on, knowledge would occupy the foreground, opening up the road to wisdom and happiness. The "*magnalia naturae*" ("wonders of nature") that the wise men of Salomon's House were meant to focus on ensuring include:

"The prolongation of life.  
 The restitution of youth in some degree.  
 The retardation of age.  
 The curing of diseases counted incurable."<sup>7</sup>

That was how the precursors of modernity envisioned the future.

Tommaso Campanella was guided by a similar vision when sketching out his picture of *The City of the Sun*. The marvelously symmetrical squares and streets of Campanella's dream city were meant to become a paragon of perfection – an inscription of reason that illustrated the nature of the perfect society, which was the embodiment of rationality (architecture participated in the *mysterium* of truth). The City of the Sun was ruled by the servants of reason – this was what life there was like. "Wisdom is the ruler of the liberal arts, of mechanics, of all sciences with their magistrates and doctors, and of the discipline of the schools."<sup>8</sup> This

fanciful city was the picture of an academy becoming the whole world – the most ambitious and far-going transposition of Plato's model.

Campanella's images anticipated the direction of great historical change. The *imaginarium* of the Enlightenment was a replica of Plato's solar symbolism. The image of light coming from above, dispelling the darkness of ignorance, ultimately became one of the key aspects of the founding myth of modernity. Encoded within these "metaphors of illumination" were all the hopes of modern rationalism.<sup>9</sup>

In the Enlightenment, attempts were made to institutionalize Plato's idea of the rule of reason, transforming the *topos* of an Academy into an array of practices. The eighteenth century became the century of academies of sciences. The academy idea appeared dressed in new, ornamental garb, bequeathed by enlightened monarchs. Enlightened despotism (*le despotisme éclairé*) was a major trend in the Enlightenment-era traditions. Russia, Prussia, and Austria, all of which were absolute monarchies, supported this credo of the eighteenth century. To them we owe the grand resurgence of the academy concept. The "great" rulers of these countries – Peter the Great, Frederick the Great, and Catherine the Great – rolled up their sleeves and got down to work, flirting with philoso-

The palace yard of Académie Royale des Sciences on a drawing by Sébastien Leclerc (1698)

<sup>6</sup> Francis Bacon, William Rawley, George Fabyan Collection, *Sylva sylvarum, or, A natural history in ten centuries [...] and the New Atlantis* (Printed for Bennet Griffin, 1683)

<sup>7</sup> Bacon, Rawley, and Fabyan, *Sylva sylvarum*

<sup>8</sup> Tommaso Campanella, *City of the Sun*, trans. Thomas W. Halliday, in *Ideal Commonwealths*, ed. H. Morley, fifth edition (Routledge, 1890)

<sup>9</sup> Marek J. Siemek, *Wykłady z filozofii nowoczesności [Lectures on the philosophy of modernity]* (PWN, 2012).

## ACADEMIA PART I The Academy Ideal

phers, eager to try their hand at combatting the power of ignorance.<sup>10</sup> They would become what we now call trendsetters, influencers shaping the fate of societies – as academies of science were established in all three countries. Impassioned democrats, we should note, did not always share the same sympathies: in 1793, on the very threshold of the Reign of Terror, France’s Jacobins abolished the French Academy of Sciences.

Did they have any reason to do so, apart from overzealousness, which is encouraged by every revolution? There may have been some perverse intuition in all this, some measure of mistrust of the haughty loftiness of majesty, which would prove unacceptable in the age of democracy. The Jacobins opened up a chapter, and it has yet to be closed. As we know, loftiness often borders on the ridiculous. The grand ambitions of the Age of Reason were mercilessly mocked by Jonathan Swift in *Travels into Several Remote Nations of the World*, or the famous *Gulliver’s Travels*. In the book, we find a mocking picture of the Grand Academy of Lagado. Among “[t]he arts wherein the professors em-

philosophy being understood in a very broad sense. The Society was expected to support “all philosophical Experiments that let Light into the Nature of Things,” taking into account, for example, “new-discovered Plants, Herbs, Trees, Roots,” or caring for “New Methods of Curing or Preventing Diseases.”<sup>12</sup> That was the true mission of philosophers: to promote wisdom that would influence human life. In their innovative nature, the American views on philosophy anticipated the direction that would become in a sense the signature of practical wisdom and would ultimately shape the ambitions related to the advancement of knowledge in all democratic societies – pragmatism. That meant the rejection of the Platonic model, with new hopes but also new worries being born on those foundations.

### The contemporary era

Rules of rationality, as we know so very well, are undergoing transformations. Thinking means a constant flow of ideas, a constant search. It would now be difficult to imitate the eighteenth century and talk about the “reign of reason.” We no longer use that language; we certainly see things differently. “We must part,” as the Polish philosopher Marek J. Siemek wrote, “with the hopes of grasping all meaning, regardless of how it is understood.”<sup>13</sup> No universally recognized measures of truth exist any longer. If so, what could the sense of the concept of scientific knowledge be? If we come to terms with the thought that “the idea of ultimate validation is a myth,” then only “non-absolute, fragmentary validations” will be possible.<sup>14</sup> In the culture of divided opinions, the idea of a hierarchical order, associated with the symbolism of illumination and rooted in images of reason reaching us from the heights of light, loses its meaning. Could science survive the demise of the concepts of knowledge formed in keeping with the tradition of the Enlightenment? Will the culture of fragments accommodate institutions that cultivate the mission of reason? Will respect for the patina-covered statue of Solomon’s House survive, or will it turn out that its splendor is gone?

In addition, new temptations are emerging. It is hard to overlook the efforts to transform Solomon’s House into a chamber of commerce and industry. We can see the growing importance of the tensions between the principle of autonomy, which shapes the aspirations of scientific reason, and the claims of the “knowledge industry” – between the ethos of truth and the criteria of efficiency based on the principle of utility. We must bear in mind that untruth may sometimes bring greater benefits than truth. Can we trust the criteria of utility without any reservations? Do we want to definitively reject the Platonic models of wisdom and demolish the sanctuaries of knowledge by replacing them with the operating systems

No universally recognized measures of truth exist any longer. If so, what could the sense of the concept of scientific knowledge be?

ploy themselves,” Swift lists the task of “extracting sunbeams out of cucumbers,” efforts to “calcine ice into gunpowder,” and studies into the “malleability of fire.”<sup>11</sup>

In closing our ledger of mockery and catalog of examples, we should stress that the democrats likewise did not overlook the historical conjuncture conducive to the success of academies of sciences. In Boston in 1780, the American Academy of Arts and Sciences was founded by a man from the generation of the great Founding Fathers – John Adams. This came four years after the Declaration of Independence, in the heyday of the American Revolution, which sought to reaffirm its own hopes. The Academy of Sciences was founded even before the Constitution of the United States was enacted. The need to consolidate institutions of knowledge was given recognition before the need for political consolidation. In fact, everything started even earlier. The groundwork for the Academy was laid by an associative movement – which was, of course, the point of democratic initiatives. In 1743, the American Philosophical Society had been founded by Benjamin Franklin – with the concept of

<sup>10</sup>François Bluche, *Le despotisme éclairé* (Fayard, 1968).

<sup>11</sup>Jonathan Swift, *Gulliver’s Travels into Several Remote Nations of the World* (Project Gutenberg, 1997), <https://www.gutenberg.org/ebooks/829>

<sup>12</sup>The Papers of Benjamin Franklin, vol. 2, ed. Leonard W. Labaree (Yale, 1961), cited from Founders Online, National Archives, <https://founders.archives.gov/documents/Franklin/01-02-02-0092>

<sup>13</sup>Siemek, *Wykłady*

<sup>14</sup>Siemek, *Wykłady*



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Rafael Santi,  
*The School of Athens*  
(1509–1511)

of artificial intelligence? The classical order, which took into account the primacy of truth, assumed that what was true was also effective. Towards the end of modernity, this order came to be reversed: what was effective was also considered to be true.<sup>15</sup>

Needless to say, we do not have good answers to all difficult questions. The search for certainty should prompt us to keep trusting science as the supreme form of knowledge. However, there will be plenty of skeptics, egalitarians, and enthusiasts of wisdom based on popularity ratings.

Can we rescue the prestige of knowledge whilst rejecting the Enlightenment-age symbolism of illumination? This question in its essence captures a great contradiction that we can no longer hide – the emancipation of reason has ultimately nullified its authority. Jacques Derrida, one of the protagonists of deconstruction, a philosophical trend in which the most radical criticism of the pathos of knowledge is now taking shape, argues that the “search for truth without any conditions attached”<sup>16</sup> still retains its significance – in fact, this is the sense of all deconstruction programs, which are always aimed at overcoming illusion.

The dignity of thinking and the ideal of knowledge alone may never lose their significance as values. Those in the know will say that this is the power of the original sin, these are the consequences of reaching for the fruits from the tree of knowledge. The desire

for knowledge is insatiable, so the foundations of Solomon’s House will not be destroyed by any furies.

Where are we, ultimately? Does the idea of a “knowledge society” not remind us a little of the dreams of Campanella, who sketched out the vision of a City of the Sun? With our Promethean emotionality and desire for immortality, can we renounce the splendors of Solomon’s House? Where do we, immortal wanderers in the kingdom of unfulfilled hopes, want to go?

Let us leave aside these unbearable questions. One thing is certain: just as in Plato’s times, we still have a lot of work to do, plenty of things to worry about. The hustle and bustle of the city, the disorder, the tussles of the sophists. We know this atmosphere, we know this mood. In our smog-shrouded “Athens,” the scales have yet to tip in anyone’s favor. The cosmopolis is choking, it does not fall asleep. We continue to grapple with the force of inertia, which encourages tendencies leading us to the verge of a disaster. Today, as we know, our doom may take the form of a climate catastrophe. In defiance of all sciences, ignorance and bad habits are raging unabated. And the temperature is rising.

But is there anything that sets us apart from the Greeks? Let us answer without hesitation: yes, there is. We do not have to found an Academy – it already exists. ■

<sup>15</sup> Jean-François Lyotard, *The Postmodern Condition*, trans. Geoffrey Bennington and Brian Massumi (University of Minnesota, 1984)

<sup>16</sup> Jacques Derrida, *Learning To Live Finally: The Last Interview*, trans. Pascale-Anne Brault & Michael Naas (Melville, 2007)

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# THE ACADEMY: THEN AND NOW

The Staszic Palace in Warsaw was the first seat of the Polish Academy of Sciences. It continues to house PAS scientific institutes and auxiliary units, including the PAS Institute of Philosophy and Sociology and the Council for the Polish Language



PAS ARCHIVE

On the changes that have taken place  
in the Polish Academy of Sciences over  
the decades and its goals and tasks  
in science and beyond.



# ACADEMIA PART I The Academy Ideal

**Jerzy Duszyński**

President of the PAS

**T**he Polish Academy of Sciences was founded back in 1952, in what is described as the Stalinist period in Poland's history. For this reason, the Academy is sometimes said to have "tarnished origins," so to speak. However, that was also a time of rebuilding Poland after the terrible war-time devastation. WWII had left many cities in rubble, and this especially held true for Warsaw, which was almost completely and totally destroyed.

## The beginning

World War II devastated the infrastructure of scientific institutions in Poland, but more importantly it also decimated the scholarly community. As a result of the war, Poland had its borders redrawn. Prior to WWII, two of the four prewar Polish universities (the John Casimir University in Lwów/Lviv and the Stephen Báthory University in Wilno/Vilnius) operated in areas that ended up outside Poland. In the years immediately following the war, cities, roads, bridges, railroads, and the educational institutions, along with the very system of education in Poland, had to be rebuilt from the ruins.

Undoubtedly, a key role in those efforts was played by the Polish Academy of Sciences, which pulled together many of the most prominent Polish scholars. It influenced the whole of the system of science in

The Kórnik Castle, the new facade. The Castle is home to one of the many libraries of PAS

Poland – as a result of severe staff shortages, it was common practice for scholars to be employed simultaneously at an Academy research unit and at a university. Moreover, the assembly of Academy members has been dominated from the outset by scholars employed at universities, who now account for 70% of its members.

Today, the legal rules that govern the functioning of the Academy bear little resemblance to the ones in force at its inception. The parliamentary acts regulating the Polish Academy of Sciences have been revised on many occasions. The first "Act on the Polish Academy of Sciences" was passed in 1951. The next one was enacted in February 1960, then amended in 1963, 1965, 1970, and 1973. The third act was passed in April 1997, and the current and fourth one dates from April 2010. In recent years, the current governing bodies of PAS have also worked intensively to prepare the Academy to meet the upcoming challenges. In 2019, by virtue of a decision of the PAS President, a team was set up to draft guidelines for an amendment to the current Act on the Polish Academy of Sciences (from 2010). In 2020, the team's efforts resulted in the drafting of an amendment to the PAS Act. Here, it should be added that the Academy's body of elected members (the "corporation," as it is known) has been supplemented with new members many times over the past 70 years, with the scientific merits of candidates (male or female) playing a decisive role in their selection.

## Scientific activity

Although the Polish Academy of Sciences has played an important role in the system of science in Poland from the outset, the Academy's scientific activity has risen in significance even more over the years. There is no doubt that the PAS is now a leading scientific institution in Poland. To back up these words, I can cite the results of the latest evaluation of scientific units conducted in 2017 by the Committee for the Evaluation of Scientific Units (KEJN). It examined the activities conducted in 2013–2016 by a total of 1,000 units, including university faculties, PAS institutes, and research institutes. Among these, 63 units were awarded the highest category (A+), and 14 of those were PAS institutes. Among the 387 units that were given the category A, there were 44 PAS institutes. An analysis of the Academy's publication and grant-winning activity in 2019 revealed that scholars affiliated with PAS institutes published as many prestigious papers (top 25%) in 2013–2018 as those affiliated with Poland's three largest universities with the best publication figures, taken together. Importantly, each of these largest universities employs as many staff members as the whole of the Academy. Likewise, the PAS is a leader in obtaining European funds for research projects. Under the EU Program "Horizon 2020," PAS insti-



KÓRNIK CASTLE

tutes have obtained as much funding as six leading universities taken together. We are a leader in terms of the number of internationally renowned researchers. The list of the World's Top 2% Scientists 2020, compiled by Stanford University in collaboration with Elsevier, included 726 researchers from Poland, including 134 from the PAS, 58 from the University of Warsaw, 45 from the Jagiellonian University, 42 from the Warsaw University of Technology, 34 from AGH University of Science and Technology, 27 from the Wrocław University of Technology, and 25 from the Adam Mickiewicz University. These are just some of the figures illustrating the stature of the PAS within the system of science in Poland.

## Organizational structure

The PAS consists of its elected body of Academy members (the “corporation”), numerous PAS committees, and 80 scientific institutions, which include institutes, laboratories, centers, botanical gardens, and other units, as well as auxiliary units: archives, libraries, museums, foreign research stations, and so on, which conduct research or R & D work.

The elected body of Academy members can legally include no more than 350 members. Their duties involve working in the five divisions of the Academy (I – humanities and social sciences; II – biological and agricultural sciences; III – mathematics, physics, chemistry, and Earth sciences; IV – engineering sciences; and V – medical sciences). In addition, they exercise oversight over the activity of the PAS institutes. The supreme governing body of the Academy is its General Assembly, which is a meeting of PAS members held at least twice a year.

The PAS institutes are primarily engaged in research, employing a total of over 9000 staff, including almost 4100 research workers. The Academy is recognized in Poland and abroad as a prominent scientific institution thanks to the outstanding research achievements of the scholars affiliated with the PAS institutes, which also promote the positive international image of Polish science. The PAS institutes are able to offer doctoral, post-graduate, and other educational programs. Currently, 59 PAS institutes plus the International Institute of Molecular and Cell Biology are involved in providing programs at different 23 doctoral schools: nine of them are run exclusively by the PAS institutes, six in collaboration with universities, five in collaboration with research institutes, and three in collaboration with research institutes and a university.

## Education

Currently studying in the doctoral programs and doctoral schools run by the PAS institutes, independent-



ADAM HOLNICKI/PAS INSTITUTE OF FUNDAMENTAL TECHNOLOGICAL RESEARCH

The A+ evaluation category was awarded to such PAS units as the Institute of Fundamental Technological Research. Photo: Division of Technological Laser Applications, Department of Experimental Mechanics, PAS Institute of Fundamental Technological Research. Chamber for thin film deposition using the laser ablation method

ly or in collaboration with universities and research institutes, there are 1803 PhD students (with women accounting for 56.3%), including 359 from abroad (data as at the end of 2020). In 2019, there were 1874 PhD students (the share of women was 57.7%), including 302 from abroad. In 2020, 341 PhD students were admitted to doctoral schools, up by 133 compared with the year before (208 students in 2019).

Doctoral students are represented at the Academy by the PhD Student Council of the Polish Academy of Sciences, on matters concerning science, culture, and social and financial conditions. The Council promotes the integration of the PAS doctoral student community, and also represents it by engaging in the work of the National Representation of Doctoral Students (KRD). Forms of support for the educational activity of the institutes include the Scholarships of the PAS President, awarded to PAS PhD students. They are awarded to candidates with outstanding scientific achievements in their field. The PAS research institutes also provide second-cycle and post-graduate studies and numerous specialist courses. However, in spite of these unquestioned achievements, I do realize that the Academy's educational mission should be even much more advanced.

## Additional funding

In recent years, one of the most important tasks of the Academy's governing bodies has been to obtain more EU funds and grants for science institutions. To obtain more EU funds and use them effectively, the Academy established the Department for Excellence in Science, which provides researchers with support

# ACADEMIA PART I The Academy Ideal

The PAS Botanical Garden in Powsin actively promotes greater public understanding and appreciation of botany



PIOTRBB/SHUTTERSTOCK.COM

in applying for European Research Council grants. Thanks to the Department's activities, the Academy launched the PASIFIC (Polish Academy of Sciences' Individual Fellowships: Innovation & Creativity) Fellowship Program with a budget of nearly 12 million euros. It is addressed to top young scientists from all over the world who want to conduct research at the PAS institutes.

## The voice of experts

We have observed a rise in the significance of the opinion-shaping role played by the Academy's assembly of members, supported by its scientific and task-force committees. The PAS reacts to current events. One example is the work of the Interdisciplinary COVID-19 Advisory Team. Its tasks include monitoring the course of the COVID-19 epidemic in Poland and analyzing possible scenarios for the development of the epidemic in Poland and Europe. The team's work resulted in the publication of *Understanding COVID-19: Report of the COVID-19 Advisory Team at the President of the Polish Academy of Sciences*, which presented the current state of knowledge about SARS-CoV-2, COVID-19, and its medical, psychological, economic, and social impacts. Since June 2020, the team has also released 31 detailed position statements presenting selected aspects of the COVID-19 epidemic.

Since April 2021, the Polish Academy of Sciences and the Copernicus Science Centre have been organizing a series of online meetings entitled "Coronavirus in the Crosshairs." Its guests include experts from the COVID-19 Advisory Team, as well as other prominent experts from various disciplines of science. For most

of the meeting, the experts answer questions asked by the audience. The purpose is to offer ordinary people direct access to experts and dispel their doubts related to the pandemic and COVID-19 vaccines. Videos of all the meetings are available on the PAS channel on YouTube.

Among the numerous activities undertaken by the Polish Academy of Sciences in recent years, especially noteworthy are those focused on the broadly-understood concern for the environment – the conservation of biodiversity and the fight against the climate crisis. The PAS adopted a strong stance in support of protecting the Białowieża Primeval Forest against large-scale felling of trees and called for the urgent development of a coherent strategy for preserving this unique site.

The PAS committees and commissions have expressed vocal opinions on nature conservation topics. Examples include the position statement on the conservation of wolves in Poland issued by the Commission for Nature Conservation and Management at the PAS branch in Olsztyn and Białystok, the position statement of the PAS Committee of Environmental and Evolutionary Biology on the conservation of old-growth forests, and many more. This shows that the PAS has one of the most influential voices on issues related to nature conservation and the climate crisis in the broad sense. As a member of the European Academies' Science Advisory Council (EASAC), the Academy also publicizes the EASAC statements on climate and biodiversity.

There is no doubt left about the rapid nature of ongoing climate change, which has been caused mainly by human activity. In 2020, to help the scientific community speak out with a stronger voice on the

alarming phenomena related to the worsening condition of climate, the Academy established the Advisory Group on Climate Crisis affiliated with the Academy President. This team consists of 15 experts representing various disciplines, ranging from physics, biology, and medicine, through energy, water management, and urban planning, to law and sociology. The Group formulates recommendations related to the state's interventions and bottom-up initiatives in social processes, the economy, and the world of business. It provides substantive support in the development of climate policy and the plans for a transition towards a zero-carbon economy. The group's position statements influence public opinion through the media, especially in the discussion on the rising sea levels.

The Academy undertakes numerous initiatives promoting broader collaboration between the Polish scientific community and research centers and organizations throughout the world. International collaboration manifests itself in the establishment of very valuable relations with leading experts in various fields of science through the participation of Polish scholars in international meetings, symposiums, and conferences. International collaboration and scientific exchange are based on numerous bilateral agreements, as well as the Academy's membership in over 100 international scientific organizations in the world. An important role in promoting the achievements of Polish science, but also of Poland's history, culture, and economy is played by the PAS research stations in Berlin, Paris, Rome, Vienna, Brussels, and Kyiv.

## Science popularization

Publications, funding of numerous science projects organized by the PAS committees and scientific units, and support for the science popularization efforts made by the PAS institutes are all aimed at disseminating cutting-edge science.

Every year, the Academy, its institutions, and committees publish several hundred titles in print, nearly half of which are scientific journals and publishing series. One of them is a series of books *Wybitni uczeni we wspomnieniach* (Recollections of Prominent Scholars).

The Academy's official scientific journal is the quarterly *Nauka* (Science), which publishes peer-reviewed original research papers and articles in various disciplines as well as articles devoted to current problems related to the organization of science and higher education. *Academia*, the Academy's popular-science quarterly published in Polish and English – in which this very article is appearing – promotes the achievements of Polish researchers in Poland and abroad. Each issue has a specific theme, recent examples include: climate change, water, energy, and tenderness. All issues are available in print and online.

The promotion of culture is the domain of auxiliary units operating within the organizational structure of PAS: the Gdańsk Library, the Kórnik Library, the Congress and Conference Center in Jabłonna, the Museum of the Earth in Warsaw, the PAS foreign stations, and the Botanical Garden in Powsin. The Gdańsk Library of the Polish Academy of Sciences, which is celebrating its 425th anniversary this year, organizes numerous promotional campaigns involving the local community (such as city games, promotional campaigns on the library's activity, for example a specially marked streetcar or a mural). Events related to the anniversary celebrations included the inscription of five works by Johannes Hevelius on the Polish National Register of the UNESCO Memory of the World Programme, including unique copies of works containing dedications written by the author and drawings he had personally colored.

In addition to providing access to its collections, the Kórnik Library teaches classes on the use of the library, database searches, library catalogs, and digital libraries. The Congress and Conference Center in

The PAS has one of the most influential voices on issues related to nature conservation and the climate crisis in the broad sense.

Jabłonna organizes exhibitions of paintings, photographs, and posters, as well as concerts and science festivals.

The PAS Botanical Garden in Powsin plays an important role in broadening the public awareness of botany. Every year, the garden is visited by hundreds of thousands of people, who have a chance not only to spend their time in an enjoyable way, but also to learn more about the Polish and foreign flora. The garden organizes numerous scientific and educational workshops and cultural events. Apart from organizing exhibitions in the traditional sense, the PAS Museum of the Earth and the Evolution Museum of the PAS Institute of Paleobiology play an educational and science-communication role by organizing workshops and publishing interesting films in social media.

Overall, the Polish Academy of Sciences is one of Poland's leading scientific institutions. It is active in research, in education, and in science popularization and dissemination. Without any doubt, we can certainly say that it is important institution whose achievements are recognized abroad. ■



# QUO VADIS, ACADEMIA?

**W**e discuss what role national academies have to play in today's world, and what challenges they have to face, with **Prof. Antonio Loprieno**, President of ALLEA, the European Federation of Academies of Sciences and Humanities

### What mission and goals do the national academies have in the context of the contemporary global challenges?

The role of national academies has changed over time. At their inception in the seventeenth century, learned societies such as the Royal Society in England, the *Akademie der Naturforscher Leopoldina* in Germany or the *Académie française* in France prompted the establishment of empirical science and the development of

scientific dictionaries and encyclopedias, as a counterpart to the prevailing religious instruction then being provided at universities. The nineteenth century saw on the one hand the birth of the modern university, on the other hand the development of the German model of academies as the locus for interdisciplinary exchange. Finally, after the model of the Russian academy, many national academies in Central and Eastern Europe established themselves in the nineteenth and



PAPANNIKOLAKIS PHOTOGRAPHY/SHUTTERSTOCK.COM

icated institutions of science in society and as open spaces for scientific exchange, academies are also the natural locus for tackling complex societal challenges.

**How can the national academies from different countries support each other in pursuing these goals?**

We should keep in mind that European national academies not only operate according to the different models described above, but also have very different budgets at their disposal. Some academies, for example in the United Kingdom, in Austria or in Germany, are comparatively well funded and have the means to fulfil their role as a think-tank or as a research institution and provide important counsel, since their impact is based on broad societal trust. Other academies, on the other hand, are less well funded and usually have to fight to have their voice heard at the sociopolitical level. A network such as ALLEA functions as a bridge between these two European realities, operating both as a center of competence in science, science communication and science advice (e.g. by participating in European research mechanisms) and as a capacity building project for our less fortunate members. At ALLEA, we try to learn from the national experiences and raise our common voice whenever in Europe we see the integrity and the primacy of science in danger. In sum: we combine best practice with benchmarking for all our members. Successful examples of this close collaboration and interaction within ALLEA are the European Code of Conduct for Research Integrity<sup>1</sup> and our recent paper on the dangers of science disinformation “Fact or Fake?”<sup>2</sup> In these cases, we can say that the interaction between academy members produces far better results than a single academy would ever have been able to achieve.

**One of the roles of the national academies is to deliver a consensus of knowledge.**

**What is needed to transfer this knowledge into practice? Are the national academies where this works best?**

The issue of knowledge consensus is a relatively new one for European academies and is connected with the democratization of information that – at different levels – has taken place in our continent in the latter part of the twentieth century and is increasingly dominating our societal discourse in times of digital turn. When knowledge, as was the case until very recently, was the private property of a small elite, there was no need for societal consensus. When on the contrary, as is the case today, everyone is just three mouse-clicks away both from a Nobel-prize level scientific paper and from the fake news of an American flat-earth believer, knowledge consensus must be at the center of academic attention. Now, there are two major keys for developing this form of consensus. The first is to maintain

twentieth century as the highest research and research funding institution in their respective country.

But since the political and social changes of the 1990s, all European academies have developed common concerns; our network ALLEA (established 1994) is a prototypical expression of this societal turn in the European academic landscape. The academies’ new concerns moved away from pure science and focused on how to best position science in a knowledge-based society. Contemporary global challenges, therefore, are an expression of these common goals of European academies: what was once “fostering empirical science” has now become “addressing global challenges.” We now realize that our most urgent societal needs (climate change, digital transformation, sustainable growth) can only be addressed on the basis of trans-disciplinary approaches. Therefore, as the most ded-

<sup>1</sup> <https://allea.org/code-of-conduct/>  
<sup>2</sup> <https://allea.org/portfolio-item/fact-or-fake/>

## ACADEMIA PART I The Academy Ideal



### Professor Antonio Loprieno

has been President of ALLEA since May 2018. He studied Egyptology, linguistics and Semitic studies at the University of Turin in Italy. He has taught at the University of Göttingen in Germany, University of Perugia in Italy, University of California Los Angeles, University of Basel. He has served as President of the Swiss Academies of Arts and Sciences, President of the Jacobs University Bremen, President of the Rectors' Conference of the Swiss Universities and holds the Presidency of the Austrian Science Board.

the highest standards of competence in our scientific community: we bear a responsibility always to look for research excellence without any form of discrimination, and to make sure this excellence is adequately mediated to society. The second key is to generate trust in science within our society by mediating scientific results to the public and to the political leaders.

In order to generate knowledge consensus, both science communication and science advice are of paramount importance: science communication means choosing from among our peers the right people and the right channels to help make our research known among larger segments of society than “just” the academic world. And science advice means making our political leaders aware that while there may be different legitimate scientific opinions on a particular issue, they should always be aware that empirical evidence is not negotiable. Never should anyone, particularly in a position of sociopolitical responsibility, indulge in spreading fake news, because

this poses a threat not only to the knowledge consensus, but also to society as a whole. Competence and trust are the main conditions necessary for creating scientific, ethical and societal consensus. This is also why science advice at the national and international level has become so important. In the SAPEA project,<sup>3</sup> which is the science advice program by European academies for the European Commission, European academies join forces to provide scientific, evidence-based advice for policy making at the level of the EU. Academies nominate experts who together provide a so-called Evidence Review Report, which in its turn is used by the Commission's Group of Chief Scientific Advisors to provide an opinion on topics ranging from sustainable food development to energy security and safety.

### What are the biggest obstacles currently faced by the national academies?

There are two main challenges currently faced by national academies. Ironically, the first challenge comes from within the academic system itself, namely the increasing visibility of European universities and other institutions of higher education. Please understand me correctly: the autonomy of universities and their major role in fostering research and innovation in Europe is a wonderful development and has been one of the key factors in promoting science and education at the continental level, more than in any previous period of history. European universities also have Europe's attention at the political level, as shown by French President Macron's initiative to establish strategic alliances between higher education institutions.

But at the same time, the universities' increased strength over the last two decades has coincided with a gradual loss of relevance for European academies: both the general public and economic and political leaders have become attentive stakeholders of the universities as education providers, whereas academies have often come to be seen – of course incorrectly – as more elitist institutions. As members of European academies, we should aspire to modify this perception and present ourselves as equally engaged as universities, if not even more so, in upholding the value of science for our modern societies.

The second challenge can be described as a diversity issue: members of European academies tend to be both generationally and culturally less diverse than the society in which they operate. This is a significant challenge for our academies: if we do not become more inclusive at all levels, including gender and background, we might compromise precisely the bridging function between science and society that we rightly consider as one of our main institutional assets. This is why ALLEA has made it one of its strategic priorities to encourage young European academies to become members of our network of academies. In

<sup>3</sup><https://sapea.info>

this respect, I very much applaud the role played by the Polish young academy under the auspices of the PAS. This bodes very well for the future.

### What is the PAS's role among the world academies society? What are its most important international projects?

The PAS is one of the most luminous examples of a successful academic development at the continental level. Since the political change of 1990, it has consistently generated the most substantial amount of research of all national scientific institutions and continues to rank very high at the international level – which cannot be said of all Central and Eastern European national academies. In other words, within a very short time span the PAS has managed the formidable task of transforming itself into an agile institution based on excellence, competing for European research grants at the highest level. It is not by chance that a Vice-President of the PAS was elected, as the candidate with the widest support, to the Board of ALLEA. And as the current chair of SAPEA, I can also testify that the experts nominated by the PAS are far more frequently asked to contribute to our Evidence Review Reports than the size of the Polish academic community might lead one to believe. Thus, the PAS represents in all respects a model for academies and offers a best practice to be followed by other Central and Eastern European academies – and even beyond.

### How to you see the future of the PAS and what would be your recommendations for it?

There is hardly a more adequate ambassador than the PAS to represent, convey, and defend Polish science at the European level. As far as we can judge as colleagues within the ALLEA network, the PAS is a success story to be invested in. My recommendation, therefore, would be the American proverb: “If it ain’t broke, don’t fix it.” I can only hope that PAS continues along the lines it has so effectively established: serving the national interests by remaining competitive at the international level. I say this because I have heard rumors, which I hope are unfounded, that PAS’s uniqueness could become jeopardized by internal competition at the national level. In my opinion, such a move would be close to suicidal in terms of the visibility of Polish science and its positive impact on society. The reason is the importance of critical mass for scientific excellence. It suffices to take a look at recent developments in Europe’s academic landscape to understand that critical mass is absolutely vital both for empirically oriented science itself and for its impact on society. Take a look at the rankings: in recent years, academic institutions in countries like the Netherlands, Germany, or France, where excellence has been systematically supported by governmental initiatives, have made the most visible prog-



### About ALLEA

ALLEA is the European Federation of Academies of Sciences and Humanities, representing more than 50 academies from over 40 EU and non-EU countries. Since its foundation in 1994, ALLEA speaks out on behalf of its members on the European and international stages, promotes science as a global public good, and facilitates scientific collaboration across borders and disciplines.

Academies are self-governing bodies of distinguished scientists drawn from all fields of scholarly inquiry. They contain a unique human resource of intellectual excellence, experience and multidisciplinary knowledge dedicated to the advancement of science and scholarship in Europe and the world.

Jointly with its members, ALLEA seeks to improve the conditions for research, to provide the best independent and interdisciplinary science advice available, and to strengthen the role of science in society. In doing so, ALLEA channels the expertise of European academies for the benefit of the research community, decision-makers and the public. Outputs include science-based advice in response to societally relevant topics, as well as activities to encourage scientific cooperation, scientific reasoning and values through public engagement.

ALLEA is constituted as a non-for-profit association and remains fully independent from political, religious, commercial or ideological interests.

Website: [www.allea.org](http://www.allea.org)

ress, whereas reductions in size, as have happened in other countries, have always gone hand in hand with loss of scholarly quality. In the world of European academies, reduction leads to loss of impact, whereas critical mass attracts even more excellence. So, my appeal to your political leaders is this: in Poland’s interest, make the PAS even stronger than it already is, and the country as a whole will benefit!

INTERVIEWED BY JUSTYNA ORŁOWSKA, PHD

**Prof. Iwona Hofman**

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# BRANDING IN SCIENCE

Identity, reputation, the system of values, experience, and relations with institutions are only some of the elements making up the brand of the Polish Academy of Sciences

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**A**s objects of research, brands are studied in terms of numerous aspects. Those relevant to the study of the Polish Academy of Science (PAS) brand include the following: identity (attributes, organizational culture, social ties), reputation (ability to deliver the desired and expected values), the system of values, relations (shaping the emotional attitudes of the audience), and experience (histories of the institutions, scientific and professional biographies of

members, stakeholder experience). In the context of questions regarding the directions of development of science, the PAS brand can be defined through such parameters as innovation in research, the prioritization of social relevance and knowledge distribution, and respect for the role that science plays in the formation of bonds.

**Key concepts**

Modern marketing, based on the management of audience attitudes and perception, places a special emphasis on the intangible components of the value of scientific institutions, including their image, brand, reputation, good public relations, and so on. The words “image” and “brand” are often treated as synonymous, with brand being sometimes equated with prestige. Marketing-based approaches to brand research make



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use of indicators for the evaluation of study programs, the quality of research and teaching staff, the level of research and teaching, the research and education infrastructure, international collaboration, and organizational culture (understood as the values, standards, and models of behavior that affect relations with the surroundings). These indicators are correlated with the academic tradition (history, location, values, and prestige) of the institution being evaluated. It can be assumed that the brand of a science institution is a result of the evaluation of all these elements and public expectations in terms of values and attitudes.

The brand of an institution can be viewed as comprising the rational (tangible) and emotional (intangible) components of the institution's values, identified and described in the processes of communication and establishment of relations with other institutions. The perception of the institution's values and character-

istics in the symbolic and functional spheres is especially important in this context, as it forms the basis for brand attachment and trust in branded products, services, or actions.

It can be assumed that the market credibility of a brand is created by its tangible components, whereas social credibility (also among consumers and audiences) is created by the identity message, reputation, the system of values, membership and participation criteria, and the unique nature of benefits from participation (elitism, distinctiveness, and the transfer of the institution's importance). The key parameters of the brand defined in this way should be construed through the prism of the institution's identity and mission.

## Brand characteristics

After adapting definition fields to the analysis of the brand of PAS as a scientific institution, we can assume that its following characteristics are of key importance:

- its status as an institution based on synergy between its body of elected members and its research institutes,
- its status as a symbol of prestige, resulting from the procedure for electing members,
- its recognizability among the national and international scientific community and in the socio-economic environment,
- the uniqueness of its research, development, and teaching programs (their narrow specializations, very good collaboration and internal communication, optimization of research costs and time, the knowledge and competences of the scholars involved, and the research infrastructure),
- the accumulation of intangible components (social identity, distinctiveness and presence in the minds of members of the audience thanks to serious participation in the public discourse, the consistency of values and declared goals with the institution's image).

Successful branding depends on the consistency of the brand's visual identity (name, logo, symbols, colors) and non-visual identity (mission, forms of activity, internal and external communication systems).

The PAS brand identity systems are consistent and recognizable, enabling the positioning of the institution as distinctive, trustworthy, and guaranteeing satisfactory institutional and individual collaboration. The PAS visual message is dominated by the color blue, which is associated with knowledge, responsibility, safety, and creativity. It is therefore well-suited to highlight the institution's mission, defined as the development, promotion, integration, and dissemination of science, as well as contribution to the development of education and the enrichment of the national culture.

## ACADEMIA PART I The Academy Ideal

The Polish Academy of Sciences organizes numerous scientific events. Photo: US Secretary of Energy Jennifer M. Granholm meets with Polish researchers in the Staszic Palace in Warsaw in September 2021



JAROSLAW DELUGA

The PAS website is managed very well. It contains a one-sentence description of the Academy at the start, followed by a comprehensive presentation of its mission, history, and tasks. Importantly, the website highlights the history of the Academy, dating back to the early 19th century, and the traditions of the Warsaw Society of the Friends of Science and the Kraków Scientific Society (transformed into the Polish Academy of Arts and Sciences, or PAAS, in 1918), which were an emanation of the strength of a nation deprived of its statehood and, just like the entire social scientific movement, played a major role in fostering the durability of independence-minded and civic attitudes. This historical aspect must not be ignored in the context of the 70th anniversary of the Polish Academy of Sciences in 2022. Taking into account distinguishing features of identity such as the system of values, the personalities of members, and the rules of conduct, we can describe the PAS brand as visible, recognizable, and attractive to audiences linked to science. PAS research institutes use the names of prominent scholars and intellectuals as their “patron” scientists, which is a very well designed element of the long-term image-building strategy of these units.

At the functional level, the PAS brand has a positive image. In particular, this applies to:

- the Academy’s organizational structure, well-established in public awareness (five divisions, 77 scientific committees, 13 task-force committees, and eight branches),
- the system of management (hierarchical and verified by the General Assembly),
- the rules for the election of members (which guarantee the autonomy of decisions for candida-

tes and units, and above all remain a measure of community trust),

- the activity of auxiliary units and units supervised by the PAS (thanks to very good communication practices, the PAS brand has been popularized by such units as the Botanical Garden – Center for Biological Diversity Conservation in Powsin, the Kórnik Library, and the joint Scientific Library of PAS and PAAS in Kraków).

### Pragmatics

The key components of the PAS brand related to prestige and uniqueness of what the Academy has to offer become evident in the analysis of the potential of the PAS institutes. Based on the reports on their activity in the period of the implementation of the higher education reform (2019–2020), we can conclude that 14 out of 69 institutes are units with the highest scientific category (A+), and 45 have the category A. This result determines the leading position of the Polish Academy of Sciences (both the institution and the units being evaluated) among higher education institutions in Poland, which also has its implications in the context of the Academy’s position in rankings. For example, the PAS units rank between the 351st and 400th position in the Quacquarelli Symonds World University Rankings (QS WUR). In SCImago Institutions Rankings, in turn, the PAS Institute of Organic Chemistry occupies the 258th place, PAS ranks 421st, and 10 PAS institutes rank between the 300th and 500th positions. SCImago (SIR) is based on evaluations of research performance, innovation output, and societal impact measured by their web visibility, which corresponds to the sphere

of brand value as such. The table below shows only some of the most prestigious statistical parameters reflecting the achievements PAS and its institutes:

	2019	2020
Expert tasks of special importance	4	3
Conferences	162	62
Journals	52	53
Monographs	32	41
Foreign agreements	6	3
Professor titles	39	47

These achievements can be summed up using the words of Rev. Prof. Michał Heller: “Gaining or creating knowledge is especially sensitive to potential growth of value.”<sup>1</sup> Incidentally, we can add that the Academy’s standard activities also include workshops and summer schools, exhibitions, dissemination of science, maintenance of databases, study visits, and international exchange programs (in 2019, for example, 450 foreign scholars visited or completed internships at PAS units, and 443 Polish scholars went to foreign countries). The Academy’s strengths include international cooperation, reflected in 78 agreements and memorandums and participation in 58 scientific organizations, including ALLEA (All European Academies) and EASAC (European Academies’ Science Advisory Council). Since 30 April 2020, the Polish Institute of Advanced Studies (PIAS) has been a member of the Network of European Institutes for Ad-



JAROSLAW DELUGA

In 2021, members of the Interdisciplinary COVID-19 Advisory Team to the PAS President received the Nicolaus Copernicus Medals of the Polish Academy of Sciences. The medals are awarded for outstanding scientific achievements, honoring scholars for their distinguished service to the scientific community in Poland

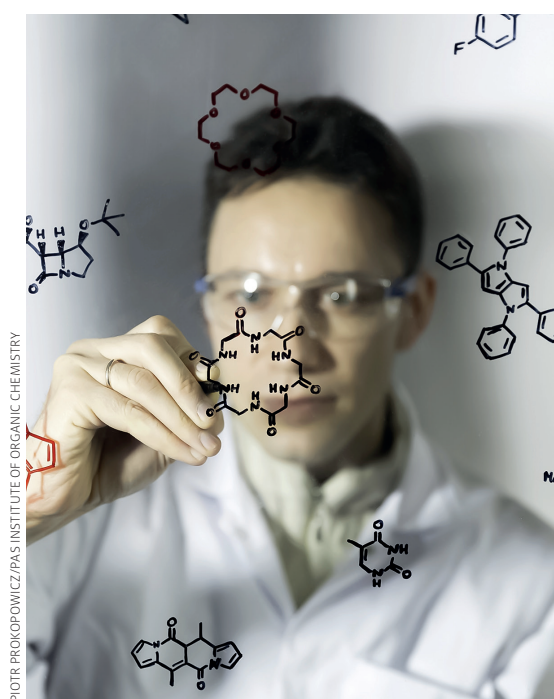
vanced Study (NetIAS). There are consultancy points for the EU Framework Programmes and the European Research Council (ERC) – in 2020, the Copernicus Astronomical Center received 14 million euros. The same year saw the opening of an interdisciplinary fellowship program for young researchers called Polish Academy of Sciences’ Individual Fellowship: Innovation and Creativity (PASIFIC) and the launch of the PAS International Institute of Molecular Mechanisms and Machines.

Examples of the Academy’s special involvement in social dialogue and research of special importance for the current situation included the initiatives taken by the Interdisciplinary COVID-19 Advisory Team to the PAS President (popularized in two special issues of the journal *Academia*). An equally significant social role is played by the work of the Advisory Group on Climate Crisis affiliated with the PAS President, for example, the position statements on rising sea and ocean levels and the prospects for decarbonization in electricity generation.

The Academy’s prestige and uniqueness are strengthened by achievements of social and economic importance, inventions, as well as national and foreign patents. Numerous research projects and patents reveal the diverse yet complementary nature of the research conducted by skilled teams. To put this into perspective, here are examples of projects implemented in 2019: “The Wellbeing of the Family,” “The Economy and Investment: Poland – China,” the development and implementation of innovative biotechnological products for agriculture and wastewater management to reduce water pollution, and the development of a biomarkers panel for early, non-invasive blood-based diagnostics of Alzheimer’s disease. In turn, the projects implemented in 2020 included: “Mental Wellbeing and Loneliness During the COVID-19 Pandemic,” “Origins, Goals, and Significance of the Three Seas Initiative,” “Digital Research Infrastructure for the Arts and Humanities DARIAH-PL,” “Managing and Reporting of Greenhouse Gas Emissions

The PAS Institute of Organic Chemistry ranks 258th in the global SCImago Institutions Rankings.

Photo shows Dr. Yevgen Poronik designing new organic compounds



PIOTR PROKOPOWICZ/PAS INSTITUTE OF ORGANIC CHEMISTRY

<sup>1</sup> Michał Heller, *Jak być uczonym* [How to Be a Scientist] (Kraków: Copernicus Center Press, 2017)

## ACADEMIA PART I The Academy Ideal

and Carbon Sequestration in Different Landscape Mosaics,” and “Biology, Ecology, and Conservation of Birds in a Changing Environment.”

In terms of the Academy’s identity and mission, we should note the discursiveness of the opinions and positions adopted in 2020 on the issues of the Code of Ethics for Research Workers, proposals of the State Committee for Science Policy regarding the reform of the Polish Academy of Sciences, and attempts to block the freedom of scientific debate and expression of scientific opinions. Other important issues here include long-term forms of activity and a well-developed system of internal communication (newsletters, magazines, websites, social media profiles). In addition, the Academy remains committed to promoting the development of young scholars through the Polish Young Academy and to supporting them in the process of applying for ERC grants. Also, the PAS has a large group of PhD students (1874 in 2019 and 1791 in 2020) and awards scientific degrees to many scholars – 170 PhD degrees and 174 DSc degrees (*doktor habilitowany*) in 2019 (only among the scholars

perceived as a leader and partner. Interestingly, activities related to the Academy’s mission and value system (opinions, position statements, and communications) are more recognizable than specific scientific achievements that impact on the resolution of social or economic problems.

The Academy’s image-building strategy brings positive effects as a result of the application of several principles, namely:

- the principle of social responsibility (the PAS President and members express their opinions on important, current topics through the prism of the Academy’s mission and values based on their knowledge and scientific and organizational skills, thus representing the scientific community and its stakeholders),
- the principle of the identification of stakeholder groups (in the narrow sense – the system of science and higher education in Poland; in the broad sense – social affiliations based on the traditional role of the intelligentsia),
- the principle of the diversification of marketing activities (inclusion of the interests of various audiences, research and teaching programs provided by the institutes, and support for young researchers),
- the principle of monitoring outcomes (internal communication, promotion and dissemination of science in the media and through publicly accessible events, monitoring of media statements on science-related issues and the operations of PAS).

A simplified SWOT<sup>2</sup> analysis of the PAS image reveals that the Academy’s strengths lie in consistency with the rational and emotional components of the brand, whereas its weakness is reflected in the insufficient emphasis placed on its involvement in the resolution of specific social and economic problems (the media are dominated by narratives playing down the role of research institutes). Assuming the position of a leader drawing together the scholarly community and accepted by that community may be seen as an opportunity to be explored by the Academy, whereas the devaluation of its role in shaping Poland’s science policy should be seen as a threat.

The Academy’s image-building strategy brings positive effects as a result of the application of several principles, including the principle of social responsibility.

employed at the PAS institutes), and 128 PhD degrees and 108 DSc degrees in 2020. Finally, the Academy maintains foreign research stations, which promote Polish science and culture abroad.

Public reception of the activity of the task-force committees operating at the Presidium of the Polish Academy of Sciences offers solid proof of the Academy’s successful branding strategy.

### Brand vs. image

Since an institution’s public image is essentially the opinion formed by its surroundings, an external picture created in the awareness of members of the audience, we should stress the consistency of the PAS image and the PAS brand in terms of the Academy’s mission, system of values, human resources, standards of conduct, and material resources. The image of the Polish Academy of Sciences is based on the conviction of its status and prestige as a kind of cross-university organization that brings together outstanding scholars whose scientific and moral authority undergirds the gravitas of the public activities taken up. The PAS is

### Recommendations

These findings may be used to formulate recommendations in the brand evaluation model. In the context of the PAS, such recommendations include the following: eliminating discrepancies between the Academy’s mission and practical actions, curbing general messaging that pertains to the past and is addressed to everyone, reinforcing the conviction that the Academy’s goals and tasks are consistent with public interests, and adding messaging that stresses the importance of research and its social and economic impacts. ■

<sup>2</sup>SWOT stands for strengths, weaknesses, opportunities, and threats.

PART II

# THE CHALLENGES OF SCIENCE



# SELF-GOVERNANCE, AUTONOMY, AND FREEDOM OF SCIENCE

On how the norms arising from the provisions of Poland's Constitution on the freedom of scientific research and the publication of its results, and on the autonomy of higher education institutions, compare with the legal provisions currently in force, in particular those of the Act of 20 July 2018 – the Higher Education and Science Law



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Article 73 of Poland's Constitution guarantees everyone the freedom to pursue scientific research and to publish its results. Similarly worded provisions can be found in many other constitutions. The most comprehensive such provisions can be found in the Constitution of Portugal – it not only declares the freedom of scientific creation, which includes the right to create, produce, and disseminate scientific works along with the statutory protection of copyright, but also requires the state to promote and support scientific research and technological innovation in such a way as to ensure their freedom and autonomy and to enable cooperation between scientific institutions and businesses.

Provisions corresponding to Article 73 of Poland's Constitution can be found in Article 13 of the Charter of Fundamental Rights of the European Union, which is worded in a very general way: “scientific research shall be free of constraint. Academic freedom shall be respected.” Here, academic freedom also comprises the traditional autonomy of universities. Although seldom declared in constitutions, this autonomy of higher education institutions is enshrined in Article 70(5) of the Constitution of the Republic of Poland – the first Polish constitution to address this subject.

In the Charter of Fundamental Rights, academic freedom is understood in the same way as it is in a certain international instrument of “soft law” relevant from this point of view – namely the Recommendation concerning the Status of Higher-Education Teaching Personnel, adopted in 1997 by the UNESCO General Conference. In it, academic freedom is defined as the right of higher-education teachers, “without constriction by prescribed doctrine, to freedom of teaching and discussion, freedom in carrying out research and disseminating and publishing the results thereof, freedom to express freely their opinion about the institution or system in which they work, freedom from institutional censorship and freedom to participate in professional or representative academic bodies.” The institutional form of academic freedom identified in the recommendation is called institutional autonomy and defined as “that degree of self-governance necessary for effective decision making by institutions of higher education regarding their academic work, standards, management and related activities.”

Article 73 of the Polish Constitution mentions the freedom of scientific research. The Polish Higher Education and Science Law does not contain a regular definition of scientific research, let alone science. Likewise, no such definitions were to be found in previous laws, including an act that included the very word “science” in its title – the Act on the Principles for Financing Science.

### Object of the freedom being exercised: scientific research and science

In keeping with the latter regulation, however, definitions by division were adopted in Article 4 of the Higher Education and Science Law (definitions of this type were once typical in both law and jurisprudence, but only until the 17th century): scientific activity is defined as comprising scientific research, development, and – odd as this may appear – artistic creation. Scientific research, in turn, comprises basic research and applied research, with the common element of their definitions being work aimed at acquiring new knowledge. The preamble to the Higher Education and Science Law begins with a reference to the pursuit of truth and the passing on of knowledge from generation to generation. This indicates that science is linked to the search for truth – irrespective of how it is understood, and this understanding, as we know, may vary in science studies (unless we agree on the existence of something that may be called “safe truth”).

For reasons related to the intrinsic complexity of science and related differences in the understanding of truth, defining science or scientific research for the purposes of law is difficult, but attempts to formulate such definitions have nonetheless been made. One such attempt was made in the aforementioned UNESCO recommendation, where research is defined as “original scientific, technological and engineering,



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## ACADEMIA PART II The Challenges of Science

Pursuit of science also involves publishing research results.

Photo shows Dr. Marta Pachocka delivering a paper on the direction of the EU's migration policy at the conference "Poland in Tomorrow's Europe" in November 2021

medical, cultural, social and human science or educational research which implies careful, critical, disciplined inquiry, varying in technique and method according to the nature and conditions of the problems identified, directed towards the clarification and/or resolution of the problems, and when within an institutional framework, supported by an appropriate infrastructure." In this definition, what distinguishes science from other manifestations of knowledge is the element of relevant methodology together with the ethos of the researcher, expressed in particular in the norms identified by the sociologist Robert Merton and referred to as CUDOS (in its current form, short for communalism, universalism, disinterestedness, originality, and skepticism). Emphasizing the importance of the ethos is likewise important for reasons related to a certain special feature of science (or at least for "true" science, as we might be tempted to say) that has been pointed out by the two-time winner of the Nobel Prize Linus Pauling: "Science is the search for the truth—it is not a game in which one tries to beat his opponent, to do harm to others." It should be added here that the Recommendation on Science and Scientific Researchers, adopted by the UNESCO

Without the freedom of scientific research and scientific expression and without the institutional guarantee of the autonomy of higher education institutions, science would cease to be science.

General Conference in 2017, also contains a definition of science, and a rather complicated one at that.

All difficulties with the formulation of an operational definition of scientific research, not to mention science (in the sociological, including institutional, as well as methodological sense), may not diminish the importance of what constitutes the point of departure for this article: without the freedom of scientific research and the freedom of scientific expression, including the publication of research results, and without an institutional guarantee in the form of the autonomy of higher education institutions, science would cease to be science, and its pursuit would become a fiction obscuring the fact of pursuing activity of a completely different nature, be it journalistic, moralistic, religious, propagandistic, or openly political action. At the same time, researchers not only can, but also should, feel obliged to exercise the freedom of scientific expression: on the one hand, by publicly presenting the results of their research, thus subjecting



them to scientific debate, and – when they consider this necessary – by stating still unverified hypotheses that they are working on, but with the clear stipulation that these are hypotheses, not research findings, and, on the other hand, by participating in the debate and speaking out in accordance with their scientific competence and the standards of research ethics.

However, the freedom of scientific research (or, more broadly, the freedom of science or academic freedom) pertains to the sphere of science and academic teaching, and not other activities, including the activity of research personnel. All this might seem obvious, but the recent introduction into legislation of what is called the "Academic Freedom Package," essentially intended to give legal protection in Poland to non-scientific claims, demand that emphasis be placed on the substantively limited scope of the freedoms being discussed. Although they are a specific expression of the general freedom to express opinions and disseminate information (Article 54(1) of the Polish Constitution), it is no coincidence that they are the subject of a separate constitutional norm, and – having a specific, qualified form – they cannot be equated in their scope with the general freedom defined as the freedom of expression in the Charter of Fundamental Rights of the European Union (Article 11), and as the freedom of speech in everyday language in keeping with specific solutions in place in the United States.

### Constraints placed on the freedom of scientific research

The period from the end of antiquity until the Enlightenment was characterized by the assumption of a general prohibition against the study of three particularly "high" spheres, namely the cosmic, religious, and political sphere (*arcana naturae, Dei, and imperii*,

respectively), or at least a principle of restraint in the desire to know them. Since the Enlightenment-age return to the ancient slogan *sapere aude* (Latin for “dare to know”), limitations on the subject and methods of scientific research have been considered exceptions, something that requires the existence of a special justification and by the same token a legal basis (except for totalitarian regimes). This is because the freedoms set forth in Article 73 of the Polish Constitution are not absolute in their nature, and the same holds true for other freedoms and rights declared in the Constitution, except for the right to personal dignity.

The freedoms being discussed here may be restricted in Poland, but only strictly within the limits set forth in the Polish Constitution. These are generally defined in Article 31(3): constitutional freedoms and rights can only be limited by statutory laws, enacted by parliament (or by an international agreement ratified, with prior consent expressed in such statutory law). If so, then this may not be done in a lower-level act of law issued based on statute, in particular in a regulation. Also, such limitations may only be imposed when they are necessary in a democratic state (which is a reference to the principle of proportionality) for the protection of its security or public order, or for the protection of the environment, health, and public morality, or for the freedoms and rights of others without violating the essence of those freedoms and rights. However, we should also remember Article 39 of the Constitution, which stipulates that no one may be subjected to scientific experimentation (not only in medicine and biology, but also in the humanities

and social sciences) without his or her freely given consent. Consequently, permissible constitutional restrictions may result in the existence of “forbidden knowledge,” for example the penalization of Holocaust denial and prohibitions against experiments on humans and, increasingly, *in vivo* experiments on animals (the 3Rs Principle, where the Rs stand for replacement, reduction, and refinement – concerning the use of live animals for scientific and educational purposes and the marketing authorization for such products as medicines and cosmetics).

“Self-forbidden knowledge,” resulting from self-regulation as an expression of the self-governance of the scientific community, may have a different nature, but not necessarily different effects. An important example of self-regulation is the Code of Ethics for Researchers, developed by the Science Ethics Commission and adopted in its current wording by the General Assembly of the Polish Academy of Sciences on 25 June 2020. Chapter 3 of the Code, which is entitled *Good practices in research*, includes the following provision: “All research in natural and engineering sciences should be preceded by an analysis of the associated risks and the impact that the research results may have on society and the environment.”

Formal restrictions on the freedoms being discussed here may be accompanied by various factual restrictions. Those resulting from direct external interventions, in particular the political ones, especially those that include elements of censorship, can be identified and therefore examined for their compatibility with law. However, it is more difficult to assess the



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Pursuant to the Polish Constitution, no one may be subjected to scientific experimentation without his or her freely given consent

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legal consequences of the systemic conditions adopted in the Higher Education and Science Law (in keeping with the legislation from 2011). The principles behind them are not an exception – despite growing criticism, they could be found, and to a large extent still can be found, in other countries.

What is meant here is a new model of a higher education institution imported from the United States, where such an institution is traditionally the main place of scientific creation and referred to as “entrepreneurial university.” It is characterized by what was previously unknown in continental Europe for reasons related to the Humboldtian tradition of public funding of “universities of culture,” namely diversification of the sources of funding along with a new model of the allocation of public funds with a focus on external funding (including from non-public sources), as well as the resulting rivalry both among and

Bologna in 1988 by the European Conference of Rectors (which states that: “The university is an autonomous institution at the heart of societies differently organised because of geography and historical heritage; it produces, examines, appraises and hands down culture by research and teaching. To meet the needs of the world around it, its research and teaching must be morally and intellectually independent of all political authority and economic power”); the Erfurt Declaration on University Autonomy (*Towards the Responsible University of the Twenty-first Century*), adopted at the Erfurt University Colloquium in 1996; the Lisbon Declaration (*Europe’s Universities beyond 2010: Diversity with a Common Purpose*), adopted in 2007 by the European University Association; and Recommendation 1792 (2006): Academic freedom and university autonomy, adopted by the Parliamentary Assembly of the Council of Europe on 30 June 2006.

Once we move on to the sources of Polish law, we must note that the word “autonomy,” used in Article 70(5) of the Constitution with respect to higher education institutions, is also used in the Constitution only in Article 25(3), in the general definition of the status of churches and religious organizations (the relations between them and the state “shall be based on the principle of respect for their autonomy and their mutual independence, each in its own scope”). Irrespective of the fact that this understanding of autonomy may be somewhat different, it is different from the self-governing nature (*samodzielność*) of local government units ensured in Article 165(2) of the Constitution – autonomy is something more than self-governing nature. Such understanding of the autonomy of higher education institutions also follows from the decisions of the Constitutional Tribunal and administrative courts, which do not apply a literal interpretation of the phrase on ensuring autonomy “in accordance with the principles set forth in statute,” which might have provided the lawmakers with greater leeway. Based on the recognition of the constitutional right of a higher education institution to autonomy, understood as an institutional guarantee of individual freedom of science and education vested in higher education teaching staff, limitations on autonomy are treated as exceptions from the rule and must be grounded upon a legal and factual basis.

At the same time, autonomy may be understood in a narrower way and mean, in accordance with the etymology of the term, the right to regulate matters important for higher education institutions in their internal regulations, starting with bylaws, self-governance in the development of internal structures (described using the term “organizational autonomy”) and autonomy in the recruitment, compensation, and promotion of staff, in particular higher-education teaching academic staff (staff autonomy). Autonomy can also be understood more broadly, including

Limitations on autonomy are treated as exceptions from the rule and must be grounded upon a legal and factual basis.

within universities and the search for more practical and economically beneficial directions of research and education. The freedom of scientific research largely boils down to the freedom of seeking sources of funding research, as opposed to the traditional choice of its subject and methodology. Here, it is necessary to add globalization, whose impacts on the possibility of publishing research results have been more negative than positive (and this is, again, mostly a matter of money), and, in the context of globalization, the purely commercial operations of primary scientific publishers.

### Autonomy of higher education institutions, self-governance in science

The more general processes indicated earlier include changes in the understanding and practical functioning of the autonomy of higher education institutions. The absence of any mention of this autonomy in the acts of European and “hard” international law may be seen as striking. Nonetheless, this autonomy is declared in various documents that can be classified as “soft” law (to a large extent special provisions, created within the framework of community self-regulation). Examples include the Great Charter of European Universities (*Magna Charta Universitatum*), adopted in



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The autonomy of higher education institutions includes the right to self-governance in recruitment and the freedom to determine programs of study and research

the freedom to harness available financial resources and assets (financial autonomy) and the freedom to determine programs of study and research (academic autonomy). Another important proposed classification is based on the division of autonomy into external autonomy (in relations with public authorities and other entities) and internal autonomy (serving directly the exercise of the freedom of science and education within the structure of a higher education institution).

The aforementioned change in how the autonomy of a higher education institution is understood and how it functions in practice results from the shift away from the model of a “Humboldtian university” to an “entrepreneurial university.” While statutory, organizational, staff and, above all, financial autonomy are as a rule expanded, the importance of academic autonomy is diminished, chiefly in the context of research, as mentioned earlier in connection with the factual restrictions imposed on the freedom of science.

These changes also pertain to statutory and organizational autonomy, for reasons related to the statutory preference of the managerial style of the administration of the affairs of a higher education institution at the expense of traditional university self-governance. The preamble to the Higher Education and Science Law mentions the autonomy of the academic community (which is not the same as the autonomy of higher education institutions), but this aspect of autonomy, which can be reduced to special academic self-governance, is not explained explicitly further in the law. Likewise, it contains no provision on the self-governing academic community, known from the Higher Education Act of 1990. Once we examine its content, it will not be easy for us to conclude that the Higher Education and Science Law implements two demands of the UNESCO Recommendation of 1997 mentioned earlier, namely internal self-governance of a higher education institution based on the majority participation of representatives of academic staff in its bodies, and the principle of collegial decision-making.

In 2013, Poland’s Constitutional Tribunal stated that autonomy is vested in higher education institutions, not in the higher education system, and therefore it cannot be invoked in attempts to define the legal situation of the Polish Accreditation Committee, a body responsible for evaluating the quality of education in higher education institutions. At the same time, it is difficult to see the Committee, which is not elected by the community, as an expression of academic self-governance, let alone the self-governance of the entire scholarly community. However, the Higher Education and Science Law includes a category of institutions representing the higher education community vested with the powers of consultancy and initiative: the General Council of Higher Education and Science, elected in a complicated system of representation, the three essentially self-governing Conferences of Rectors (of academic schools, of public higher vocational education institutions, and of vocational schools), and national representations of councils of students and PhD students. Another representative body is the Central Council of Research Institutes. The Council for Scientific Excellence, which is competent for individual cases of scientific promotion, has all the characteristics of a special self-governing body: electability and decision-making powers. Needless to say, it is impossible to talk about self-governance of science in Poland without mentioning the Polish Academy of Sciences.

The scope of this article does not include the question of the extent to which the structure of self-governance of higher education and science designed in this way corresponds, especially in the current situation of the growing statist and centralist tendencies, to the actual impact of its components on public decisions related to science and therefore affects the possibility of exercising the freedom of scientific research and the publication of its results, as guaranteed by the Constitution. I must restrict myself to the charitably formulated statement: this impact is small in scale. ■

# WHY GREATER DIVERSITY MAKES FOR BETTER SCIENCE

**F**ailure to bring the perspective of women into scientific inquiry makes it incomplete, slower, and more costly, says **Dr. Alicja Puścian** from the Nencki Institute of Experimental Biology, Polish Academy of Sciences.

## **Are women underrepresented in science and other areas of professional life?**

ALICJA PUŚCIAN: I'm sad to say that gender inequality continues to pose a major problem in various circles, including Academia. This is particularly evident in positions that involve greater independence and greater influence over where Science is headed and how it is funded. A relatively large number of women decide to pursue a career in Science. Over time, however, the "funnel" narrows, and women become increasingly underrepresented. The higher the positions, the fewer women there are. The most dramatic decline is evident at the stage of transition from being a member of someone else's research team to being a lab leader. This is when you set up your own team, gain full scientific independence, begin to educate students and PhD candidates, and conduct research according to your design.

I recently attended the General Assembly of the ALBA Network, the largest academic initiative promoting equity in neuroscience. It is funded by leading international neuroscience organizations: FENS (Federation of European Neuroscience Societies), SfN (Society for Neuroscience, United States), and IBRO (International Brain Research Organization). The ALBA Declaration on Equity and Inclusion has been signed by several hundred scientific institutions all over the world, including leading academic centres such as Cambridge and Yale. One of the goals of the ALBA Network is to collect data on inequalities in

Science, not only gender inequality but also inequalities that affect other underrepresented groups. At the meeting I've mentioned, data for various continents were presented, showing that over the past 20 years, the percentage of women among individuals holding professorship/tenure positions has averaged 20%. Still worse, the situation has remained practically unchanged over the past two decades. The higher up we go, the more women drop out of careers in Science. We should ask why this is the case. I'd like to stress here that this is a global effect.

## **Is this the case for all disciplines?**

Historically, some disciplines have been especially dominated by men. These are mostly exact sciences, engineering sciences, and military-related disciplines. But as the debate on equality in Science continues to evolve, there are more and more female students. Medical schools also have far fewer female faculty members. This effect is less pronounced in the humanities, but women holding leadership positions in these disciplines also face discrimination. I recently heard an anecdote told by Prof. Edyta Gruszczyk-Kolczyńska. She, according to the custom, addresses her male colleagues as "Professor X," but they publicly refer to her as "Mrs. Gruszczyk-Kolczyńska", even though she is a senior, highly accomplished scholar. So even in groups where a lot of women hold top positions, they do not get respected as naturally as men do.



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Jill Biden, the US First Lady, is an educator and has a doctoral degree. When Joe Biden was elected President, she was therefore introduced as Dr. Biden. This sparked so much controversy that people began to question her degree, although she is an extremely experienced researcher. If she were a man, I don't think people would have these doubts. Such questioning of the qualifications of women is sad, but it is unfortunately very common.

#### **Why is that the case?**

Such behavior is rooted in stereotypes. In my view, the percentage of people who deliberately seek to devalue women is very small. In most cases, we are dealing with unconscious bias, and the key role here is played by upbringing. Importantly, the issue of unconscious bias applies to both men and women – we should not forget that women also discriminate against other women and themselves. There are many studies on this subject. Such discrimination results from persistent schematized thinking that we don't realize exists. Unfortunately, however, this thinking has a direct impact on how women are treated in Science and how their achievements get evaluated.

In one of the most famous experiments, which illustrates this phenomenon very well, participants were given two almost identical résumés, and the only difference was the name of the applicant – one was male and one was female. It turned out that gender had a dramatic effect on the opinions formed about

the given person as a scientist. A woman was considered less competent and therefore less useful for a potential research team than a man with an identical résumé. This proves that we harbor stereotypes and beliefs about women as lacking ability and intellectual competence. We expect them to perform worse than men.

Another issue that is equally difficult to accept is that people are a lot more likely to doubt that women's achievements are solely the result of their own work and to suspect that someone must have helped them. Of course, we also do this to ourselves as well. Reports show that our male colleagues are much less likely to experience this sort of self-doubt.

Young female researchers are especially vulnerable to such pressure, with their skills and competencies often being called into question. But at this stage of their careers, they don't have a sufficient "arsenal" to defend themselves. They are at the beginning of their scientific path, and they have yet to prove their worth. Statistics show that young women are a lot more likely to fear they may not make it, although this has nothing to do with their actual abilities. Men, in turn, are highly unlikely to be asked how they got to a certain point in their career. Women experience this constantly.

#### **Has it always been this way?**

Throughout history, there have been communities where women are more respected than men. Therefore, this cannot be the only feasible reality that has

## ACADEMIA PART II The Challenges of Science



PIOTR GAWDZYK

### Alicja Puścian, PhD

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been with us since the beginning of humankind. An anthropologist would probably tell us more about this. That said, most societies are patriarchal.

Although we are hardwired to stereotype, there are effective ways of disposing of such schematized beliefs. The first step is to put your cards on the table and say honestly and openly that they exist. Without holding any grudges or alleging ill will. The purpose is to become aware of how we behave and how the functioning of these established patterns affects our lives and the lives and careers of others.

There are more and more examples of non-discrimination policies. For example, before members of the ERC (European Research Council) panels evaluate grant applications, together they watch a short video on unconscious bias. Importantly, they do so together, which turns this into a social declaration on what should and should not be evaluated. Namely, they should assess to what extent the project meets the

criteria of innovation, scientific excellence, groundbreaking nature, and feasibility, and should ignore such aspects as the applicant's tone of voice, age, or whether they have a family. Another effective way to battle bias in the evaluation of research projects involves appointing independent observers to sit on panels. They have no say in the evaluation of candidates, but they monitor the discussion to make sure it doesn't take a wrong turn, for example, "She's so young, can she handle it?". According to the Nobel Prize-winning economist Daniel Kahneman, the least expensive and most effective way to avoid the trap of stereotyping in the evaluation of applications on their merits involves introducing as much diversity as possible into the panels, which means making sure that people from different cultural and ethnic backgrounds are adequately represented. Such panels take into account a sufficient number of heterogeneous points of view, which in itself has great potential. Above all, however, they can formulate the most objective opinions possible using these various contexts. Diversified panels are one of the simplest and least expensive methods of avoiding unconscious bias.

### What is the situation of other minorities in science?

Science needs researchers who come from diverse backgrounds and cultures, including members of the LGBT+ community, and people with disabilities. It has been demonstrated that diverse research teams are more innovative. The ability to ask new and fresh research questions is influenced by who you are: what you read, what your social interactions are like, and what you think about. We need people with the most diverse experience possible because Science is a social process. This may seem obvious, but we still have a lot of work to do to make it happen. The "Women for Science" initiative founded at Nencki Institute acts as an advocate for all underrepresented groups in Science, including the LGBT+ community and people with disabilities.

The problem of discrimination is also reflected at the legislative level. When I was the Chairwoman of the PhD Students' Council of the Polish Academy of Sciences, the proposal to include funding of educational aids for PAS doctoral candidates with disabilities in the amendment to the Higher Education Law aroused great controversy. The proposal succeeded, but with great difficulty, although it would seem to be obvious that all individuals with disabilities should have access to the financial resources they need for additional readers and other equipment that allows them to complete their research.

### What is PAS doing to improve the situation?

Women make up only a few percent of the members of the Academy. I'll repeat after Prof. Jerzy Duszyński,

President of PAS, that this is a reason to be ashamed. Fortunately, however, the underrepresentation of women at the PAS institutes is receiving growing attention. The International Institute of Molecular and Cell Biology recently organized the Women in Science Symposium. It's an amazing and extremely valuable initiative.

The Nencki Institute of Experimental Biology, where I work, has established the aforementioned initiative called "Women for Science." From the outset, it has been clear to us that we want to operate on a large scale, and we need to collaborate with leading international initiatives that have aligned goals and missions. For this reason, we organize events together with a sister organization called Women in Science at Yale, and we collaborate with the Women Faculty Forum at Yale and the ALBA Network. In Poland, we work with the Foundation for Polish Science and the Polish Women Scientists Network. We operate on a partnership basis, and we act professionally because we want to be perceived in the international arena as people who are doing a good job. Our efforts have been noticed and appreciated. Recently, we received the ShEO Award in the Equality Champions category from the weekly *Wprost*. This is a great reason to be proud and, in a sense, the crowning achievement of the first year of our activity.

I think there will be more and more initiatives like ours, and they will grow in importance, especially as changes in the perception of the importance of faculty diversity become evident in ever-wider groups. There is more and more talk that the failure to realize women's research and economic potential leads to the loss of enormous resources. Actions aimed at eliminating gender inequalities are one of the priorities of the European Commission's Horizon Europe research and innovation framework programme, inaugurated in February 2021. To apply for funding under this program, research organizations will have to develop and implement Gender Equality Plans by 2022. This is a major step, one that makes us aware of the great importance of factors that are seemingly unrelated to scientific excellence.

### **In implementing equality plans, are we not losing sight of professional factors?**

As scientists, we also must look at the less obvious factors that can affect research results. There is no doubt that the underrepresentation of women and discrimination against women and other groups in Science is dragging us down, and this has been documented on multiple occasions. I think most researchers are now aware of this problem, but it should also be highlighted and explained to the public, presented as a matter that affects all of us. After all, the life of the average Polish family depends in a very significant way on who is involved in Science.

### **In what way?**

As I've said, if women and other minorities are not given a seat at the table, we're wasting our innovation potential. This also means that we have yet to ask a lot of questions that are important for society and address the big picture in many aspects of our lives.

For example, it is commonly believed that women are less likely to die from heart disease. However, if we look at the problem more closely, we'll find that we define how heart attacks and strokes should be diagnosed in terms of the male body. Female physiology has not been taken into account in these definitions, and it does not fit into the characteristics of these conditions. That's why women with a heart attack sometimes don't receive the help they need because the symptoms of this serious, life-threatening disease manifest themselves differently in their case. For example, they often don't experience chest pain, which is a well-known symptom of a male heart attack. Many women, therefore, go misdiagnosed and die. To go further, the effects of many pharmacological substances available on the market on female physiology remain poorly studied. This failure to account for diversity pertains not only to diagnostics but also to treatment methods and interpretation, which affects people's life and health. Another serious issue is transport safety. Until recently, crash test dummies didn't reflect the female body type. The body of a woman is statistically smaller, and its weight is distributed differently. Many cars not tested to keep women safe are still on our roads, making us more likely to die or become seriously injured just because we are women. Although all of these issues have been identified, we will still have to wait a long time for any radical improvement.

Similarly, most of the programmers responsible for how banking systems, social media, and search engines operate are men. This affects not only what data these systems collect, but also how virtual reality is designed. The underrepresentation of women makes it incomplete, even distorted. What's more, it turns out that when men decide how money should be spent on urban infrastructure, many investments don't take into account the need to pick up children from school or daycare or walk with strollers. I'd like to stress again that this is not caused by ill will – men are simply unable to include the perspective of women because they are not women. It's impossible to respond to the needs of all of us unless all of us are represented where the decisions are being made. So we must continue to follow this path and do everything we can to make sure that the future generations of women not only see a place for themselves in Academia but also want to pursue careers in Science, boldly and with no hesitation.

INTERVIEW BY JUSTYNA ORŁOWSKA, PHD

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# A COMMUNITY OF SCHOLARS

Who and what makes the Polish Academy of Sciences the autonomous institution that it is? The answer: people, institutions, and ideals.

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The Academy's community-based character, understood as one of its core values, is determined by the following parameters: a distinctive scientific identity, the compatibility of the Academy's vision with the expectations of internal and external stakeholders, the continuation of the traditions of a social scientific movement open to the challenges of the era, acceptance for polyphonicity in science, and its styles of management.

## Historical legacy

The project of establishing a Polish Academy of Sciences was given official form as a result of the discussions of scholars at the 1st Congress of Polish Science, held from 29 June to 2 July 1951 in Warsaw. Its purpose was primarily to work out a model for the functioning of various science institutions in Poland in the context of the tasks resulting from the needs of a country recovering from World War II. In relation to science, those needs were modern, enlightened, and positivistic in tone as they combined research, development, education, and dissemination of knowledge. The Polish Academy of Sciences as an institution was expected to integrate the activities of research institutes, universities, and scientific societies within the state's scientific policy appropriately to the political and social conditions of the time, and to be the first to initiate and conduct scientific research.

The intentions of the authorities and scholars were well reflected in the Act on the Polish Academy of Sciences enacted on 30 October 1951. This law stressed the importance of the Polish Academy of Arts and Sciences (which had emerged as a result of the transformation of the Kraków Scientific Society in 1872, and started to operate under the name “Polish Academy of Sciences” in 1918) and the Warsaw Scientific Society (founded in 1907 as a continuation of the Society of Friends of Science) in cultivating attitudes of civic responsibility for science and towards science, which came to symbolize the model of PAS activity. This is reflected the tradition of the scientific movement in Poland, which dated back to the 18th century, if we include the mature, institutional forms of knowledge dissemination, or even earlier, if we consider the origins of Renaissance academies and libraries, which fostered the pursuit of knowledge. The history of these processes is well-documented in the chronicles of universities, but it is worth considering the importance of shared excitement with new discoveries for the status of modern science.

Scientific societies, or strictly speaking the social scientific movement that developed in Poland especially in the period of the country's partitions, played a fundamental role in upholding intellectual and moral attitudes in society. Despite operating for the benefit of a nation deprived of its statehood in what were very difficult conditions, these societies did not differ from European ones in terms of their work ethos, structure, and situation within the landscape of cities in the era of industrialization. Likewise, they responded to the intellectual aspirations of the bourgeoisie. If there was any difference, it lay in the determination of their founders and the commitment of their participants, brought together by the patriotic need to work for their future, independent country. Polish literature is filled with images of idealism and



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pragmatism on the part of those who pursued and popularized knowledge, for example in the novels of Eliza Orzeszkowa and Bolesław Prus and the journalistic writings of Aleksander Świętochowski. Participation in popular lectures helped shape consumers of science and progressive romantics.

As a social movement, scientific societies in Poland and all over the world offered modern and relatively accessible ways to gain knowledge and shape civic attitudes for at least two centuries, and the organizations that used the word “society” in their names (in keeping with the Western European tradition) were institutions of prestige for scholars. The Polish Academy of Sciences merged those traditions.

## The associative aspect of identity

If we assume that the identity of an individual or an institution means self-definition and distinctive positioning, and that an association is characterized by voluntary participation, self-governance, and durability, we can say that PAS identity has an associative aspect.

An institution’s identity is built based on its mission, understood as long-term goals accepted by its members and actions taken within the legal order and relevant for the institution’s culture. Acceptance and pursuit of the mission determine the effectiveness of community activities, the institution’s stronger position as a subject of the state’s policy, and the independence of decision-making processes. At the top of the hierarchy of identity components is the autonomy of goals and community relations resulting from the democratic principles of action.

The Academy declares that its mission is “to work comprehensively to further the advancement of sci-

ence, in the service of society and for the enrichment of Poland’s national culture, while adhering to the highest standards of research quality and ethical norms.” These generally defined prerogatives are described in detail at the functional level of the Academy’s divisions, scientific and task-force committees, territorial branches, the Polish Young Academy, and the science ethics commission. The structure of scientific and task-force committees is essentially consistent with the classification of scientific fields and disciplines, but it also takes into account sub-disciplines, major research areas that are representative of disciplines but are not themselves disciplines, and the distinctive characteristics of interdisciplinary research.

The Academy’s mission should be interpreted through the prism of its statutory and regulatory tasks, which include conducting advanced research of strategic importance for the development of science and the economy, forging networks of national and international research teams (including multidisciplinary ones), supporting the development of young researchers, producing expert studies taking a stance on important issues, and disseminating science. These are all long-term tasks, independent of the political and socioeconomic situation. In their essence, they come close to constituting the strategy of an autonomous institution shaping state scientific policy, in the sense that they define the framework for the permanent presence of the Academy as an institution that initiates and conducts socially useful research.

The associative aspect of identity is expressed in voluntary participation in the activity of the Academy as a body of distinguished scholars convinced of the value of its mission and tasks, but this participation is nonetheless preceded by elections that are held among members of the scholarly community and reflect the evaluation of the scholarly reputation of the candidates and their impact. This fosters the development

## ACADEMIA PART II The Challenges of Science

of a community of scholars that enjoys public trust and guarantees the self-governance of the Academy in defining its goals and building its organizational structure in keeping with democratic principles.

### The articulation of the Academy's identity – the election of members

The multi-level management of the Academy may be seen as complementary to the associative aspect of its identity: the election of Academy members and internal structures at each level is guided by the principle of responsibility for the Academy's brand as a science institution, created by the bond-forming message encapsulated in its mission, as well as its system of values, appropriate to the scientific discourse, efficient organizational culture, and criteria of membership and cooperation.

The Academy consists of domestic and foreign members elected by its supreme governing body called the General Assembly. The responsibility involved in the election of national members is all the greater as they have the right to vote in the Assembly. By the same token, they influence the directions of the Academy's operations, the quality of its work, and its relations with the social and economic environment. The scientific achievements of candidates for members of the Academy are subject to verification, starting from the first stage of recommendations at the level of committees and then divisions. Those voting in the elections for new members of the Academy can therefore be certain that they are casting their votes for scholars whose achievements and attitudes deserve respect. Choosing the best of the best is a criterion that also applies at the level of scientific and task-force committees, which are therefore true representatives of research communities within specific disciplines or research areas.

The PAS General Assembly is chaired by the elected President, who heads the Presidium, an executive body that takes all strategic decisions in the intervals between the meetings of the General Assembly. The participation in the Presidium of representatives of the divisions, the chairs of the Councils of Provosts of the divisions, the heads of the branches, and directors of the PAS scientific units ensures observance of democratic standards in the management of the elected body of scholars. Such participation also provides an opportunity for a proportional division of tasks and responsibility for strengthening the institution's brand. The planned enlargement of the Presidium to include a representative of the chairs of the scientific committees is an expected decision, motivated unambiguously by the need to better appreciate the

importance of the committees as the Academy's vanguard among researchers who may be disappointed with the institutionalization of science in Poland. It should be stated that the scientific and task-force committees, which operate in affiliation with the PAS Presidium (some of them are also called councils) or with a specific division, as well as the Polish Young Academy and the science ethics commission, are units that are especially recognizable and particularly subject to public scrutiny for reasons related to the forms of their actions, addressed to socially involved and sensitive recipients outside the interest groups. These forms include popular science lectures, training programs, workshops, book promotions, popular science publications encouraging searches for information outside "filter bubbles," lessons at schools, presentations at science festivals, and so on. In today's world, such actions determine the recognizability and credibility of a science institution in the media and among consumers. In the case of the Academy, their purpose is to disseminate knowledge and experience that impact directly on the well-being of society.

In this context, the Academy's communication strategy should focus to a greater extent on efforts to emphasize the social usefulness of the Academy's scientific activities in the public sphere, for example by publicizing in the media inventions, discoveries, patents, and solutions to demographic and health problems that are results of the work of scholars and research teams affiliated with PAS. Science communication campaigns and strategies translate into a sense of identity and community among members of the institution, as they increase public understanding and acceptance of the tasks, needs, and challenges facing the Academy as an initiator of research and a coordinator of the transfer of knowledge.

Despite being the last link that can be included in scientific communication processes, in the sense of the stimulation of public interest in the activity of the corporation of scholars, the elections of members of the Academy provide the basis for the democratic management of science in Poland according to the Humboldtian model, which is difficult to achieve and involves the independence of universities from the state.

### The democratic culture of self-determination

The culture of self-determination, like any form of "cultivation of the soul" in keeping with Cicero's concept (*cultura animi*), must be organized at three levels: normative, symbolic, and material. These can be attributed to the legal acts and the regulations of the institution's status and functioning, the values defined by the institution's mission and evident in practice,

and the products of scholarly work. These things have already been discussed here, but it is worth highlighting those aspects of the Academy's activity that are attributed to the democratic culture of self-determination. These are: the procedure for electing members of the Academy and members of the Academy's units who are not PAS members within the wording of the Act (members of committees and councils elected by the university community), the structure of management and internal control, collegiality as a principle observed in determining the institution's tasks and assessing their implementation, research autonomy, and freedom of science and education. It appears that the consistent application of the culture of self-determination has shaped the Academy's image as a leader and partner for other autonomous institutions of state scientific policy (academic leadership), one that provides good conditions for research (entrepreneurial culture, the freedom to choose working conditions) and safeguards the balance between rivalry and cooperation.

## Space for integration

The legal basis for the Academy's operations is provided by the Act on the Polish Academy of Sciences of 30 April 2010 (*Journal of Laws* 2010, No. 96, item 619) and the Statutes of the Polish Academy of Sciences, which regulate in detail the activities and responsibilities of the Academy's units and bodies. The Act guarantees the autonomy, self-governance, and freedom of science as the universal founding values of the corporation. Article 2 of the Act sets forth the list of the Academy's tasks, which can be summed up as: conducting scientific research and R&D work, educating young researchers, issuing opinions on projects and programs related to science, pursuing national and international scientific cooperation and collaborating with the socioeconomic environment, formulating the principles of ethics in science, and conducting expert activities. Performing these tasks would not be possible without an alliance of generations, talents, and communities, without a sense of identity defined in terms of utilitarian uniqueness and a durable community referring to traditions, authorities, and values.

In late October 2021, the PAS Research Station in Paris hosted a prestigious international conference (attended by such scholars as Prof. Norman Davies, Prof. Daniel Beauvois, and Prof. Maria Delaperrière) devoted to the legacy of Jerzy Giedroyc and the Paris-based emigration monthly *Kultura*, which made me realize that this alliance is a characteristic feature of the Academy and it comes in many variants, which are responsible for the institution's dynamic nature. Despite having different scientific interests, the young researchers at the station were not only excellent co-organizers of the event, but also the most faithful participants in the discussions and friendly

guides for the large group of scholars of various ages who arrived from various European countries and had various attitudes towards hybrid conferences. Interest in science and respect for science provided the basis for an intergenerational exchange of experiences and ideas about the future of research, reinforcing the conviction that it is worth trying to understand different points of view and learning more about specific areas and methods. The station has recently hosted teachers, art historians, and physicists. All were welcomed by the announcement of the Polish Academy of Sciences' Individual Fellowship: Innovation and Creativity (PASIFIC) program, launched in 2020. It would be difficult to find more timely and compelling evidence of the possibility of integration.

At the Academy, this alliance of generations manifests itself in collaboration between scholars of various levels of seniority within divisions and committees and through the Polish Young Academy. Intergenerational relations often reveal the natural tendency to look for authorities and masters along with a synergy of experiences and the enthusiasm of explorers. Discussions held at the meetings of the committees are very informative in this regard. The Academy's governing bodies recognized in time the potential of young researchers, and members of the scientific community selected those among them who were pursuing bold projects, taking into account the achievements of the past and understanding the requirement of the continuity of research as processes immersed in time and space, as the essayist Jerzy Stempowski wrote. Great importance is attached to the education of PhD students and young scholars (called independent research staff members) at the PAS research institutes and to the expert involvement of young researchers in scientific activities that are in a sense endorsed by the Polish Academy of Sciences, for example in scientific societies.

The establishment of interdisciplinary research teams, successful applications for external funds in grant competitions, benefits from the exchanging of experience and the transfer of know-how in teams that bring together representatives of scientific disciplines all have a very favorable impact on integration, which is turning into an essential element of creative work in today's world.

On the eve of its 70th anniversary, the Academy is faced with challenges generated by the era of rapid electronic communication, which minimizes accountability for the merit of the messaging being communicated (the "post-truth" era). The quality of research and the verification of its results by teams of experts constitute the Academy's response to this challenge in science. As for the challenges arising from social disintegration, the Academy's response involves strengthening its autonomy and the associative aspect of its identity. ■



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# BOLDLY FACING CHANGE

What kind of reform is the Polish Academy of Sciences in need of? An outline of the goals and tasks for the future

**Paweł M. Rowiński**

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**T**he Polish Academy of Sciences occupies a special place in the landscape of Poland's scholarly institutions. It acts as a scientific society with an elected body of members, as the country's strongest network of research institutes, as a patron of the arts, and as an scholarship-awarding institution. It also successfully supports Polish researchers in writing applications for ERC grants.

The Polish Academy of Sciences represents Poland in many international organizations and maintains high-profile research centers in major European capitals – in Berlin, Brussels, Kyiv, Paris, Rome, and Vienna. If we include the foreign outposts maintained

by the PAS institutes, the Academy is also represented near both of the Earth's poles – by the Hornsund Polish Polar Station at Isbjørnhamna bay, Hornsund Fjord in Spitsbergen, and by the Arctowski Polish Antarctic Station, located off the coast of Admiralty Bay on King George Island in the Southern Shetland archipelago in Antarctica. The Oceania, the PAS Institute of Oceanology's Research Vessel, conducts research on the world's seas, there is a Polish astronomical observatory in Chile, and hardware built at the PAS Space Research Centre is used on numerous interplanetary missions. The PAS is an important member of the European organizations that bring together Europe's most important academies of sciences: the European Federation of Academies of Sciences and Humanities (ALLEA), the European Academies' Science Advisory Council (EASAC), and the consortium of academy networks (SAPEA) within the European Scientific Advice Mechanism, and it respects the guiding principles of these organizations.

## Keeping up with the world

The future of the PAS should be considered in the context of its strong representation in the international arena, and the overriding goal of all of the Academy's activities should be to strengthen its position in the system of science and higher education in Poland. This will lead to the achievement of the best quality in the form of scientific excellence, and consequently to increased global presence of Polish science. Such a goal will be achieved through efforts to improve the application of international research and education standards (for example with the use of international advisory bodies). We also want to increase the presence of the Polish Academy of Sciences in debates on important issues in public life.

Any future changes should serve to strengthen the scientific position of the PAS institutes in the national and international arenas. The key to stimulating progress in science lies in competitiveness. In the conditions of strong international competition, the Academy must work to attain and maintain its rightful place.

Discussions on the future of the PAS are part of the debate on the future of the academies of sciences in general – in the time-frame of several years, but also decades. We must be able to integrate the role of the Academy into the new reality, characterized by the presence of knowledge-based societies, the provision of education in the digital sphere, and learning throughout life. We are now witnessing a fourth industrial revolution, involving such processes as the growing use of cyber-physical systems, the Internet of Things, and cloud computing, which will undoubtedly gain momentum in the coming years. The future world may be indeed very different from what we have become accustomed to. Academies must respond to the challenges posed by changes that result from the climate crisis, demographic problems, migrations, and the rapidly changing labor market.

Some talk about a coming era of transhumanism, with advances in science and technology resulting in the improvement of living conditions for humans and the elimination of various limitations on human life. In such a scenario, academies, which stimulate the development of science, should take up a very important place, but only if they are able to adapt to the rapidly changing reality.

Although they enjoy enormous authority, academies are in a sense independent of the formal education system. As such, they can boost the value of the numerous new study programs being developed at various stages of education, which is unlikely to be limited to the formal system. Academies are likewise top-class think-tanks – indeed they may be described as “edu-tanks” – and their expertise should be used in the effective management of regions, countries, and even international institutions.

Probably all academies of sciences are involved in the debate on the future, including as participants of science organizations. Undoubtedly, it is a lot easier to discuss the future of universities, as their social importance, resulting from their educational function, is immediately noticeable to the outside world. Importantly, however, many academies, including the Polish Academy of Sciences, perform important educational functions, and should continue to do so in the future.

Discussions on the role of academies of sciences are particularly important at a time when populism and nationalism are growing in strength in many places in the world, and disinformation is everywhere. Academies of science should speak a strong voice, bring science and its findings closer to the public, provide it with reliable information, and speak out on the most important issues. Academies of sciences must promote the values of humanism and critical thinking, which should be the foundation of public education. There is no doubt that one of their main tasks involves restoring and reinforcing trust in science.

## Reforming academies

Ongoing changes in the external environment are prompting many academies to reform. Some are setting up research universities on the basis of their institutes, whereas others are streamlining their operations by investing in stronger internationalization, quality of research, and significantly improved social communication. Among European academies, we can notice considerable structural similarities in the Austrian Academy of Sciences and the Royal Netherlands Academy of Arts and Sciences, which have similar goals: scientific excellence, multidisciplinary, mobility of scholars, international cooperation, and involvement in the improvement of the quality of life for societies. They play the role of leading research centers in their respective countries, and work closely with their self-governing associations of member-scholars. This model works very well. Both in Poland and abroad, academy institutes generate a significant share of the scientific output of their respective countries, and at the same time participate in the internationalization of science. This would therefore indicate that any and all planned reforms should strive to strengthen the aforementioned integrity.

The academy of the future should be a role model in promoting and creating scientific excellence, co-create and fulfill what we call European values, develop ethical standards, and provide advice on compliance with ethical principles and on academic freedom. We would like to have the tools to provide independent advice to all decision-making bodies using the latest advances in science in all of its disciplines. At the same time, the Academy should act as a source of reliable knowledge for the public, work out effective and attractive science promotion mechanisms, speak



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out on matters related to the evaluation of scientific research, and help to formulate the highest standards for such evaluation. In other words, we see the PAS as an important platform for intellectual exchange and scientific reflection, visibly and audibly present in the public debate, and firmly rooted in its economic and social environment.

In practical terms, the Polish Academy of Sciences should be an autonomous scientific institution observing the principle of freedom of research. To advance its goals effectively, the Academy should have the opportunity to obtain substantial funds for research from domestic and foreign sources. Its research institutes must provide it with the tools for conducting groundbreaking and pioneering interdisciplinary research of theoretical and practical significance, and ensure the publication of research results in reputable journals. At the same time, what distinguishes the PAS from numerous similar institutions in the world is that the Academy should provide education at the doctoral and post-doctoral level (potentially also masters-level graduate education) in the form of problem studies according to an individual program and through the active involvement of doctoral students in the research process, which involves solving scientific problems.

At the PAS, doctoral candidates are not students in the traditional sense, but young researchers and scholars in their own right who are preparing for a future academic or professional career. Over the years, the Academy appears to have proven its effectiveness in education. To negate its engagement in this area would mean squandering a public good. However, the profile of PAS graduates should be that of young holders of doctoral degrees free to choose also a professional career and able to develop skills useful in work for in the public or private sectors, including the acquired ability to analyze processes and data in various fields. For this reason, PAS institutes should have the right to confer degrees in selected scientific disciplines, while maintaining stringently high requirements and standards, and should be able to create and promote interdisciplinary dissertations.

### Headed for change

The Academy has appointed a team to develop a draft amendment to the Act on the Polish Academy of Sciences, so as to ensure greater integrity of the Polish Academy of Sciences. The idea is to link the elected body of Academy members (the “corporation”) more closely to the PAS institutes, which will participate more intensively in the work of the elected body of scholars. In turn, the member-scholars will have relevant opportunities for academic and expert monitoring of the activity of the institutes. Simultaneously, the institutes will retain their independence, which is

indispensable for the conduct of scientific research at the highest level.

The integrity of the PAS as a whole is also ensured in the draft bill that has been developed by means of a strong link between advanced research and advanced education, provided within the Academy at the doctoral and post-graduate levels. The draft introduces structural solutions that will definitely facilitate institutional flexibility and internationalization, thus ensuring that a high level of quality of all PAS units. We are convinced that the best way to improve the quality of the Academy’s functioning involves boosting its integrity and basing it on new principles, because it is this very integrity that builds the potential of the Academy.

We have introduced many mechanisms into the draft bill to integrate various parts of the Academy: at the level of the General Assembly, the Presidium, the Divisions, and the Branches. We have simplified the structure of the Divisions, and described in detail the various decision-making processes within the Academy as a whole. Among the new measures, we propose the establishment of an “International Council of the Polish Academy of Sciences,” which should speak out on matters of importance to the Academy, especially its strategy, the directions of its development, and the general matters specified in the individual provisions of the law. It is an important instrument for internationalizing the PAS and integrating the elected body of scholars and the network of research units.

The draft also provides for the establishment of a General Assembly of the PAS Institutes, a body with broad powers to deal with matters relevant to the functioning of the research institutions within the Academy. We also propose the establishment of a council of chairs of the Academy’s committees to highlight their role and to include them in the decision-making process. We envision the establishment of a federation of doctoral schools as a form of their in-depth cooperation. The schools will meet the highest standards developed within PAS. We have also provided for the possibility of creating a federation of institutes, which may establish new legal entities – Academy research centers. Importantly, a certain symbiotic relationship between all of the elements that make up the Polish Academy of Sciences guarantees that politicians will have limited influence over the freedom of scientific research and how it is organized.

The elected body of scholars and the network of research institutes, as two integral and interconnected parts of the Academy, will stand a chance of generating the critical mass needed to for the results of the Academy’s work to be attained and presented as a whole, not in a scattered way. In this way, the autonomy of the PAS will be reinforced, including by amending the Act on the Polish Academy of Sciences in order to include these principles. ■

#### Further reading:

Raich M., Dolan S., Rowiński P.M., Gisullo C., Abraham C., Klimek J., Rethinking future higher education, *The European Business Review*, 1/2019, pp. 33–49, <https://www.europeanbusinessreview.com/rethinking-future-highereducation/>



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# SCIENCE COLLABORATION ACROSS BORDERS

Over the past two decades, Polish higher education institutions and research institutes have made significant progress in internationalizing their activity. Likewise, the Polish Academy of Sciences has taken many steps to boost the collaboration between the PAS researchers and their partners abroad.

# ACADEMIA PART II The Challenges of Science



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## Anna Plater-Zyberk

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**A**mong science institutions in Poland, the Polish Academy of Sciences currently boasts the best results in terms of staff internationalization, the number of articles published collaboratively together with co-authors from other countries, and the number of grants won under the EU's framework programs. This situation, though still far from ideal, is the result of the commitment of many people working both at the PAS institutes and at the PAS Chancellery (including its auxiliary units).

## Measures of internationalization

One of the main indicators used to gauge the degree of internationalization of research institutions is the number of scientific articles published internationally. At the PAS, publications with international co-authorship account for almost half of all publications each year (about 47%), 44% are results of national

collaboration, and single-author publications make up the remaining 9%.

The number of scientific articles published by PAS authors in collaboration with international co-authors has remained at the level of between 2500 and 3000 per year (Chart 1).

Another metric worth mentioning is the number of research projects financed or co-financed from the European Commission's framework programmes and the amount of the funding received. In the European Commission's latest framework programme "Horizon 2020," implemented in 2014–2020, PAS research units secured almost 103 million euros (Charts 2 and 3).

Another measure of internationalization is the number of foreign scholars who conduct research at a specific institution. In the Polish Academy of Sciences, their share is at the level of 8%, but it is very unevenly distributed. At some of the PAS institutes, more than one-fourth of the research staff is made up by foreign researchers – these include the Center for Theoretical Physics (40%), the Copernicus Astronomical Center (31%), the Institute of Physical Chemistry (25%), and the Institute of Mathematics (25%, data collected in October 2021). However, there are several institutes with no foreign researchers. Many foreign scholars are also attracted by doctoral schools created or co-created by the PAS institutes (Table 1).

**Table 1**

Selected doctoral schools of the Polish Academy of Sciences with the percentage of doctoral students from abroad (data as of 31 December 2020)

School name	PAS Institutes	Share of foreign doctoral students in the number of the PAS doctoral students in a given school
<b>BioPlanet</b>	<ul style="list-style-type: none"> <li>• Museum and Institute of Zoology, PAS</li> <li>• Mammal Research Institute, PAS</li> <li>• Institute of Paleobiology, PAS</li> <li>• Institute of Parasitology, PAS</li> </ul>	60%
<b>GeoPlanet</b>	<ul style="list-style-type: none"> <li>• Copernicus Astronomical Center, PAS</li> <li>• Space Research Centre, PAS</li> <li>• Center for Theoretical Physics, PAS</li> <li>• Institute of Geophysics, PAS</li> <li>• Institute of Geography and Spatial Organization, PAS</li> <li>• Institute of Geological Sciences, PAS</li> <li>• Institute of Oceanology, PAS</li> </ul>	53%
<b>Doctoral School of Information and Biomedical Technologies at the PAS Institutes</b>	<ul style="list-style-type: none"> <li>• Systems Research Institute, PAS</li> <li>• Institute of Biocybernetics and Biomedical Engineering, PAS</li> <li>• Institute of Theoretical and Applied Informatics, PAS</li> <li>• Mossakowski Medical Research Center, PAS</li> <li>• Institute of Computer Science, PAS</li> <li>• Institute of Fundamental Technological Research, PAS</li> <li>• Research and Academic Computer Network (NASK) – National Research Institute</li> </ul>	46%

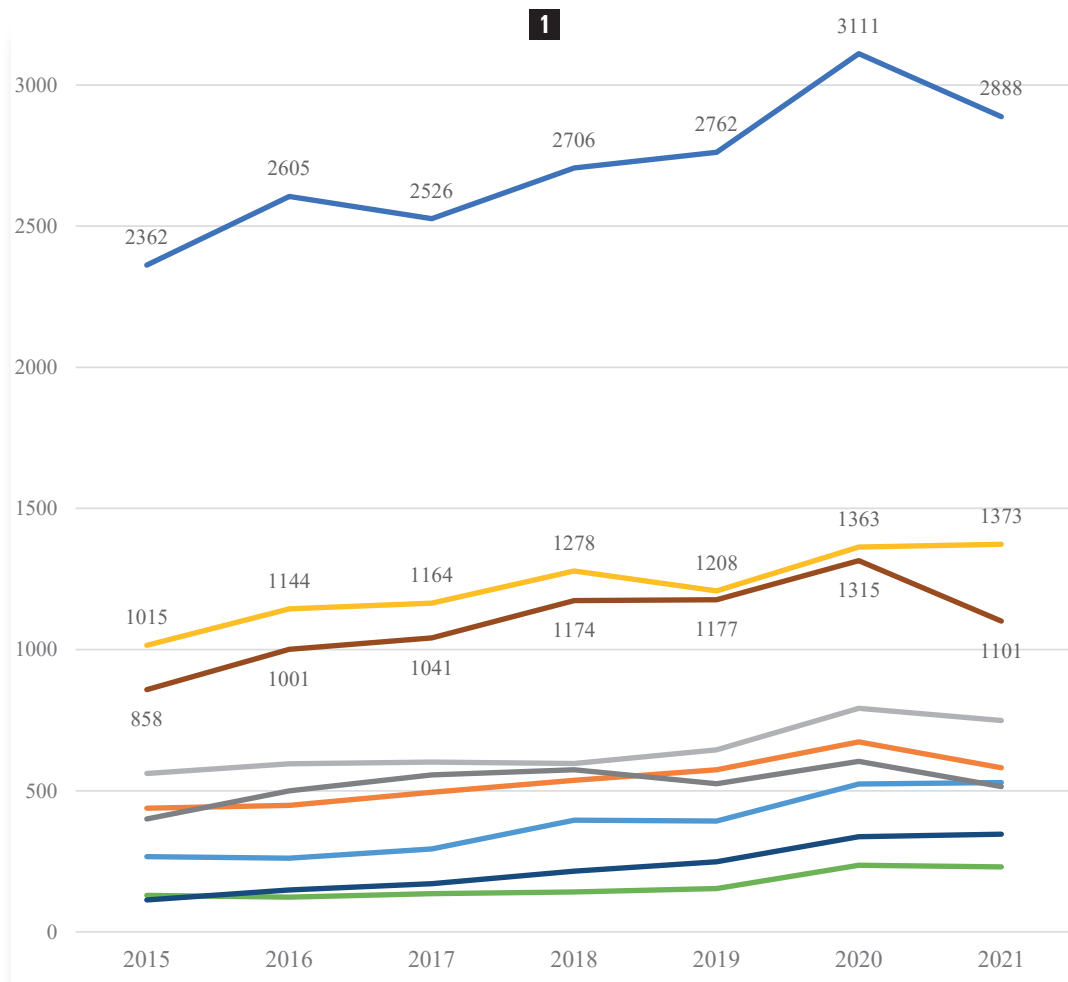


Chart 1  
Number of articles with international co-authorship published in 2015–2021, after SciVal (29 October 2021)

- Polish Academy of Sciences
- Jagiellonian University
- University of Warsaw
- AGH University of Science and Technology
- Adam Mickiewicz University in Poznań
- Warsaw University of Technology
- Nicolaus Copernicus University in Toruń
- Silesian University of Technology
- Poznan University of Technology

2

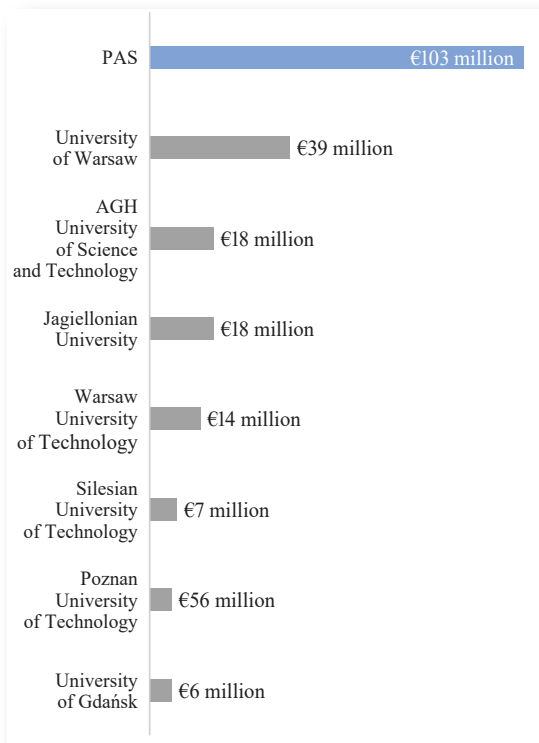


Chart 2  
The value of net funding from H2020 secured by selected Polish scientific institutions (NCP, data as of 5 March 2021)

3

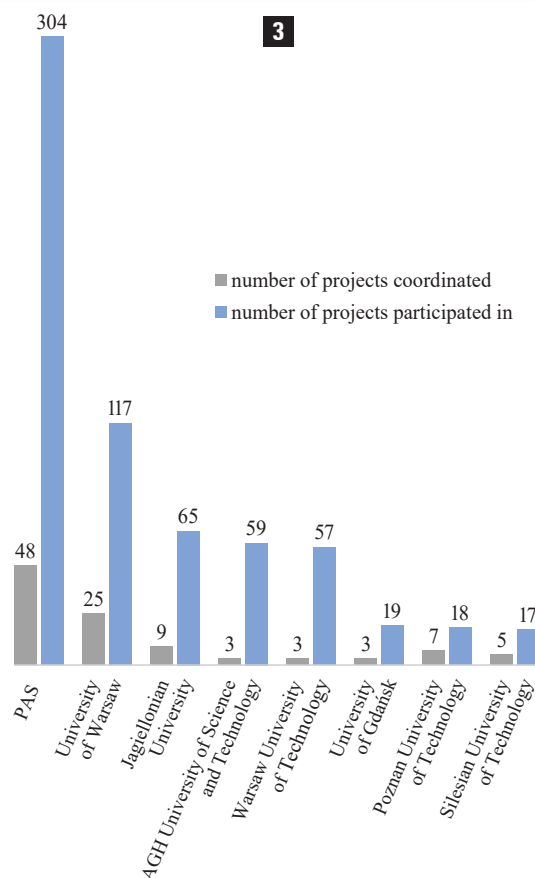


Chart 3  
Number of H2020 projects participated in and projects coordinated (NCP, data as of 5 March 2021)

## ACADEMIA PART II The Challenges of Science

Fig. 1  
Number of PIAsT fellows  
by country of origin



The PAS Scientific Center  
in Paris



### International initiatives of the Polish Academy of Sciences

In 2017, the Polish Institute of Advanced Studies (PIAsT) began operating within the structure of the Academy. The Institute recruits exclusively foreign researchers to come to Warsaw for five or ten months to conduct research primarily in the field of humanities and social sciences. Since its inception, the PIAsT has so far granted fellowships to 92 individuals from 27 countries. Since 2021, PIAsT fellowships have also been partially funded by the Polish-US Fulbright Commission (Fig. 1).

The Academy's initiatives addressed to foreign scholars also include the PASIFIC fellowship program, co-financed by the Polish Academy of Sciences and the European Commission from the funds of the Horizon 2020 framework programme. The aim of this program is to select and fund 50 two-year research fellowships at the PAS institutes. In the first call for applications, the Academy received 348 submissions from 60 countries, and selected 35 laureates. The second call closed on 30 December 2021.

In addition to financing stays of foreign scholars in its institutes, the Academy also offers funding to pay for visits made by researchers from Polish research units to foreign partner institutions. The Academy has already signed 80 cooperation agreements with institutions in 44 countries. Every year, the PAS Chancellery allocates about PLN 2.7 million to the funding of foreign travel. The PAS is also a member of 60 international organizations (see page 49), where the Polish scientific community is represented by the PAS committees. As for collaboration with international organizations, it is worth mentioning the European Federation of Acade-

### The PAS is a member of the following international organizations:

- |  |  |
|--|--|
| 1 AIEB (International Association of Byzantine Studies)  | 34 IFToMM (International Federation for the Promotion of Mechanism and Machine Science)  |
| 2 AIDP (L'Association Internationale de Droit Pénal)   | 35 IGU (International Geographical Union)  |
| 3 ALLEA (European Federation of Academies of Sciences and Humanities)                          | 36 I-INCE (International Institute of Noise Control Engineering)   |
| 4 APDIC (Alloy Phase Diagram International Commission)   | 37 IMU (International Mathematical Union)  |
| 5 CIEHS (Commission Internationale des Études Historiques Slaves)                              | 38 INQUA (International Union for Quaternary Research)   |
| 6 CIHM (International Commission of Military History)  | 39 IPA (International Permafrost Association)  |
| 7 CIHS (International Committee of Historical Sciences)  | 40 ISC (International Science Council)   |
| 8 CIN (International Numismatic Council)   | 41 IUAES (International Union of Anthropological and Ethnological Sciences)  |
| 9 CIPL (Permanent International Committee of Linguists)  | 42 IUBMB (International Union of Biochemistry and Molecular Biology)   |
| 10 CISM (International Centre for Mechanical Sciences)   | 43 IUCr (International Union of Crystallography)   |
| 11 COMNAP (Council of Managers of National Antarctic Programs)                                 | 44 IUFoST (International Union of Food Science and Technology)   |
| 12 COSPAR (Committee on Space Research)  | 45 IUFRO (International Union of Forest Research Organizations)  |
| 13 EASAC (European Academies' Science Advisory Council)  | 46 IUGG (International Union of Geodesy and Geophysics)  |
| 14 EFB (European Federation of Biotechnology)  | 47 IUGS (International Union of Geological Sciences)   |
| 15 EFI (European Forest Institute)   | 48 IUHPST/DLMPST (International Union of History and Philosophy of Science and Technology – Division of Logic, Methodology and Philosophy of Science and Technology) |
| 16 EFNIL (European Federation of National Institutions for Language)                           | 49 IUHPST/DHST (International Union of History and Philosophy of Science and Technology – Division of History of Science and Technology)                             |
| 17 ENRIO (European Network of Research Integrity Offices)                                      | 50 IUNS (International Union of Nutritional Sciences)  |
| 18 EVSSAR (European Veterinary Society for Small Animal Reproduction)                          | 51 IUPAB (International Union for Pure and Applied Biophysics)   |
| 19 EPB (European Polar Board)  | 52 IUPAC (International Union of Pure and Applied Chemistry)   |
| 20 Euro-CASE (European Council of Academies of Applied Sciences, Technologies and Engineering) | 53 IUPAP (International Union of Pure and Applied Physics)   |
| 21 EU-SAGE (European Sustainable Agriculture through Genome Editing)                           | 54 IUTAM (International Union of Theoretical and Applied Mechanics)  |
| 22 FARO (Forum of Arctic Research Operators)   | 55 NuPECC (Nuclear Physics European Collaboration Committee of the ESF)  |
| 23 FIB (International Federation for Structural Concrete)                                      | 56 RILEM (International Union of Laboratories and Experts in Construction Materials, Systems and Structures)   |
| 24 IAF (International Astronautical Federation)  | 57 SCAR (Scientific Committee on Antarctic Research)   |
| 25 IAP (InterAcademy Partnership)  | 58 SCOR (Scientific Committee on Oceanic Research)   |
| 26 IASC (International Arctic Science Committee)   | 59 UAI (Union Académique Internationale)   |
| 27 IAU (International Astronomical Union)  | 60 URSI (International Union of Radio Science)   |
| 28 ICA (International Commission for Acoustics)  |  |
| 29 ICLAS (International Council for Laboratory Animal Science)                                 |  |
| 30 ICO (International Commission for Optics)   |  |
| 31 ICS (International Committee of Slavists)   |  |
| 32 IFIP (International Federation for Information Processing)                                  |  |
| 33 IFRWH (International Federation for Research in Women's History)                            |  |

mies of Sciences and Humanities (ALLEA), where Prof. Paweł Rowiński, Vice-President of PAS, serves as a member of the Board.

Support for scholars from Polish research institutions is also provided by the Academy's foreign offices: the foreign scientific centers in Paris, Vienna, and Rome, the Center for Historical Studies in Berlin, the Polish Science Contact Agency (PolSCA) in Brussels, and the PAS Representative Office in Kyiv. These institutions not only promote internationally the ac-

complishments of Polish scientific institutions and the scientists affiliated with them, but are also places where research projects are carried out (PAS Center for Historical Studies in Berlin), provide conference space for international scientific conferences (Paris, Vienna), and support Polish applicants in applying for grants from framework programs (PolSCA). In the latter realm, additional support is also provided by the Office for Scientific Excellence, established in 2016. It specializes in the European Research Council's

## ACADEMIA PART II The Challenges of Science

(ERC) competitions and offers training and support for researchers applying for ERC grants.

### Polish polar stations

Also noteworthy are the PAS foreign research stations that conduct polar research. These are the Arctowski Polish Antarctic Station, which was established in 1977 and operates under the logistical and scientific auspices of the PAS Institute of Biochemistry and Biophysics, and the Polish Polar Station in Hornsund (in southern Spitsbergen), established in 1957 and managed by the PAS Institute of Geophysics. The Arctowski Station conducts research in the fields of oceanography, geology, geomorphology, glaciology, meteorology, seismology, and ecology. In turn, the polar station in Hornsund runs a monitoring program aimed at improving understanding of the Arctic nature and its changes. The station also records measurements in the areas of climate science, glaciology, hydrology, oceanography, seismology, atmospheric physics, geomorphology, and permafrost. Both stations and their scientific community work closely with researchers from other countries.

### Science and the Web

The Poznań Supercomputing and Networking Center (PSNC), affiliated with the PAS Institute of Bioorganic Chemistry, also impacts significantly on the internationalization of the research conducted by Polish scholars. Established in 1993, the PSNC primarily acts as a national center for high-performance computing and as the operator of the Polish fiber-optic research and education network PIONIER. Using the GÉANT network, the PSNC connects PIONIER with European research and education networks and provides the Polish scientific community with access to the glob-

Climate mission:  
the Polish Polar Station  
in Hornsund, Spitsbergen



B. LUKS/PAS INSTITUTE OF GEOPHYSICS

al Internet. The network also has a direct fiber-optic connection with the scientific center of the European Organization for Nuclear Research (CERN) in Geneva. The Center's computing resources are used by the Polish scientific community, by foreign scholars under the framework of the PRACE (Partnership for Advanced Computing in Europe) computing power exchange agreements, in the field of nuclear physics (the Worldwide LHC Computing Grid, WLCG) and radio astronomy (Low-Frequency Array, LOFAR), as well as scholars linked to numerous international ESFRI projects (European Strategy Forum for Research Infrastructures). The Center in Poznań is one of Poland's largest centers involved in international research projects. Over 28 years of its activity, the PSNC has participated in nearly 300 such programs and initiatives, in particular in the area of information and communication technologies (AI/big data, multi-scale modeling, quantum communication and computing, and cyber security) and their applications in the digital transformation of science, the economy, and society.

### The Academy and the borders

Thanks to the activity of the Polish Academy of Sciences and the programs of the National Science Center and the Polish National Agency for Academic Exchange, access to resources and tools enabling international cooperation has improved significantly in recent years. It should be noted, however, that Poland's is still among the less-mobile academic communities in Europe, and we still need systemic support in this area of scientific activity. A system of incentives for the internationally most active research units is needed, and so is support from Polish government agencies aimed at helping institutes open up to researchers from abroad. Another important form of support is that provided by central administration bodies in Poland, for example in speeding up the procedures for legalizing the stay of foreign scholars in Poland.

From the perspective of the Academy's 70 years of existence, we can see clearly its accomplishments and presence in international science: the articles published internationally, grants under the EU Framework Programmes, international prizes awarded to the PAS staff and members, international conferences organized by the PAS academic community, and above all research that pushes forward the leading edge of science and contributes to its development in the world. All those who participate in this international dialogue deserve recognition, as well as the kind of support that will allow them to successfully venture beyond the current boundaries of knowledge. ■

I am thankful to Prof. Roman Słowiński and Ms. Anna Halama for their help with editing this text.

PART III

# THE CURRENT THREATS



# SCIENCE IN THE TIMES OF A NEW OBSCURANTISM

We are now observing an extreme crisis of confidence in science. Why are anti-scientific viewpoints so popular, and why have we ceased to trust academia?



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## Andrzej Szahaj

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It has been several centuries since Francis Bacon sketched out a picture of a marvelous world that would be created through scientific inventions in his novel *New Atlantis*, and almost a century and half since the birth of scientism, an ideology whose patrons include Bacon. According to the tenets of scientism, science was expected to solve once and for all the troubles besetting humanity in the developmental and spiritual spheres.

The nineteenth-century belief in the redemptive power of science continued for many decades. Some especially hot-blooded proponents of scientism worried that science would end in the 1930s, as all the mysteries of nature would have been unraveled by then. Although that prediction did not come true, such optimism continued unabated for many more years, and the faith in the earthly power of science only became more profound. Sending man to the moon was a clear sign of the legitimacy of science. Indeed, there was nothing to suggest that the twenty-first century would witness the arrival of the era of a new obscurantism, epitomized by today's anti-vaccination movement. And so we may ask: What happened? We should seek to identify the causes of this situation in several areas.

### Science

Starting from the late nineteenth century, the exact sciences, humanities, and social sciences became increasingly refined in their theoretical aspect, complicated, and distanced from what we call common sense. Understanding them required at least a university degree. Barriers came to be posed here by increasingly narrow specializations. At the same time, there was an increasingly acute lack of theoretical work that attested to the fundamental unity of science, to the internal connections between its disciplines, to the general sense of all scientific inquiry.

This role was once successfully played by philosophy. As various disciplines became increasingly specialized and theoretically refined, however, the integrative function of philosophy became increasingly difficult to fulfill. Moreover, the cultural and interdisciplinary position of philosophy diminished as the nineteenth-century expansion of new fields linked to the world of technology and engineering (technoscience) caused philosophical reflections to be seen as insignificant, as they were impossible to translate into technological inventions and technological progress.

Modern-era science quickly shifted from a disinterested search for truth as a result of the contemplation of the world (*theorein* in Greek) to a striving for technological utility, which sought ever greater control over nature and society.

As a result of those processes, science became increasingly effective in the technological sense, but also less and less aware of the true significance of new inventions for the future of humanity (moral reflections failed to stay apace of technological progress), and intellectually increasingly refined and insensitive to the human need for meaning.

That process was exacerbated by the disappearance of science popularization, which came to be deemed an activity that took up the valuable time of scholars and was not appreciated by the scientific community. The institutional environment of science, increasingly focused on efficiency understood as cost effectiveness, also started to devalue the popularization of knowledge as an activity that did not bring tangible scientific results, and therefore was (purportedly) worthless. On top of this all, science studies began to conclude – in a way that increasingly demythologized the nineteenth-century image – that science was a field of social practice that was not free from the influence of all sorts of political ideologies, the interplay of group interests, or pressure from those in power, that scientists were not free from such vices as vanity, jealousy, or a penchant to cut corners to gain applause, fame, and financial success.

In this way, scientific reflection on the nature of science itself (whether sociological, philosophical, or historical) certainly undermined its Enlightenment-era depictions as a semi-divine activity, thus bringing science back down to Earth. Scientific reflection confirmed the excellent capacity for self-reflection and self-criticism present in science, but it also to some extent eroded away at its cultural status. Much greater importance was attached to the processes linked to efforts to pinpoint the place of science in the new political and economic context. For a long time, science mainly sought to meet the external needs of modern nation-states. Before that, it had contributed to their creation. Modern scientific pursuits in such disciplines as history, linguistics, archeology, and ethnography offer visible proof of this fact. At some point, however, the role of the patrons of science was assumed mainly by private business organizations.

### Links to the state

It is possible to identify significant weaknesses in the state's patronage of science, primarily related to its desire to consolidate its power over both its own citizens and its natural and political environment. That situation was linked to the development of many fields of science and the social practices they regulated. Such



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is a Full Professor at the Nicolaus Copernicus University in Toruń, a member of the PAS Committee on Philosophical Sciences, and a former member of the PAS Committee on Cultural Studies. In 2008–2016, he served as the Dean of the Faculty of Humanities at the Nicolaus Copernicus University in Toruń. He has authored many books on the philosophy of politics and the philosophy of culture. He has held fellowships at the universities in Oxford, Cambridge, Leeds, St. Andrews, Berkeley (University of California), Charlottesville (University of Virginia), Palo Alto (Stanford University), as well as at the Netherlands Institute for Advanced Study in the Humanities and Social Sciences and the Rockefeller Foundation Bellagio Center.

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## ACADEMIA PART III The Current Threats

advances helped modernize the functioning of countries, but also resulted in stronger control of citizens (as brilliantly described by the prominent French historian Michel Foucault); radically improved the situation of entire populations (examples include the Green Revolution in India), but also led to disastrous environmental consequences of the use of certain technologies based on the achievements of science (the famous case of DDT, an insecticide used on a large scale after World War II that proved to be extremely harmful to the environment).

The process of state-building was also linked to the development of the arms industry, which relied on the achievements of science – as we know, this sector was the source of most of the important technological inventions of the twentieth century. That said, state funding left a lot of room for basic research and the education of citizens in terms of the quality of their intellect and character. In this way, a certain balance was struck between the state's desire to use science to consolidate its power and the traditional recognition of scientific inquiry as an autotelic activity.

The situation began to change in the 1980s, which witnessed the onset of the hegemony of neoliberal ideology, marked on the one hand by the governments of Ronald Reagan in the United States and Margaret Thatcher in the United Kingdom, and on the other by the long-lasting dominance of neoliberal economic theories propounded by Friedrich August von Hayek and Milton Friedman (Nobel Prize winners in 1974 and 1976). Neoliberalism altered the state's policy towards science and its social environment.

### Links to the economy

Utility – understood in the narrow (economic) sense – rose to the fore. From then on, science was above all expected to serve the purpose of consolidating the power of individual economies, with its advances being harnessed by the world of business. Various scientific disciplines thus became almost directly drawn into the gears of the capitalist machine of profit and exploitation.

The expansion of the neoliberal perception of effectiveness and success into the realm of academia manifested itself both in the gradual privatization of science and in the subordination of its findings to economic indicators. One of the offshoots of this process was the invasion of the evaluation of scientific activity by means of performance indicators, in the form of points scored for publications. The profitability of science was understood as the possibility of monetizing scientific findings. Research institutions, in particular universities, started to be treated increasingly like corporations. The notion of profit, which previously had no traction within the walls of academic institutions, became ubiquitous. For example, people

began to wonder if a given university or a particular faculty was “turning a profit” – something that had to seem absurd to those who (like the present author) grew up in the times when science was a relatively disinterested endeavor. The governing bodies of academic institutions started to talk about the necessity of “bringing more free-market mechanisms into the universities,” about encouraging competition understood in a way analogous to market competition, and about evaluating the heads of faculties and individual employees in terms of their ability to secure funding for their research (a condition that might be described as “grant fever”). Collegial bodies, such as university senates, started to focus on the topic of money at their meetings.

The concept of the university as a community of truth-seekers began to be supplanted by the understanding of higher education institutions as businesses. This was coupled with elements of what the prominent English political scientist Colin Crouch has called the “corruption of knowledge.” For example, individual academic disciplines – not only those closely linked to technology and engineering, such as robotics, chemistry, and pharmacy, but also economics, psychology, sociology, political science, computer science, and cognitive sciences – began to focus primarily on the market success of their output, completely forgetting about their traditional mission. Under these circumstances, those branches of science that could not be directly linked to the capitalist market started to be treated as needless (this held true, for example, for philosophy, the history of art, and musicology) or to be forced to justify their existence by coming up with “practical applications.” In turn, universities and other higher education institutions started to be perceived as a branch of the economy and became subject to market pressure. That led them to gradually renounce their traditional mission of the disinterested pursuit of truth, the education of critical, enlightened citizens, and the transmission of culture to new generations.

Those who wanted to remain true to the ethos of science and education – understood as the enhancement of the self-critique of Western culture, something that had always made it stand out in a positive way from the rest of the world – began to be perceived as defenders of an aristocratic vision of academia, as being out of touch with reality. Such a perception ignored the fact that what lay behind those seeking isolation from the pressure of current and everyday affairs was the potential to make the world a better place, through faithfulness to such ostensibly impractical virtues as critical objectivity and the ability to think of various alternatives, to reflect calmly on the past, and to think about the future without haste. Increasing contempt for the disinterested nature of scientific pursuits, understood as freedom from the pressure

to produce instant utility (stemming from the typical impatience of turbo-capitalism, which demands quick achievements), has resulted in a shift away from basic research both in the natural sciences and in the social sciences and humanities.

## The pressure of profit-making

This atmosphere of pressure on academia, which was expected to yield to the demands of the capitalist market, also had its impact on the policies of the state, which increasingly saw science as a branch of the economy of the same sort as trade or industry. In addition, the neoliberal way of thinking about the world demanded the state's gradual withdrawal from the traditional functions of initiative and supervision. Under these circumstances, individual scholarly disciplines began to focus increasingly on the acquisition of funding from private sources. This held true in particular for the natural and other sciences mentioned earlier, whose findings could find market applications. Major corporations started to allocate huge resources to scientific research. In some disciplines, such as pharmacy and computer science, they have almost completely replaced state funding.

But farming science out to corporations and letting them reap the profits proved to have disastrous consequences for the moral aspects of scientific pursuits. That was because they were motivated only by a desire to generate profits, and paid no heed to the moral aspects of individual scientific achievements. Stripping science of morality, as a result of its subordination to the requirements of the capitalist market (further reinforced by the pursuit of fame and fortune on the part of individual researchers ready to offer their talents and skills to whoever paid more), led to what could be called science becoming corrupted by the world of business. This is especially evident in the aforementioned disciplines.

Big pharma, an industry known for its ruthlessness and self-interest, practically monopolized scientific research into new drugs, subordinating it to the imperative of profit generation. For example, pharmaceutical companies spent decades developing drugs that would generate the highest profits – not the ones that are needed most on health-based grounds. In turn, the IT sector proved to be extremely effective in attracting the most talented scientists, who were eager to contribute to the birth of what is called surveillance capitalism, just as banks successfully attracted the most talented students of mathematics and physics to help devise new financial instruments that ultimately proved to have disastrous consequences (the financial crisis in 2007–2008). If we add the bribing of individual researchers by large oil and mining corporations interested in climate denialism, we arrive at a gloomy picture of a deprived world of science in

which the profits of those who finance research are more important than any knowledge-related or moral considerations.

## The pseudo-market of ideas

All this cast a shadow over the authority of science and did not remain without influence on the ongoing crisis of confidence in science. It has provided ammunition to people who, for various reasons, have always looked at science with suspicion. Before the era of the Internet, such individuals gained no recognition as the spread of ideas was limited by the technical nature of the media and by the culture of the reviewing process and selection, which separated at the very beginning what was sensible (rational) from what was unwise (irrational).

The age of the Internet has brought unlimited possibilities for promoting various ideas. Anyone can freely spread anti-scientific views, taking advantage of the aversion felt by some people to science as a system associated with the oppressive state (the freedomists), exaggerating the actual shortcomings of science, and feeding on (justifiably) deeper distrust in the world of big business, interested only in making profits and using science for its own purposes. When we add the withdrawal of the state from its role as the regulator in the aftermath of neoliberalism, we end up with a sad picture of the current state of affairs – a pseudo-market of ideas where scientific truth struggles against absurdities, research integrity clashes with intellectual deception, and the state just sits back and watches.

## Combating the new obscurantism

In these circumstances, the only hope for rebuilding the cultural position of science lies in its capacity for reform and show that it nevertheless is indeed independent of the great forces and interests that have corrupted it. But this alone is not enough: science must show that it can be critical of these very forces. Importantly, scientists must also be able to popularize the achievements of science, to point out its numerous benefits, especially those in the spheres of morality and cognition (not utility!). The purpose is to constantly remind everyone that science is a priceless form of life where the freedom of inquiry goes hand in hand with the ability to think critically, and the value of an individual success is measured by its community impact. In this fight against the new obscurantism, however, we need the help of the state, which should return to the position of the main patron of science and also actively engage in the process of educating society to enhance its ability to distinguish between truth and falsehood, between scientific findings and absurd ideas. This is because it is naïve to expect that in the high competitive market of ideas, the truth will manage to defend itself all on its own. ■

Further reading:

Crouch C., *The Knowledge Corrupters: Hidden Consequences of the Financial Takeover of Public Life*, Polity Press, 2015.

Foucault M., *Discipline and Punish: The Birth of the Prison*. Trans. Alan Sheridan. Pantheon Books, 1997.



**Prof. Jerzy  
Kołodziejczak**

was a physicist who served in 1999–2003 as Vice-President and President of the Polish Academy of Sciences.

It is with great sadness that we note that Prof. Jerzy Kołodziejczak passed away on 1 August 2022.

He had served as the Director of the PAS Institute of Physics, the Chairman of the Scientific Council of the PAS Institute of Physics, and the Chairman of the Scientific Council of the PAS Institute of High-Pressure Physics.

He was an Ordinary Member of the PAS and also a member of the Warsaw Scientific Society.

# ARE WE ON THE VERGE OF AN ERA OF NEOIGNORANCE?

Why do some people call into question the methodology of science and its achievements? Why are such opinions garnering public interest and even support, even though their arguments are primitive and disconnected from the facts?



ROGER UTTING/SHUTTERSTOCK.COM

## Jerzy Kołodziejczak

PAS Institute of Physics

Many manifestations of public life point to the twilight of the contemporary stage of civilization, which was a natural consequence of the Age of Enlightenment, born out of the intellectual freedom of the most prominent representatives of humanity who lived in the period from the late seventeenth century to the nineteenth century. In that epoch, human reason, freed from all shackles, was seen as the light illuminating the path to knowledge of the truth about the world and man. It was human reason that led to the scientific revolution in the late nineteenth and early twentieth centuries, and then – as a result of the practical application of the new knowledge about the world and its phenomena – to the acceleration of the industrial revolution and the technological revolution, with the latter continuing until now. Certain cyclical macroeconomic phenomena are closely linked to groundbreaking scientific discoveries, which are pushing the boundaries of industrial

activity and therefore defining the ways in which societies are organized. The nineteenth century saw the development of industry using thermodynamics and the study of electricity. The twentieth century started with fundamental discoveries and understanding of the nature of the microworld. It was a period of the atom and electronics. In turn, the early twenty-first century was defined by computer science, biotechnology, nanotechnology, and genetic engineering.

How far forward has mankind managed to leap since the times of cave dwellers? The answer would seem to be clear and obvious to everyone.

### And yet...

Theories questioning the achievements of modern science continue to emerge. Let us cite here a few examples: *there is no coronavirus, and the pandemic was caused by the development of the 5G mobile network. Vaccines are harmful to humans and have numerous negative effects, which include altering human DNA. The Earth is flat, not spherical. There is no global climate change, and if there is, it has not been caused by not human activity, but by the shifting of the North Pole towards Siberia. The Earth's climate has changed many times throughout history, even before the advent*

Speakers' Corner in London's Hyde Park is a place where everyone is permitted to freely express their views on any topic, in the name of the freedom of speech



## ACADEMIA PART III The Current Threats

Theories that run counter to today's scientific knowledge include the one promoted by flat-earthers



FOTOHELIN/SHUTTERSTOCK.COM

*of man, and such changes have always been induced by various natural processes. The moon landing was a hoax, and the films were fakes made in Hollywood.*

Such disinformation and fake news stories are often spread with the help of media outlets focused on sensationalist coverage. A special role is played here by the Internet, where anyone can write anything and trumpet all sorts of nonsense as the alleged scientific truth. This bears a resemblance to London's famous Hyde Park, a forum allowing for the free expression of all views for the sake of the freedom of speech (provided that the speech does not offend the Queen). The Internet, online platforms, and instant messengers are not only carriers of true scientific values, seedbeds for rationalism, and sources of knowledge. Unfortunately, they have also become a very serious source of tacky content, stupidity, and pseudo-knowledge. The goal is, obviously, commercial. But for reasons related to how this mechanism functions, people's imagination has been captured by mass and primitive pop culture and individuals who are famous for being famous. It is them who are pushing through this irrational message, supported by politicians who dream of ruling an uneducated yet obedient nation without any problems. In this way, the marvels of communication tools, which are products of great minds, are turning against the idea behind their development to serve an evil cause. For these reasons, Internet users should be advised to be very careful and to learn to distinguish truth from falsehoods.

I will not comment here on information that obviously contradicts the facts and is published by various media outlets, on the Internet, and sent via various messengers. Examples are numerous, e.g., the flat Earth model and the shift of the North Pole towards Siberia as the cause of climate change. Likewise, there

is no point arguing with pseudo-theories about the alleged moon landing hoax or with those who promote the view that the recent pandemic has been caused by the 5G technology used in the mobile networks. Proponents of such views cannot point to any physical or medical mechanism that could have caused the pandemic. Such false statements are formulated intentionally and are contradicted by what we know about the effects of microwave electromagnetic radiation on the human body. Their authors ignore the existence of the coronavirus as an empirical fact confirmed by numerous observations. They probably do not know that scientists have accurately pinned down not only the morphological form of the coronavirus, but also the way in which it affects the human body.

### A special case

In turn, the issue of climate change must be taken more seriously. It is undoubtedly true that throughout history the Earth's climate has changed many times due to natural causes. Billions of years ago, the species of microbes known as cyanobacteria evolved in the primordial sea and changed the composition of the Earth's atmosphere, saturating it with oxygen, a gas that was poisonous to life at that time. This led to the emergence of new, more energy-efficient life forms based on the oxidation processes. The absence of greenhouse gases in the atmosphere caused a global ice age, and the surface of the entire planet became covered with glacial ice (the Snowball Earth). After that, natural volcanic processes triggered the emissions of greenhouse gases, temperatures rose, and the glaciers began to retreat. Yes, throughout the Earth's history, natural processes have resulted in global climate change many times. But this does not mean that

humans cannot be the cause of the changes underway right now. We know the exact amount of greenhouse gases emitted into the atmosphere as a result of human economic activity. Science allows us to predict what changes in the Earth's temperature may be caused by this amount of greenhouse gases. The scientific conclusions are unambiguous and consistent with what anyone can observe in winters without snow and heavy frost. The accelerated retreat of glaciers in Greenland, in the Himalayas, and in Antarctica is a serious warning to humanity. Humans did not appear from nowhere – together with all of their activities, they are a natural part of nature at a certain stage of life of our planet. In this sense, the ongoing climate change has been caused also by natural processes. The Earth will survive this change, but this may not be true for the species that now inhabit it, including humans. They will be replaced by other species, just as cyanobacteria once were.

Spreading fake, pseudo-scientific news leads to the emergence of various conspiracy theories holding that some dark forces want to take over the world and enslave people's minds through special microchips allegedly planted in humans with COVID-19 shots. Anti-vaccination movements claim that this is the purpose of aggressive pro-vaccination propaganda, and there is no pandemic. Such propaganda is intended to scare people enough to take vaccines, and if they do not agree, vaccinations will become mandatory.

## Neignorance

Why do some people call into question the methodology of science and its achievements? Why has their number grown so dramatically in recent decades that we can say we are about to enter an “era of neignorance”?

It appears that the reason lies in great and rapid advances in science and human development. The vast

accumulations of knowledge and the complex nature of science and technology render these advances extremely difficult to absorb and understand, even for well-educated people.

In the late eighteenth and early nineteenth centuries, when the English physicist and chemist Michael Faraday was presenting the results of his cutting-edge research to the British Royal Society, all of its members, regardless of their specialization, understood those findings. With today's knowledge and very narrow specializations, something of this sort would be impossible. What, then, should poorly educated or uneducated people do, frightened by what they can observe yet not understand? How are they supposed to absorb and understand this huge amount of knowledge that is so hard to grasp?

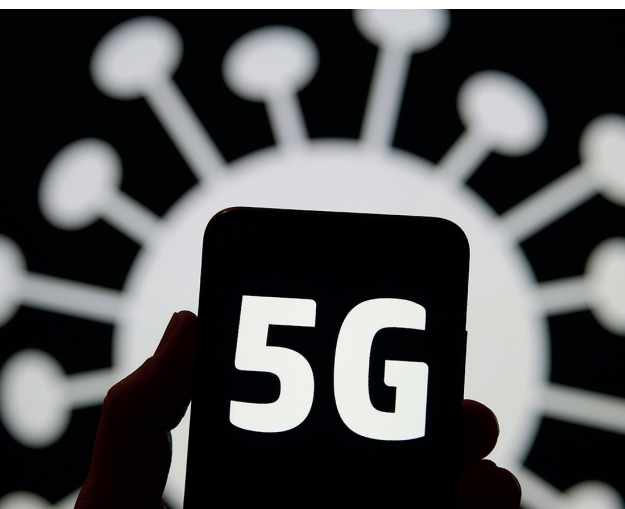
This is impossible, so they restrict themselves to newspaper headlines, and believe that once they read them, they will know everything. They rely on general slogans, but they do not in fact understand

Disinformation and fake news stories are often spread with the help of media outlets focused on sensationalist coverage. A special role here is played by the Internet.

their meaning. By its very nature, fake news offers simple explanations of very complicated processes and phenomena taking place in the world. By uncritically absorbing pseudo-scientific reports from various outlets, the Internet, and social media, such people create their own interpretation of the problems and phenomena that interest them, which gives them a false sense of their comprehension. Unlike others, they know the truth. It does not matter that such pseudo-knowledge is not supported by facts. If it contradicts the facts, then so much the worse for the facts. Such people, being ignorant of science, are also arrogant. I do not know how many times I have heard such “intellectuals” mocking science as useless: “People had runny noses back in ancient China, and they have runny noses now, so what has medicine given us?”. In this type of people, we can observe a certain pattern of behavior: the degree of their arrogance and self-confidence is inversely proportional to the level of their knowledge.

Fortunately, there are also people who not only read newspaper headlines but also reach for professional literature on specific subjects to learn more about the world. But even this does not make them

According to one conspiracy theory, the coronavirus pandemic is caused by 5G technology



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MATEJ KASTELIC/SHUTTERS TOCK.COM

Reliable knowledge lies not in conspiracy theories, but in scientific research and statements by experts

experts in comparison with people who have spent years or sometimes their whole lives conducting scientific research to uncover the truth about the world and its phenomena.

If neignorant individuals take up important positions in decision-making and political spheres, this may have especially dangerous consequences. When combined with various ideologies and the replacement of science with pseudo-science for the purpose of political needs, ignorance has often triggered dramatic events, bringing nations and the world to the brink of ultimate catastrophe. Consequences of ignorance on the part of those in power and state support for pseudo-science deliberately created to meet the political needs of Nazism and communism should serve as a warning. The effects included millions of deaths in two world wars and the planned, industrial-scale extermination of entire nations.

Fortunately, most people have open minds and are aware of the vastness of today's knowledge. They realize that they will never know everything, especially not in a way that will allow them to understand everything. Such people understand what the scientific truth is, how it is reached, and how it must be verified. If they want to learn something, they will go to true experts. On matters related to the pandemics and COVID-19, they will go to virologists, vaccinologists, and epidemiologists, and they will consult with climate scientists to find out more about climate change. Such people can verify sources of information, so they will reject the theories of self-proclaimed pseudo-intellectuals on the Internet, and trust the research findings of reliable professors from Oxford.

Unfortunately, we can see an alarming trend of such attitudes becoming increasingly rare, just as increasingly loud-mouthed and aggressive ignoramus are growing in numbers. This must raise justified con-

cerns about the world entering an era of neoignorance. Members of the scientific community are increasingly remaining passive in the face of these dangerous phenomena. This probably results from the conviction that they have no influence whatsoever on the course of the events or their scale, as well as from their powerlessness and the lack of tactics in the "battle for the truth." So we shut ourselves up in our ivory towers and devote ourselves to our mission, which is digging at and uncovering the scientific truth. While doing so, we forget that the mission of scientists also involves disseminating this truth and actively fighting against falsehoods. Since we are not doing enough to popularize scientific knowledge, the public is defenseless and vulnerable to falsehoods. This fact is used, consciously and with premeditation, by dangerous falsifiers of truth. In the mission of a scholar, the promotion of scientific knowledge – not only through professional, specialized, and often hard-to-understand publications, but also through various forms of science popularization – is no less important than scientific inquiry itself. Voltaire corresponded with emperors and kings not for the sake of a hollow fame, but in order to enlighten them.

Media outlets, including social media platforms, are full of categorical and arbitrary statements that promote some alleged "truths" and conspiracy theories. In addition to actively fighting against falsehoods, we should put the issue succinctly and tell the authors of such pseudo-truths: go learn, educate yourself. The level of self-confidence and arrogance is always inversely proportional to the level of knowledge. Socrates discovered this truth at the end of his life, when he already had amassed enough knowledge and experience to say, "I know that I know nothing." His wisdom lay in his awareness of his own ignorance and in his humility in the face of the unknown. ■

# INFORMATION VS. DISINFORMATION

What does the phenomenon of online “fake news” stem from? What are scholars doing to combat disinformation?



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Here is how the Polish science fiction writer Stanislaw Lem summed up the Internet almost two decades ago: “The ability to transmit the content of a new book or letter to the opposite hemisphere a million times faster than before is about as consequential as the fact that a cup of tea will not get any sweeter if you stir it with a spoon.” Those words were written at the time of widespread enthusiasm for the new medium – its capacity and increasing speed and the promise of unlimited content availability, a time when municipalities, schools, and families were being connected to the Web.

In the early twenty-first century, we were convinced of something that Lem did not find convincing – that the Internet, as a medium that emerged out of the academic world, would above all bring universal enlightenment, even to places where traditional schooling did not reach. That was how the traditional media talked about the Internet, and that was how companies like Google and Amazon wanted to be perceived – the former wrapped our communications up in advertising algorithms, and the latter transformed from a bookstore of great assistance to scholars into the world’s largest all-purpose store. Such is the communications reality we live in.

In 2022, we can say that two decades ago, even before the advent of global social media, stirring may not have made Lem’s cup of tea any sweeter, but hardly anyone predicted that it would actually become as bitter as it is today. Back in the 2000s, the Internet was associated with democratic decentralization, which – assuming good faith on the part of its users – was seen as a tool facilitating free thinking and learning.

When the Arab Spring broke out several years later, we were still optimistic about the positive impact that was being exerted on democracy by social media, as the very latest embodiment of the Internet. We saw how people were using social media, free from the influence of the political authorities (unlike the press, radio, and television), to resist tyrants and publicize their crimes. We watched their successes, but in the end also the tragedy that befell Syria. Those events were accompanied by enthusiasm for the democratization of content publication on the Internet as such and on social media as such. The same held true for us, living in peaceful Europe. Is there much left of all that today?

The problem of false or manipulated information is certainly neither new nor unique to the Internet. Persuasion disguised as information, meant to serve the interests of specific influence groups, has always

been part of human society. No medium ever received more bad press in this regard than... the nineteenth-century tabloids. The film industry, in turn, once succumbed to totalitarianism, and television is still openly manipulative. However, false information on the Internet is unique and very dangerous in that it spreads with particularly great speed and produces lies that are difficult to detect and straighten out.

**Fake news**

In late August 2021, the journalist Brecht Castel tweeted the results of an investigation conducted using OSINT techniques (collecting information from publicly available sources). He targeted a single instance from among many online manipulations, but it was one that had a great impact. The investigation demonstrated very clearly the two most important difficulties in the struggle against fake news on social media. For one thing, such manipulations are extremely easy to create, and they spread very quickly. For another, the networks make it systemically difficult to combat fake news, and such efforts consume a great deal of energy.

Brecht Castel examined a photo that had been posted on Facebook. It showed a woman dressed in medical scrubs and holding a placard saying “573 days face to face with COVID patients while unvaccinated/ Never got COVID/I have an immune system/ Don’t mandate my choices!”. In two weeks, it was shared by 424,000 people and viewed by 44 million users. Grist to the mill for vaccine opponents.

Very few professionally crafted messages manage to garner as much publicity as is received by such lies, which are based in their form and content on emotions that attract crowds of Internet users. Was she a medical professional? Did she actually have contact with patients for so long? Is she really not vaccinated? No facts were relevant for the spread of this “news” and the creation of this emotional message. Fact-checking was a very time-consuming process, and the reporter did not arrive at clear conclusions.

Establishing the facts related to doubtful content takes a lot more time (and a tremendous amount of resources!) than distributing it effectively – this is the first obstacle in the fight against manipulation. Another very serious obstacle is posed by the fact that most social networks, especially Facebook and Twitter, systemically and by design offer no opportunity to remove false or manipulated content. Social-networking websites (except for LinkedIn) state in their terms of service that the content published by their users reflects their opinions, which as such are not evaluated for truthfulness, and any disputes over facts should be settled in court.

Social media owners profit from the emotions generated by their users’ opinions, which they treat as facts. This situation is fundamentally different in the

traditional media, which bear editorial responsibility for the content they distribute. Such responsibility is not always easy to enforce, but it exists, at least formally, and it is built into the media system.

## Populism

When did we notice that the distribution of fake news on social media poses a major problem for society? In June 2016, Britain held a referendum on leaving the European Union. In November 2016, the Americans elected Donald Trump to be their president. Fake news, disseminated on social media on a massive scale, contributed significantly to the outcome of both elections.

In April 2017, an article in *Nature Communications* warned of the threat that fake news posed to the debate on climate change. In the introduction, the authors state: “[a]s the challenges and environmental consequences of climate change manifest, the need for a society of science-literate citizens is becoming increasingly apparent. Achieving this, however, is no easy task, particularly given the proliferation of fake news and the seeds of confusion it can sow.” The article also lists the causes of this problem: the rapid expansion of digital media together with extremely fast paced consumption of their content and, consequently, a less critical evaluation of news sources.

The 2015 Paris Agreement threatened some very powerful groups of influence, whose members decided to fight for their interests by exploiting the ignorance on the part of many members of the public about the true nature of digital media. Political populists did the same thing in the 2016 elections in both the United States and the UK. Then, when we had already started talking loudly about this new type of information manipulation, science started to be seen both as a victim of the new situation (for reasons related to attacks mounted against what we know about the climate crisis) and as a remedy (the capacity for critical analysis).

## What is science doing to fight manipulation?

In the years that followed, the world of science responded to this challenge with greater commitment to quality communication in new media. Many research institutions allocated more resources to communication, with scholars establishing a stronger presence on the Internet, not only with strictly scientific content, but also with more intensive science popularization efforts. Scientists are now studying manipulation in digital media, drafting guidelines for journalists and editors, and teaching a critical approach to absorbing information. Above all, however, they are using the



SKYPICS STUDIO/SHUTTERSTOCK.COM

new media to fight scientific untruths. This also holds true for the Polish Academy of Sciences.

What are we doing? We are providing information, dispelling myths, and consciously using persuasion – based on scientific knowledge and methodology. We can hardly hope for a quick win in the fight against disinformation for reasons related to the structure of the entire field of communication that influences public opinion. Even if all editors in the “traditional” media made their communication channels available to scholars speaking with one voice, their impact on public opinion would be limited because television, radio, newspapers, and even Internet websites are now secondary to social media, driven by grassroots-level passions and fears. This problem is especially acutely felt in Poland, where the authority of public media as a reliable source of information has collapsed completely.

In Poland, just as in many other countries, there are websites that have been created in response to manipulated information about climate change. Such websites contain position statements put forward by

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research institutions and simple yet reliable responses given by scholars to frequently-spread myths. Examples include the Polish-language websites naukaoklimacie.pl and klimat.pan.pl, the latter being managed and run by the Polish Academy of Sciences. In recent years, the publicity gained by the problem of fake news has acted as a wake-up call for representatives of the media, causing them to become openly aware of this issue, approach sources with greater caution, and eagerly invite scientists to join the public debate. Unfortunately, this has not eliminated the problem of the spread of fake news. The outbreak of the COVID-19 pandemic highlighted the crucial role of that part of communication that does not depend on professional editors but is eagerly influenced by political and commercial interest groups – which essentially means social media. In the sphere of communications, the fight against the pandemic has exposed fundamental difficulties in stopping the river of lies pouring out of the Internet.

In spite of everything, science content is relatively popular in the media, and the PAS is eagerly exploiting this opportunity. We are helping boost awareness of the climate crisis and the importance of the fight against the COVID-19 pandemic. Many members of the public understand that the most important and urgent problems facing humanity can be resolved through the work of scholars.

In recent months, the voices of expert bodies appointed by the PAS President received especially wide coverage in the media. Over the past year or so, the Interdisciplinary COVID-19 Advisory Team and the Advisory Group on the Climate Crisis have issued numerous position statements, addressed not only to journalists and decision-makers, but mostly to citizens, thus influencing the opinions of the public. Together with easy-to-understand commentaries, those position statements have reached millions of recipients, influencing their behavior in Poland and improving social acceptance for pandemic prevention measures. The statements were repeated in various forms and quoted, or at least partially conveyed in a good way, by almost all major traditional media outlets and many local ones. We have also explored the potential of social media.

The PAS committees regularly speak out on key social, ethical, health-related, and biodiversity issues. These voices reach the public more effectively via social media. In terms of communication, we are no longer completely reliant on the will of traditional media outlets.

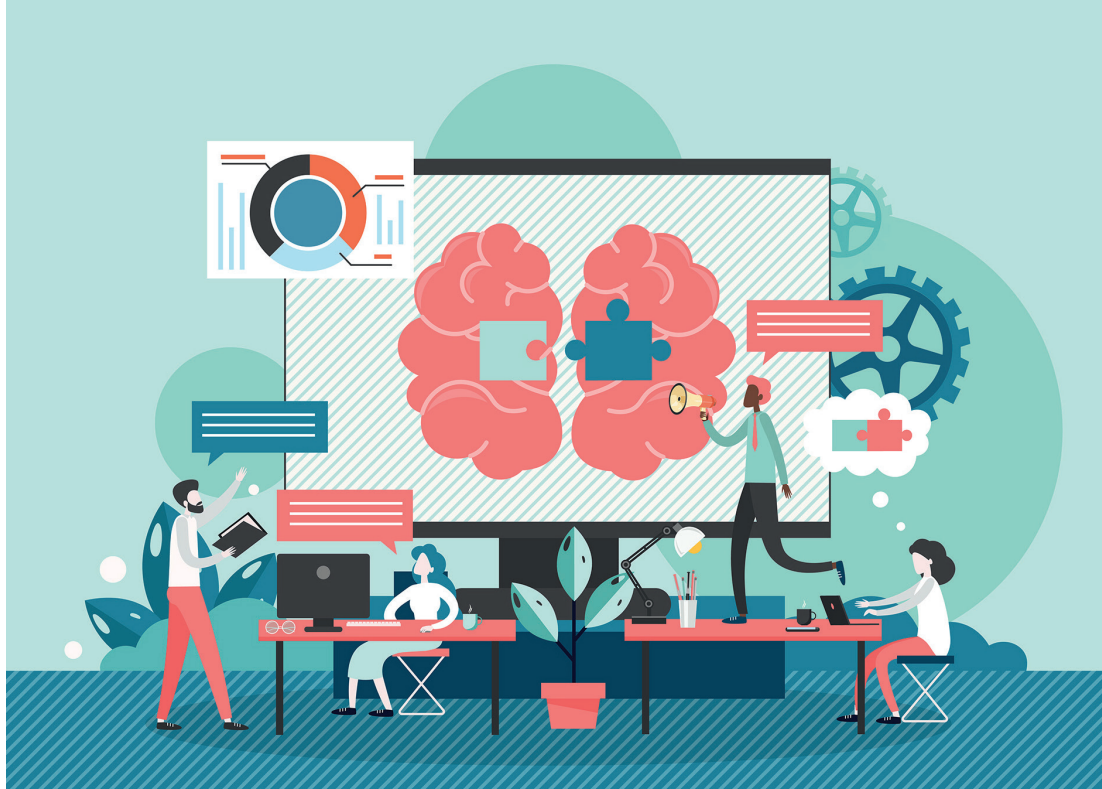
Although we should not delude ourselves that reliable scientific knowledge will soon become as popular on social media as manipulation fueled for example by fears, we should nonetheless be especially active in the online world. The climate crisis and the fight against the COVID-19 pandemic have sparked

what could be called a fad for science. We have used this trend to reach out to a growing number of people using new channels. We take into account their distinctive characteristics because we formulate content differently on Facebook (the most popular social media outlet) than Twitter (focused on short-form content and influential in specific social groups). We were surprised and pleased by the effectiveness of the LinkedIn network, created with career-related content in mind, in reaching out to people interested in science. To promote reliable knowledge as widely as possible, we are working with the Copernicus Science Centre (CSC) on the series of meetings “Coronavirus in the Crosshairs,” where participants resolve their doubts by asking questions directly to, and receiving answers directly from prominent scientists. Together with other European academies that are members of the European Academies’ Science Advisory Council (EASAC), we prepared and disseminated materials that reached a very wide audience.

If it is difficult for reliable knowledge to compete with emotional manipulations, the main ways to fight them involve reaching out to those members of the public that are not sure if they should trust scientists. It turns out that the publication of rational arguments by such a prestigious institution as the Polish Academy of Sciences often tips the scales in favor of trust in scientific arguments and the scientific method. It is likewise important to publicly suggest appropriate solutions to decision-makers and to sketch out scenarios of behavior, as the PAS committees and advisory teams and groups do. Consequently, the policymakers who want to listen to such arguments can more easily make decisions backed by the authority of science. Unfortunately, many politicians would rather not antagonize those voters who are easily manipulated.

### Misuse of the word “communication”

In today’s world, communication comprises everything, not only the exchange of information between partners and stakeholders. We are particularly eager to use to this word to refer to practice of one-sided persuasion and advertising, which is the complete opposite of communication in the (original) linguistic sense. When launching products and services, businesses and institutions embellish such launches with advertisements, which at the stage of preparation (or the internal stage) are called communication. “Has the marketing department already prepared the communication strategy for the new product?” a project manager might ask. The word “communication” has become all-pervasive as its meaning became completely reversed in many aspects of life, turning into disguised utilitarian persuasion that has taken the place



SKYPICS STUDIO/SHUTTERSTOCK.COM

of the exchange of information – from communication, through crisis communication and marketing communication, to science communication.

## Science communication

Contrary to what we read in many studies, science communication is not a new field – this practice has accompanied scientific research at least since its modern redefinition. Today, it is starting to gain a certain meta-awareness: its subject and methods have yet to be found. This search comes more from the general tendency to “parcel off” consecutive areas of knowledge and practices. What previously belonged to the sphere of teaching and later dissemination is now becoming part of the extremely popular field of “communication” under the overwhelming influence of marketing theory and practice. Science communication as an institutional practice, as part of public relations – organized in many ways – often mimics e-commerce or political marketing practices.

The difference between science communication and political debate is emphasized by *The Oxford Handbook of the Science of Science Communication*: “(...) science communication must faithfully reflect relevant scientific norms or risk undercutting the trust that enshrines science in its privileged rhetorical place.”<sup>1</sup> For the same reason, managing a scientific institution’s social media profiles is dramatically different from commercial marketing. In practice, this means that a scholarly institution must have scruples in the fight for reach, which is everything for politicians, online stores, and unfortunately journalists.

## It’s context that creates meaning

Scientists sometimes make mistakes in their communications via new electronic media. They quite often

want to “immediately publish everything everywhere,” which sometimes proves at odds with the expectations of the audience as all channels have somewhat different users, and these users differ in their reactions.

International studies shows that more than half of Twitter mentions of new scientific publications do not generate any response. This happens not because they were poorly crafted, but because it was wrongly assumed that social media are deprived of any context, like an arbitrary library catalog, a bibliography, or a bulletin board that will accommodate any content. Meanwhile, publishing content on social media is always embedded in a specific context or requires the creation of surrounding information that is clear to recipients. If we want a specific study to appeal to people, we must present its findings as part of an experience or a situation that is understandable to non-scientists.

Research by the PAS scholars published in August 2021 suggests a link between anti-science attitudes and the collective narcissism of some social groups. According to psychologists, defensive attitudes in a group can be linked to its support for decisions that undermine the health and well-being of its members. Hence the enormous popularity of anti-vaccine attitudes among nationalists, a situation that was quickly and intuitively spotted by politicians eager to trip up scientists.

A great deal has been done, but is it enough? Scientists are increasingly active in digital media, and they are trying to influence decision-makers. Unfortunately, their influence over politicians is weak and short-lived. Many politicians, including the highest-ranking ones, have chosen the path of confrontation with scientific knowledge for their own benefit. Among all the elements of the fight against the pandemic of manipulation and disinformation, this one is in my opinion the most difficult to eliminate. ■

<sup>1</sup> K.H. Jamieson, D.M. Kahan, and D.A. Scheufele eds. *The Oxford Handbook of the Science of Science Communication* (Oxford: Oxford University Press 2017).



MAKSIM SHMELOV/SHUTTERSTOCK

# NEO-BARBARISM UPON US?

Remarks on the chronology  
of stages  
in scientific development.



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**M**arxism, which was among the dominant intellectual currents of the twentieth century, accustomed many of us in Eastern Europe to dividing human history up into traditional eras, using criteria generally based on the nature of human relations, especially economic ties: the pre-historic era (primitive communism) was followed by antiquity (slavery), next by the Middle Ages (feudalism), then by the early modern period. The late modern / contemporary times, in turn, were seen as divided into a period of capitalism, followed by the time of socialism and communism. The latter were held up – at least in the Eastern bloc – as the crowning achievement of human development. The division

into historical eras thus overlapped with classifications based on types of economic relations, namely primitive communism, slavery, feudalism, capitalism, and finally communism.

**The legacy of the past**

This traditional division of historical periods was also employed to define the stages of development of science. We still continue to talk about science in antiquity (Greek, Hellenistic, and Roman science), about medieval science, Renaissance science, and Enlightenment-era science. At the same time, other terms taken from general history are also widely applied to the history of science, such as romanticism and positivism. Interestingly, our Eurocentric approach forgets about other cultures to such an extent that although we are aware of the amazing achievements of Arab science in the Middle Ages and the incredible and even older accomplishments of Chinese science, none of those non-European cultures are actually reflected in the European classifications. Consequently, our previous framework, adopted to characterize the eras of human

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development, was dominated by European political and economic divisions dating from the nineteenth century.

It turned out, however, that neither socialism nor the never-truly-realized communism actually became the final stages in the development of human civilization. Therefore, capitalism returned to being considered the “most perfect” stage. Not everyone knows that this is probably because socialism proved itself to be viable in just one country, namely Sweden, while communism has never been implemented in its full form in any place in the world. Capitalism, on the other hand, raised the prosperity of many countries, especially in Western Europe and on the Northern Hemisphere. However, the growing dislike for the word “capitalism” (which we owe mainly to Marx and the communists, who copied him ineptly) shifted the focus from economic matters to – above all – the political organization of this system. As a result of those negative connotations, people were less likely to talk about capitalism as such and instead more frequently discussed Western parliamentary democracy or liberal

however, himself soon withdrew from his original idea. This is because it turned out that humanity was indeed very capable of creating new social solutions that refuted the idea that we had entered such a final stage.

### The Anthropocene

It likewise came to be noticed that, over the past 200 years or so, humans have disrupted the Earth’s environment to such an extent that we in fact need to define a new epoch – a period in which the planet has become thoroughly dominated by humans, with a decisive role being played by their impact on the natural environment and the entire biosphere. The name given to this epoch is the “Anthropocene” – the human epoch. The Anthropocene, in turn, can be broken down into “sub-epochs.” Importantly, some geologists consider it to be the most recent stage within the Holocene, the youngest and ongoing epoch, which started about 11,500 years before present (in geology, the present time means 1950).

On the other hand, various scholars, especially those in the social sciences and humanities, are describing the present time as a “post-liberal” era. Sometimes, we can also encounter the notion of neoliberalism as a system glorifying capitalism and representing the apotheosis of the free market. Just as the Renaissance broke with the Middle Ages, seeking instead the restoration of the ideals of antiquity, the post-liberal era in a sense departs from the liberalism of the previous period.

The term “post-liberalism” appears understandable and useful to describe this situation, including in the context of the history of science. On the one hand, it entails – as mentioned earlier – a departure from the classical concepts of liberalism. On the other hand, it may mean the abandonment of liberalism in general, or a complete withdrawal from any liberal concepts and ideas. The latter option is more conspicuous and definitely more popular. The term “post-liberalism” carries negative connotations, which result from disillusionment with liberalism. In science, however, it has limited significance, because what matters most in science is precisely the freedom of research.

The same holds true of the term “neoliberalism.” It also has negative connotations, but these are related to a greater extent to the adoption of certain liberal assumptions of a philosophical, economic, and social nature, to the exploitation and manipulation of people to accumulate or maintain wealth. In the human sciences, neoliberalism functions within the scope of management theory, among other fields.

However, if we look at the present stage of development from the perspective of the characteristics that played a dominant role in a specific period, we could notice certain regularities that were already evident

Humans have disrupted the Earth’s environment to such a great extent that we need to define a new era: the Anthropocene.

society, which was soon replaced by the term “civil society.” Therefore, science came to be viewed as being divided into “capitalist science” or “socialist science” (at least until the late 1980s). Scholars on either side of the Iron Curtain responded to this with understandable doubts or, at the very least, with sarcastic and indulging smiles.

Without analyzing whether those classifications were right or wrong, we should note that already in the nineteenth century and later, especially in the second half of the twentieth century, attempts were made to posit new divisions. That period saw the emergence of dichotomous terms, which emphasized the changes in development resulting from advances in science and technology, among other things. The division into pre- and postindustrial eras gained popularity, with the turning point for those eras coming in the nineteenth century. It witnessed technological advances and numerous discoveries and inventions in many fields, which were considered a phenomenon that also changed the face of science. Examples include the theory of evolution and Darwinism.

On the other hand, slogans such as “the end of history” appeared in the context of liberal society being regarded as the final stage of social development. The author of this particular concept (Francis Fukuyama),

in previous eras and may help us to find a different solution in the present. Indeed, this does not undermine any of the above-mentioned terms that define new times.

Important characteristics of previous eras include the notions of advancement and regression – which distinguished individual eras from one another at different times and to different degrees. If we adopt the classifications present in the history of art and literature, the Middle Ages, which followed antiquity, could be described as an era of regression. After the Middle Ages, synonymous with backwardness and ignorance (at least in the stereotypical view, since the medieval era also had its “renaissances,” such as the Carolingian Renaissance), the Renaissance came as a period of rebirth and flourishing in human development. In the early modern era, according to the categories used in the history of literature and art, the Renaissance was followed by the Baroque, considered to be a period of returning of mysticism, spiritism, and belief in the supernatural, even though this was also when European science started to rise to new heights. In the history of science, the seventeenth century is regarded as the beginning of modern science. The Enlightenment marked a further return to rationalism and sober thinking, to the study of phenomena in an experimental manner, and to the abandonment of the reliance on feelings and divine inspiration. But the Enlightenment was followed by Romanticism, mystical and primarily guided by feelings. Positivism later moved away from romantic sentimentality and towards science, especially the exact and natural sciences (scientism). However, it was succeeded by modernism, which could be described as a neo-romanticism and another return to faith in the supernatural and revelation.

Likewise, it was denied that progress provided the basis for prosperity and successful development of humanity. In the conservative approach, the primary value is the preservation of traditions and old and “better” ideals – in this view, progress may pose, and indeed poses, a serious threat.

## The role of science

In fact, much of at least the second half of the nineteenth century and the whole of the twentieth century were a period of the absolute dominance of science and belief in science. This happened independently of trends in literature and arts, in economics and sociology. Those worlds functioned in a sense on their own and without links to the interpretation that was current in the exact sciences. Neither existentialism, nor expressionism, nor abstraction and formism in art affected the general – rational – assessment of reality based on certain assumptions present in science at that time. Similarly (though conversely), economics and sociology (and the human sciences in general) were



Johannes Vermeer,  
*The Astronomer*  
(ca. 1668)

nonetheless believed to provide some scientific basis for interpreting the world and reality, at least in its social fabric. That was when such works as Gustave Le Bon’s seminal book *The Crowd: A Study of the Popular Mind* (1895) were written.

In the period of positivism, in the second half of the nineteenth century, great hopes were pinned on science and human knowledge was glorified in a special way. In some circles, science began to be regarded as equivalent to religion, as a domain of human activity that could successfully take the place of religion. It turned out that such a conviction, too, often entailed disastrous consequences. Half-baked theories on the fringes of science, especially in psychiatry, medicine, and the treatment of mental disorders, led to many horrible practices in the “field” of eugenics.

As experience and the history of humanity teach us, however, every age of reason is followed by an age of ignorance, characterized by a dearth of reason and actions that are not guided by common sense.

Twentieth-century rationalism, largely influenced by positivism (including neo-positivism), had to have its special culminating point, followed by a return to sentimentality, emotions, and disbelief – including in science. This means that we must be about to enter a new Middle Ages, or a new barbaric stage of development – a new barbaric era (*neobarbaricum*). What will be the place of science in this new era?

## Neo-barbarism

In this ongoing debate, I wish to popularize the term “neo-barbarism,” harking back to the history of ancient Rome. The Romans saw themselves as the keepers of high culture and advanced civilization, in opposition to the onslaught of barbarism, the unrefined culture of the barbarians – who as we remember, ultimately

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PUBLIC DOMAIN, WIKIMEDIA.ORG

Joseph-Noël Sylvestre,  
*Sack of Rome by  
 the Visigoths on  
 24 August 410* (1890)

managed to overrun that glorious city. The proposed term “neo-barbarism” appears more fortuitous here than a potential alternative, “new Middle Ages”: tempting as it is, the latter would presuppose the existence of some universally accepted ideal (such as Christianity) that might serve as a kind of cement holding together all aspects of the new era. In reality, there is no ideological and cultural binding force in the form of a single prevailing religion or philosophy, even if some form of shared ideology does exist.

Also, it should be noted that the term “neo-barbarism” already has some currency. In 2015, it was used in an article that Mark Garavan, an Irish sociologist deeply interested in human-ecological relations, posted on his blog. There he argued perversely that neo-liberalism had evolved into neo-barbarism, and the main goal of the latter consists in “controlling the very mechanisms of thought, primarily in the media and education.”

From the perspective of human behavior, the current epoch can be therefore defined as *neobarbaricum tempora* – new barbaric times. Let us now try to list its most striking and evident characteristics. First of all, although the current epoch has little in common with traditional religion or philosophy in the existing sense, it does nevertheless appear to have its own distinct philosophy of sorts, with its own set of tenets and principles.

## Central themes of neo-barbarism

The main characteristic of the epoch of new barbarism is the belief that despite all the various advances made in science, we have nevertheless been unable to get at the truth, including the absolute truth sought by philosophers, and so we must assume that no absolute truth exists. Such an assumption changes everything about how humanity has so far approached our earthly affairs. Besides, it also violently rejects and departs from traditional religion, which has its own ethics and, above all, harbors the belief that absolute truth exists, and that such truth means God.

Since absolute truth cannot be gotten at or reached, today’s heralds of the new barbaric era conclude that what we are interested in is not truth, but merely power. In other words, what matters is not whether our claims accurately reflect the truth, but rather, how many other people come to believe in them. This is the underlying assumption of the now popular social-engineering methods, regarded as science-based ways of influencing society. For this reason, the ultimate outcome of our actions involves not reaching any truth, but merely attaining and holding onto political power. Consequently, the question of whether what we claim is true or false is not relevant, or even taken into consideration. It now becomes perfectly clear that this assumption stands in stark conflict with the principles of science, which always seeks to get to the very bottom of whatever it studies.

## A question of power

In this respect, the heralds of *neobarbaricum* are extremely rational, and so is their quasi-philosophy or ideology. Their main and only goal is to attain and hold onto political power using any and all means. Consequently, people in power or those who aspire to rise to power use limitless methods to convince people that their arguments are correct (while in fact the game is not really about the strength of arguments at all, but about real power). There are no boundaries on one’s actions, stemming from religion, morality, philosophical and ethical beliefs, and so on. Rather, the objective is to defeat one’s opponents and gain power – not to prove to anyone that there is any real absolute truth, only to persuade them that we are the ones who are in the right.

## Post-truth

A certain concept has been developed that is extremely useful in this debate: the concept of “post-truth,” as opposed to truth, with “fake news” as one of its offshoots. Viewed in this way, the main characteristic of the new barbaric era is the manipulation of people without any constraints stemming from morality, integrity, and religious or agnostic ethics. In simple terms, we can say that, like in Niccolò Machiavelli’s treatise *The Prince*, attaining and holding onto power is an end that justifies all means. We are interested not in truth, but only in power. This has already impacted significantly on the situation of science and scientific research, where, as we have said, the primary goal has always been to get to the bottom of things, to uncover the truth.

Importantly, the worst misfortune associated with the post-truth concept is that there is not actually any such thing as a “post-truth.” Rather, post-truth simply refers to falsehoods and untruths, presented as if they were true (or: just as true as anything else). The very word “post-truth” dangerously softens and hides, or masks, the fact that what we are talking about are simply lies. In literary terms, we could add: disgusting lies used deliberately to spread disinformation.

Fake news and post-truth have a long tradition in history. In ancient times, however, they were used to create certain false artifacts to lend credibility to the power people gained, privileges they held, and lands and properties they seized – and sometimes also to turn others into targets of negative sentiment. In the study of history, such false sources were called *apocrypha* (from the Greek for hidden, secret). Although the term was associated with non-canonical scriptures, it was used in pre-Christian antiquity to describe sources of dubious or uncertain origin. There were plenty of such apocrypha, and they also existed in science. Perhaps the best-known apocryphal text to this day is the famous *Protocols of the Elders of Zion*, a hoax created by the political police in Tzarist Russia, the Okhrana, to stoke up resentment against the Jews.

In today’s world, the Internet is a special platform for the transmission of information in an almost unlimited manner, so fake news stories (modern-day apocrypha) can be spread and replicated in unlimited quantities and forms. Such activity results in disinformation, which is now a widespread phenomenon.

## Scientific theories and the manipulation of society

Importantly, this situation was also fostered by the growing popularity of various theories that are false but not completely unfounded, that do have a certain and often important context and scientific underpinnings resulting from, or referring to, various math-

ematical solutions, especially those based on basic probability theory and game theory. We could also list here disaster theory, Laplace’s analytical theory of probability (holding that nature and its laws can be described using certain mathematical solutions), determinism (if A, then B), chaos theory (everything is chaotic, there are no rules; chaos breeds more chaos), and the butterfly effect, a neatly formulated theory demonstrating that seemingly irrelevant and unrelated phenomena, regardless of where they happen, may trigger incalculable effects, including catastrophes.

All these theories, along with my favorite – “black swan theory,” posited by Nassim Nicholas Taleb, an American economist of Lebanese origin – have served to reinforce the general belief that impossible things are possible after all. In a word, questioning the truths previously regarded as absolute became in a sense the main motivation for scientific inquiry, not only in the social sciences.

In his theory, which was popular a few years ago, Taleb argues that humans are unable to predict certain kinds of events simply because it is commonly believed that such things cannot happen. But when they do nevertheless happen, theories get formulated

Unrestricted manipulation of people has become a key characteristic of the new barbaric era.

after the fact to explain these events. The term “black swan” here reflects the fact that in the Middle Ages people did not believe that black swans existed, and yet they do exist, although they are very rare and not as common as white swans.

Taleb’s theory refers back to a concept developed by Thomas S. Kuhn in the 1960s. Kuhn argued that progress in science was achieved through scientific revolutions in defiance of the traditional accumulation of information. His concept assumes that information accumulation expands our knowledge and understanding of the world (as described in his book *The Structure of Scientific Revolutions*). According to Kuhn, science changes through scientific revolutions, which introduce a new vision of the world. A scientific revolution is followed by a paradigm shift and the introduction of new interpretations. Examples of such revolutions include the Copernican Revolution, Charles Darwin’s theory of evolution, Albert Einstein’s theory of relativity, and quantum physics.

Studies into the unpredictability of events led to the development of certain techniques that may facilitate the management of large groups of people in what are

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called unstable systems – ones in which it is impossible to determine all the elements that influence a given situation or when at least one element is indeterminate. (Incidentally, unstable systems are studied in a field known as continuous-time control theory.)

Let us assume the following: if we believe that the world is governed by chaos, then it would be useful to develop a method for managing it, for example in the form of a theory. If the world is governed by the principles of catastrophe theory, then it would be useful to create a method for managing those catastrophes, or at least for managing people during the threat of cataclysmic events. If it is true that the world is governed by revolutions (or at least they occur cyclically) and each period of stability is followed by an inevitable upheaval, then it would be worth developing a theory about how such periods should be predicted and how people should be managed once a revolution starts.

In short, social scientists began to formulate new theories by drawing extensively on economic, natural, and mathematical sciences. And despite expecta-

to eliminate the old threats. On the contrary, they have made those threats stronger, expanded them on an unprecedented scale, and spread new fictions.

Fake news is nowadays used in unlimited ways. It is frightening that fake news is used not only in good faith, or to fight against the deliberate misleading of people, but above all in bad faith, or when someone cares not about the truth, but only about getting people to believe him or her, not others. Truth is needed, surely but on the other hand, the truth must also always be on my side – or so the logic goes.

All these things could be treated examples of human idiocy, human folly. This phenomenon could be explained in a relatively banal way. We simply have so much information that it is no longer under our control. So we begin to believe even the most ridiculous news if someone or something convinces us that it reflects the absolute truth. An excellent example is the currently popular concept of “information noise,” which can end up undermining the credibility of almost any piece of information.

### The new humanities and populism

The end of the twentieth century was characterized by postmodernism. Now, we often talk about post-postmodernism in literature and in the arts. This minimalist philosophy assumes that it is not possible to establish, for example, the truthfulness of particular sources, because sources are always being processed via the historians’ own views, knowledge, and beliefs. Consequently, we are always only dealing with an approximation of the truth, and never with its reconstruction. When it comes to science, postmodernism was based on the assumption that all sources and all methods of studying them are acceptable. Formulating whole new general theories to explain the world was not only allowed, but even recommended. In this way, postmodernism made its own small contribution to the development of theoretical inquiry characterized by a great deal of leeway and the freedom to make methodological and theoretical assumptions.

What are the implications of this for politics, for contemporary society, and for our interpretation of the past? Does this situation also affect the shape of today’s scientific research?

Disappointment with the old morality and longstanding ethical principles have resulted in the emergence of populist, or people-oriented, groups and politicians in world politics. However, it would be a mistake to think that this populism is somehow aimed at improving the collective social situation.

What does it involve, then? Promising people whatever they want most, so that the people making these promises can attain and hold onto power.

Technological progress and science have failed to eliminate the old threats. On the contrary, they have made those threats stronger, expanded them on an unprecedented scale, and spread new fictions.

tions to the contrary, those theories came to be put into practice almost immediately. It quickly became apparent that they could have practical importance for the management of people in various situations: emergencies, democratic elections, political crises, and social revolutions.

### Superstitions and prejudices in the world of information technology

So what has happened (in the twentieth century and the times in which we live)? In spite of amazing advances in technology and science, humans are now just as susceptible to all sorts of superstitions and unfounded beliefs as they were back in the barbaric period and in the proverbial Middle Ages. The old superstitions have remained, and new obsessions (such as conspiracy theories) have also emerged, although the methods of their dissemination changed quite a bit. Technological progress and science have failed



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These things may include a bigger childcare allowance from the government, additional pension benefits, tax cuts, lower bills, better health, appreciation of difficult living conditions, and a higher minimum wage. But them may also involve directing public resentment against foreigners, outgroupers, emigrants, refugees, people with preferences other than the dominant ones in society (such as members of the LGBT+ community), Jews, Arabs, Kurds, and people from the Caucasus region (this never gets old). Against people who are different in any respect: the lame, blind, stupid, disabled, the “pseudo-elites.” The pseudo-elites are the most vulnerable to attacks as they are not precisely defined (we do not really know who belongs to this group), and everyone envies them all their wealth and power (if they have neither, this does not change anything – the pseudo-elites are certainly bad, and we should remember that university professors are also pseudo-elites!). Briefly put, all the oldest human faults – such as xenophobia, racism, jealousy of other people’s status, education, and wealth, envy, and perception of others as the source of one’s own misfortune or poverty – have not only resurfaced, just as they did in previous eras, but are now also being deliberately exploited by populist politicians. It is impossible to resist an analogy between this situation and the early days of

fascism in Italy under Benito Mussolini and the Third Reich under Adolf Hitler. Back then, all these faults of human nature were also being harnessed in order to pull society together and instill a universal hatred of the purported enemy.

Unfortunately, these policies and such populist propaganda have enjoyed scientific and technological support both from private companies and from governmental bodies – including not just authoritarian regimes but also parliamentary groups in democratic systems.

Such phenomena as Cambridge Analytica (CA) in the UK, Internet troll farms in the Russian Federation, and government use of Pegasus spyware (in countries including Poland, as it turns out) are the realities of modern politics in times of burgeoning populism and attempts to control society. Simultaneously, it has become clear that even democratic governments use IT tools to control their own societies, as demonstrated by the story of Edward Snowden.

In this new epoch of the Anthropocene and its present sub-epoch, which here we have been calling the time of “neo-barbarism,” is it possible to temper the all-pervasive power of the propaganda and social engineering techniques used to manage and manipulate society?

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In my opinion, the only solution may involve returning to the traditional ideals of humanism and treating democracy and its open political system in a very thorough and literal way. Not giving in to easy slogans and seemingly obvious solutions, and above all, feeling obliged to keep a careful and watchful eye on those who wield power and those running for office.

### Science is now more important than ever

Scientific research has always been based in an indisputable way on the freedom of research, on the autonomy of universities and scientific institutions, and on the independence of academia from government institutions. Ensuring the latter appears to be the most difficult, given that state research needs to be financed chiefly from public funds. The current situation also entails additional tasks incumbent upon the scholarly community, academies of sciences, and scientific societies. In addition to fulfilling their traditional role, which involves drawing together top-level academics, they are forced to take positions and speak out on important political and social issues. In Poland, good examples include the Interdisciplinary COVID-19 Advisory Team to the President of the Polish Academy of Sciences.

It is also worth remembering that today's world is experiencing a number of processes that cannot be considered favorable or positive – and this applies not only to Poland, Europe, and Russia, but above all to the United States. On the one hand, environmental threats (the greenhouse effect) could soon bring humanity to the brink of vast tragedy. On the other, there are widening disparities between a small group of rich individuals and countries vs. a growing group of poor people and countries that are only becoming poorer. This widening economic disparity poses the greatest danger to modern times, one that is equal in force to the environmental threat. In the past, such situations

have triggered disasters, wars, and revolutions, claiming millions of lives.

And so what can be done by an average person who lives in the early 2020s?

Most importantly, we must continually strive to distinguish between true and false information. We must not let others manipulate us. In particular, however, we must pursue the values and ideals that have been crucially important for humanity as a whole – and also for each individual human. Examples include solidarity, empathy, sensitivity to the situations and problems of others, and the rejection of prejudice and bias. But the most important thing is to maintain and promote the conviction that a single, indisputable truth is indeed out there somewhere. We may never fully understand it, never actually arrive at the absolute truth, but we must strive to draw ever closer to it, while continually checking if we have been exposed to lies disguised as truth, if we are being manipulated by the system or by others. In this era of neo-barbarism, people should be especially vigilant so that they cannot be easily misled. In a word, the greatest virtue lies in questioning all unproven facts and opinions. “I doubt, therefore I am” – one way of understanding René Descartes’s *cogito ergo sum* – returns with redoubled energy and significance.

Undoubtedly, tolerance is an important virtue to cultivate. We should bear in mind, though, that it is a value that in its extreme form can result in misfortune. According to Karl Popper’s famous paradox of tolerance, a tolerant society can become the victim of the intolerance of others, and its freedoms can be restricted by others. Popper stressed: “We should therefore claim, in the name of tolerance, the right not to tolerate the intolerant.”

In order not to end on such a pessimistic note, we should stress that groundbreaking eras have always resulted in the birth of new, positive phenomena, not just tragedies and misfortunes. We could refer here to the excellent book *Barbarzyńska Europa* [Barbarian Europe], authored by the recently deceased Prof. Karol Modzelewski. In it, he argued that although barbarians destroyed the traditional Roman civilization, they also took a lot from it and even enriched it with new laws and new solutions, which we still make use of today.

Let us hope that in the Anthropocene – and its current sub-epoch of neo-barbarism – humanity manages to learn some positive lessons from this situation that will allow us to survive, to persevere. Perhaps we will again revisit formerly cherished ideals, or perhaps we will opt for completely new solutions. One thing appears indisputable: integrity in science and the professionalization of scientific research can be and are extremely helpful in the struggle against populism and fake news. And so perhaps it is indeed in science, in research freedom, that the very last hope of humanity now lies? ■

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Wit Szostak

# Ingarden and Time

(A Fragment)

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The two photographs do not allow us to say much more with honesty. We could add a few details to the previous descriptions or refine our observations. But the rest is all conjecture and imagination, which can be supplemented by snippets of general history. The man shown in the photographs is hiding. He is the old man and the young man, but at the same time he is more than that and is neither of them. He is gone.

Yet perhaps the shared name, fingerprints and date of birth, the same biographical details, and the presence of the young man's experiences and memories within the experiences and memories of the old man, are not enough to conclude that it is the same person in both photographs? Perhaps time — those long forty-four years that separate the photographs — is too powerful a force to speak of the identity of these two men? How much of the young man remains in the old? What about the first heralded the second? What the young man saw as the present the old man sees as the past. What the young man saw as the very recent past, such as the moment just before he pressed the door handle of the pho-

tographic studio in Karlsruhe, the old man sees at best as a memory, or as an indistinct void where a memory used to be. The young man is probably not planning many of the things that the old man has accomplished in life and then simply forgotten. Those forty-four years connect the two men. Yet for neither of them do these years exist. For the first, they are not here yet, and he doesn't even know whether they will come at all, while for the second they no longer exist: they are gone.

The captions to the photographs allow us to state merely that the first was taken in 1916 and the second in 1960. It is only the story connecting these photographs that lets us add that the man in the first is twenty-three years old while the old man in the second is sixty-seven. The person whose image has been preserved in these two photographs is neither the young man of the first nor the old man of the second. He was young and he was old, but he was also a child, a middle-aged man and, finally, a man who was ten years older than the one in the second photograph when he died unexpectedly in 1970.

The man who is young in the first photograph and old in the second was never either of these for me. And this is a completely different story, unknown to him or to his relatives, who have kept the two meticulously captioned photographs. For me, he was the author of books, someone I never met and whose external appearance, despite the two photos, with which I have been familiar for years, has not embedded itself in my memory. When I call his name to mind, it is not the young man or the old man that I see, but book covers; what I remember is not his face but his ideas, his theories and the circumstances in which I read his works. I recall the people with whom I discussed them. And some of these people are also gone.

These are not just my first associations when I hear his name or see his photographs but my own first-hand experiences. I remember myself, many years ago, the person who, at roughly the same age as the young man in the first photograph, read his books, written over the course of those forty-four years between the two photographs. And that me is also long gone.



AGATA "ENDO" NOWICKA

**Roman Ingarden (1893–1970)**

Polish philosopher, university professor, member of the Polish Academy of Arts and Sciences (PAAS) and Polish Academy of Sciences (PAS), a student of Edmund Husserl. Author of numerous works on phenomenology, dealing with with such issues as the problem of identity and the category of time. Also an amateur photographer.

This fragment comes from the publication *Scholars in Search of a Better World: 20 Tales from Poland* (PAS, Warsaw 2021), a collection of literary portraits of Polish scholars written by renowned modern writers, including Marie Skłodowska-Curie (by Izabela Morska), Bronisław Malinowski (by Ignacy Karpowicz), and Leszek Kołakowski (by Joanna Bator).

SCHOLARS IN SEARCH  
OF A BETTER WORLD:  
20 TALES FROM POLAND

COPERNICUS HEN HEVELIUS CHWIN  
DOMEYKO NOWICKI LUKASIEWICZ  
ORBITOWSKI ZAKRZEWSKA CHUTNIK  
BAUDOUIN DE COURTENAY  
SIWCZYK JOTEYKO ŁOZIŃSKI  
SKŁODOWSKA-CURIE MORSKA  
SMOLICHOWSKI MUSZYŃSKI  
ZNAMIECKI WIĄSIŃ WĘGŁ GOŁIŃSKI  
MALINOWSKI KARPOWICZ HIRSZFELD  
MALANOWSKA CZOCHRALSKI SIEMIŃ  
BANACH MUREK INGARDEN SZOSTAK  
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KIELAN-JAWOROWSKA WOJCIECHOWSKI  
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The book  
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