Humboldt's nightmare

Greatness and misery of the university

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An increasing number of testimonials reflect a climate of unease in higher education. There is talk of a sense of distress, a loss of meaning, and a profound crisis of purpose. Yet, at the same time, never in the history of humanity have there been so many students in higher education and so many academics (researchers and professors). Never have states invested so much in higher education. So what is the situation exactly? A deep crisis, or mere jolts in a rapidly expanding field?

Criticism of the university[1] is perhaps as old as the institution itself. Let us take a look in the rearview mirror. Professors have a tendency to repeatedly lament the idleness of students and the decline in academic standards. The humanist Sebastian Brant, a poet, jurist, and professor at the University of Basel, already complained at the end of the 15th century that "the youth despises the sciences. They prefer to learn randomly about useless and barren things" (Brant, 2004). Students have their grievances against their professors as well. French historian Ernest Lavisse, at the end of his academic career, reflected on his student experiences, criticizing his teachers for feeding him with hollow knowledge[a]. In the novel "Herzog," which depicts a few chaotic days in the life of an academic, American writer Saul Bellow revisited his own frustrations as a student who learned beautiful things about philosophical concepts or literature but was unprepared for the struggles of life[b]. Some students do not see the university as a nurturing mother ("alma mater"), but rather as a factory of social conformity. Thus, at the very beginning of the 20th century, Albert Thierry, a student at the École nationale supérieure de Saint-Cloud, advocated for the "refusal to succeed," a phrase that continues to resonate among protesting students[2], and he preferred to abandon an academic career to become a simple teacher. Protest has also touched academic research. A significant moment was mathematician Alexandre Grothendieck's protest during his 1972 conference at CERN when he asked, "Shall we continue research?" Grothendieck intended to denounce the harms of science, particularly in its military applications. In 1970, he also launched a small journal "Survivre... et vivre," likely one of

[1] The reader will forgive me for my excessive use of synecdoche as I equate higher education and research with the university. This is merely a linguistic convenience. Since I tend to be quite verbose, I employ a dual system of references: footnotes marked by Arabic numerals and notes indicated by alphabetical characters, which are all placed at the end of the article. The data and Python scripts used to create the figures for this essay are available on my GitHub page.

[2] Élise Gauthier, "Étudiants : le retour du refus de parvenir," Socialter, September 2022, www.socialter.fr/article/refuser-de-parvenir-etudiants. See also Arthur Gosset's document Ruptures.

the first technocritical and ecological journals in the Francophone space (Pessis, 2025).

This brief historical excursion suggests that criticism of the university is inherent to the institution itself, and thus there may be little cause for concern about recent critiques. This would be relevant if, year after year, the university had followed a gentle evolution, rendering today's situation not vastly different from yesterday's. However, that is not quite the case. Over the past three decades, the university has undergone the most significant upheaval since its inception about a millennium ago: never before have there been so many academics and students; the number of articles (Bornmann & Mutz, 2015; Hanson *et al.*, 2024) and patents has grown exponentially; and never has so much money been invested in education and research. The "Lisbon Strategy," developed by the European Council, aimed to transform the European Union into "the most competitive and dynamic knowledge-based economy in the world by 2010, capable of sustainable economic growth accompanied by a quantitative and qualitative improvement in employment and greater social cohesion" (Kok, 2004, p. 5). To achieve this, the European Union planned to allocate 3% of its gross domestic product (GDP) to research and development.

Yet, this frenzy of resources has not resolved any of the acute problems facing Western society. It is a society in constant crisis, evident in the succession or coexistence of crises: ecological crisis, climate crisis, demographic crisis, public health crisis, etc. Furthermore, the new university was designed to fit into a globalized world, but globalization is being challenged and evolving into a multipolar system marked by a significant rebalancing of means of production and the reformation of antagonistic blocs[3]. In 2024, twenty-five years after the Lisbon Strategy, former European Central Bank president and former Italian Prime Minister Mario Draghi pointed out the failures of European scientific policy: the 3% GDP investment goal in research has not been met[4], and the European Union has lagged economically behind its two main competitors, the United States and China. Doubts linger over the economic added value touted by the new university.

1 The Ancien Régime University

1.1 The Birth of the University

The university emerged in Europe during the 12th and 13th centuries, with the founding of the University of Bologna and then the University of Paris, driven by groups of students (as was the case in Italy) or by masters (as in France and England). The very term 'university' refers to the idea of a community or corporation (*universitas*). Spain was an exception, with universities established by royal decree (the University of Salamanca, founded in 1219). The creation of universities came at the expense of cathedral schools, which had previously educated the scholars that the Church needed. The reasons for the decline of the cathedral schools are unclear, but it is likely that the spontaneous emergence of universities was a response to the growing tension between advocates of pure

[3] Apostolos Thomadakis, The End of an Era: What's Next After Globalisation? July 2025, www.socialeurope.eu/the-end-of-an-era-whats-next-after-globalisation

[4] In 2023, the 27 countries of the European Union allocated an average of 2.26% of their GDP to research and development; France was below this figure at 2.18%. Switzerland allocated 3.22%, the United States 3.45%, and China 2.58%. Source: Eurostat.

belief (such as Bernard of Clairvaux) and proponents of the marriage between faith and reason (like Abelard, who believed that belief could not exist without understanding). Universities also met the increasing demand for literate individuals in the Church and for legal scholars in the early forms of royal administration.

Although the university has evolved significantly over the centuries leading up to the French Revolution, it is convenient to refer to it as the Ancien Régime university, as it had one sole purpose throughout this period: to train the intellectual elite, primarily jurists and theologians, and to a lesser extent, to teach philosophy, medicine, mathematics, and astronomy inherited from the Greeks. Latin remained the written and spoken language[c]. Students and professors could be nomadic, seeking education or employment far from their community of origin. Thus, the university can be seen as one of the earliest inherently cosmopolitan organizations. Its operation was relatively democratic, as professors (known as "regents" in the terminology of the time) and rectors were elected rather than appointed by a higher authority.

By the 16th century, the university began to descend into a crisis that would prove fatal. In his book "Pantagruel," Rabelais included a letter from King Pantagruel to his son Gargantua, warning him against education at the university, where one emerged full of knowledge but with little understanding. The intellectual decline that intensified during the Grand Siècle sharply contrasted with the magnificence of the buildings of the time. In France, for instance, Cardinal Richelieu endowed the French capital with grand structures (the Sorbonne, the College of the Four Nations, etc.). This architectural refinement concerned all of Europe, from the University of Coimbra to that of Krakow.

1.2 Birth of Modern Science

Modern science was born in the 16th century, largely independent of universities, with notable exceptions such as Oxford and Cambridge (where Newton taught) and Leiden (which marked the beginning of clinical medicine). There were indeed colleges (such as the Royal College—which became the Collège de France after the Revolution, the colleges run by Jesuits and Oratorians, Port-Royal, etc.) that were more open to new ideas than universities, but they were not directly linked to universities. The powerful sought the services of great scientists like Galileo, Euler, or Bernoulli, and established academies to host them. In 1603, Prince Federico Cesi financed the creation of the Academy of the Lynceans (l'Accademia dei Lincei) in Rome, one of its first members being Galileo. Other academies were established throughout Europe in the 17th and 18th centuries. Scientific patronage played a decisive role in the emergence of modern science.

What may seem paradoxical from our modern perspective is that the Church was also a hub of modern science. For instance, Copernicus, a canon, was able to compile his observations in secrecy, and his works were revealed only after his death. Father Marin Mersenne founded his own academy in Paris in 1635, which foreshadowed the Academy of Sciences, and he maintained an extensive network of correspondence with contacts in various countries, serving as an informal precursor to the establishment of the first scientific journals in the 1660s. It was another French priest, Pierre Varignon, who synthesized the thoughts of Newton (the principles of mechanics) and Leibniz (integral calculus), thus becoming (now forgotten) the creator of what is known today as Newtonian classical mechanics in its mathematical form.

Modern philosophy also developed entirely outside the university: Montaigne, Descartes, Pascal, Spinoza, Hobbes, Hume, and Rousseau were not academics. The fates of the scholars Giordano Bruno and Giulio Cesare Vanini—tortured and executed for heresy—encouraged great caution regarding the free dissemination of ideas; Spinoza's major work, the Ethics, was published posthumously and immediately placed on the Church's index, like many works deemed subversive by both the university and the Church.

What drove the early physicists and philosophers was the pursuit of truth, a calling largely supported by the great patrons of the time and widely shared within the academies and scholarly circles where scientists and philosophers gathered. As I highlighted earlier by mentioning the fates of Bruno and Vanini, the search for truth could very well lead to the stake.

There was not necessarily an immediate application of scientific work. For example, when the former military man and French mathematician François Blondel published his treatise on "the art of throwing bombs" in 1683, presenting advances in ballistics made possible by the new mechanics, artillerymen received these new theories negatively. It was not until the mid-18th century that mechanics became part of the curriculum in French military schools.

1.3 Intellectual Life Outside the University

Private circles, salons (for example, those of Madame de Scudéry, the Duchess of Aiguillon, or Longueville), and academies were the venues where new ideas were disseminated. This era saw the emergence of terms like "femmes savantes" in French (literally learned woman, to refer to women who frequented or organized salons) and "pedant" (initially meaning "teacher" or "educator," which evolved to describe people who show off their knowledge). For women excluded from universitie—both as students and as professors—such as French mathematician Marie Crous, these private circles provided a means to share their work. The university attracted primarily students from bourgeois families (wealthy artisans, royal officers, merchants, etc.). Naturally, most of the population could not afford to send their children for an education. Aristocrats preferred to hire private educators or send their children to private colleges. On average, the number of individuals who attended university represented between 1% and 2% of the total population in Europe, with variations between countries. England saw a continuous increase in student enrollment leading up to the first revolution, with approximately 2.5% of the population having attended university by 1640, followed by a slow decline until the late 18th century (a reduction by a factor of 2). In France and neighboring countries, the number of graduates continued to rise despite the perception of the university, albeit at a much lower proportion than the population. For instance, there were about 6,000 students in 1600 (0.3% of the population) compared to 13,000 in 1789 (0.45% of the population). Some have argued that this increasing number of graduates, even as high-ranking careers in administration and the military closed off to commoners, contributed to a surplus of elites and frustration due to limited social mobility [d]. This may explain the radicalism of figures such as Marat (physician), Robespierre (lawyer), Saint-Just (jurist), Danton (lawyer), Billaud-Varenne (lawyer), and Carnot (military) under the French Revolution. The relevance of the curriculum to professional requirements was also questioned. For instance, in 1782, the jurist Boucher d'Argis complained about the obsolescence of law courses: "*Let us start directing the talents of professors towards truly useful subjects, then students*

will eagerly come to listen to them." (Charle & Verger, 2007, p. 69). Diplomas no longer represented competence but became merely a necessary formality for career advancement.

There were attempts at reform. In response to the rigidity of the University of Paris amid the humanist revival, King Francis I established the Collège Royal in 1530; however, this state initiative did not lead to a broader reform of the French university system. Notably, the creation of the Jardin du Roi (under Louis XIII), the Paris Observatory (under Louis XIV), and the first academies (the Académie française in 1635, the Académie royale de peinture et de sculpture in 1648, and the Académie des Sciences in 1666) was not linked to the University of Paris.

In Germany, as in most countries influenced by the Reformation, princes were more willing to contribute to a revival of the university system. In 1733, the Duke of Brunswick-Lüneburg (who was also King of England, George II) founded the University of Göttingen with significant changes compared to other universities: the use of German as the language of lectures, the establishment of seminars and lectures instead of readings and scholastic disputes, government control over the hiring of professors, and an openness to Enlightenment ideas.

When the French state expressed the need for specialized engineers, it created specific schools (such as the École des ponts et chaussées in 1743, the École du génie in 1749, veterinary schools in 1762, and the École des mines in 1783). The management style of these professional schools differed radically from that of universities: strict government oversight, fixed number of students (numerus clausus), boarding, and rigorous student selection.

The proto-industrial revolution of the 18th century gave rise to the first weaving machines and engines. This technological acceleration spurred a demand for more technical profiles. However, it would not be the Industrial Revolution that hastened the end of the Ancien Régime university, but rather the French Revolution.

2 The Humboldt Model

2.1 Death and Renaissance of Universities in France

When the French Revolution broke out, the opposition to societal reform – what we might now call the reactionary faction seeking a return to the past – was made up of parliaments, universities[e], supporters of absolute monarchy, and the majority of the high aristocracy and clergy.

The university of the Ancien Régime collapsed along with the Ancien Régime itself throughout Europe, except in England. In France, the Convention closed the universities in 1793, and Napoleon reinstated them in a different form in 1806. He imposed a highly selective system of grandes écoles modeled after the École des Mines, the École des Ponts et Chaussées, and the newly founded École polytechnique in 1794, along with the École Normale Supérieure (designed to train teachers under state control). The Jardin du Roi, transformed into a natural history museum, was one of the few institutions to survive the Revolution, alongside the Collège Royal (which became the Collège de France) and the École des enfants de l'armée (which would become the École nationale des arts et métiers after the Revolution).

After the Restoration, the French state sought to eliminate any centers of dissent in higher education (with mixed success, given the strong student mobilization during the revolutions of 1830 and 1848), and also aimed to prevent the resurgence of professional corporations. It did not restore the old universities but extended Napoleon's work with an emphasis on creating vocational schools. The École nationale des eaux et forêts was founded in 1824, followed by the École centrale de Paris in 1829. The French state sought to impose strict requirements for obtaining degrees to avoid the resurgence of unvalidated diplomas. This explains the French specificity of entrance exams, rankings, the highly structured format of education, and the importance of degrees in professional careers, particularly for high-ranking civil servants.

Ancien Régime universities had a bad reputation due to the dissolute lifestyles of students (notoriously known for their drunkenness, brawls, etc.). The new universities became centers of contestation, thus serving as focal points for the liberal opposition against the authoritarian royal drift in France[5]. Then, starting in the 1850s, it was the anarchist and socialist students who were kept under surveillance by the state.

From the ruins of the Ancien Régime university emerged a new university whose missions aligned with the needs of the time. These needs changed radically within a few decades. Medicine made spectacular progress due to experimental studies (with dissections allowing for a better understanding of organ functions, surgery, vaccination against smallpox, etc.). In the 18th and early 19th centuries, fortunes were made from the inventive genius of a few bold designers (steam engines, looms, steelmaking), but the refinement of machines required an additional level of conceptualization. Thermodynamics and modern fluid mechanics arose from the need for fundamental sciences to address practical problems that empirical approaches could not resolve. The state established specific chairs in engineering schools to support the industrial apparatus; thus the École centrale de Paris was born (in 1829). While theology and law had been the flagship subjects at the Ancien Régime university, they gave way to medicine, literature, philosophy, and sciences. Commerce was not forgotten; the École Supérieure de Commerce de Paris was founded in 1819.

The late 19th century was marked by the massive creation of research laboratories within universities. The research effort required more material and human resources. The number of students increased significantly across Europe. In France, the young republican government recognized the importance of education for gaining the support of a population (mainly rural and resistant to the Republic) for the new political order. For Jules Ferry, it was essential that the state take responsibility for public education from primary school to university. In 1881, primary education, which had been the responsibility of municipalities and often provided by priests, was organized by the state. The young Republic trained its "black hussars" to be the republican pillars of the new school system. Scholarships were established to allow some gifted children from the working classes to continue into secondary, and then higher education. After centuries of exclusion, French universities opened their doors to women[6]; Madeleine Brès became the first woman to graduate in medicine in France in 1875. However, the opening to women was hesitant: women constituted barely 10% of students in 1910, and 27% in 1936. The university also diversified the subjects taught: the École libre de sci-

[5] This was also the case in Germany and Russia. In Germany, states implemented representatives called curators to monitor what was happening in their universities.

[6] Such a prohibition did not exist in Italy.

ences politiques, better known as Science-Po Paris, was opened in 1871; the faculty of Hautes Études Commerciales was created in 1881; the École Supérieure d'Électricité (Supélec) was established in 1894 to meet the industry's high demand. While the French Revolution sought to dismantle trade guilds, the French state reinstated the grandes corps d'État in the 19th century, whereby a civil servant's career was entirely conditioned by the grande école that educated them.

2.2 Switzerland between French and German Models

The Swiss university model underwent significant changes under the dual influence of France and Germany in the 19th century. During the Ancien Régime, Switzerland boasted a prestigious university center in Basel (founded in 1460) and universities in Lausanne (1537) and Geneva (1559), primarily established to train pastors.

Throughout the 19th century, the larger cantons either developed their existing universities or founded new ones (in Bern, Zurich, Neuchâtel, Lucerne, and St. Gallen). These universities primarily provided instruction in theology, humanities, law, medicine, pharmacy, and physics. They also established their own higher schools of engineering and business. For instance, the University of Lausanne opened an engineering school in 1869 (which would become the École Polytechnique Fédérale de Lausanne a century later), a pharmacy faculty in 1873, and finally a business school (Faculty of Higher Commercial Studies) in 1911.

In 1855, the Federal Council established the Swiss Federal Institute of Technology in Zurich, inspired by the model of the École Polytechnique in Paris. Therefore, the Confederation intervened in higher education, which had previously been the exclusive domain of the cantons.

In 19th-century Switzerland, the university system appeared oversized relative to the Swiss population (2.5 million inhabitants), as most cantons had their own university. By 1900, there were 8,000 students for a population of 3 million (0.27% of the population, compared to Germany with 44,200 students, or 0.08%). Switzerland was notable for a significant female student population (20%) compared to neighboring countries and a large proportion of foreign students (47% of students were foreign). This openness to international participation was exemplified by the appointment of Russian Lina Stern as a professor of physiological chemistry at the University of Geneva in 1918.

2.3 The Acceleration of the United States

The major changes in the Humboldt model did not originate from Europe, but from the United States. It is noteworthy that the first universities appeared on the East Coast of the United States right at the beginning of English colonization. For instance, Harvard College was founded in 1636 based on the English model and became a university in 1780, just four years after American independence. The wave of university creation followed the westward movement of the frontier.

One specific feature of American universities from the outset, in contrast to their European counterparts, is that a number of them, particularly elite universities, are private (like Harvard) and possess immense financial resources. Even public universities like Chicago benefited from financial support from wealthy patrons (Rockefeller for Chicago) and bequests from former students who expressed

their gratitude for the years spent at their alma mater.

American universities innovated in several areas:

- They created departments grouping chairs within faculties, indicating a more collective approach to academic management and a means to counteract the dominance of influential professors known as "mandarins".
- They implemented a probationary phase where candidates for professorship served as assistant professors. Once tenure was granted, access to a professorship was guaranteed by university statutes.
- Research more readily showcased a utilitarian purpose. The first business school was founded in 1881 (the Wharton School of Finance at the University of Pennsylvania) to provide upper management for financial administration.
- They ensured greater autonomy for researchers by providing annual grants and more robust logistical support (notably libraries) than in Europe. However, salaries for researchers remained low for a long time.

Academic freedom was strictly regulated, and one could lose his position due to political views (for example, the renowned philosopher Bertrand Russell had his appointment to the City College of New York canceled after a press campaign targeted him for his writings on marriage, deemed immoral).

The United States experienced a significant increase in the number of students by the end of the 19th century: about 10% of an age cohort had attended higher education. At the same time in Europe, the number of individuals who had gone to university did not exceed 2%, a rate comparable to that at the end of the Middle Ages. The gap between the old continent and the United States widened further at the beginning of the 20th century. Unlike Europe, where university education was primarily for children from the upper classes, American universities served as a driver of social mobility: 36% of students were from the middle class in the 1930s. The enactment of the "Servicemen's Readjustment Act" (commonly known as the GI Bill) in 1944 allowed millions of veterans to pursue higher education.

Compared to European states, the United States suffered from the vastness of its territory. Most research was concentrated in California and on the East Coast, leaving much of the country as an academic desert.

2.4 Importance of Private Research

While the 19th century was marked by a revitalization of academia, it is essential to acknowledge that the majority of technological research remained private. By 1920, the United States already had 300 private research laboratories, reflecting the added value that industrialists saw in research (Godin, 2011). Technical achievements such as the transatlantic telephone required significant efforts in both technical and scientific domains, leading to an advanced form of coordination. It was during this period that the term "research and development" (R&D) emerged within American companies.

A distinction was also made between fundamental and applied sciences, with the belief that fundamental research fed into applied research, which in turn supported the capabilities for developing new products—a model known as the "linear model of innovation," where technological progress is viewed as a successive sequence of steps (Godin, 2006). This linear vision faced considerable criticism later on but remained widely used to the point of becoming a rhetorical figure in the governance of science in the 20th century. Among the early critiques of the linear model was Schumpeter's model, which viewed innovation—independent of invention—as the driving force behind technical progress: innovation is defined as the decisive stage where a technology is disseminated and produces economic effects.

The significant role of private research can be measured by examining the development of pharmacology in the 20th century. At the beginning of the 20th century, the pharmaceutical industry was made up of a plethora of pharmacies and small businesses. All medications known at that time were derived from the study of the natural environment (plants and minerals). In just a few decades, this industry restructured around large firms that included research and development departments covering pharmacology, chemistry, and biology; medications were produced through synthesis, often inspired by natural elements, or by testing the potential of new molecules. This research effort coincided with a revolution in dosages (the introduction of tablets and precise dosing of active components), clinical trials, and statistical studies of therapeutic and toxic effects, as well as the patenting of new molecules, study planning, production, and marketing[f].

2.5 The Growing Role of the State in Research

The Humboldt model required state intervention to finance salaries and infrastructure, but it did not interfere in research areas[g]. Naturally, technological research was of primary importance to states, particularly in relation to military applications of science: artillery, firearms, and naval warfare could grant military supremacy to states possessing these technologies. However, there were no state-led research projects or governance of research until the mid-20th century.

The early signs of state-controlled research appeared in Italy with the "Consiglio Nazionale delle Ricerche," founded in 1923 by the fascist government. The French adopted a similar model with the creation of the "Caisse nationale de la recherche scientifique" in 1935 (which became the *Centre national de la recherche scientifique* in 1939).

The United States established a short-lived *Science Advisory Board* in 1933, tasked with overseeing long-term fundamental research. The federal government's foray into research ultimately faltered, partly because funding largely came from the patronage of major industrialists. It was not until after entering the war in 1941 that the United States coordinated its research and development efforts by creating the *Office of Scientific Research and Development* (OSRD). This organization oversaw the Manhattan Project (the creation of the first atomic bomb). After the war, the director of the OSRD, Professor Vannevar Bush (MIT), advocated for the continuation of this federal body to maintain the United States' technological lead. The U.S. government partially followed his advice. Initially, it preferred to create its military research centers, but in 1950 it approved the establishment of the *National Science Foundation* (NSF), the first research funding agency.

For Western states, the interest in research was mainly justified by the need to enhance military power through the development of new technologies: explosives, nuclear weapons, supersonic aviation, radar, computers, rockets, etc. However, these states also began to show more interest in civilian applications during the 1950s with the development of nuclear energy and large industrial projects requiring substantial resources (aerospace, trains).

During the war (in 1944), Switzerland established the *Commission for the Promotion of Scientific Research* (CERS). After the war, the Confederation aimed for research more aligned with economic needs, and due to federalism, this could not be achieved solely through the ETHZ. In 1952, it created the *Swiss National Science Foundation* (SNSF), initially endowed with a modest budget (4 million Fr), intended to serve only as supplementary funding. However, it heavily invested in nuclear research (under Paul Scherrer) for both civilian and military purposes. For the construction of the first nuclear power plants, private industrial partners were engaged with financial support from the Confederation (approximately one-third of the financial effort contributed by the private sector)[h]. The Federal Council approved Switzerland's participation in three major European projects: the *European Organization for Nuclear Research* (CERN), established in 1953; the *European Organization for Space Research*, founded in 1961 (which became the *European Space Agency* in 1972); and finally, the *European Molecular Biology Organization* (EMBO) established in 1974.

2.6 Massification of Higher Education after 1945

The massification of higher education began in the United States as early as the first quarter of the 20th century. After a pause during World War II, the number of students significantly increased in the United States between 1950 and 1975, rising from just under 2% of the total population in 1950 to 5% in 1975. A second plateau is observed between 1975 and 2000, followed by a marked but brief increase in which the proportion of students rises from 5.4% in 2000 to 6.8% in 2010 (see Figure 1). Since 2010, the relative number of students has notably declined, falling back to 5.6% in 2022. This decrease is multifactorial. Part of it is due to the aging population. The benefits of long-term and sometimes quite expensive studies appear less clear to some of the youth in the United States. This has led to discussions about the student debt crisis[i].

The process of massification is much later in Europe and has not been uniform across all countries. In France, there was a strong increase in the number of students between 1950 (129,000 students, or 0.66% of the population) and 1995 (2,167,436 students, or 3.6%), representing a sixteen-fold increase in absolute terms. The proportion of students remained stable at 3.5% of the total population between 1995 and 2013, and then began to rise again, reaching 4.4% of the total population. Demographic factors largely explain the slowdown observed since 1995. The limited employment opportunities for young people prompted more of them to opt for long studies by the 1990s.

Switzerland and Germany have followed a different trajectory. Massification only began around 1960 (about 0.3% of the population in higher education), with a more consistent increase in the number of students over time[j]. In 2022, the relative number of students was 3.2%, which is almost half the rate in the U.S. and 30% lower than the relative number of French students. The reason is that Switzerland and Germany continued to emphasize vocational training and apprenticeships (known as dual education) outside of higher education.

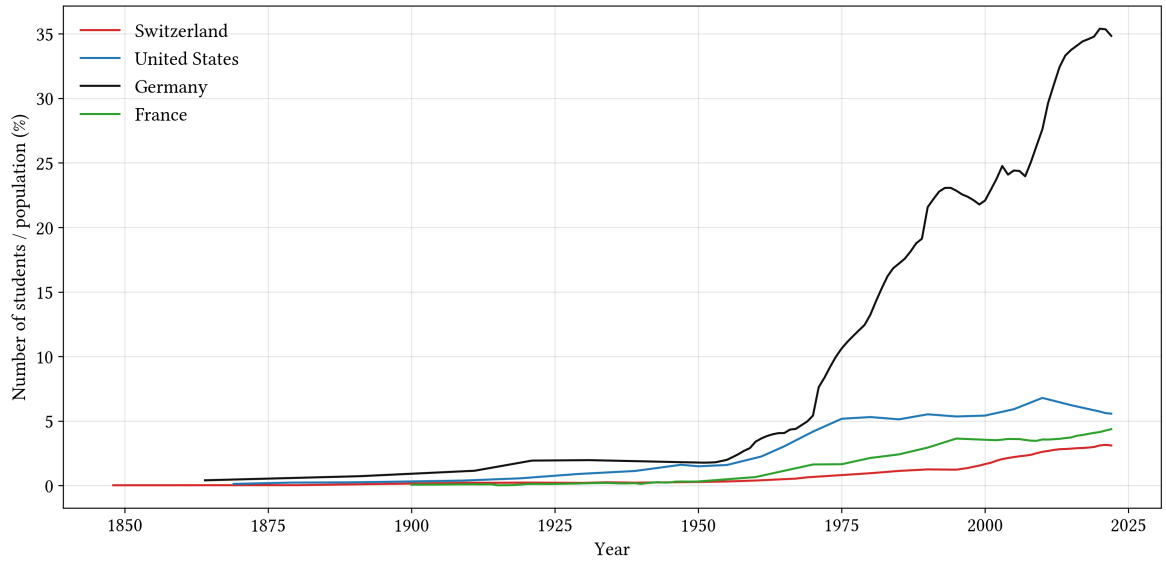

Figure 1 Evolution of the number of higher education students since the mid-19th century.

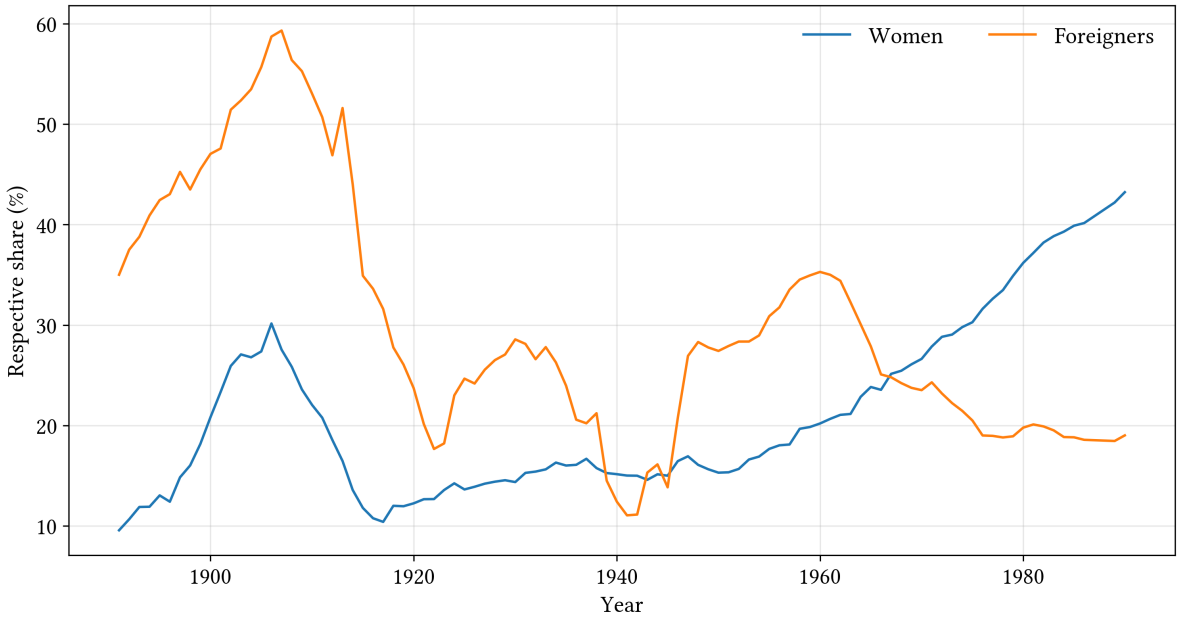

Figure 2 Evolution of the share of female and foreign students in the Swiss "hautes écoles" (Swiss higher education institutions) between 1890 and 1990. Source: historical statistics of Switzerland.

Two other characteristics of the massification of higher education include the increase in the number of women among students, and to a lesser extent among faculty, as well as the beginning of the internationalization of universities. To properly assess these changes, let us examine the increase in

the number of foreign students and the proportion of women among students in the Swiss "hautes écoles" [7] over a century between 1890 and 1990 as illustrated in Figure 2. Switzerland was a notable exception in the 19th century due to the large contingent of foreign students and the highest rate of women among students compared to other Western countries (Charle & Verger, 2007, p. 127); however, this uniqueness faded at the beginning of the 20th century with a dramatic decline in the female proportion (from 30% to 10% between 1905 and 1915). Then, starting in 1920, Switzerland caught up with its neighbors, with the proportion of female students rising from 12% in 1920 to 43% in 1990, a figure well below the French (55%) or U.S. (51%) rates. The distribution between sexes remains fundamentally unequal across fields: law, humanities, and medicine attract a large number of women, while sciences, technology, engineering, and mathematics remain predominantly male domains. With an average foreign student rate fluctuating around 20%, Switzerland admits a significantly higher proportion compared to other Western countries: the U.S. had barely 3% of foreign students in 1990, 9% in France, and 5.7% in Germany (Charle & Verger, 2007, p. 272).

Less data is available regarding the faculty. In Swiss higher education institutions, the percentage of female professors remained low until the 1980s, with women making up less than 10% of the faculty (see Figure 3). The proportion of foreign professors was similar to that of foreign students: about 20%.

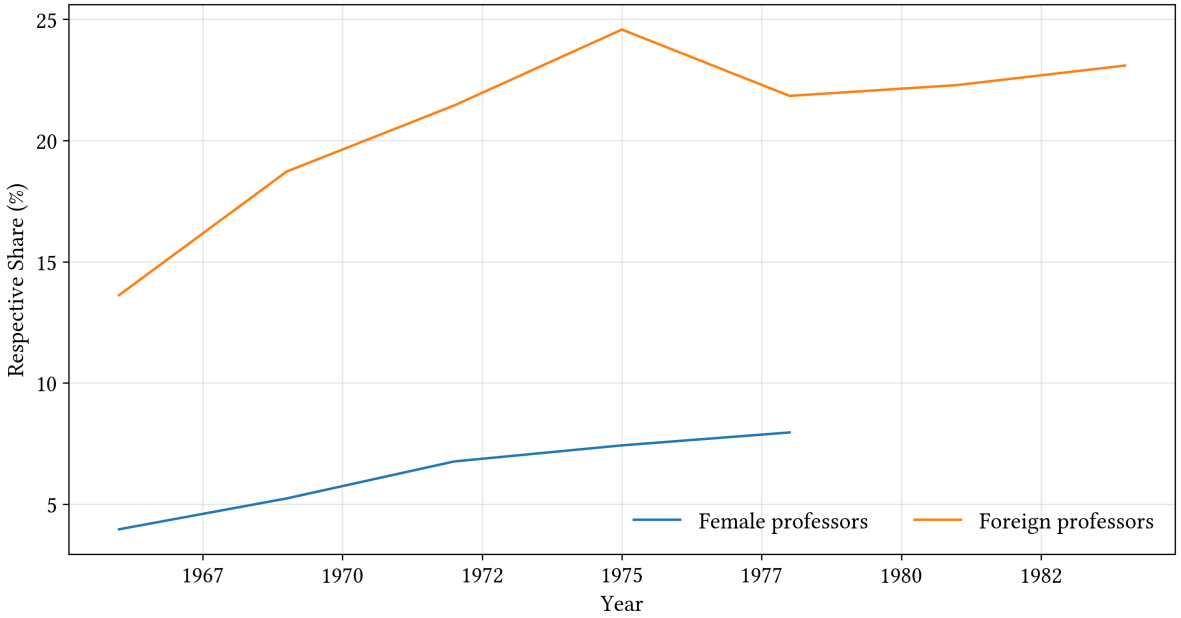

Figure 3 Evolution of the share of female and foreign professors in Swiss higher education institutions between 1890 and 1990. Source: historical statistics of Switzerland.

[7] In Switzerland, "hautes écoles" or "Hochschule" (post-secondary education) includes the ten cantonal universities and the two federal polytechnic schools (ETHZ and EPFL since 1969). In parallel, there are vocational schools (accessible to graduates of a federal certificate of competency), specialized higher education institutions since 1997, and pedagogical higher education institutions.

2.7 Universities as Actors of Social Justice

Since the very beginnings of the Humboldtian university model, students were involved in the political upheavals of their time. In the 1960s, campuses became hotbeds of social protest: the Vietnam War mobilized American youth against conscription, the devastation of war, and American imperialism. Critiques of capitalism and consumer society grew louder. Many students and intellectuals looked towards Mao's China and Fidel Castro's Cuba as alternative societal models. This period also saw the rise of the "beat generation," the demand for sexual freedom, and the increasing use of recreational drugs.

However, universities also played a significant role in the fight against inequality. Despite the abolition of slavery a century earlier, the United States was still a racially segregated country in the 1960s, with the Black population living in far worse conditions than the rest of the population. American universities took on the issue of economic poverty affecting African Americans head-on. They implemented affirmative action programs aimed at addressing these inequalities. By the end of the 1960s, American universities had committed themselves to being agents of justice by rectifying disparities.

In Europe, the main issue remained social inequalities, which had scarcely diminished despite strong economic growth during the Thirty Glorious Years. French sociologist Pierre Bourdieu spoke of the social reproduction of elites: even though higher education was officially open to all graduates, it remained a tough battle for children from the most disadvantaged social classes, with a success rate of barely over 50% in 1970. A series of reforms profoundly changed access to higher education: an increase in the success rate for the baccalauréat, a multiplication of degree programs, alternatives to entrance exams for elite schools (selection based on application materials, reserved spots for candidates from immigrant backgrounds), and various forms of assistance (scholarships, housing aids).

Concurrently, the central role of the teacher was challenged. The aim was to make subjects more accessible and less austere by placing the student at the center of the learning effort; the student was to cease being a passive recipient of knowledge and become an active participant in acquiring skills. In the United States, the prominent figure of "new education" was philosopher and psychologist John Dewey, who contributed significantly to the discussion of educational methods. In Europe, between the two World Wars, a multitude of experiments were conducted, influenced by the Italian doctor Maria Montessori, the German Rudolf Steiner, and the French Célestin Freinet. In 1967, three chairs of education sciences were established in France (about forty years after a similar chair was created in Belgium, which was a pioneer in this area). The massification of education and the critique of the meritocratic system (accused of perpetuating social inequalities) led to several important reforms. In France, these included the Faure law of 1968 (autonomy of universities), the Haby law of 1975 (single college), the Savary law of 1984 (university reform), the Jospin law of 1989 ("the student at the center of the system"), the Pécresse law of 2007 (accountability of universities), and the Peillon law of 2013. Driven by the so-called "new pedagogues" like Philippe Meirieu, new methods for teaching mathematics and reading were employed. These reforms faced criticism from teachers and many intellectuals, who believed that "pédagogisme" was the reason for the decline of the French school system (Lafforgue & Lurçat, 2007). The "new pedagogues" associated with Philippe Meirieu long disputed the claim of decline, but eventually, faced with the mounting evidence from PISA

rankings[8], they argued that educational reforms were being unjustly blamed, and that the decline of schools was a consequence of broader societal processes (Prost, 2013; Meirieu, 2018).

Among professors, there has been a gradual evolution in thinking about the purpose of the university. In the Humboldt model, the university's ideal is the pursuit of truth. This ideal came under scrutiny starting in the 1960s. Many intellectuals began to advocate for a more active role for universities. For instance, Professor Ira Harkavy (2006) from the University of Pennsylvania argues—an idea widely accepted in the United States—that the university's goal is not merely to satisfy scientific curiosity, but to improve the world by fostering the emergence of the "good society" through the education of its citizens:

> "I believe, should be to contribute significantly to developing and sustaining democratic schools, communities and societies. By working to realize that goal, democratic-minded academics, I further believe, can powerfully help American higher education in particular, and American schooling in general, return to their core mission—effectively educating students to be democratic, creative, caring, constructive citizens of a democratic society. "

3 The New University

The Humboldt model was gradually abandoned from the 1980s onwards to make way for a new university. This transformation was neither abrupt nor solely decided by the states. Quite the opposite, it unfolded over several decades without a predetermined plan and involved a multitude of actors (international organizations such as the OECD, ministries responsible for higher education, academics). Another notable characteristic is that it affected all Western countries and contributed to the establishment of a single university model inspired by major American universities. For this reason, one might refer to an American model of the university.

3.1 Reasons for the Profound Transformations of the University Model

To understand the elements that justified the overhaul of the academic system, it is important to recall the social and economic context of the 1970s:

- The Western world had experienced strong economic growth since the 19th century, resulting in a spectacular rise in the standard of living and wealth of populations. Science was credited with economic successes.
- At the beginning of the 1970s, a lasting crisis emerged: the abandonment of the gold standard for the dollar, the oil shock, falling growth, rising unemployment, and social unrest.
- Around the same time, the Meadows Report on the limits to growth highlighted the ecological crisis, overpopulation, environmental degradation, and so on.

[8] Program for International Student Assessment, see § 3.2.

- Confronted with the economic crisis, politicians[k] convinced themselves of the virtues of liberalizing flows (capital, goods, people).
- This marked the dawn of globalization and what is today referred to, with varying degrees of accuracy, as the neoliberal turn. Globalization became the mantra promoted by international organizations (UNESCO, World Bank, etc.).
- With the advent of a globalized economy, it became possible to advocate for a transition from economies with a strong industrial base to tertiary economies centered on services. The delocalization of industries and increased agricultural imports were expected to offset decreases in the primary and secondary sectors.
- Given that the tertiary sector generates high added value, this economic transformation was anticipated as a catalyst for economic growth, which had been stagnating since the first oil shock despite traditional stimulus plans.
- The tertiary sector required a greater number of educated individuals in higher education, necessitating an increase in the number of higher education graduates.
- People began to speak of a "knowledge society" to describe this new societal paradigm.
- Economic development after 1945 had deepened inequalities within the population, and there was a desire for universities to play a key role in addressing these inequalities.
- Universities were perceived as ivory towers with distant ties to economic actors and societal problems. Knowledge transfer to the private sector needed to be promoted, and universities had to become more engaged with societal issues. This led to the birth of public-private partnerships (PPP).
- Internationally, the fall of the Berlin Wall in November 1989 marked the end of the Cold War and the belief in the end of history[l].

The transformation of universities was not inevitable; it did not follow a linear and planned evolution but resulted from a confluence of circumstances. It was not without resistance or hesitation.

3.2 The Role of the OECD

Undoubtedly, the cornerstone of the new university was the Frascati Manual published in 1963 by the *Organisation for Economic Co-operation and Development*[m] (OECD), which has been updated from time to time (OCDE, 2016). Its purpose was to provide a common methodology for the statistical analysis of research and development expenditures. The underlying idea was that research is the engine of economic growth. There was no immediate impact between this discourse and national higher education policies, but the idea gradually permeated. OECD experts frequently intervened to advise states.

In Switzerland, it was Professor Eduard Fueter who represented Switzerland at the OECD in the 1960s. He saw value in the statistical tools proposed by the OECD for quantifying research efforts at both public and private levels, as this would allow for comparisons with other countries and thus guide national research support policies. However, the Confederation was initially uninterested, as it

had already established its own research strategy (Joye-Cagnard, 2010, pp. 377–387). It was only after Switzerland gained some stability in its research institutions that the Confederation began to heed the OECD experts. These experts recommended federal support for industrial development and new technologies while criticizing the lack of top-down initiatives. In 1989, they stated (Benninghoff & Leresche, 2003, p. 76):

> "Freedom of research, university autonomy, and federalism restrict the possibilities of exerting deeper influence. The direct influence of the Confederation is limited to defining priorities in the area of federal institutes of technology, promoting applied research (CERS and PNR), international scientific cooperation, and public sector research."

In 1997, the OECD decided to establish the *Programme for International Student Assessment* (PISA) in the form of surveys every four years to evaluate the skills of students at the end of their compulsory education (generally around the age of fifteen). The surveys focus on "mathematical literacy," "scientific literacy," "reading comprehension," and "creative thinking." The ultimate goal of these surveys is to compare the effectiveness of various educational systems based on identical quantitative criteria. This represents a revolution in evaluating the performance of educational systems (Wentzel *et al.*, 2021, p. 14):

> "PISA has swept away the dimension of prestige to replace it with that of excellence—effectiveness, equity, efficiency, etc. It then becomes possible to compare based on versatile and localized criteria such as prestige, but according to ordainable, comparable criteria across time and space, like excellence."

3.3 The Role of the European Union

Studies have proliferated, showing that investment in research and development is essential for growth through innovation. Conversely, the lack of exchange between the private sector and universities was seen as a hindrance to economic growth.

In 1983, the European Council endorsed the creation of multi-year programs known as "framework programs," aimed at providing financial support for supranational research projects, creating synergies within the European Union, unifying a European scientific and technical space, and transferring knowledge to the private sector. In total, the European Union funded seven framework programs between 1984 and 2013, with an increasing budget (from less than €1 billion per year in 1984 to €7.6 billion per year from 2007 to 2013).

In Europe, the Lisbon Strategy (2000) called for massive annual investments in research and development amounting to 3% of the gross domestic product [9]. Five years later, the strategy was revised with the launch of the ambitious Europe 2020 program, which allocated €11 billion per year for the period from 2013 to 2020. The ambition of the European Union was to foster the emergence of a "European Research Area" capable of competing with the United States and China in new technologies (nanotechnology and biotechnology, materials, space, etc.). This also involved strengthening the scientific workforce through "excellence scholarships" (Marie Skłodowska-Curie Actions).

[9] The 3% target has an attractive power, as the EU allows a maximum deficit of 3%, and NATO also requests a 3% investment in the military sector.

Lastly, the European Union emphasized societal themes such as health, climate change, and inclusion.

Perhaps the most significant aspect of the new European strategy was the decision that research must be guided by a dedicated body, which includes the evaluation of projects and outcomes according to quantitative criteria. Another central theme of the reform in research funding was *excellence*. Thus, the European Council established the European Research Council to oversee research at the EU level: [10]

> "ERC (European Research Council), created by the European Union in 2007, funds exploratory research projects at the frontiers of knowledge across all fields of science and technology. The sole selection criterion is excellence."

Free trade also pertains to universities. The European Council established a student and staff exchange program in 1987. This was the first step toward creating a European study market, solidified with the Bologna Reform (1999). The initial step was to harmonize various educational systems across Europe by drawing inspiration from the U.S. system (which has three levels: graduate, postgraduate, and PhD thesis, which became bachelor, master, and doctorate). Compatibility between educational systems was made possible through mutual recognition of qualifications (students must earn a certain number of ECTS credits [11] to validate their academic year) and their division into course units. The system was further enhanced by the certification of diplomas [12] at the European Union level in 2008.

3.4 Governance of the New University

Research and teaching were the two pillars of Humboldt's model. The new university adds a third pillar: innovation. Canadian historian Benoît Godin (2008, p. 41) notes:

> "Innovation is also a political concept in another sense. From its very beginning in the 1960s, science policy has been concerned with funding scientific research, with technological innovation as the expected output. Over time, the terms used came to reflect this very first goal. What was called science policy in the 1960s became science and technology policy in the 1970s, then innovation policy in the 1990s."

Innovation is a polysemous word, as it can mean "the action of creating, the thing created, and the value of its novelty" (Bontemps, 2023, p. 27). Therefore, it is not always clear what is meant when the word is used as a slogan. In the technical literature on the subject, it rarely means "invention" or "creativity"; it more often refers to "the market launch of new products"[n]. It is no coincidence that at the European Commission level, the "Commissioner for Science and Research" during the Barroso Commission (2004–2014) was renamed "Commissioner for Research, Science and Innovation" under the Juncker Commission (2014–2019), eventually becoming the "Commissioner for Startups, Research, and Innovation[13]" under the von der Leyen Commission (2019–2029). As a result, the

[10] https://www.horizon-europe.gouv.fr/erc
[11] Acronym for *European Credit Transfer and Accumulation System*.
[12] https://www.sbfi.admin.ch/fr/le-cadre-europeen-des-certifications
[13] The commissioner is led by Ekaterina Zakharieva, a trained lawyer, bureaucrat, and with no experience in research or

word "science" has disappeared from the title of the commission itself.

Similarly, in Switzerland, the Federal State Secretariat for Education and Research, which oversaw research and higher education at the federal level and was under the Federal Department of the Interior, became the Federal State Secretariat for Education, Research, and Innovation[14] (SEFRI) in 2012 under the Federal Department of Economy (renamed for the occasion as the "Federal Department of Economy, Education, and Research").

The new university thus intends to play a major economic role by facilitating the development and commercialization of new products, a role previously assigned to the research and development departments of private companies. This transformation of universities into a specific type of business has necessitated a significant change in governance.

The most visible consequence has been the power granted to university presidents:

- Before the reform, in most European universities, the president held little decision-making power. Typically, this was an aging professor (average age 55) who accepted a short term and then returned to his chair or laboratory. The role of president conferred a status of "primus inter pares".
- After the reform, presidents are a young individuals in his forties (39–44 years old) who serve multiple terms and do not return to his teaching and research duties afterward. Prior to being appointed president, they have already held leadership positions (dean, vice president, etc.), implying limited teaching and research experience after obtaining his doctorate. They concentrate extensive powers, especially in terms of appointments and financial allocations, behaving like a chief executive officer.
- The new university enjoys increased autonomy from the state. The link between the university and the state is formalized through strategic plans, generally quadrennial. The strategic plan serves as a negotiation tool.
- In return, the new university has adopted a management model modeled after that of businesses, intended to improve operational efficiency[15] .
- The old university operated on a collegial basis, a supposed drawback being the difficulty in reaching decisions[9]. The new university is a hierarchical entity with leadership taken by the presidency.
- The state provides operational grants to universities based on their strategic plans. Additionally, it establishes funding agencies that allocate subsidies to researchers based on competition aimed at selecting the best projects[16]. The success rate typically hovers around 20% (see figure 13).
- International rankings of universities provide a measure of the performance of the most pres-

business (https://fr.wikipedia.org/wiki/Commissaire_européen_la_Recherche)

[14] fr.wikipedia.org/wiki/Secrétariat_d'État_à_la_formation,_à_la_recherche_et_à_l'innovation

[15] English universities introduced business-inspired management called "new public management" in the 1980s. They also implemented performance audits (the "research assessment exercise" in 1985).

[16] France established the National Research Agency in 2005. It is the counterpart of the U.S. National Science Foundation, created in 1950, or the Swiss National Fund for Scientific Research, established in 1952.

tigious institutions. Audits are conducted to assess the performance of various laboratories. The status change of Western universities has occurred gradually: in the 1980s and 1990s among Anglo-Saxons, and in the late 1990s and early 2000s for continental Europe. Professors Sheila Slaughter and Richard Münch referred to this transformation of the academic world as "academic capitalism" (Slaughter & Rhoades, 2010; Münch, 2014).

- Some presidents have become media celebrities, portrayed as "managers" whose "vision" has revolutionized a particular university. Consequently, long articles—either laudatory or critical—and biographies are published about them, as was the case for:
  - In Germany, Wolfgang Herrmann, president of TU Munich[17],
  - In Switzerland, Patrick Aebischer, president of EPFL[18] (Delaye, 2015),
  - In France, Richard Descoings, director of Sciences Po Paris[19] (Bacqué, 2015).

  Many others remain in anonymity (they are just senior officials among others). Thus, the major French newspaper Le Monde published an article announcing the appointment of nearly all university presidents until 1989. After that, such information became less regular, and finally, after 2008, no appointments were covered in an article by Le Monde (Laillier & Topalov, 2022, p. 222).

Many others remain anonymous (they are only high-ranking individuals). The fact that the academic world is no longer viewed as an institution responsible for producing and disseminating knowledge but rather as primarily an economic actor has revolutionized the way science is conceived and upended the sociology of the researcher.

Another characteristic is that universities are integrated into a globalized world. On one hand, their structures are similar from one university to another across the globe, and on the other hand, the number of foreign students and professors within a given university is increasingly rising. Consequently, the competition to attract the best students and professors is now global.

3.5 Funding for the New University

3.5.1 United States

The United States is both the largest funder of public research and the country that demonstrates the greatest transparency in the long-term use of public funds[20]. Therefore, we begin with them.

[17] https://www.spiegel.de/lebenundlernen/job/uni-praesidenten-regieren-ihre-hochschulen-wie-koenigreiche-a-871965.html

[18] http://www.mhaenggi.ch/texte/odysseus-vom-genfersee

[19] https://www.nouvelobs.com/l-enquete-de-l-obs/20130301.OBS0542/richard-descoings-le-fantome-de-sciences-po.html

[20] It is ironic to note that the SNSF in Switzerland and the European Research Council for the European Union have been advocates of open science, particularly promoting FAIR (Findable, Accessible, Interoperable, Reusable) data, yet these institutions do not always adhere to these principles. One must sift through annual reports to reconstruct data series, while in the United States, data is compiled and accessible online.

The U.S. government funds three types of research[21] according to OECD classification:

- basic or fundamental research,
- applied research, and
- experimental development.

These terms are defined by OCDE (2016, p. 47) as follows:

> "*Basic research* is experimental or theoretical work undertaken primarily to acquire new knowledge of the underlying foundations of phenomena and observable facts, without any particular application or use in view. *Applied research* is original investigation undertaken in order to acquire new knowledge. It is, however, directed primarily towards a specific, practical aim or objective. *Experimental development* is systematic work, drawing on knowledge gained from research and practical experience and producing additional knowledge, which is directed to producing new products or processes or to improving existing products or processes."

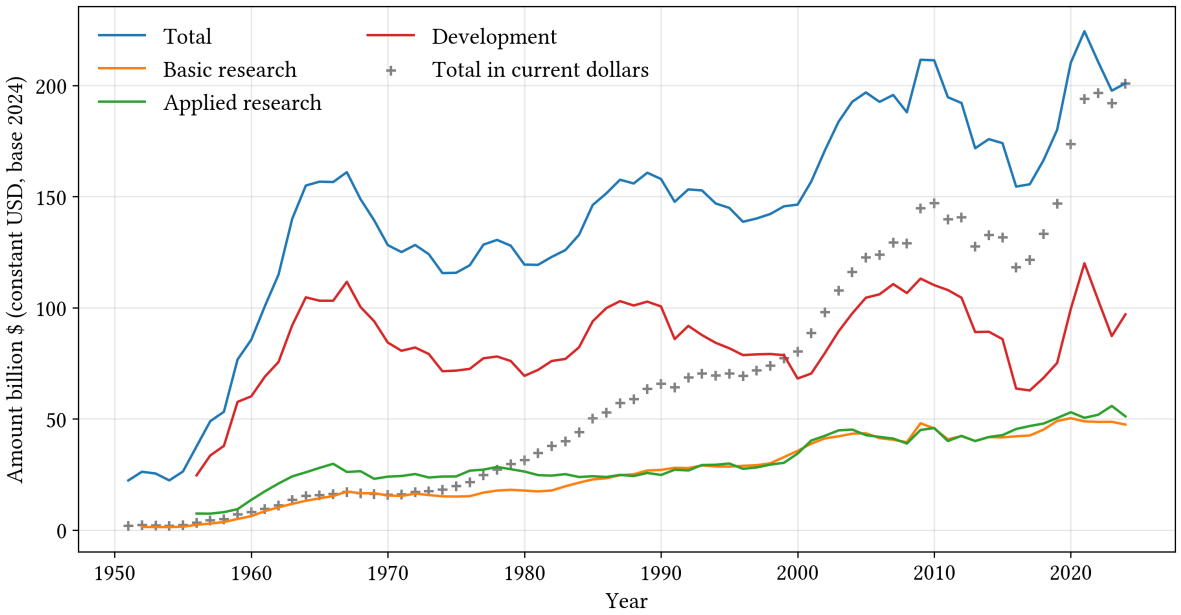

Figure 4 Amount of federal spending since 1951. Source: Pece & Anderson (2024).

In 2024, the U.S. government allocated a budget of $201 billion for research (3% of its total budget, or 0.7% of its Gross Domestic Product). Examining the trend since 1951 in figure 4, investment in research and development may seem to have increased continuously—except for the six years following the 2008–2009 financial crisis—since the budget has grown from $1.8 billion in 1951 to $201 billion in 2024. However, this growth is misleading. When adjusted for constant dollars (with 2024 as a base), we note[22]:

[21] A fourth line appears in accounting documents: "R&D plant," which corresponds to infrastructure investments, whether tangible or intangible.

[22] Pece C. V., Anderson G. W., Federal Funds for Research and Development: Fiscal Years 2023–24. NSF 25-328, National

- An initial phase of budget growth from $26 billion to $154 billion in constant dollars between 1954 and 1967.
- A decline between 1968 and 1975 (during the Vietnam War), reaching a low of $116 billion in 1975.
- An irregular increase from 1976 to 2009, when the budget surpassed $200 billion USD the first time.
- A decline from 2010 to 2016 following the financial crisis, with a minimum of $154 billion in 2016.
- A rapid increase under the Trump administration from 2016 to 2021, peaking at $211 billion in 2021.
- A slight decrease under the Biden administration from 2021 to 2024, hitting a minimum of $201 billion in 2024.

It is also worth noting that the research budget represented 5.1% of the federal budget in 1951 compared to 2.9% in 2024. Another notable trend in U.S. science policy has been the steady decline in experimental development funding in favor of fundamental and applied research; experimental development accounted for 70% of the federal research budget in the 1950s but dropped below 40% in the 2010s. Conversely, fundamental research rose from 10% in 1951 to over 30% in the 2010s.

A unique aspect of U.S. public funding is the significant contributions from the military and health sectors[23]. Over the past fifty years (1975–2025), the Department of Defense has received between 40% and 65% of the budget, while the Department of Health and Human Services has seen its relative share of the federal budget increase from 10% to 25% (see figure 5). The National Science Foundation has been the poor relation, with a budget ranging from 2.5% to 4.7%.

In the 1970s, the government was the main funder of research in the United States, accounting for 55% of total research funding (see figure 6). The private sector contributed 40%. By the mid-1980s, the private sector became the primary funder of research. Over the past fifty years, the average growth rate of funding provided by businesses has been 4.9%, while the government has only increased its budget by an average of 1.2% per year. As a result, by 2022, the private sector represented 76% of the $750 billion allocated to research in the United States, while the federal government accounted for 18%.

The federal government also funds higher education. Until the 2010s, it only provided part of the funding, with the remainder coming from the respective states where the institutions and universities are located (see figure 7). During the 2010s, federal funding became as significant as state funding, and with the COVID crisis, it surged to represent two-thirds of university funding. States finance the operations of public universities (employee salaries and operational expenses), while the federal government covers the following expenditures (from a total budget of $236 billion):

- Repayable student loans (Direct Loan Program), amounting to $98 billion in 2021.

Center for Science and Engineering Statistics (NCSES) Alexandria (VA) U.S. National Science Foundation, 2025. Source: https://ncses.nsf.gov/pubs/nsf24332

[23] American Association for the Advancement of Science (AAAS). Source: https://www.aaas.org/programs/r-d-budget-and-policy/historical-trends-federal-rd

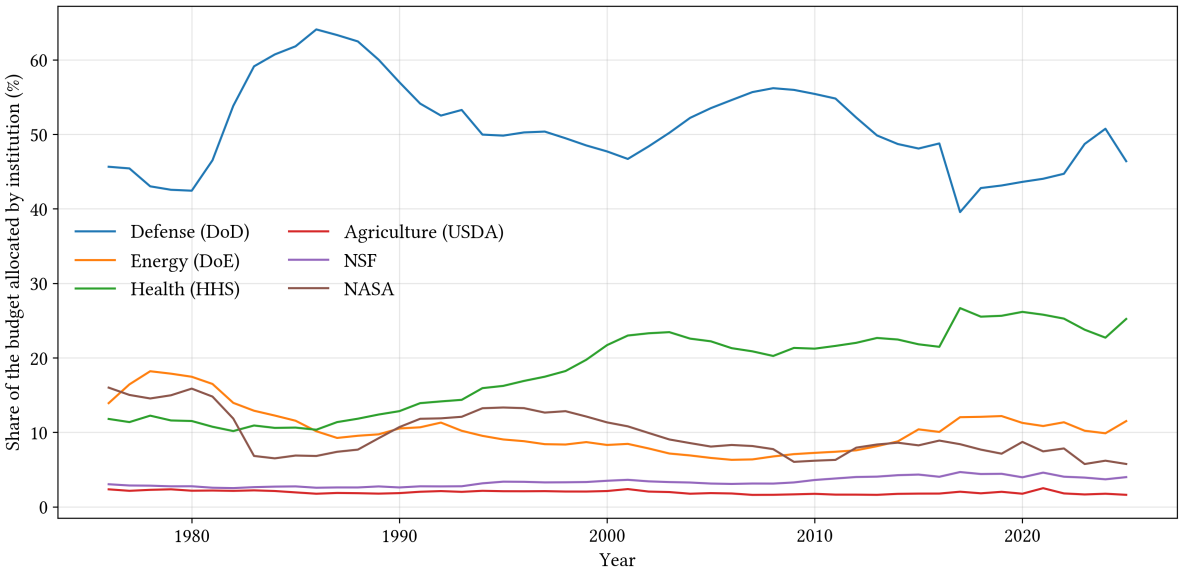

Figure 5 Evolution of the respective shares of fundamental research, applied research, and experimental development in the U.S. federal budget. Source: Pece & Anderson (2024).

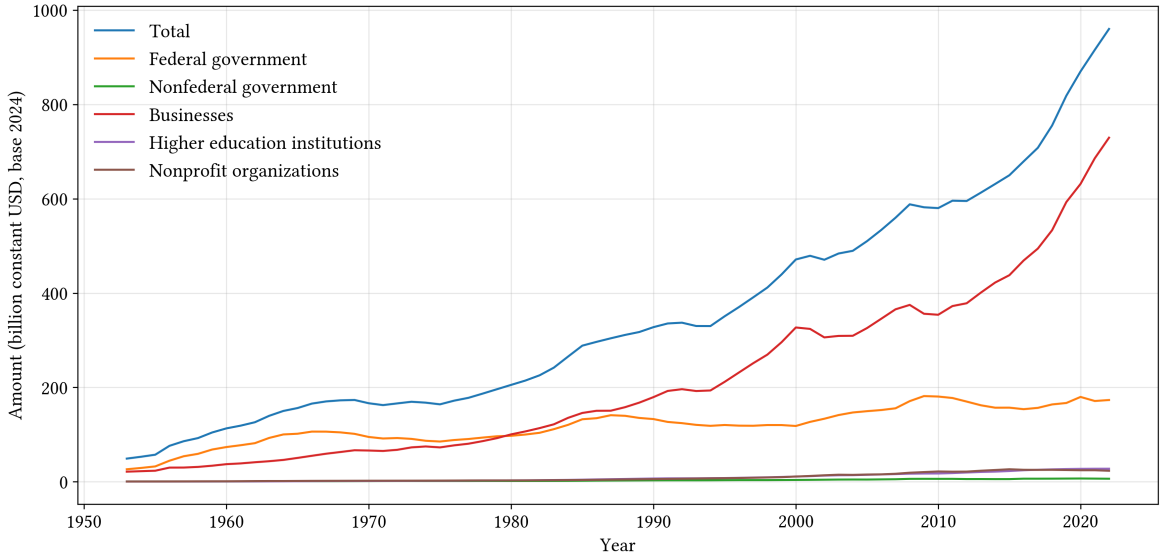

Figure 6 Evolution of funding distribution by source from 1953 to 2022. Source: Pece & Anderson (2024).

- Non-repayable student grants, including Pell Grants totaling $31 billion in 2021.
- Veteran assistance, totaling $10.5 billion in 2021.
- Research funding through grant agencies (NSF, NIH, etc.) amounting to $47 billion in 2021.

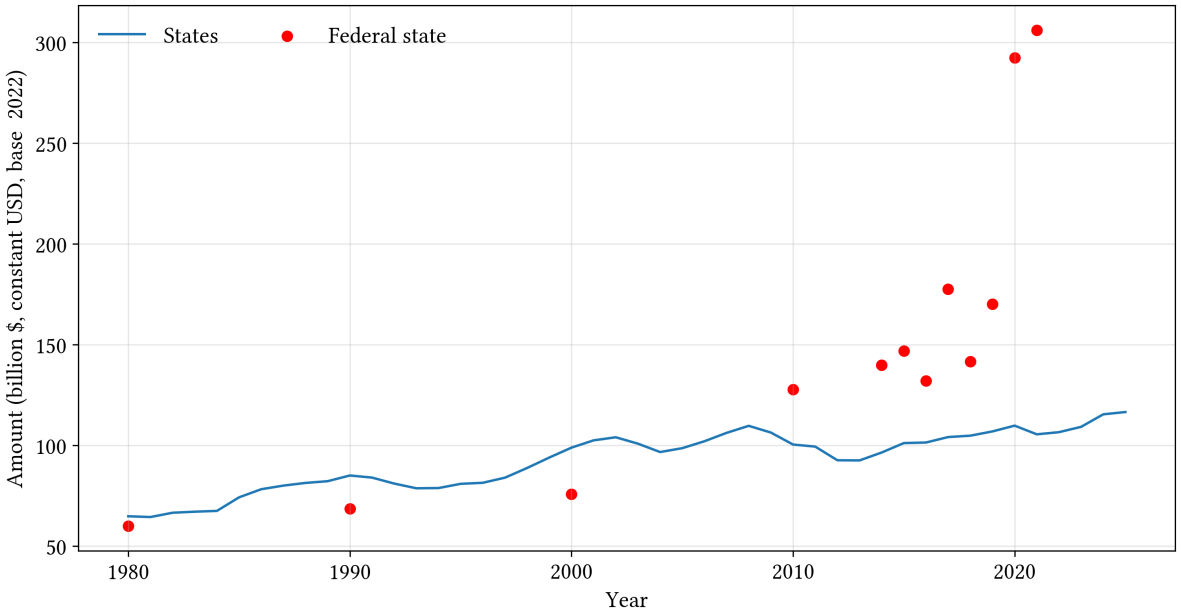

Figure 7 Evolution of the distribution of funding by source from 1953 to 2022. Source: NCES and the Grapevine report 2025 from the State Higher Education Finance (SHEF).

3.5.2 Switzerland

At the federal level, higher education is managed by the *State Secretariat for Education, Research and Innovation* (SEFRI) of the *Federal Department of Economic Affairs, Education and Research* (DEFR). In 2024, the SEFRI budget was 4.7 billion Swiss francs. The SEFRI budget includes federal support for cantonal universities and universities of applied sciences (HES), contributions to the Swiss National Science Foundation (SNSF), and financial participation in major European infrastructures like CERN. For collaboration with the European Union and international cooperation, the Confederation spent 965 million francs in 2024. The largest allocation is for the SNSF, amounting to 1.2 billion francs. The two federal institutes of technology (EPF) and innovation support (via the agency Innosuisse) fall under the DEFR rather than the SEFRI. Overall, the Confederation invested 6.6 billion francs (which is 7.6% of the federal budget) in 2024.

Table 1 Distribution of the budget allocated to higher education in Switzerland in 2024 in thousands of francs within the Federal Department of Economic Affairs, Education and Research (DEFR). Source: State Account 2024, Volume 2, source: https://www.efv.admin.ch/fr/compte-etat.

DEFR	EPF[a]	2 651.9
	HEFP[b]	63.2
	Innosuisse	297.4
	Total	3 012.5
SEFRI	Cantonal Universities	738.5
	Universities of Applied Sciences	583.8
	Swiss National Science Foundation	1 199.3
	Swiss Academies of Arts and Sciences	48.9
	Institutes[c]	114.0
	European Organizations[d]	95.3
	International Cooperation	49.3
	Mobility (Erasmus)	54.7
	Scholarships for Foreign Students	9.9
	EU Research Programs[e]	560.2
	European Space Agency	195.5
	Total	3 649.4
Total		6 661.86

[a] Federal Institutes of Technology in Zurich and Lausanne
[b] Federal Pedagogical University
[c] This includes 34 institutions categorized as research infrastructures, research institutions, and technology competence centers.
[d] This includes the European Organization for Nuclear Research (CERN), the European Organization for Astronomical Research, the European Spallation Source, free-electron lasers, synchrotrons, and the European Molecular Biology Laboratory (EMBL).
[e] EU Framework Programs (Horizon Europe 2021–2027).

In addition to the two polytechnic schools, Switzerland has ten universities. In 2024, the budget for these higher education institutions was 9.5 billion francs, a figure that has continuously increased since 1995 at an average annual growth rate of 2.6% (in constant francs). Over the past thirty years (1995–2024), the main sources of funding have been:

- the Confederation, contributing 41% of the funding.
- the Cantons, contributing 32% of the funding.
- the private sector (contracts, private foundations), accounting for 7%.
- international funding (primarily from the European Union), representing 2%.

Switzerland has two major funding agencies:

- the Swiss National Science Foundation (SNSF), which funds basic and applied research.
- Innosuisse, which supports innovation and technology transfer to companies.

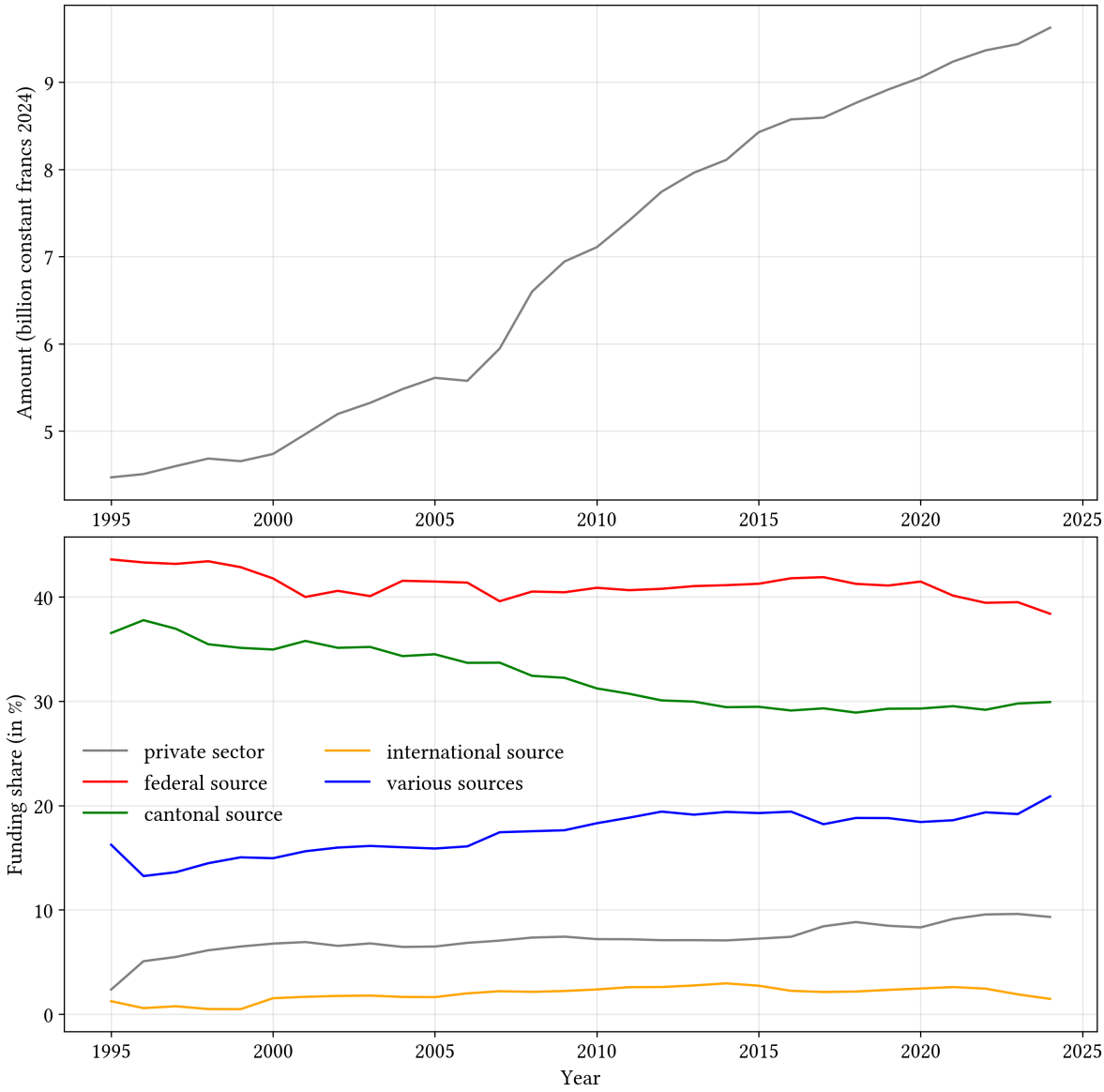

Figure 8 (a) Evolution of funding for higher education in Switzerland from 1995 to 2025 in constant francs. (b) Source of funding for higher education. Source: OFS.

The SNSF budget was 1,327 million francs in 2024, while Innosuisse's budget was 296 million francs. Additionally, Swiss researchers can participate in European projects under the Horizon framework program; the Confederation's financial participation was 524 million francs in 2024. Over the past two decades, the Confederation has significantly increased its subsidies to funding agencies: the growth rate from 2000 to 2024 was 5.2% for the SNSF and 6% for Innosuisse (or the Technology and Innovation Commission that preceded it).

Figure 10 shows that the relative funding rate for the humanities has increased over the past twenty years. In 2005, they accounted for 20% of the total grants allocated by the Swiss National Science

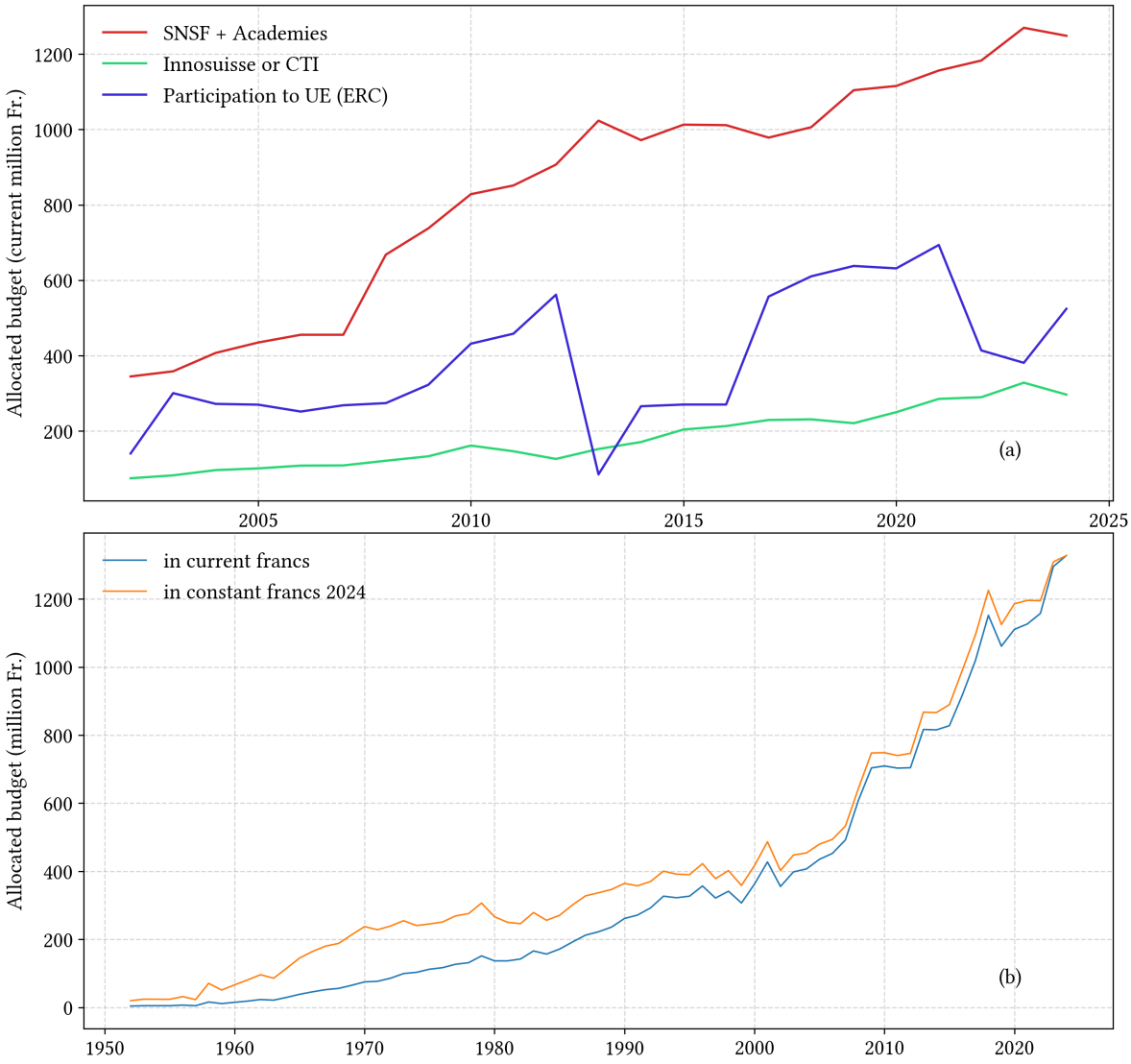

Figure 9 (a) Evolution of the budget allocated by the Confederation to the SNSF and Swiss academies (approximately 0.4% of the total budget), funds for applied research, and participation in European Union (EU) research programs. (b) Evolution of the budget allocated by the Confederation to the Swiss National Science Foundations (SNSF) since its inception in 1952; amounts are expressed in constant or current francs.

Foundation. By 2024, they make up almost 30% of the total budget. Life sciences have remained relatively stable (around 40%). The relative funding rate for engineering sciences has decreased from 40% to 35%.

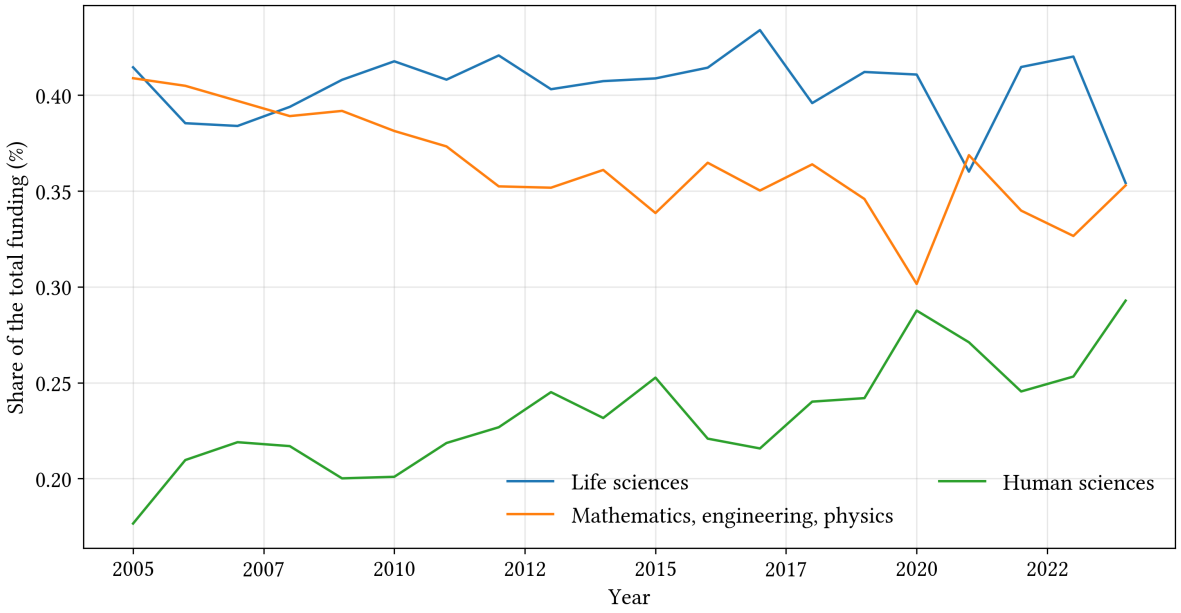

Figure 10 Evolution of funding rates by major themes. Source: SNSF.

3.5.3 France and European Union

We finish with France, which differs from Switzerland and the United States in that research is financed by the French government and the European Union[p]. The budget allocated by the French government to research and higher education has been relatively stable over the past fifteen years, averaging around €32.7 billion (see figure 11).

There are two significant, one-time investments: in 2010 (the budget increased to €58 billion) and in 2014 (the budget was €36.8 billion), corresponding to the "Grand Emprunt" initiated by President Sarkozy, renamed the "Programme des Investissements d'Avenir". In 2010, funds were distributed through the following calls for projects:

- "Centers of excellence" program (€15.6 billion).
- "Excellence thematic projects" program (€2.8 billion).
- "Institutes of excellence in decarbonized energies" program (€0.9 billion).
- "Research in the field of aeronautics" program (€1.7 billion).
- "Nuclear of tomorrow" program (€1 billion).

A second aspect of the investments for the future program injected more than €6 billion in structural investment:

- "Ecosystems of excellence" program (€4.1 billion).
- "Ecology, sustainable development, and mobility" mission (€2.3 billion).

Private higher education has increased significantly in recent years[24], leading the French government to also calculate the "domestic education expenditure" for education, which combines the budget allocated to higher education and research with the operating costs of private education institutes. Over 20 years (2005–2025), this expenditure has increased from €30 billion to €43 billion (in constant euros, base 2024). Thus, the private sector accounts for most of the increase in funding allocated to higher education; simultaneously, public funding has stagnated in absolute terms and decreased in relative terms (it represented nearly 9% of the total state budget in 2010 compared to 7% in 2024).

In 2005, France established an agency intended to function similarly to the U.S. National Science Foundation, called the "National Research Agency" (ANR). The average annual budget of the ANR since its establishment in 2005 has been €936 million (in constant euros, base 2024). The growth of the ANR's budget has been modest, with barely 1% average growth per year since 2005. French researchers can also submit projects to the European Research Council (ERC). On average, the ERC has annually provided €232 million (constant euros) in grants to French researchers. While France contributes 17.5% to the ERC budget, it only receives 11% of European grants[25] (Cour des

[24] The number of students enrolled in a private institution rose from 446,230 (19.3% of the total number of students) in 2011 to 789,894 (26.6%) in 2023, a 77% increase, while the number of students in the public sector grew by 14%. The private sector comprises almost all business, management, and accounting schools. It hosts 79% of higher technician students in apprenticeships and 40% of engineering students.

[25] In other words, France receives back 62% of its contributions to the ERC. This rate is similar to the average return rate of France's contributions to the European Union: on average, France has paid €25 billion per year to the EU and has

comptes, 2025, p. 37).

The amount of grants obtained by French researchers has an annual growth rate of 1%. Public research represents 34% of the total amount allocated to research and development in France in 2024. In 2024, France dedicated 2.12% of its gross domestic product to research and development (a figure far from the 3% target set by the Lisbon Strategy in 2000).

Figure 11 (a) Evolution of the budget allocated to the Ministry of Research and Higher Education (MIRES) and its relative share in the French state budget; evolution of domestic expenditure for higher education (including all expenses for public and private higher education institutions and public research). (b) Total grants awarded by the National Research Agency (ANR) and total grants awarded by the European Research Council (ERC) since their creation. (c)

received an average of €10 billion, or 60% of its contribution.

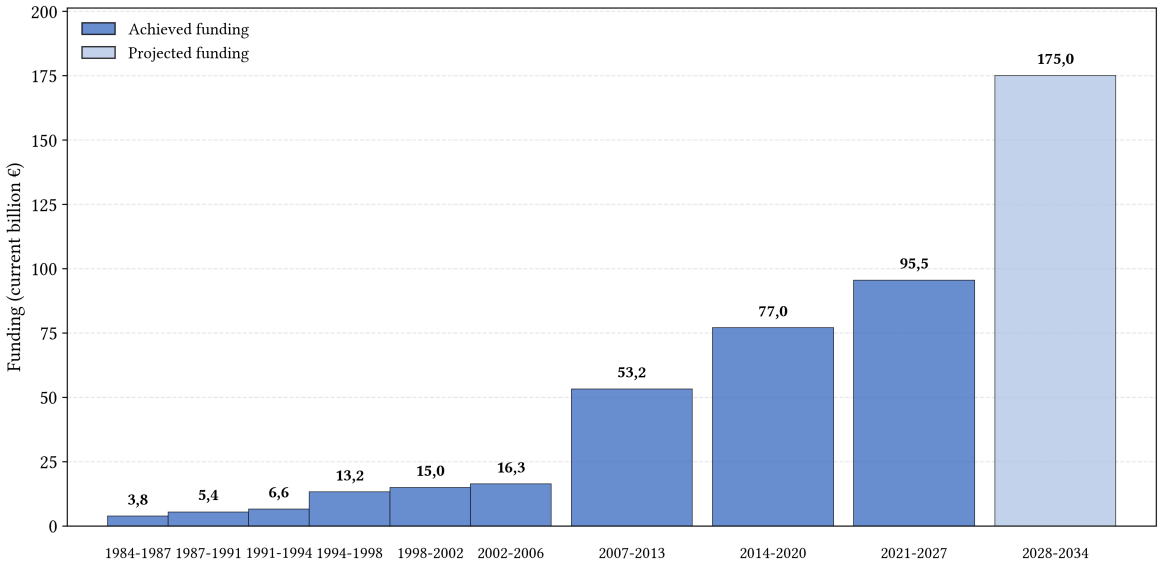

Figure 12 Evolution of the budget allocated to the European Union's research programs in current euros.

The European Union has a budget of €2,070 billion[26] for the seven years of the 2021–2027 multi-annual plan. Within this plan, the budget dedicated to research and development (the "Horizon Europe" plan) has been increased to €95.5 billion and has been divided into four pillars:

- Pillar 1 "scientific excellence": a program with a budget of €24.9 billion – of which €16.1 billion for the European Research Council (ERC) and €6.6 billion for researcher exchanges (Marie Skłodowska-Curie actions) – intended to finance projects in the field of fundamental research.
- Pillar 2 "European industrial competitiveness": the largest research and development program, with a budget of €53.8 billion, aims to strengthen technological and industrial capabilities in six domains (health; culture, creativity, and inclusive society; civil security for society; digital, industry, and space; climate, energy, and mobility; food, bioeconomy, natural resources, agriculture, and environment) through public-private partnerships.
- Pillar 3 "innovation": a specific program aimed at disruptive technologies[27]. The program is budgeted at €13.4 billion and is managed by a new entity called the *European Innovation Council* (EIC).
- Cross-cutting pillar "European Research Area": with a budget of €3.4 billion, this program aims to create a unified research space within the European Union.

[26] Estimate following the mid-term review by the European Council.

[27] Disruptive technology refers to an innovation that enables the introduction of a product that completely replaces a dominant product (or service). For example, the electric light bulb and the internal combustion engine have replaced candles and animal traction.

3.6 Competition

According to its supporters, the university reform aims to increase competition among researchers to attract the best talents. This allows for more funding and the recruitment of top students, initiating a virtuous cycle where competition enhances academic performance, measurable through objective criteria (such as the number of articles or patents).

The establishment of funding agencies—such as the National Science Foundation, the Swiss National Science Foundation in the US, and the National Research Agency in France—represents the first step towards a competitive research market. Substantial resources are allocated to the best projects. According to the doctrine of the new university, excellence can be cultivated through selection. Antoine Petit, the president of the National Center for Scientific Research (CNRS), stated on this subject[28]:

> "We need an ambitious, unequal law—yes, unequal, a virtuous and Darwinian law that encourages the most high-performing scientists, teams, laboratories, and institutions at the international level; a law that mobilizes energy."

Within the political class of the 2000s, which recognized the need for reform in higher education and research, the idea of competition as a driver for elevating research was prevalent. Thus, French President Nicolas Sarkozy drew an analogy with cycling competition in an interview with the scientific journal Nature (2020):

> "I love watching the Tour de France. We've never seen the pack accelerate because those at the rear go faster; the pack accelerates when the leaders accelerate."

The ranking of universities and research institutes has led to competition at both national and international levels. International comparisons motivated the establishment of academic performance tracking tools to ensure public funds were well-invested. Organized competition is in line with the broader philosophy of "new public management," particularly by emphasizing research governance, accountability and performance measurement based on explicit and objective criteria (Hood, 1991).

According to the doctrine of the new university, funding agencies serve as a valuable tool for:

- Allocating grants based on the merits of researchers and fostering the emergence of the best research teams.
- Guiding research by prioritizing actions whose outcomes interest public authorities or industry.
- Making public investment policies in research and development visible.
- Promoting applications and transfers to industry or society.
- Addressing inequalities among individuals or research sectors, achieving a balance between efficiency (the aim of competition) and equity (essential for maintaining cohesion within a community).

As shown in figure 13, funding agencies are selective, with an average acceptance rate below 30%.

[28] Antoine Petit, "La recherche, une arme pour les combats du futur" Les Échos, 26 November 019.

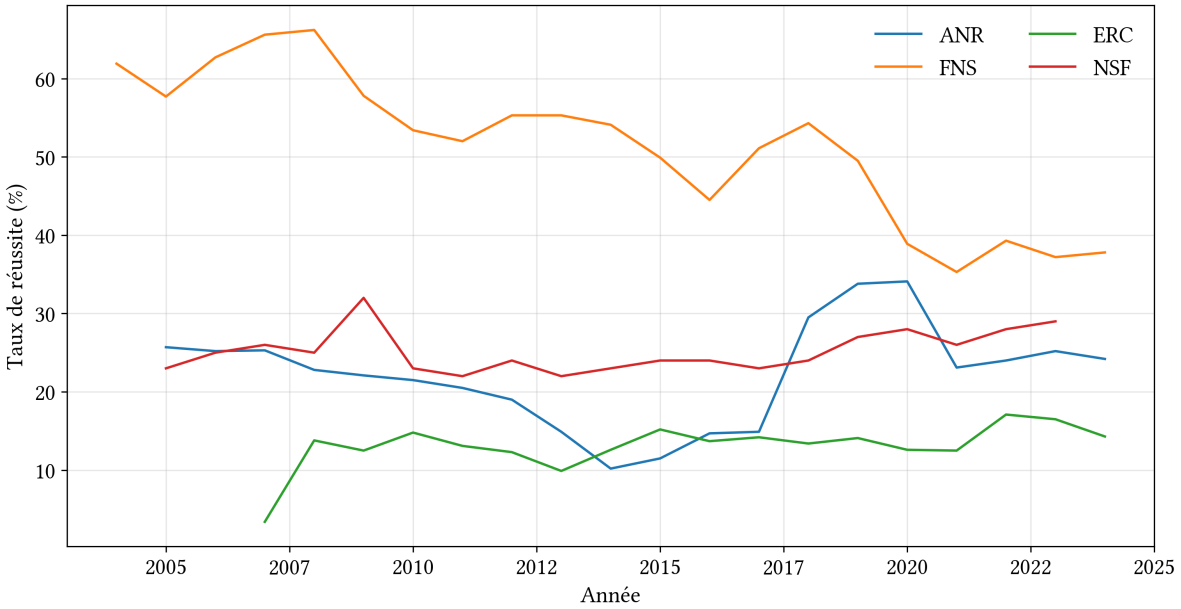

Figure 13 Success rates of projects at major funding agencies: Swiss National Science Foundation, National Research Agency, European Research Council, and National Science Foundation. Source: SNSF, annual activity reports of the ANR, dashboard.tech.ec.europa.eu, and NSF merit review reports.

The Swiss National Science Foundation has long been an exception, with an acceptance rate above 60%. In contrast, the European Union maintained a low success threshold (below 15%), which, according to the European Research Council, was a guarantee of quality. In the United States and France, criticisms regarding the bureaucratic burden of submission processes and low success rates have been acknowledged, leading to an increase in acceptance rates, now reaching between 25% and 30%.

Funding agencies are an effective means of influencing research directions and imposing themes they consider important. Thus, in 2017, the National Research Agency (ANR) introduced an action plan to combat "gender inequalities"[29]:

> "Gender inequality is a continuing problem in higher education and research, as in other fields, which is why the ANR is contributing to the deployment of a policy to promote equality between sexes and to move scientific culture towards a systematic awareness of the sex and/or gender dimension in research across all scientific fields."

The Swiss National Science Foundation (SNSF) has adopted a similar stance[30]:

> "Gender equality is a key concern of the Swiss National Science Foundation. The SNSF is fully committed to promoting a balanced representation of women and men in different roles and bodies, and in research as a whole.

[29] https://anr.fr/fileadmin/documents/2019/ANR-annual-report-2017.pdf
[30] www.gendercampus.ch

> "The underrepresentation of women in science and research is still a reality in Switzerland. Men are more likely to finish their doctoral thesis and continue as researchers. The share of female professors remains stable but low.
>
> "The underrepresentation of women stands in stark contrast to the law[q] and to the values held by the majority of the Swiss population. The advantages for the economy are also well known—for instance, it has been proven that mixed teams are more productive.
>
> "Diversity and equal opportunities are important quality criteria for research in Switzerland. The principle of gender mainstreaming is an important guideline in this respect. It is an internationally tried-and-tested strategy for establishing gender equality at all levels. In a first step, the social and structural inequalities between men and women are highlighted; subsequently their impact is analysed and, in a final step, the root causes of these inequalities are eliminated. This means that the different parameters determining the lives of men and women need to be factored in from the outset for all decisions, projects and ideas."

Specifically, this equal opportunity policy led in 2019 to the SNSF achieving the same success rate for men and women — see figure 14(a). While men previously had about a 20% higher success rate than women for free research projects, this rate was suddenly equalized to that of women. Notably, in 2019, the success rates across major scientific disciplines (life sciences, mathematics and engineering, humanities) were also brought to the same level (slightly above 30%) — see figure 14(b). Given the significant weight of engineering sciences in funding requests, the uniformization of success rates resulted in decreased funding for engineering sciences and increased funding for the humanities (see figure 10). Another consequence of the funding reform was an increase in the average amount of grants: for the SNSF, the average grant amount rose from 241,000 francs in 2005 to 772,000 francs in 2024—see figure 14(c). European grants awarded by the ERC increased from €1.1 million in 2007 to €2 million in 2024. Therefore, the increase in the average grant amount has more than doubled over approximately twenty years.

3.7 University Demographics

The new university has led to notable changes in the composition of the student and faculty bodies, as well as in the number of personnel involved in the effective functioning of universities (which includes members of the administration, as well as technical and administrative staff).

The expansion of higher education observed after World War II (see figure 1) continued after 2000, but with contrasting trends across different countries:

- In the United States, there was a significant increase between 2000 and 2010, followed by a sharp decline in the number of students.
- In France, there was stagnation between 2000 and 2010, followed by an increase in the number of students, primarily in private institutions.
- In Switzerland and Germany, there has been a continuous increase in the number of students.

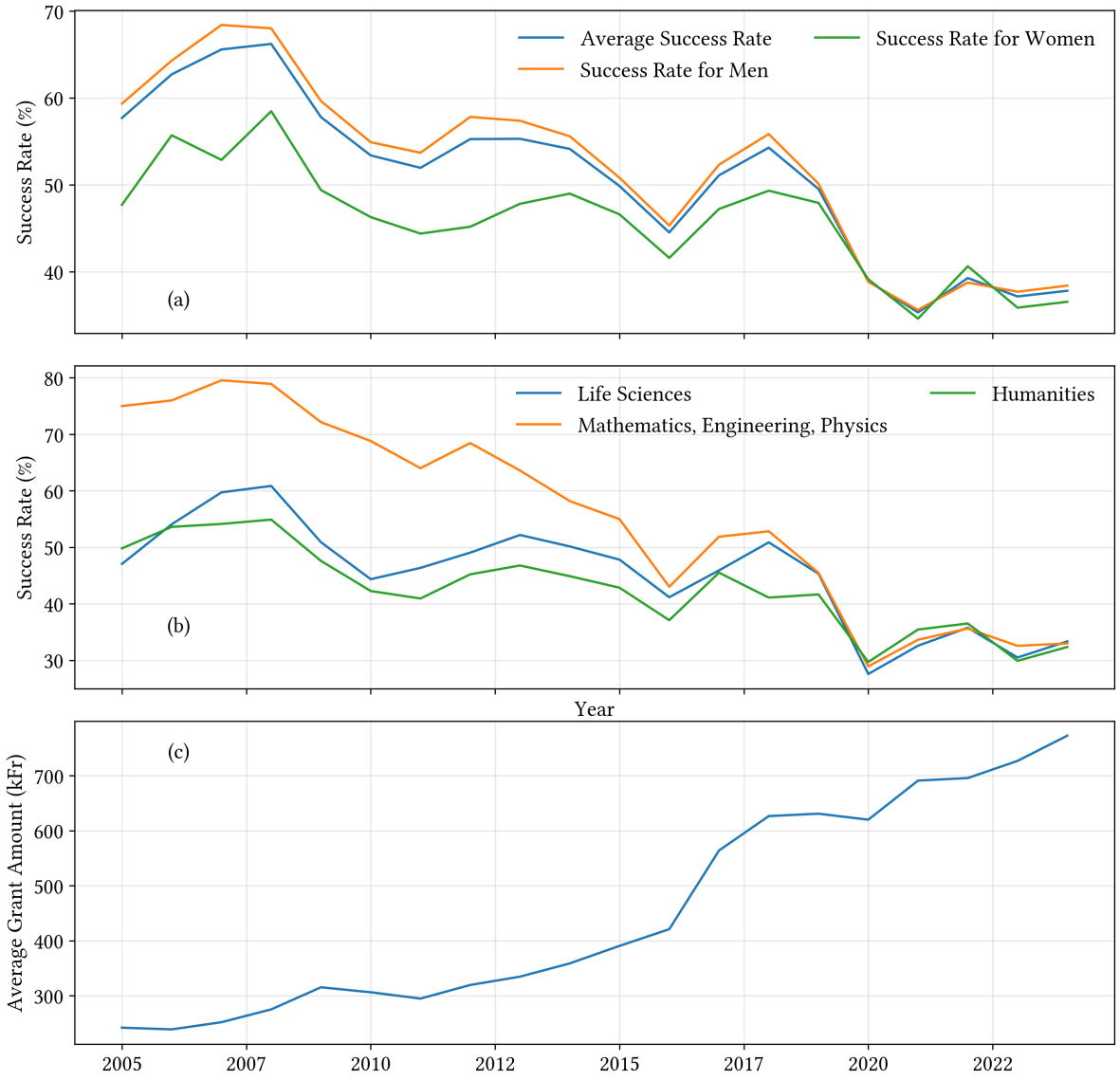

Figure 14 (a) Success rates of free project submissions to the Swiss National Science Foundation (SNSF) for men and women; source: SNSF. (b) Success rates by discipline; source: SNSF. (c) Average grant amounts for free projects.

This expansion has been accompanied by:

- The feminization of the student body. Once a minority in 1980, accounting for 32% of students in Swiss higher education institutions, women became the majority by 2024 with 52% of the total student population. This average, however, poorly reflects strong disparities. For instance, at EPFL, although the number of female students has continuously increased since 1980, women are still a minority, constituting 32% of the total in 2024—up from 10% in 1980, see figure 16. In law or medical faculties of other Swiss universities, they are in fact the major-

ity. In the United States, the percentage of female students[31] rose from 29% in 1977 to 47% in 2019.

- Increased international mobility among students. The number of foreign students in Swiss universities increased from 19% to 35% between 1990 and 2024 (see figure 15). For EPFL specifically, the proportion of foreign students rose from 30% to 64% during the same period (see Figure 16). In the United States, international students (non-permanent residents)[32] represent about 35% of master's and doctoral degrees in science and engineering[33]. In comparison, 12% of higher education students in France in 2025 are foreign[34] and 11% in Germany[35].
- A decline in educational standards across most OECD countries[36]. This decline over the past decade is observable at both secondary – through PISA surveys – and tertiary levels – through OECD's *Survey of Adult Skills*[37]. The decline is particularly notable in the United States; the OECD survey reveals that 20% of bachelor's degree graduates lacked sufficient skills in reading, writing, and arithmetic[38], and one-third suffer from deficits in mathematical skills (numeracy). However, it is essential to highlight that, contrary to PISA surveys, which rely on standardized tests conducted regularly since 2000, there is a lack of reliable data on student levels and acquired skills. The grade inflation observed over the past three decades partially obscures the decline in knowledge and skills[39].
- An extension of study duration, with highly variable failure rates depending on the country, overqualification of many graduates in relation to the job market, and disillusionment expressed by both recent graduates and employers.

3.7.1 Increased International Mobility

For a long time, international student mobility was driven by the search for prestige associated with certain elite universities or specific training needs. Nowadays, mobility is often viewed as a key to obtaining a job in the host country. This is especially true in the United States (the most documented country) and Switzerland, although other European countries are also affected, albeit to a lesser extent.

[31] https://ncses.nsf.gov/surveys/graduate-students-postdoctorates-s-e

[32] https://ncses.nsf.gov/pubs/nsb20243/talent-u-s-and-global-stem-education-and-labor-force

[33] The category *science and engineering* (S&E) includes: agricultural and natural resources sciences, biological and biomedical sciences, computer and information sciences, engineering, geosciences, atmospheric and ocean sciences, mathematics and statistics, multidisciplinary and interdisciplinary sciences, physical sciences, psychology, and social sciences according to the current nomenclature used in the U.S. Therefore, psychology and computer science are classified under *science*, while mechanical engineering falls under *engineering*; health professions are classified as *science* except at the doctoral level, where they are considered *S&E related*. Comparisons with other countries are complicated due to the differences in each system. Source: https://ncses.nsf.gov/pubs/nsb202332/glossary

[34] https://op.europa.eu/webpub/eac/education-and-training-monitor/fr/country-reports/france.html

[35] https://op.europa.eu/webpub/eac/education-and-training-monitor/en/country-reports/germany.html

[36] With some exceptions like Finland or Japan.

[37] https://www.oecd.org/fr/publications/les-adultes-possedent-ils-les-competences-necessaires-pour-s-epanouir-dans-un-monde-en-mutation_e8d52c02-fr.html

[38] https://www.opencampus.org/2021/06/10/a-troubling-lack-of-skills-in-literacy-and-numeracy/

[39] https://www.ed.gov/about/homeroom-blog/addressing-grade-inflation-collective-action-problem

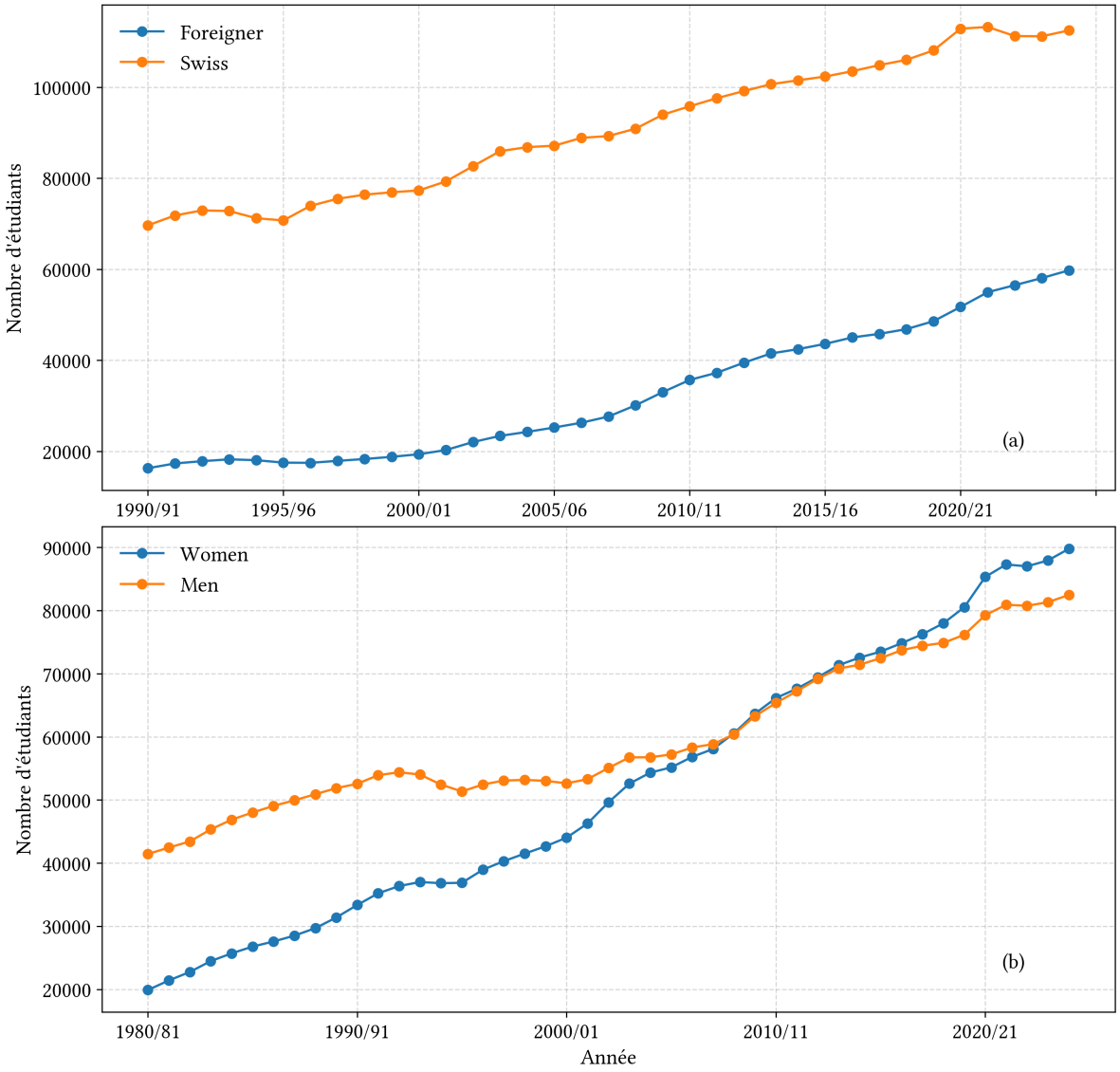

Figure 15 Evolution in the number of students in Swiss universities since 1990. (a) Trends by nationality. (b) Trends by sex.

In the United States, foreigners now comprise the majority of graduates in critical technology sectors. For instance, in mathematics and computer science[40], 47% of master's degree graduates working in the U.S. are from abroad, and this rises to 58% for those with doctoral degrees (compared to 37% and 43% for the overall "science and engineering" category).

Certain economic and academic circles in the U.S. perpetuate the myth of a shortage of qualified labor[41] (the same narrative can be found in Switzerland), which is contradicted by facts:

- On one hand, a labor shortage would have led to increased wages and prices, which is not the

[40] https://www.axios.com/2024/03/13/us-workforce-foreign-born-stem-research
[41] https://www.fwd.us/news/stem-immigrants/

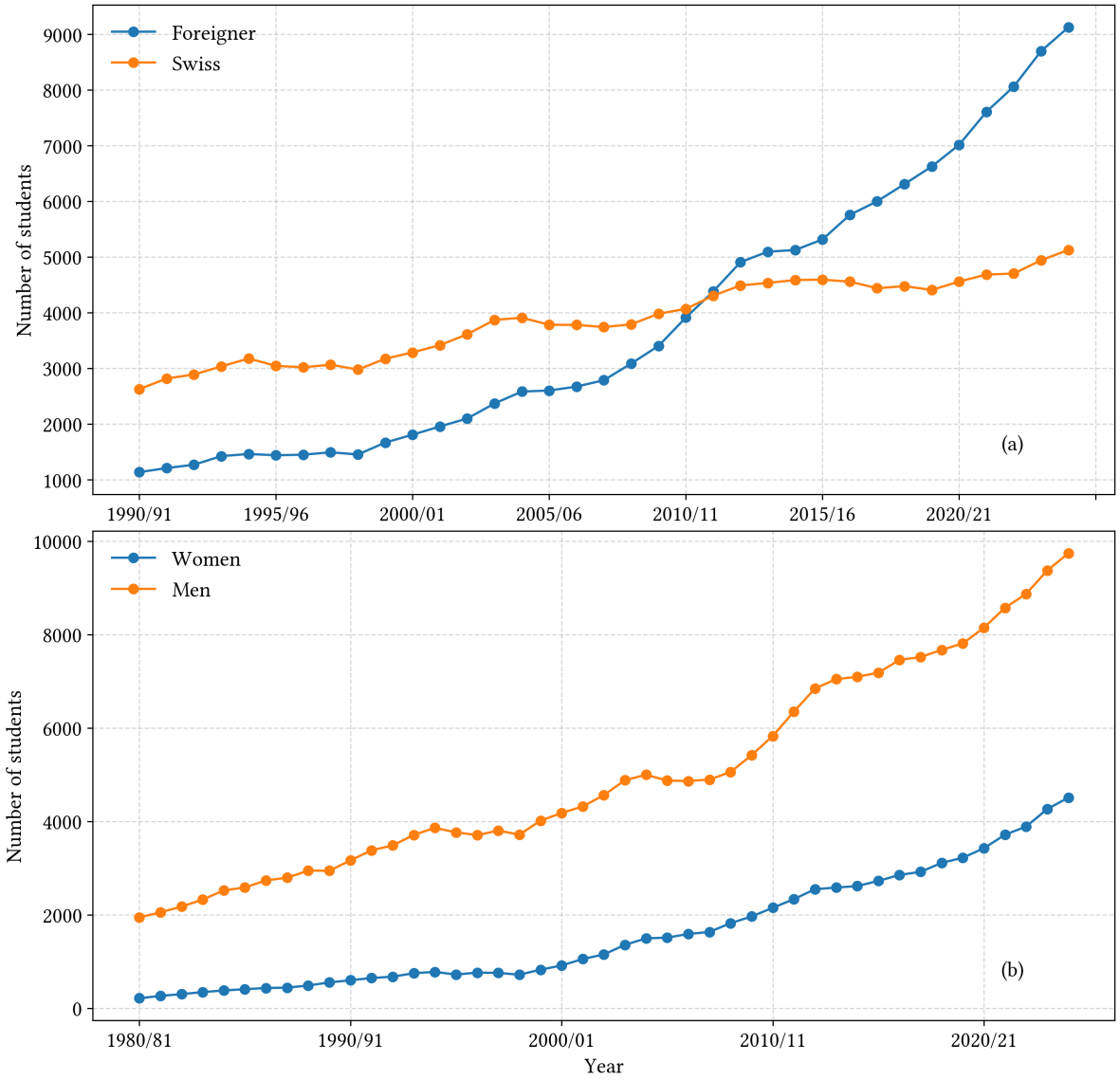

Figure 16 Evolution in the number of students at the École Polytechnique Fédérale de Lausanne since 1990. (a) Trends by nationality. (b) Trends by sex.

case.

- On the other hand, it is the relatively low wages in STEM[42] fields compared to other professions (business management, law, commerce, etc.) that deter U.S. workers with STEM degrees from seeking employment in this sector: only 28% of STEM graduates work in this field[43].

The current H-1B visa system allows large U.S. companies to pay foreign workers less[44], turning them

[42] An acronym for "science, technology, engineering, and mathematics"

[43] https://www.census.gov/library/stories/2021/06/does-majoring-in-stem-lead-to-stem-job-after-graduation.html

[44] https://www.epi.org/publication/h-1b-visas-and-prevailing-wage-levels/

into a mass of compliant and disposable labor, as revealed by Professor John D. Skrentny's research[45] (University of California San Diego). The wage gaps between foreign and native workers range from 17% to 34%[46].

In the United States, there is also a decline in scientific vocations within the academic sector: at the postdoctoral level, the number of U.S. citizens or permanent residents has decreased by 6.5% between 2018 and 2023, dropping from 45% to 42% of the total postdoc population[47]. The field of life sciences is particularly affected by this disinterest (in favor of industry)[48]. The challenges of a scientific career (forced mobility, stretched family ties, couple life, lower salaries than in the private sector, etc.) also deter foreign students from pursuing certain positions.

3.7.2 Extension of Study Duration

In recent decades, there has been a significant increase in the duration of studies:

- In the job market, a university degree is an asset to stand out from competitors, leading to an increasing number of students in universities. Consequently, this has resulted in a devaluation of the degree when the number of graduates surpasses a certain threshold.
- There is a decline in academic standards in many Western countries, resulting in a dilution of essential skills content and an extension of study duration. For example, in the Canton of Vaud, compulsory schooling duration has been increased from 10 to 11 years[49].
- The "knowledge society" requires more well-trained individuals, encouraging further studies, especially in Western countries where public higher education is relatively inexpensive.
- The failure rate in exams has increased, and students are taking longer to graduate. This phenomenon is multifactorial (Bound *et al.*, 2012).
- Some students must work alongside their studies to finance their education, extending the duration of their studies. Others take breaks during their education to pursue other activities. Additionally, some change their field of study due to failure or dissatisfaction with their initial choice.

On average, in OECD countries, only 43% of students enrolled in bachelor's programs graduate within the allotted time (3 or 4 years depending on the country). This rate rises to:

- 59% when allowing for an additional year.
- 70% three years after the theoretical duration of the bachelor's program[50].

[45] https://www.latimes.com/opinion/story/2024-01-09/science-jobs-technology-stem-majors
[46] https://www.epi.org/press/a-majority-of-migrant-workers-employed-with-h-1b-visas-are-paid-below-median-wages-large-tech-firms-including-amazon-google-and-microsoft-use-visa-program-to-underpay-workers/
[47] https://ncses.nsf.gov/pubs/nsf24320
[48] https://www.science.org/content/article/fewer-u-s-scientists-are-pursuing-postdoc-positions-new-data-show
[49] https://www.rts.ch/info/regions/vaud/2024/article/les-eleves-vaudois-feront-leur-gymnase-en-quatre-ans-a-partir-de-2032-28427090.html
[50] https://www.oecd.org/en/publications/education-at-a-glance-2025_1c0d9c79-en/full-report/who-is-expected-to-complete-tertiary-education_a1099e2e.html

This also implies that a significant number of students leave university without a degree.

The phenomenon is particularly pronounced in the United States, where 39% of students drop out of college without obtaining a diploma[51]; this massive failure has profound repercussions on salary inequalities later since a degree largely determines salaries in salaried jobs (McCall, 2022). The causes of this extension of studies are varied:

- Insufficient preparation of students. At EPFL[52], the failure rate after the first year is on average 30% for students with a Swiss maturity (thus admitted without selection to EPFL), and it drops to 9% for students with a Swiss maturity and the "Physics and Applications of Mathematics" option (maturity with an enhanced mathematics program).
- Inadequate student support. One consequence of the massification is that the average number of students per professor has significantly increased. In Switzerland[53], there were 41 students per higher education professor in 1997 compared to 62 in 2024.
- The cost of education. The rise in these costs forces some students to work alongside their studies to finance their education. The financial burden of studies varies greatly from one country to another:
  - This phenomenon is particularly significant in the United States, where the high cost of education (15 k$ to 30 k$ per year for public universities, 50 k$ to 80 k$per year for private ones) leads many students to undertake part-time studies.
  - In Switzerland[54], tuition fees are generally below 2k CHF/year (except for institutions like the École hôtelière de Lausanne, with fees exceeding 33k CHF/year), representing a minimal cost compared to the average cost of a student borne by taxpayers.[55]
- The level being too high for some students. In 2016, EPFL introduced remedial courses in mathematics and physics, which helped to reduce the dropout rate and better redirect students toward a more suitable bachelor's program: ultimately, 58% of first-year students graduate from EPFL within eight years, and 30% have redirected to another higher education institution. Only 8% have definitively left higher education.

3.7.3 Disillusionments

In many countries, there is an oversupply of graduates who are struggling to find their place in the job market. Consequently, these graduates end up accepting jobs for which they are overqualified based on their academic credentials. On average, within the OECD[56], there is a 12% salary gap between

[51] https://educationdata.org/college-dropout-rates

[52] https://www.epfl.ch/about/data/fr/abandonner-pour-mieux-se-reorienter-les-parcours-detudes-apres-lepfl/

[53] https://www.bfs.admin.ch/asset/fr/34248604

[54] https://www.swissuniversities.ch/fr/themes/enseignement-et-etudes/informations-etudes/taxes-detudes/taxes-detudes-hes

[55] When calculating this average cost as the ratio between university expenses and the total number of students, it amounts to 34k CHF per year per student in 2024. This figure may vary depending on how this average cost is defined, for example, by separating operational, educational, and research expenses.

[56] https://www.oecd.org/fr/publications/les-adultes-possedent-ils-les-competences-necessaires-pour-s-epanouir-dans-un-monde-en-mutation_e8d52c02-fr.html

what graduates earn and what they expect based on their degrees.

Disillusionment is not limited to graduates alone. In the United States, 40% of employers believe that higher education institutions do not adequately prepare students for careers in their fields[57]:

- 86% of employers feel that young graduates lack soft skills (i.e., oral communication, flexibility, critical thinking).
- There can be significant gaps between the immediate needs expressed by companies (e.g., in artificial intelligence) and the training offered by universities.
- Employers now prefer to hire young graduates based on their actual abilities rather than their formal qualifications. The value of the degree has diminished.
- Collaboration between the private sector and academia remains limited, while at the same time universities cannot provide customized training due to the diverse needs of businesses.

From the perspective of American students, there is also strong criticism regarding the relevance of study content[58]:

- 77% of recent graduates claim to have learned more in six months on the job than in four years of university studies.
- 89% of companies actively avoid hiring young graduates.
- Human resources managers believe they would save over $4,500 in training costs if new employees arrived better prepared.

However, it is far from certain that the situation is worse today than in the past. Graduates have always tended to feel that some of their courses were of no use, and companies still wish to reduce the costs of internal training.

3.7.4 Modification of University Personnel

University personnel has undergone significant changes with the reform of the university system. I will focus here on the case of EPFL, which is representative of what is occurring in Swiss higher education institutions. Figure ?? illustrates the evolution of the number of professors, management staff, administrative personnel, technical staff, as well as intermediate personnel, including assistants (PhD students) and research collaborators. The change initiated in 2000 with the appointment of President Aebischer is clearly visible. Table 2 allows for an assessment of the growth rates of the different categories of personnel over the two decades from 1980 to 1999 and during the period from 2000 to 2024.

The growth in the number of students has been significant since 1980, particularly since 2000. This increase in the student population is primarily driven by the influx of international students, whose numbers have grown by nearly 7% per year between 2000 and 2024, whereas the number of Swiss students has risen by less than 2%. This increase in student numbers is accompanied by a growth in the number of professors, but at a much slower pace: prior to 2000, both categories grew annually

[57] https://www.testgorilla.com/blog/entry-level-talent-pipelines/
[58] https://workplaceintelligence.com/college-graduate-skills-study/

Table 2 Annual growth rates (in %) of the number of professors, intermediate staff, technical and administrative personnel, and the number of students.

Category	1980–1999	2000–2024
Professors	2.1	3.4
Intermediate staff	6.2	3.2
Technical and administrative personnel	0.5	4.0
Students		
– Total	2.5	4.2
– wiss students	1.9	1.8
– Foreign students	3.9	6.7

at a rate of about 2%, but after 2000, the number of students has increased far more rapidly than the number of professors.

The disparity is even more pronounced with intermediate staff: before 2000, the number of scientific collaborators and assistants grew at a rate of about 6% per year. This indicates that research teams surrounding professors were expanding and included researchers. The reform at EPFL led to a significant reduction in the size of research teams, resulting in a decline in the growth rate of this category to 3.2% (the same rate as that of professors).

The bureaucratic apparatus has increased the most: while it was roughly constant during the period from 1980 to 1999, it has grown at a rate of 4% since 2000 (implying a doubling in size over 18 years). As the size of laboratories has been reduced, it is primarily the central administration that has been significantly strengthened since 2000.

Two other notable characteristics in the evolution of personnel at EPFL (see Figure 18) are:

- the highly cosmopolitan nature of the staff;
- the feminization of the faculty.

In a few decades, there has been a reversal in the composition of the staff. Foreigners represented:

- 24% of the staff in 1980;
- 62% of the staff in 2024.

Over the decade, we observe stagnation in the number of Swiss nationals, while the number of foreigners continues to grow.

In 1980, EPFL employed 116 professors, and there were no female professors. By 2024, women accounted for 25% of the faculty. A drastic shift in recruitment policy is evident from 2014 onwards: from that date, the number of male professors has decreased by 3% per year, while the number of female professors has increased by 8% (resulting in a doubling of the number of female professors in nine years).

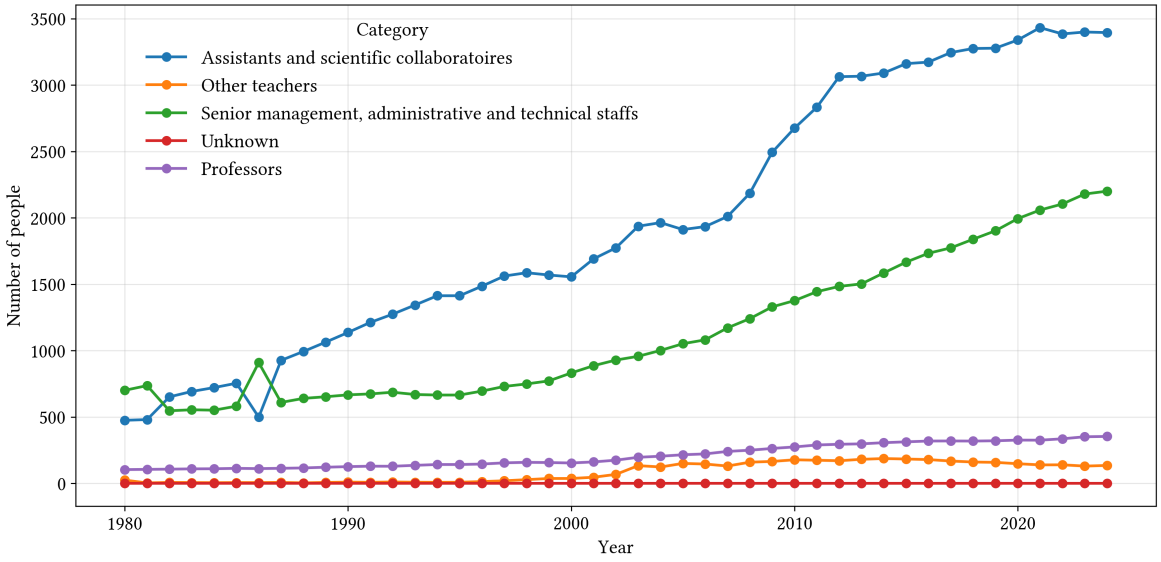

Figure 17 Evolution of the number of positions (in full-time equivalents) at EPFL by category since 1980. Source: OFS.

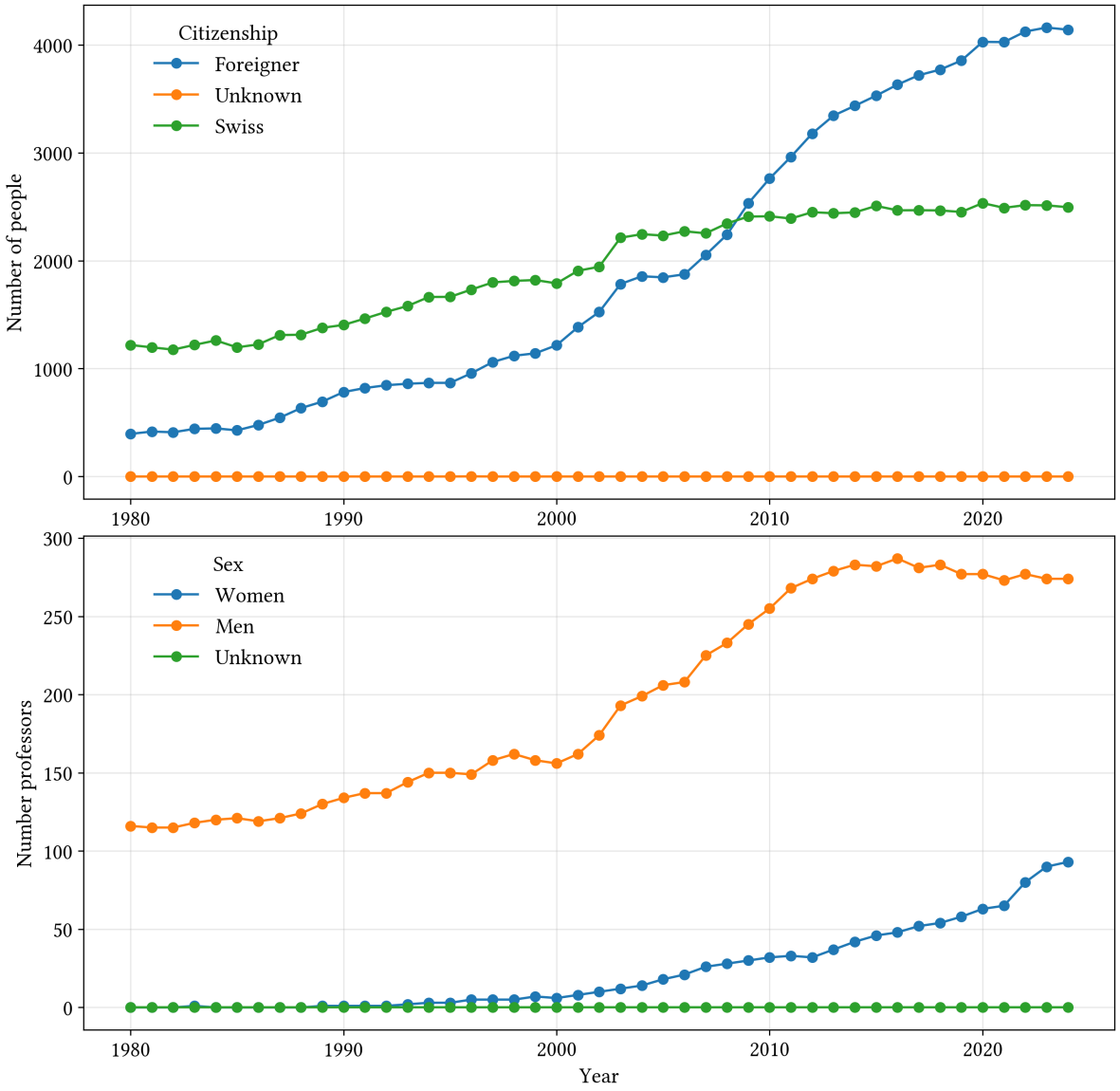

Figure 18 (a) Evolution of EPFL personnel according to nationality. (b) Evolution of the number of EPFL professors by gender. Source: OFS.

3.8 Public and Private Research

In most Western countries, governments have implemented public policies to support research, particularly aiming for the goal of 3% of Gross Domestic Product dedicated to research, as recommended by the OECD. Historically, the private sector has accounted for the majority of research efforts, but it was believed that the influx of public funding would change this situation. This has not been the case, except in Switzerland.

In Switzerland, the private sector contributes to nearly three-quarters of the research effort (see figure 19). There has been a slight decrease from 1980 to 2023, with the private sector's share dropping from 74% to 69%. This decline is primarily due to the rapid increase in public research funding over the past fifteen years, which has outpaced private funding growth.

In the United States, the opposite trend is observed: the private sector's share of research effort has risen from just under 70% to nearly 80%. A similar, albeit less pronounced, trend is apparent for the OECD average, with the relative share of private research expenditures increasing by approximately 10 percentage points over 15 years.

The European Union ranks the lowest among industrialized countries regarding private investment in research, with the private sector representing only 65% of total research expenditures, showing little change over the past two decades. The proactive policies of governments and the ERC have not altered the relative weight of the public and private research sectors.

China shows the most notable change: the private sector accounted for 40% of research expenditures in 1990, compared to 77% in 2023, representing almost a twofold increase over thirty years.

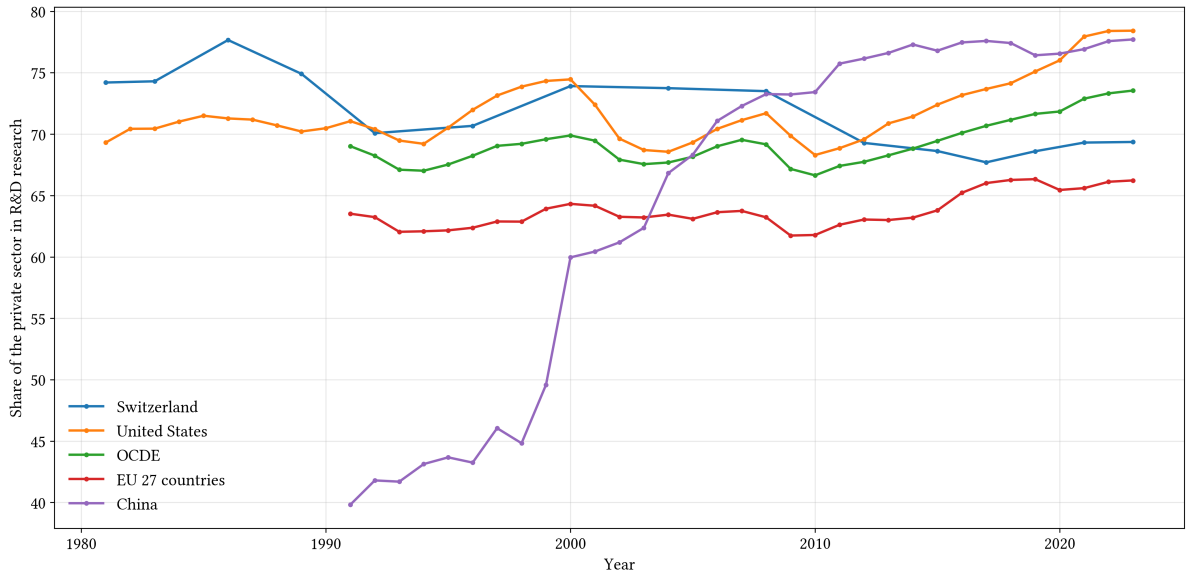

Figure 19 Trends in the share represented by private research expenditures compared to total research expenditures for Switzerland, the United States, China, and the averages for the OECD and the European Union with 27 countries. Source: OECD.

4 Assessment of the New Policy

4.1 Economic Assessment

Switzerland ranks among the top performers in the OECD, dedicating more than 3% of its Gross Domestic Product (GDP) to research and development, thereby adhering to OECD recommendations. In 2021, it stood at the fourth position among countries making the most financial efforts to support the research sector[59]. Figure 20 illustrates that over the past thirty years, Switzerland has made a consistent effort by investing an increasing share of its produced wealth in research and development. This rate is comparable to that of the United States and is 50% higher than the average rate in the European Union.

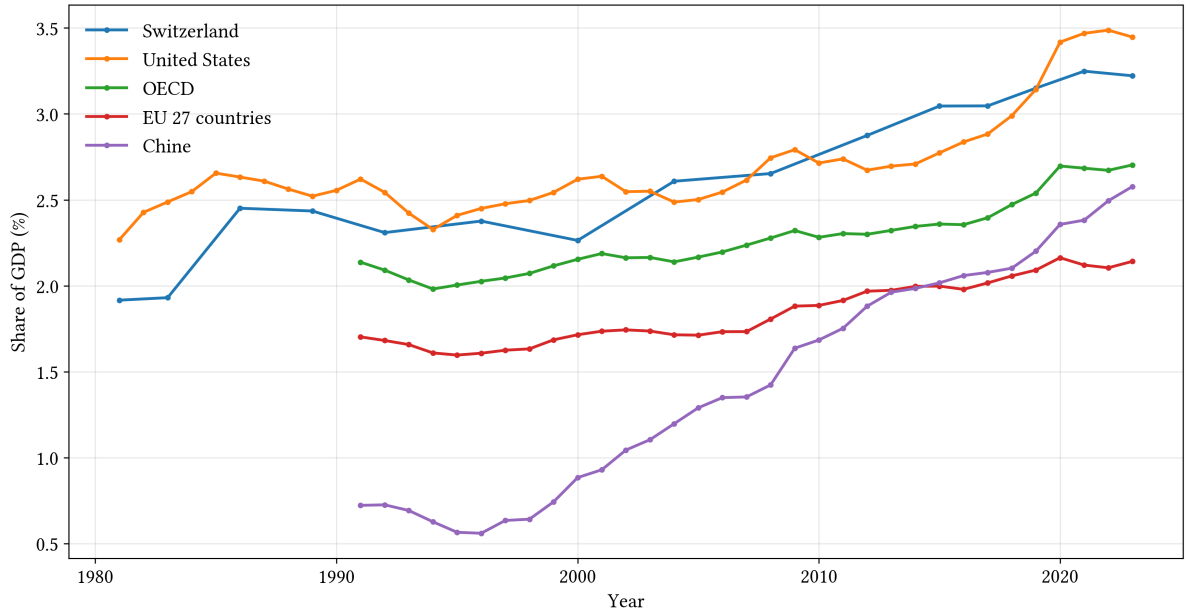

Figure 20 Evolution of the share of produced wealth allocated to research. Source: OECD.

It is worth noting (see § 3.8) that Switzerland distinguishes itself from other countries due to the extent of federal financial support for research: private sector research and development accounted for three-quarters of the national research effort in 1981, but now it represents only two-thirds. Public spending has grown significantly more in Switzerland than private spending on research and development. In contrast, it is noted that since 2010, private research has surged in several major industrialized countries outside the European Union: in China and the United States, the private sector represents nearly 80% of research efforts.

To measure research performance, several criteria can be considered, such as the number of patents, articles, or the volume of high value-added exports:

- I am referring to triadic patents, which are patents filed with the United States, European,

[59] Switzerland is ranked behind Israel (5.6%), South Korea (4.9%), and the United States (3.5%).

and Japanese offices[60]. In 2022, Switzerland filed 1,601 applications, or 182 patents per million inhabitants, far ahead of Japan (131) and South Korea (82), and well ahead of the United States (45) and the European Union (26).

- A 2017 analysis revealed that Switzerland had a score of 2.9 for highly cited publications (HCP), indicating that it contributes nearly three times more than expected to the top 1% of the most cited articles worldwide[61].
- In 2024, Switzerland exported $89 billion worth of high value-added products (pharmaceuticals, scientific instruments, electronics), with a historical average of $50 billion per year during the period 2007–2024. It ranks fourteenth when comparing absolute export values[62]. This category of products represents 30% of Swiss exports.
- Switzerland is ranked as the most innovative country on the Global Innovation Index established by the World Intellectual Property Organization based on 80 indicators related to the socio-political environment, educational system, infrastructure, and knowledge creation[63]. With a score of 66, it significantly outperforms the United States (61.7). It has held the top position since the index was created in 2011.

We can examine whether the reform in higher education and research has impacted economic growth, as this was the primary objective of the reforms. Let's look at the GDP growth rates over different periods:

- The growth rate during the thirty glorious years was 3.7% per year (1951–1971).
- In the four decades that followed (1972–2011), it dropped to 2.2% per year.
- In the recent period (2012–2024), it continued to decline (hovering around an average of 0.86%).

International comparisons show that over the last decade, Switzerland has performed worse than its neighbors (1.1% for the European Union and 1.5% for the United States). According to a study by Raiffeisen Bank[64], Swiss economic growth is attributable 76% to population increase, which is driven by immigration. This means that other factors have contributed to an average growth of only 0.2% per year in Switzerland, among which research and development account for a mere 0.02 percentage points of growth[65]; based on these figures, one can assess the validity of the statement made by the president of the SNSF, who wrote in Le Temps[66] that the proposed 10% cut in the SNSF budget announced by the federal government (an annual reduction of around 130 million francs) would cost Switzerland 0.3 percentage points of GDP.

[60] https://www.bfs.admin.ch/bfs/rm/home/statisticas/catalogs-bancas-datas/infograficas.assetdetail.33948391.html
[61] https://www.nature.com/nature-index/news/the-secrets-of-switzerlands-surprisingly-high-citations-success
[62] https://www.theglobaleconomy.com/Switzerland/High_tech_exports
[63] https://www.wipo.int/gii-ranking/en/switzerland
[64] https://www.raiffeisen.ch/rch/fr/connaissances/themes-entreprise/pole-de-recherche-et-place-economique-suisse/croissance-economique-en-suisse.html
[65] In other words, according to Raiffeisen Bank, research and innovation represent 2.3% of average Swiss growth. Since the effects of technological innovation take time to manifest, it remains challenging to precisely evaluate the cause-and-effect relationship between R&D investment and GDP growth.
[66] https://www.letemps.ch/opinions/investir-dans-la-recherche-scientifique-est-dans-l-interet-de-notre-pays

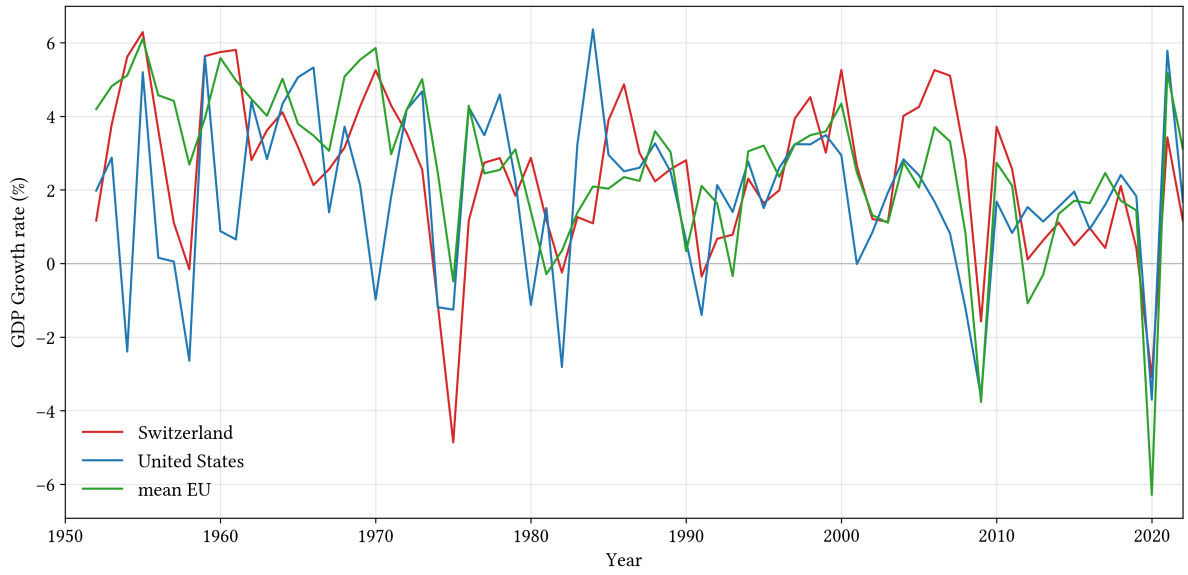

Figure 21 Evolution of the GDP growth rate. Source: Maddison historical statistics.

From an economic perspective, the reform promoted by the OECD has not lived up to its promises. Economic growth is driven by many processes beyond just financial investment in research. Naturally, this conclusion requires nuance. The time series shown in figure 21 reveals significant fluctuations in GDP growth due to international events that have profoundly impacted the global economy:

- 1973–1974 and 1979–1980: the first and second oil shocks, which led to high inflation and economic stagnation.
- 1990-1991: the early 1990s recession (partly linked to the Gulf War and rising oil prices), which caused a severe real estate and banking crisis in Switzerland during the 1990s.
- 2001: the burst of the internet bubble.
- 2008-2009: the subprime mortgage crisis and global financial crisis (with two major Swiss banks heavily exposed).
- 2020: the Covid crisis.

Several other macroeconomic factors at the Swiss level also explain Switzerland's lackluster economic growth since 2010:

- The euro crisis in 2011 led to a significant influx of capital into Switzerland, forcing the Swiss National Bank to set a minimum exchange rate of 1.2 CHF/EUR to counteract the appreciation of the franc. In January 2015, the SNB abandoned this minimum rate, and the euro continued its decline.
- The strong franc caused a loss of competitiveness and negatively affected tourism.
- Weak European growth is also dragging Switzerland down (60% of Swiss exports go to the

European Union).

- President Donald Trump initiated a trade war by imposing tariffs. Initially, the U.S. administration planned to raise tariffs to 39%, before reducing them to 15%.[67]

Despite these fluctuations, financial support for research enables Switzerland to maintain its long-term position in a competitive international market.

4.2 Decline

4.2.1 Revolution or Decline?

There is a significant gap between the promise of a third technological revolution and actual breakthroughs in science and technology. Although there is considerable discussion about the digital revolution surrounding artificial intelligence, it is important to note that this is more of an evolution than a revolution. Machine learning and large language models are rooted in the concept of neural networks, which emerged in the 1950s. In this context, one can argue that the paradigm is not new and that the current technology is the result of a gradual evolution of mathematical concepts since the early 1950s, as well as the continuous increase in computing power and storage capacity (Ekundayo & Ezugwu, 2025). Moore's Law—stating that the number of transistors in microprocessors doubles approximately every two years—may also give the impression of infinite progress, but:

- On one hand, we are approaching the physical limits of processor fabrication, and
- On the other hand, the investment required to increase transistor density has been enormous: between 1971 and 2017, the number of researchers dedicated to microprocessor manufacturing increased by a factor of 18 (Bloom *et al.*, 2020).

In reality, the situation does not resemble a revolution, not even an evolution, but rather a scientific decline despite the sensational announcements and some noteworthy successes.

4.2.2 High Production and Decreasing Productivity

The significant investment in research and development has led to a substantial increase in the number of scientific articles and patents, as shown in figures 22(a) and 23(c). Taking Switzerland as an example, the university reform appears to have positively impacted scientific output, which has doubled over 20 years:

- The number of articles increased from just under 3 to 7 articles per 1,000 inhabitants between 2000 and 2025, as illustrated in figure 22(b).
- The number of triadic patents[68] rose from about 125 to 175 per million inhabitants between

[67] https://www.rts.ch/info/economie/2025/article/exportations-suisses-vers-les-usa-rebond-apres-le-choc-des-droits-de-douane-29035137.html

[68] A *triadic* patent is a patent filed with the European Patent Office (EPO), the Japan Patent Office (JPO), and the United States Patent and Trademark Office (USPTO). It represents a class of patents considered to be more innovative than

1995 and 2020, as displayed in figure 23(d).

These two figures reflect Swiss excellence and the seemingly favorable evolution of Swiss scientific output.

However, a closer look at the figures reveals a different story:

- In Switzerland, the number of researchers has more than doubled between 2000 and 2025.
- Regarding publications, researcher productivity increased by 50% between 2000 and 2010 (with an average of 1.2 articles per researcher per year), but has seen a slight decline since 2010. This trend is also evident in other leading research countries, with the exception of China [see figure 22(e)].
- In terms of patents, researcher productivity increased slightly between 2000 and 2005, but has decreased by 30% since 2005, a trend consistent across other countries except for China [see figure 23(c)].
- The number of citations an article receives was about 50 for Switzerland in the early 2000s, but this number has continuously decreased since 2005 [see figure 22(c)]. Naturally, more recent articles are less likely to be cited than older ones. however, when we plot the cumulative sum of citations relative to the cumulative sum of articles to mitigate this temporal effect, the same trend emerges: Swiss articles are cited less than before [see figure 22(d)], and a similar trend is observed for the European Union and the United States.
- The number of citations received by researchers in Switzerland significantly increased in the early 2000s, with a doubling of citations between 1995 and 2008. Since 2008, however, this number has sharply decreased. A similar trend is observed for the European Union and the United States [see figure 22(f)].

4.2.3 What is the degree of innovation?

Researchers have focused on the innovative nature of articles and patents. Park *et al.* (2023) introduced an innovation index called cd (for "consolidating-disruptive"). If an article X (or a patent) is innovative, subsequent works that cite it are less likely to also cite earlier articles predating X. Conversely, if an article Y (or a patent) is viewed as a consolidation of existing knowledge, subsequent works that cite it are more likely to cite earlier articles predating Y as well. The cd index ranges from -1 (pure consolidation) to 1 (total innovation), and it is calculated five years after the publication year of each article (or patent filing). Figure 24 shows that articles and patents are becoming increasingly less innovative, indicating that for several decades, we have relied on the contributions made in the early decades of the 20th century, with little truly new being discovered. This is particularly true in the fields of physics and life sciences.

traditional patents.

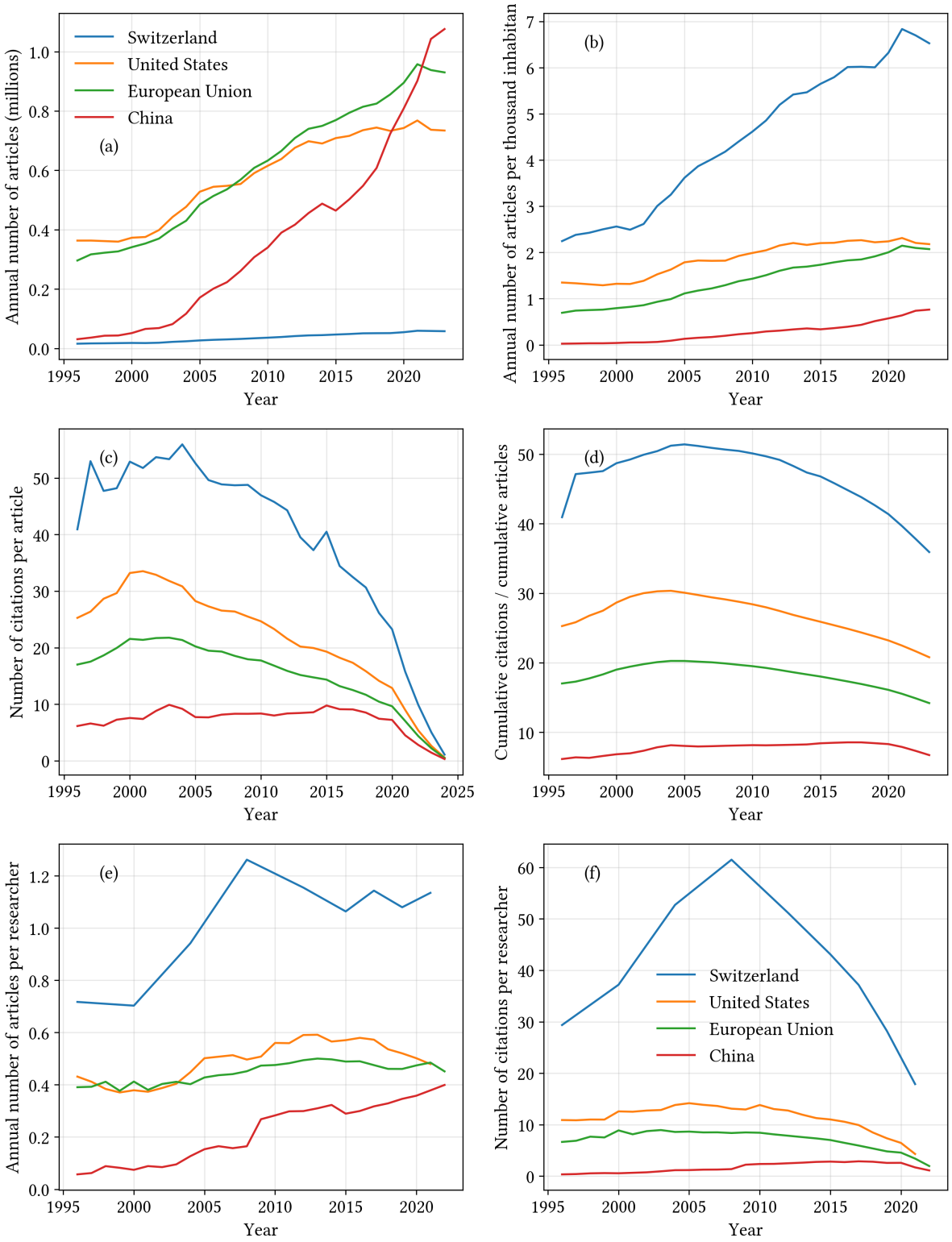

Figure 22 (a) Total number of scientific publications since 1996. (b) Total number relative to the number of researchers. (c) Number of citations per article. (d) Number of citations per researcher. Source: Scimago Journal & Country Rank.

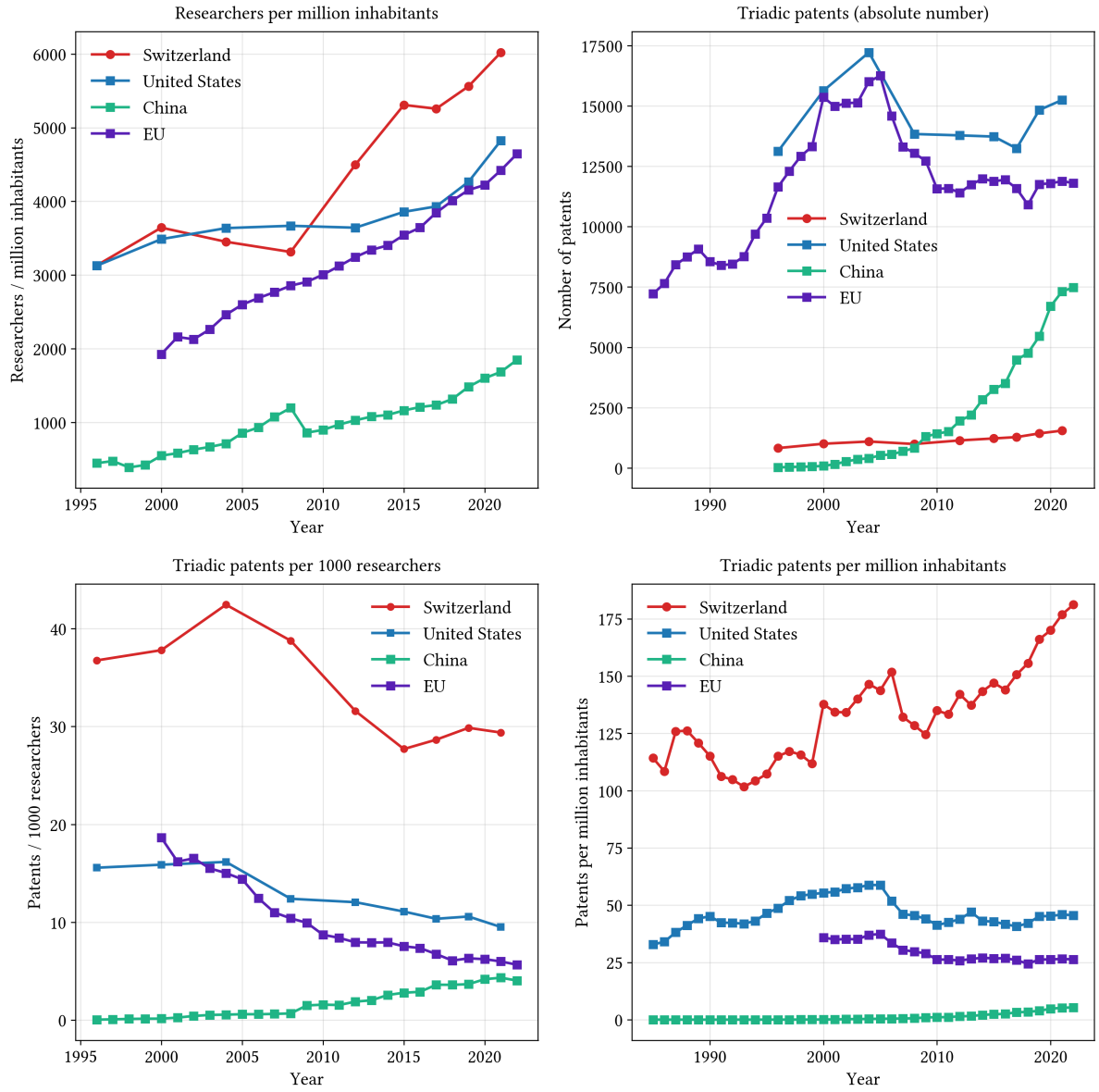

Figure 23 (a) Evolution of the number of researchers per million inhabitants (b) Evolution of the number of triadic patents. (c) Evolution of the number of triadic patents relative to the number of researchers. (d) Evolution of the number of triadic patents per million inhabitants. Source: OECD and World Bank.

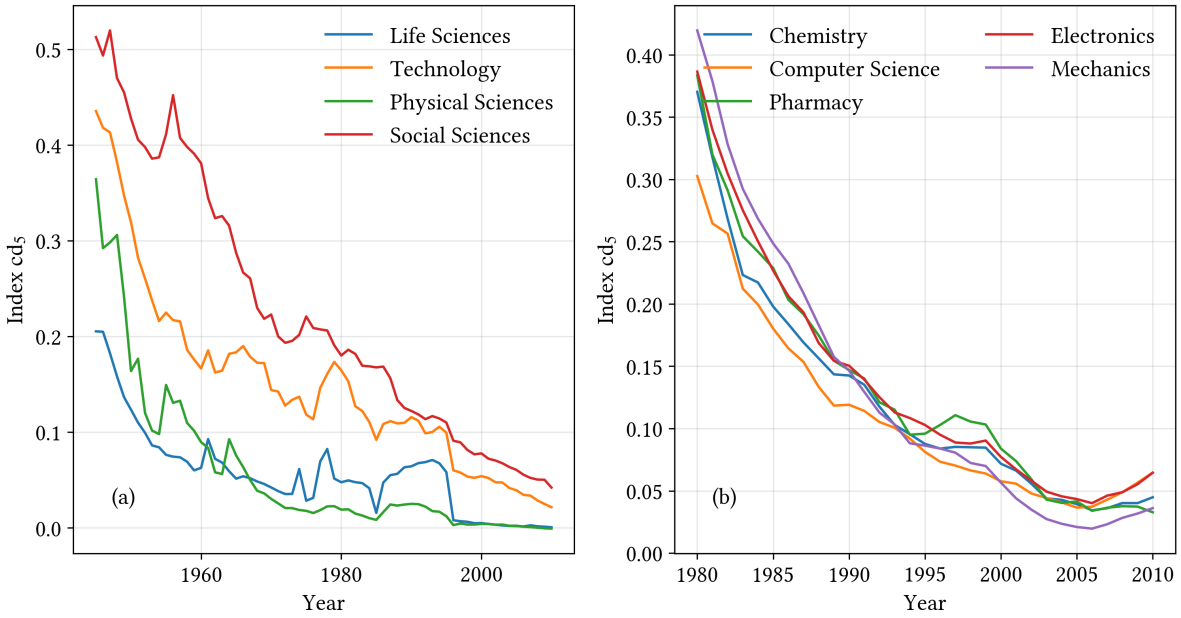

Figure 24 (a) Innovation index cd_5 between 1945 and 2010 for scientific articles. (b) Innovation index cd_5 between 1980 and 2010 for patents. The statistical study analyzed approximately 25 million articles published between 1945 and 2010, as well as four million patents. Source: Park *et al.* (2023).

4.2.4 Reasons for Decline

There are multiple reasons explaining the decline:

- The accumulation of knowledge over recent decades has been immense, and the degree of specialization is increasingly advanced. For any newcomer claiming to make a significant contribution to a scientific discipline, it is essential to first assimilate what has been produced by previous generations. this is referred to as the *burden of knowledge*. A greater degree of specialization implies that, on one hand, it is more challenging for a researcher to make a major contribution to a scientific field (these often represent localized advancements), and on the other hand, collaboration is frequently necessary to tackle issues. Consequently, the likelihood of encountering a solitary genius is diminishing (Simonton, 2013). Two examples:
  - The average age at which a mathematician publishes his first article in a major journal has increased from 28 to 33 years between 1950 and 2014, and
  - The average number of authors has increased from 1 to 2.5 (Brendel & Schweitzer, 2019).

  A similar trend is observed when examining the age at which the Nobel Prize in Physics, Chemistry, or Medicine is awarded and the number of laureates sharing the prize. In the early 20th century, the average age was 50 years, with the youngest laureates (10th percentile) being 37 years old. By 2025, the average age has risen to 74 years, and the youngest laureates are 57 years old. On average, therefore, the age of Nobel Prize recipients increases by two years per decade. This increase illustrates two points:

  - It becomes more difficult to assess the significance of a scientific discovery immediately after the publication of results. Laureates receive their prizes long after the discovery.
  - It is also more challenging to achieve scientific breakthroughs in the early years. Consider that Albert Einstein was 26 years old when he wrote his four major papers (in 1905), including the one on the photoelectric effect, which earned him the Nobel Prize in 1921.

- It is necessary to gather increasingly larger teams to study problems that span multiple disciplines. According to Nicholas Bloom, an economics professor at Stanford[69]:

  > "It's certainly true if you go back one or two hundred years, like when Edison invented the light bulb. It's a massive piece of technology and one guy basically invented it. But while we think of Steve Jobs and the iPhone, it was a team of dozens of people who created the iPhone."

- There is a strong link between technological capability and scientific discovery. Astronomy made a leap at the beginning of the 17th century when the first telescopes allowed for detailed observations of the moon's surface and Jupiter's moons. Nowadays, infrared telescopes can see galaxies hidden by cosmic dust, while X-ray and gamma-ray telescopes detect highly energetic

[69] https://www.gsb.stanford.edu/insights/big-ideas-are-getting-harder-find

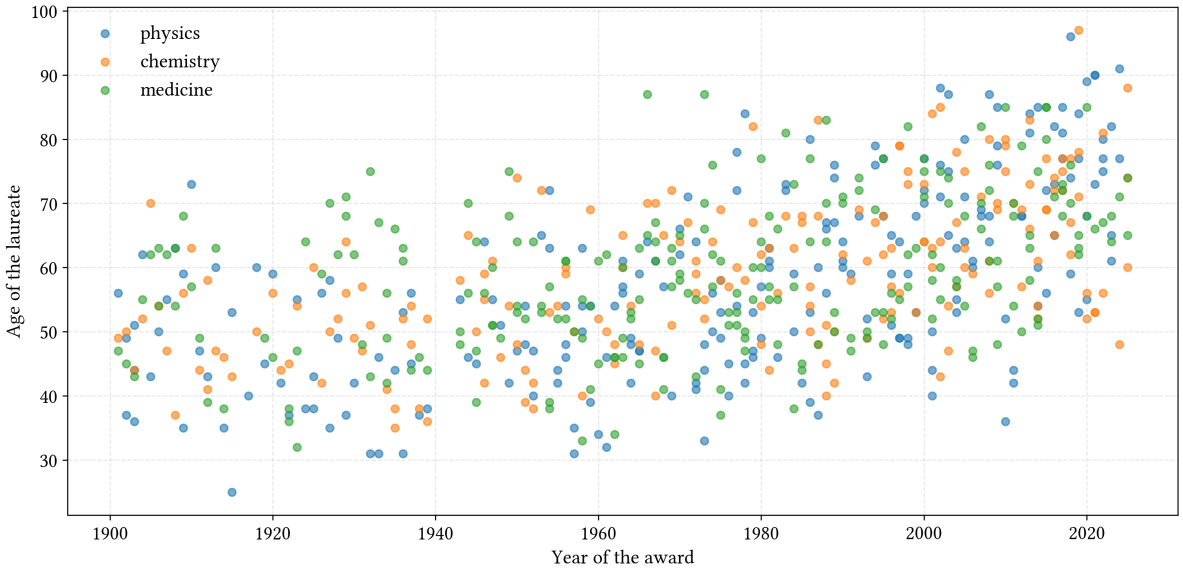

Figure 25 Age of Nobel Prize laureates. Source: Nobel Prize Committee.

particles coming from neutron stars and black holes.

- Research depends on increasingly expensive devices. For example, the underground facility built by the European Organization for Nuclear Research (CERN) straddling France and Switzerland, known as the Large Hadron Collider (LHC), cost $8.9 billion in 2008[70].
- In 2012, Scannel *et al.* (2012) observed an inexorable decline in the productivity of the pharmaceutical industry (see figure 26): with one billion dollars in 1950 (in constant 2023 dollars), the industry produced between 20 and 40 new drugs each year. By 2020, it produced only three new drugs for the same amount. According to Scannel *et al.* (2012), this decline can be attributed to three main factors:

    1. As drugs become more effective, increasingly greater resources must be deployed to surpass the effectiveness of existing drugs.
    2. Health agencies have instituted increasingly strict regulations to ensure patient safety.
    3. Companies must allocate a larger portion of their personnel to administrative tasks (bureaucracy, advertising, legal services).

    It should be added that:

    1. Pharmaceutical research suffers from a lack of rigor in protocols (Harris, 2017).
    2. Results suffer from low reproducibility (Baker, 2016). According to Ioannidis (2005), 85% of results are not reproducible.
    3. There can be an abundance of articles that make bibliographic analysis difficult. For instance, four months after the onset of the COVID-19 pandemic, Brainard (2020)

[70] https://fr.wikipedia.org/wiki/Grand_collisionneur_de_hadrons

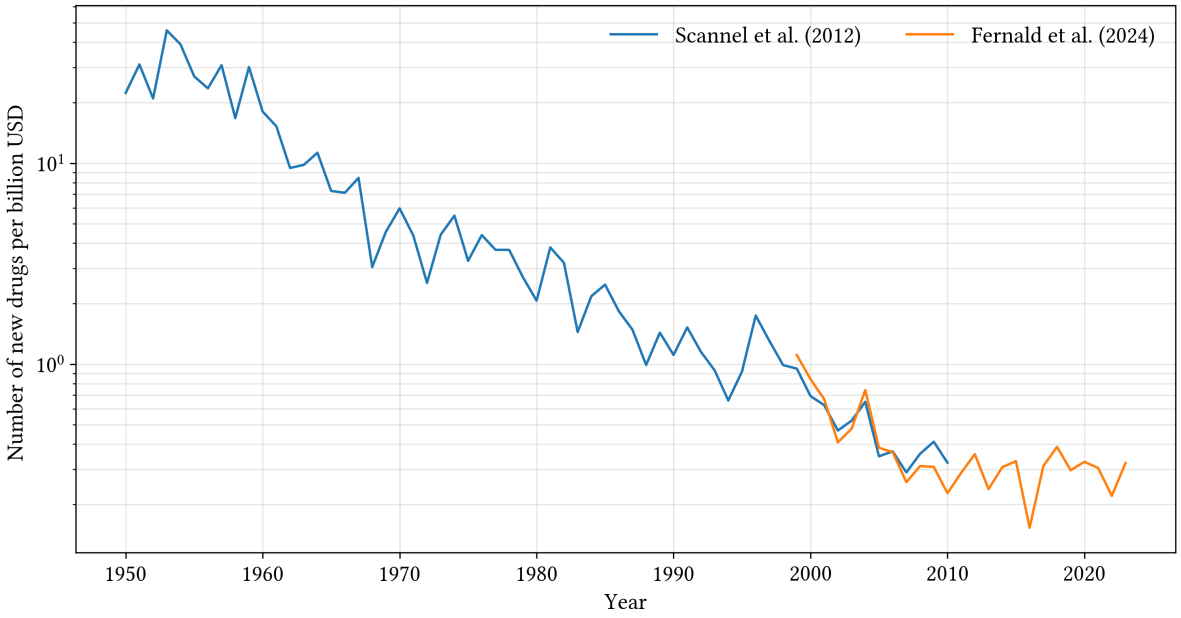

Figure 26 Number of new drugs developed for an investment of one billion dollars (in constant 2023 dollars). Source: (Scannel *et al.*, 2012; Fernald *et al.*, 2024).

counted over 23,000 articles on the topic.

4. Although fraud concerns only a tiny fraction of articles[71], the damage can be enormous[72].

- Scientists are not solely motivated by the glory of discovery or the desire for knowledge. More prosaically, scientists seek money and power. As Paula Stephan wrote (Stephan, 2012, p. 35):

> "Puzzle solving and the recognition awarded to priority are not the only rewards to doing science. Money is also a reward, and scientists are, indeed, interested in money. They want, to quote Stephen Jay Gould, "status, wealth and power, like everyone else." An eminent Harvard scientist said it well when asked by newly appointed Dean Henry Rosovsky the source of scientific inspiration. The reply (which "came without the slightest hesitation") was "money and flattery."

She adds (Stephan, 2012, p. 5):

> "MBAs from a top program have the prospect of earning slightly more than three times the faculty salary—$559,802, to be precise—after they have been out 10 or more years and started their career in banking."

[71] In 2020, the Retraction Watch database reported approximately 22,000 retracted articles (Serghiou *et al.*, 2021).

[72] Two examples. Professor Don Poldermans, a cardiovascular medicine specialist, was dismissed from the Erasmus Medical Center in Rotterdam for falsifying data; according to Graham Cole and Darrel Francis, the number of deaths caused by Professor Poldermans' recommendations (the use of beta-blockers) has led to hundreds of thousands of victims (Cole & Francis, 2014; Vogel, 2014). More recently, Eliezer Masliah, a world expert on neurodegenerative diseases, admitted to manipulating several results (Piller, 2024).

Indigenous students with the highest potential are increasingly moving away from long scientific studies, opting instead for more lucrative and secure careers. In Western countries, positions not filled by native students are occupied by foreign students (see § 3.7.1). On average, in the United States, 43% of PhDs are awarded to foreigners, and this rate rises to 58% in mathematics and computer science and 55% in engineering[73].

- Chance and risk-taking play a significant role in scientific discoveries[74]. With the increasing standardization of the profession and the increasingly homebound nature of research, it is likely that these two favorable factors are in decline. By forcing researchers to publish, they are hindered from investing in riskier paths (Binswanger, 2015; Heckman & Moktan, 2020).
- It is important to remember that research is also an act of creation that requires conducive conditions. These conditions sometimes come together in a specific place and time; for instance, the University of Göttingen has repeatedly served as a hub of innovation, exemplified by the role of David Hilbert in providing a new impetus to mathematics by seeking synergies with new physics[75]. At times, we are struck by the emergence of extraordinarily great scientists in a specific region within a short period, without any simple explanation for this phenomenon. This was the case in Hungary at the beginning of the 20th century[76]. Conversely, certain periods seem to lack great minds. The prominent French mathematician of Ukrainian origin, Alexandre Grothendieck (2023), was very interested in the fertility of ideas in mathematics. He was quite critical of his contemporaries and his time (the 1960s–70s):

  > "It seems that we have already entered a period of desiccation, where this source is not, certainly, drained, but where access to it is condemned by the final verdict of general disdain and by the reprisals of derision."

4.3 The University System and Its Apparatchiks

The university reform has fundamentally transformed the essence of the university. It is important to revisit what the university was like up until the 1980s.

[73] https://ncses.nsf.gov/pubs/nsb20245/foreign-born-stem-workers

[74] The English even coined a word for fortunate accidents that lead to a discovery: *serendipity*. However, it should be noted that chance discoveries require the scientist to be astute enough to recognize the originality of the discovery: "Chance favors only the prepared mind," Pasteur said (Simonton, 2004).

[75] Following in David Hilbert's wake, there is a multitude of great mathematicians and physicists: Hermann Minkowski, Felix Klein, Emmy Noether, Max Born, Hermann Weyl, Ludwig Prandtl, Richard Courant, Werner Heisenberg, etc. The American physicist Robert Oppenheimer earned his doctorate there.

[76] Some notable Hungarian physicists and mathematicians who made significant contributions to science include Theodore von Kármán, Eugene Wigner, John von Neumann, Leó Szilárd, Edward Teller, Dennis Gabor, Paul Erdős, Paul Halmos, John G. Kemeny, George Pólya, Michael Polanyi, Cornelius Lanczos, Peter Lax, etc. Many of them immigrated to the United States and changed their names accordingly. Due to their strong accents and shared background (a small country of 8 million inhabitants in the heart of Europe), they were nicknamed the Martians.

4.3.1 Purpose of the Humboldtian University

The Humboldtian university aimed to educate students by providing them with the theoretical and practical foundations necessary for their future professions. To achieve this, the university relied on professors who were expected to conduct research so that the subjects they taught would align, more or less, with the current state of knowledge. The ideal of the Humboldtian university was the pursuit of truth. This *truth* is not revealed as in religions, but rather emerges from observations or theories and is then tested through experimentation. It does not assert itself automatically; instead, it must be validated over a more or less lengthy process, where scientific publication and peer approval are the two central elements. It is through their publications that scientists gain recognition, and it is this prestige that secures them additional resources to conduct their research (Gingras, 2018).

However, one should not be deceived about what the quest for truth and the pursuit of prestige practically mean in the daily lives of researchers; scientists are not monks driven by a vocation, but human beings whose scientific curiosity may be intertwined with advanced forms of narcissism and a thirst for social recognition, which together produce knowledge.[r] Nonetheless, the university was a special place, dedicated to training and scientific research, and its relevance ensured the success of research in the 19th and 20th centuries[s].

4.3.2 Purpose of the New University

The new university has been transformed into a corporation, led by a president who possesses the powers of a chief executive officer and operates under a market-driven logic. This transformation alters the university's core purpose:

- Its two historical missions, education and research, have been turned into services, which are quantitatively evaluated through ECTS credits (see § 3.3) and publications. The significance of publications is measured using bibliometric indices, and a researcher's reputation fundamentally depends on his output, assessed through the number of articles, the impact factor of the journals in which these articles are published, and the number of citations of his work.
- The university has adopted a third mission: innovation. Research conducted within universities must lead to tangible applications in the form of patents or collaborations with the private sector to develop and market new products intended to boost economic growth.
- The university commits to major causes. It aims to be a catalyst for global transformation. Therefore, it advocates for social justice, equality, diversity, and inclusion on a societal level. Environmentally, it seeks to be virtuous by championing sustainable development and the fight against climate change. Politically, some universities or institutions publicly express support or opposition regarding specific candidates or issues of general policy.

It is noteworthy that while the word "veritas" is included in the motto of some of the most prestigious universities in the United State. If a truth is deemed offensive to a community, it is simply banned. A recent example is provided by an editorial in the journal *Nature Human Behaviour*[t], which asserts that "science must respect the dignity and rights of all humans" (Nature Human Behaviour, 2022); the editors of the journal *Nature Reviews Psychology* are calling for diversifying ci-

tations based on "gender, race, career stage, and geographical location" (Nature Reviews Psychology, 2025). Some learned societies no longer even reference science when stating their missions and values. An example is provided by the venerable *International Glaciology Society* (IGS), established in 1936, whose values displayed on their website[77] are diversity, integrity, innovation, and excellence—terms that could equally apply to any commercial firm; science and the qualities required for research are no longer included in the values of these societies.

4.3.3 The Academic System as an Economic Market

The academic market is organized around a few key players:

- Students act as clients, ordering or benefiting from services that allow them to acquire skills and a diploma, which is essential for accessing the job market. Universities compete for students, which is understandable for private institutions since tuition fees are a vital resource for their survival[78]. This is also true for public institutions, whose overall budget and state funding depend on the total number of students, regardless of their origin.
- Professors, once the soul of the university, have been relegated to the role of executors[u]. Researchers have become simple employees generating knowledge[v]. Educators have become mere transmitters of skills.
- Publishing houses grant access to online journals. They are service providers that charge exorbitant prices for their services:
  - The oldest of them, Elsevier, controls almost 20% of the scientific publishing market[79]; in 2024, it reported a revenue of 3.2 billion francs[80] with an operating profit of 34%, making it one of the most profitable companies in the world.
  - Its main competitor, Springer, reported a revenue of 1.7 billion francs[81] with a profit margin of 28%.

  Universities must pay substantial sums to subscribe to scientific journals and cover publication costs in open access; in 2024, a consortium of French universities signed a contract with Elsevier worth €143 million over four years[82]. Such extraordinary profits are made possible by the free labor of many involved[w] and the fact that universities pay for both publication and access to articles.
- Bureaucrats "govern" (as they put it) science (see § 3.4). For a long time, bureaucracy was limited to a logistical role supporting teaching and research. The head of the bureaucracy was typically a late-career professor who accepted a single mandate, as someone had to devote themselves to the common cause. The president's power barely extended beyond the bureau-

[77] https://www.igsoc.org/about/our-values
[78] https://www.theguardian.com/education/article/2024/may/16/universities-in-england-risk-closure-with-40-per-cent-facing-budget-deficits-report-office-for-students
[79] According to the study by Sebastian Mayoni.
[80] 2024 Activity Report, p. 16.
[81] Springer's press release
[82] https://next.ink/142995/la-recherche-francaise-signe-avec-elsevier-pour-un-montant-de-134-millions-deuros-sur-4-ans/

cratic apparatus, and his salary (or bonus) was not much higher than that of professors. This changed with the new university model. The president is now granted considerable powers regarding recruitment or promotion, financial resource allocation, and the university's development. Great responsibility accompanies high salary[x]; the highest-ranking bureaucrats are the only ones who have seen their salaries increase significantly with university reform. The bureaucracy's role has shifted from supporting professors and researchers to organizing the academic market. There is also a professionalization of senior bureaucratic roles. Professors who attain high positions do not return to their professorships once their term is over; instead, they seek new positions or sometimes transition to large companies where they serve as technical directors or board members (Laillier & Topalov, 2022).

4.3.4 Problems Related to the Commodification of the Academic System

The university has ceased to hold a special position in the organization of a nation (it was supposed to be a public service for the common good), and has instead become a fully-fledged economic actor, operating like any other business that sells goods or services. This transformation of the university raises significant underlying issues:

- Conducting science involves acquiring knowledge about the world around us through study and observation. It is generally agreed that this approach does not necessarily adhere to a commercial or utilitarian logic. Galileo, studying the fall of bodies, had no practical application in mind. There is a substantial danger in blurring the boundary between science—as knowledge—and technoscience—which confers practical utility to this knowledge. When a private company invests in technoscience, it can measure the economic value created. In public research, researchers are not evaluated based on the economic value they contribute to creating, but rather on their production of articles, derivative products (including patents), and funding they have obtained, among other factors. It is difficult, if not impossible, to assess the intrinsic value of a scientific contribution[y]. When metrics are established to supposedly indicate the impact of a researcher's work, they incentivize the researchers to tailor their researches in order to optimize their scores on those metrics [z].
- The academic environment has become a competitive market among universities. In reality, it is a very particular market compared to capitalist markets, which generally have a multitude of buyers and a variety of offers without monopolies. In the modern university, there are a limited number of suppliers (usually one or two research funding agencies per country) and a significant number of demanders. According to economist Mathias Binswanger (University of St. Gallen), the academic market resembles the centralized market of the Soviet Union more than it does the market of liberal economies (Binswanger, 2010, p. 40):

  > "Hence, artificial competitions are being created to make fields such as science, education, or healthcare more efficient. Similar to high-level sports, a constant competition is desired to achieve the best performance. However, this ideal quickly proves to be a naive dream. If "marketless" competitions were effective, planned communist economies would have been successful. There was no market, but plenty of artificial competitions aimed at boosting efficiency. In former East

> Germany, this was referred to as "socialist competition," because even Lenin, after the success of the revolution in Russia, stated: "Now that power is in the hands of the socialist government, our task is to organize competition." Yet, the planned socialist economy, with its artificial competitions, failed miserably, and we are experiencing the same failures with today's artificial competitions."

The central administration creates the illusion of "governing" research, which is harmful in several ways. Fierce competition causes a portion of the time needed to develop a project to be wasted, and the frustration from these failures drives some members of the scientific community to withdraw from participation[aa]. As the system produces more PhDs than there are recruitment opportunities (private or public), there is a growing precariousness among young researchers. They are expected to pursue postdoctoral positions and short-term contracts. A significant portion of talented individuals leaves research, as they prefer stable employment over the promise of potential jobs; only those fortunate enough, those who are solely dedicated to science, and those who settle for makeshift solutions remain in the system. Consequently, the system is marked by low efficiency. This inefficiency is evident in the hiring of certain professors at major universities despite significant gaps in their expertise. In my field (fluid mechanics), I know a few professors who lack fundamental mathematical skills yet have managed to slip through the cracks, maintaining the illusion of their capabilities[83].

4.3.5 The Castes of the Academic System

The system has created a caste of administrators, former colleagues who have become experts in research management. French sociologist Raymond Bourdieu (2002) remarked on this as follows:

> "Thus, an environment is created where research is discussed and decided upon, while the real researchers are absent; a setting inhabited by individuals who move from "presidency" to "presidency," from "office" to "office," ultimately acquiring, aside from familiarity with the insiders of this world, a practical mastery of the unwritten laws that allow them to manipulate committees and impose directions and decisions by pushing certain agendas or proposing specific voting procedures. [...]
>
> "What they desire is for all researchers to be present in plenary sessions to listen to them and ratify their decisions on research they are not conducting. Instead of being held accountable to researchers for their management of research, they demand researchers account for their own research."

Managers create the problems they then claim to solve. It is a high-wire act that requires circular arguments to justify their existence. First, it is necessary to allege real or fictitious problems: economic decline compared to the United States (or China), lack of competitiveness in research, the great challenges of today's world, etc. Thus, it becomes necessary to reform the university by creat-

[83] British sociologist Harry Collins (2014, p. 69) recounted how, by observing scientists (gravitational wave physicists), he acquired their technical language and a qualitative understanding of their research. A discussion was arranged between him and a real physicist. This discussion (without mentioning the participants) was then presented to nine field specialists, who were to determine who was the sociologist and who was the physicist. Two out of nine believed Collins was the physicist, while seven out of nine saw no difference between the two participants (Giles, 2006).

ing financial incentives, multiplying bureaucratic mechanisms (audits, evaluation of funding agencies), and opening up to business and the world. Years go by, and it becomes clear that this does not work. Therefore, a new reform must be launched, along with criticism of those resistant to change. Managers create an artificial, supposedly competitive environment, needlessly complex, in which researchers and educators struggle. The report by Gillet *et al.* (2023, pp. 60–61), citing the failure of higher education and research reforms (SIRIS, 2019), recommended:

> "In the face of the increasing complexity of regulations, the diversity of project funder rules, the multiplication of processes and management tools, and the internationalization of research, researchers and unit directors need effective expert support from high-level administrative personnel who are trained to understand the realities of researchers' work and are valued accordingly (job categories suited to the function, professional advancement, recognition by their employers and users). [...]
>
> "The management school for research proposed by the CNRS[84] and discussed with its partners is a good example of what could be implemented."

This report follows directly from the one submitted by Philippe Aghion and Élie Cohen in 2004, which also noted that « *French research is in very poor shape, and the process that has been underway for several years must undoubtedly be accelerated if France wants to maintain a few centers of excellence in the coming years.* » (Aghion & Cohen, 2004, p. 79). Noting the failure of previous reforms, Aghion and Cohen proposed a new approach consisting of the creation of the National Research Agency to « *bring forth centers of excellence, initiate a dynamic of reform through comparison and example, and avert the failure logic that sets in after each major failed reform.* » Indeed, the authors emphasized the virtuous cycle that the new research funding would undoubtedly initiate:

> "Good institutions and good departments will thus be able to attract good researchers and fund exchange programs. Gradually, everyone will realize that this is a functioning system, and "best practices" can spread from projects to departments, and eventually to universities. We therefore advocate a gradual approach. The idea is to progressively lay the groundwork for a cultural revolution in higher education."

No doubt that the report by Philippe Gillet and his co-authors will be followed in a few years by a new report detailing the alarming state of French research and proposing a reform of the reform. Based on this report, in December 2023, President Emmanuel Macron[85] intended to "*implement a real revolution for our researchers*" in under 18 months by announcing the creation of a Presidential Science Council and a transformation of research institutes into "program agencies."

4.3.6 An Increasingly Vertical Vision of University Hierarchy

In Switzerland, the Swiss National Science Foundation (SNSF) questioned in 2021 in an issue of its magazine Horizons[86] whether it might be beneficial to adopt a more authoritarian approach in universities. It cited the case of the École Polytechnique Fédérale de Lausanne (EPFL) and the sweeping

[84] Centre national pour la recherche scientifique
[85] https://www.vie-publique.fr/discours/292294-emmanuel-macron-07122023-recherche-française
[86] https://www.horizons-mag.ch/2021/09/02/the-power-of-the-academic-oligarchy/

powers granted to its president:

> "Universities with a hierarchical governance system have certain advantages, however, that could also prove positive in a Swiss context – such as in matters of flexibility and speed. This is the opinion of Martin Vetterli, President of EPFL, which is the university in Switzerland with the most pronounced top-down governance structures. This presidential system has existed since the university was founded and is identical to that of ETH Zurich. Vetterli's predecessor Patrick Aebischer used this system to restructure the university according to the American model – with him as the boss who led the university from the top down. This also shows just how much the structure of a university can depend on how its boss decides to organise it.
>
> "The structure of EPFL enables it to react quickly to things today, says Vetterli. "Within the space of 18 months, we were able to set up a new Master programme". In a university with a different governance system, it would probably have taken longer. However, Vetterli insists that universities of technology such as EPFL and ETH have duties to politicians, business and society, so they have to be more agile and able to act quicker than the traditional university.
>
> "But not even at EPFL is it possible to ignore the professors when it comes to running the institution, says Vetterli, and he quotes a saying that's popular in the USA: "Managing professors is like herding cats. It's impossible. You can only move the food."

As noted by Aghion & Cohen (2004, p. 70), universities are "universes of non-decision" where "university councils resembled more parliamentary assemblies than boards of directors: discussion overshadowed action."

The primary virtue of a science administrator is to work in alignment with the desired direction of the system (and thus according to a small circle of influential individuals). The foremost quality required is therefore allegiance to the system, and the second quality is the ability to promote the system. In their study of the careers of some of these administrators, Laillier & Topalov (2022, p. 142) noted:

> "The ANR allowed the positioning of individuals at the heart of the governance of scientific policy who, due to their training and the professional world to which they belonged, were best equipped to implement the orientation advocated by the reform's proponents. The obligatory reference to 'fundamental research' should not be misleading: it is striking to see how scientists from major research organizations were excluded from the most strategic positions of the new agency at its inception. It is also remarkable to observe how limited the research experience of the new leaders was. Certainly, most of the engineers in charge held a doctorate and had possibly conducted research early in their careers. However, they were characterized by their background in engineering schools and had not been socialized into independent research concerning industrial stakes. Everything suggests that the initial heads of the ANR also believed that they were the main architects of the agency. Its deputy director, Antoine Masson, had been the project leader for establishing the ANR within the ministry since 2004. This project was closely followed by the director of technology, Jean-Jacques Gagnepain,

> and the chief of staff to the minister, Gilles Bloch. They then proceeded to recruit from their own circles, those most likely to share their vision and approach to science."

A third essential quality is, as much as possible, to present the smoothest image. Naturally, some university presidents, such as Richard Descoings[87] (Sciences-Po Paris), made headlines, but their great effectiveness in the eyes of the system rendered them untouchable. Harvard University provides us with two examples roughly twenty years apart:

- In 2005, President Lawrence Summers delivered a speech on the reasons for the underrepresentation of women in science, technology, engineering, and mathematics[88], one of his points concerned innate differences in aptitude between men and women, which sparked an uproar among Harvard professors, widely covered by local media. A few months later, President Summers was forced to resign.
- In 2023, Congress summoned the presidents of three major universities (Harvard, MIT, and the University of Pennsylvania) due to a wave of antisemitism that followed the Hamas attack on October 7[89]. When the inquiry committee asked Claudine Gay, president of Harvard, whether a call for genocide against Jews would be a violation of Harvard's code of conduct, she responded that it depended on the context. This response caused a scandal. Despite support from the board of trustees, she was also pressured to resign.

Ginsberg (2011, p. 100) discussed university presidents, stating:

> "Administrators who come into conflict with campus radicals or, for that matter, minority groups are, at the very least, likely to be labeled "controversial," and shunned by the search firms that hold the keys to new positions and promotions in the administrative world. Corporate headhunters will never touch a "controversial" individual, though of course such traits as indolence, ineptitude, and out-and-out stupidity are rarely disqualifications for career advancement in the field of higher education administration."

The system no longer requires university chief administrators to be established scholars (Ioannidis, 2010; Aust *et al.*, 2021; Laillier & Topalov, 2022)—even though press releases announcing their appointments still refer to them as leading scientists. Generally, these individuals have limited research experience, typically obtained within a few years after their doctoral degree, and have quickly embraced a bureaucratic career (often before the age of 40). This is why Jérôme Aust *et al.* (2021) refers to them as "ex-pairs".[90]

[87] http://tempsreel.nouvelobs.com/l-enquete-de-l-obs/20130301.OBS0542/richard-descoings-le-fantome-de-sciences-po.html

[88] https://www.harvardsalient.com/p/the-20th-anniversary-of-larry-summers

[89] https://www.letemps.ch/monde/antisemitisme-endemique-sur-les-campus-americains-harvard-et-d-autres-prestigieuses-universites-sous-le-coup-d-une-enquete-du-congres

[90] "ex-pairs" means "former peers" in French. It is also a play on words that uses assonance with "expert."

4.4 Bureaucratic Asphyxiation

The new university has been built on a powerful bureaucracy. Bureaucracy itself is not an issue; it is even essential when aiming to organize the cooperation of many people towards specific objectives. As long as the university's missions were to provide education or conduct research, the need for bureaucracy was relatively light. However, this has changed with the new university. There are several causes:

- The management of large research projects (requiring substantial facilities such as the synchrotron at CERN and involving teams from multiple countries) necessitates administrative and technical staff.
- The increasing power of presidential teams, with their desire to oversee research and direct it towards technological applications, also requires administrative personnel.
- The implementation of particular strategies that do not address the university's needs but rather follow current trends consumes significant resources. The "diversity, equity, inclusion" program is a prime example of a strategy that is particularly resource-consuming.

One could debate the validity of these developments, but it is crucial to emphasize the danger that the bureaucratization of the academic environment poses.

4.4.1 Autonomization of the Bureaucracy

Every bureaucratic system tends to become autonomous, meaning it seeks to gain independence from its controlling authority to ensure its longevity. Once autonomized, the bureaucratic system no longer serves the interests of its overseer (the interests that initially justified its existence) but rather its own interests. In the best case, the system plays a double game; in the worst case, it exercises its own power[ab].

In the case of universities, there is a latent autonomization. This is partly due to the fact that in Western countries, most politicians lack knowledge of the academic environment—the only recent counterexample was Angela Merkel in Germany—and in most cases, they possess little scientific culture, which limits their understanding of contemporary research mechanisms and issues. Furthermore, the internationalization of the faculty and university bureaucracy contributes to placing globalists at the head of institutions; however, they have no interest in aiding the development of the host country; they are primarily interested in the continuity of the system[91].

It is easy to understand the interest that Swiss universities have in bilateral agreements with the European Union and the many urban legends they propagate while touting Swiss sovereignty: when they talk about brain drain, engineer (or doctor) shortages, the need for students, or the fostering of the younger generation of academics, it should be understood that increasing the number of grad-

[91] The English journalist and essayist David Goodhart focused on the sociology of those he called the "anywhere" (those from anywhere or who are pro-globalization) as opposed to the locals he referred to as the "somewhere" (Goodhart, 2017). Here, I refer to the "anywhere" as globalists. The university system greatly favors globalists, as they are more mobile, open to globalization, and less tied to any country, having either no family or a nomadic family. Since they lack strong cultural ties to the places they frequent, they tend to associate with people who share similar characteristics.

uates helps to lower salaries[ac], and that ensuring scientific succession provides a large number of researchers on fixed-term contracts, serving as a pool and producers of articles, and that ensuring a bridge with the European Union compels the Confederation to allocate more funds.

Globalism has also brought an end to a practice that proved effective: schools of thought. Institutions such as the Göttingen school in fluid mechanics, physics, and mathematics (which revolutionized the field in the early 20th century), the Chicago school in economics (liberalism), the Annales school in history (global history combining history, economics, and social sciences), and the Frankfurt school in philosophy (critical theory of society) emerged. Around a professor or a core group of professors, a team is formed over several generations, fostering the accumulation and transmission of knowledge, particularly implicit knowledge. Explicit knowledge can be clearly articulated in the form of rules, equations, theorems, principles, etc., while implicit knowledge is more elusive; it is learned through interaction with an educated person or through mimicry. Learning a language requires explicit knowledge of grammar and vocabulary, but also implicit knowledge[ad] that can only be acquired through contact with native speakers (for example, to master pronunciation).

4.4.2 The Schizophrenic Discourse

One characteristic of the technocratic discourse used by university leaders is the ability to state one thing and its opposite. Their feat lies in articulating completely contradictory ideas:

- The academic system celebrates excellence—its key concept—while declaring itself to be inclusive and a proponent of social justice.
- It praises democratic and progressive values while establishing a hierarchical and authoritarian structure.
- It aims to address societal needs while focusing solely on technological innovation.

The irony of bureaucrats is highlighted by their denunciation of the "over-administration" that turns a researcher's life into an obstacle course, as described in the report by Gillet *et al.* (2023, p. 19, 24):

> "While all the indicators aimed at assessing the quality and scientific output of countries and institutions have their limitations, they nevertheless agree in placing France's performance in terms of research and innovation at a rather average position, with no real improvement in recent years. The consequences of the efforts and investments recently made by the state as part of the LPR[92] and France 2030 are not yet discernible. Whether in terms of overall scientific output, high-level scientific production, or innovation results, France has consistently occupied a position inconsistent with its economic ranking, and has been declining for several years. While these indicators may not appear dramatic, they raise questions for a country like France. [...]
>
> "The burden of administration weighs heavily on staff, both in research and in research support, representing a real constraint for unit directors. This situation makes the professions of researcher and innovator resemble an obstacle course: beyond the over-

[92] LPR: Research Programming Law. This law, enacted in 2020, aims to strengthen scientific research in France for the decade 2020–2030.

> administration observed at the research unit level, and the excessive number of interlocutors and points of contact, the evaluation processes—numerous, uncoordinated, and unsynchronized—observed at all levels (personnel, projects, units, establishments) often lack impact and, in their current configuration, hinder research activities."

The schizophrenic discourse has found its language, a bureaucratic jargon called inclusive language. This language includes both:

- Modifications intended to "de-invisibilize" women or "demasculinize" the language. These modifications consist of using double inflections (like "les étudiantes et les étudiants") or the median point (like "les étudiant·e·s").
- Language elements drawn from activist movements that prohibit certain words.[93] Similar to books on proper French usage, language prescriptions are now found in guidelines provided by universities and editorial committees. For example, one should no longer say "une personne coloré·e" (sic), but "une personne racisé·e" (sic), while condemning the use (stigmatizing) of the word "race." One should also not say "sexe de naissance," but "sexe assigné à la naissance."
- Elements intended to combat discrimination. We refer to "personne en situation de handicap" to "not reinforce stereotypes and myths surrounding disability."
- Ambiguous words. The most typical example is "gender," which has become polysemic, making it difficult to know to which meaning one is specifically referring. The word "excellence" is another key term in official discourse, with a semantic shift from the manifestation of clear superiority to conformity with the dominant model.

Although inclusive language has existed for several decades, it is only very recently that universities have adopted it: at the end of the 2010s, this new jargon emerged in the official communication of numerous universities. This occurred naturally, without consultation. The president of Clermont–Auvergne University, Mathias Bernard[94] justified his decision to impose inclusive writing in 2022 (despite the ministerial ban):

> "This is the result of collective work, involving both students and teaching and administrative staff... The goal is to promote equal access for women and men, both in academic fields and in professions within the university itself or beyond. In this work on gender equality issues, the question of representations that influence behaviors arises. Everything related to gender stereotypes conveyed by different types of representations is part of the identified areas of action that the university has recognized. [...]
>
> "This is a proposal from the university based on research in social psychology conducted within our institution. It is not at all a militant approach. We are on a path that relies on scientifically validated elements and aligns with social responsibility and the institution's commitment to inclusion."

[93] https://www.epfl.ch/schools/enac/fr/a-propos/diversite-bureau/langage-inclusif/langage-inclusif-et-non-discriminatoire-en-francais/

[94] Historian by training, Mathias Bernard is emblematic of the apparatchiks of the academic system: a professor at 34, a dean at 36, a university president at 42.

All the usual language elements can be found here: he praises the collective effort while it is a personal decision[95], he speaks of equal opportunities[96], and he incriminates the gender biases and stereotypes that influence behaviors. He insists that this is absolutely not a militant approach, as it is based on science.

To gain insight into the intellectual decline of the academic system, one must examine the scientific output justifying inclusive writing. This landscape oscillates between activist research and pseudo-science, incorporating all the elements of militant literature (conspiracy theories, feminine symbolism, rewriting of history) and remnants of outdated theories (the Sapir–Whorf hypothesis, implicit association), which contradict the history of language and linguistics (Szlamowicz, 2018; Manesse & Siouffi, 2019; Charaudeau, 2021; Meney, 2024; Lornac, 2025).

The question remains how this literature continues to maintain its illusion. Inclusive language is founded on a contradiction: postfeminism seeks to eliminate the separation of the sexes (hence its emphasis on gender as a social construct of identity) while simultaneously demanding "strict equality of opportunity" between sexes due to the indistinction of individuals, urging the language to stop "invisibilizing women" by creating distinctive markers like the mid-point.

It is also striking to note that many movements claiming to be subversive or oppositional use inclusive language, the very language of bureaucracy. The strength of a system lies in its ability to contain dissent in a commensal form, rendering dissenters dependent on the very system they strive to critique.

In a compelling essay, Thomas Bauer (2024), a professor of Arabic and Islamic studies at the University of Münster, argues that contemporary society exhibits less tolerance for ambiguity than ancient societies[ae]. One might argue instead that ambiguity does not necessarily disappear; rather, it is merely displaced to areas where individuals prefer not to take a stance for fear of disrupting the new balance or to avoid a problematic reassessment. Reformulating Bauer's thesis, one could say that ambiguity offers a space for accommodation where multiple opinions or interpretations can coexist, satisfying the stakeholders whether they are aware of it or not. This zone of ambiguity is not immutable; it evolves over time and circumstances. Identifying the ambiguities of an era and the mechanisms of change reveals much about the societal dynamics of that time. The apocryphal saying attributed to Cardinal Retz, "one only escapes one's ambiguities at one's own expense," highlights the potential cost of clarifying one's positions. From this perspective, inclusive language indeed serves as an ideal tool for creating ambiguity while claiming the opposite.

The schizophrenic discourse tinted with postmodernism (see § 4.6.6) prevalent in the new university has made the use of inclusive language a norm among the new elite and their adherents.

4.4.3 Lassitude

Sometimes, works of fiction best describe the absurdity of the modern world. In a short story titled "The Lottery in Babylon," Borges (2018) imagined a society where everyone's life was governed by

[95] It matters little that all published surveys to date show a majority against inclusive writing.

[96] As noted by sociologist Alain Bihr (2017, p. 116) in his analysis of neoliberal newspeak, equal opportunity is "a true contradiction in terms." In practice, it is an inequality implemented in the name of equality.

a vast lottery, which could lead to both the best fate and the worst outcome, abruptly changing everything for better or for worse. In response to the significant increase in the number of projects submitted to funding agencies, some of them have decided to conduct a lottery to allocate certain projects (Heyard *et al.*, 2022; Luebber *et al.*, 2025).

In another story titled "The Mark Garble Foundation," Leo Szilard (1961) envisioned a society where a wealthy entrepreneur would be concerned about the rapid advances in science and would ask a researcher about the best way to slow down this progression. The researcher explained that the solution was quite simple: one just needed to create a foundation to oversee research:

> "You could set up a foundation, with an annual endowment of thirty million dollars. Research workers in need of funds could apply for grants, if they could make out a convincing case. Have ten committees each composed of twelve scientists, appointed to pass on these applications. Take the most active scientists out of the laboratory and make them members of these committees. And the very best men in the field should be appointed as chairman at salaries of fifty thousand dollars each. [...]
>
> "First of all, the best scientists would be removed from their laboratories and kept busy on committees passing on application for funds. Secondly, the scientific workers in need of funds would concentrate on problems which were considered promising and were pretty certain to lead to publishable results. For a few years there might be an increase in scientific output but by going after the obvious, pretty soon science would dry out. Science would become something like a parlour game. Some things will be considered. interesting, others will not. There will be fashion. Those who follow the fashion will get grants. Those who won't, will not, and pretty soon they will learn to follow the fashion too."

Szilard, one of the physicists behind the Manhattan Project, keenly sensed the evolution of science based on his experiences. The story, written in 1948, anticipated the creation of the National Science Foundation, which served as a model for most funding agencies. The psychological consequence of this development (bureaucratization and lottery in funding and career advancement) has profound effects that are still not fully assessed.

Anyone who has spent enough time within the academic system has seen the rise of a bureaucratic apparatus alongside a reduction in the budgets allocated to each team, despite the increasing funding for higher education by the state. It is not hard to understand that, faced with a cumbersome and petty administration, researchers and educators are beginning to express their frustration. John Aubrey Douglass (University of California, Berkeley) recently noted[97]

> "In the 1960s, for example, faculty outnumbered administrators. Now, depending on the institution, administrators often outnumber faculty by five to one, or more. Today, a significant portion of a campus's operations and funding is not directly related to its teaching, research and public service mission. [...]
>
> "University leadership will become even more difficult, and undoubtedly dissatisfaction among faculty and, more generally, the academic community will grow. In turn,

[97] https://www.universityworldnews.com/post.php?story=20250110104204107

> shared governance, a hallmark of American higher education and one reason for its global reputation, faces, I think, a rocky future."

This exasperation is most often kept silent for the time being. Occasionally, some prominent figures in research express their frustration with the bureaucratization of research, such as the German physicist Sabine Hossenfelder, who explained her reasons for leaving the university:[98]

> "I applied for grants on research projects because it was a way to make money, not because I thought it would leave an impact in the history of science. It's not that what I did was somehow wrong. It was, and still is, totally state of the art. I did what I said I'd do in the proposal, I did the calculation, I wrote the paper, I wrote my reports, and the reports were approved. Normal academic procedure.
>
> "But I knew it was bullshit just as most of the work in that area is currently bullshit and just as most of academic research that your taxes pay for is almost certainly bullshit. The real problem I had, I think, is that I was bad at lying to myself. Of course, I'd try to tell myself and anyone who was willing to listen that at least unofficially on the side I would do the research that I thought was worth my time but that I couldn't get money for because it was too far off the mainstream. But that research never got done because I had to do the other stuff that I actually got paid for."

More rarely, we see official protests from professors leading to calls for the removal of university presidents. For example, Ernst Hafner, who was newly appointed head of the École polytechnique fédérale de Zurich in 2005, was forced to resign after a revolt from professors frustrated with his project, which aimed to revolutionize the school and align it with the American model.[99]

On a few occasions, when not constrained by their authority, committees of researchers or educators—now merely advisory bodies following university reforms—raise alarms about the climate of distrust instilled by university administrations. For instance, following the submission of the Gillet report, the Scientific Council of CNRS warned against bureaucratic authoritarianism, reflecting on internal crises and accusations of poor success with the European Union[100]:

> "This *a priori* distrust of staff goes beyond mere anecdote and touches on the core of an administration conceptualized on control and risk aversion, rather than on trust and support. [...]
>
> "We arrive at a situation of self-censorship, with part of the community opting not to waste time on random and time-consuming European projects. This bad reputation is compounded by broader factors: many researchers feel demoralized after experiencing successive rejections, regardless of the funding agency. Furthermore, apart from the specific case of the ERC, European projects are rarely isolated. It is through integrating into an informal network of European partners that a team can participate in project consortiums, some of which are approved. This networking effort is long-term; [...] the recurring underfunding of French research compared to leading European countries (Germany, Netherlands) exacerbates underfunding. [...]

[98] https://www.math.columbia.edu/~woit/wordpress/?p=13907
[99] https://www.letemps.ch/suisse/president-lepfz-pousse-vers-sortie
[100] https://www.cnrs.fr/comitenational/cs/recommandations/Rapport_Entraves_vf.pdf

> "Lastly, European partners unofficially express a growing distrust towards any team under CNRS oversight. The CNRS has developed a reputation of being a partner that can respond late and poorly to administrative requests—consortium agreement negotiations, financial reports. It is likely that CNRS teams unintentionally find themselves sidelined, quietly, from forming new consortiums."

The French researchers' collective, Rogue, added:

> "The Gillet report does not engage with the reality of the current system. The University, an institution for the development and transmission of knowledge, is practically overlooked. It is only addressed from a financial perspective: how to ensure hours at the lowest cost?"

Antoine Petit, the president of the CNRS, provides a radically different opinion[101]:

> "Simplification has been a major issue for several years, and everyone naturally wishes for it. The very organization of the French ESR, based on cooperation and management among different oversight bodies within mixed research units (UMR), adds real value. However, it is also true that it can introduce a certain complexity in daily operations. Scientists and support staff have strong and legitimate expectations for simplifying their work and being collectively more efficient. The proposals in the report are interesting and aim to reduce the administrative burden on laboratories. The CNRS has already done a lot to simplify administrative tasks in laboratories."

Before the university reform, the academic environment was already highly hierarchical and structured, and one might have thought it would not resist the transformation of the university model. The old university system was almost feudal, where the professor held a position akin to a mandarin, and generally, their power derived from their prestige; leadership positions were reserved for professors with scientific legitimacy and nearing the end of their careers (thus possessing substantial experience in both institutional knowledge and human relations), and their power was limited by counterpowers. They have been replaced by individuals who are often significantly less experienced and lacking considerable scientific prestige. As the scientific journalist Nicolas Chevassus-au Louis (2025, p. 93) wryly notes, the new leaders are "second-tier researchers, by academic recognition standards, but very well-connected due to their careers," fully committed to transforming the academic world into a business. These leaders may possess a number of managerial qualities, have useful networking skills, and appear visionary[102]. However, they may lack significant scientific prestige, culture, and experience.

The low scientific legitimacy is compounded by the clash of work ethics. Sociologists refer to the "knowledge capitalism" to describe the purpose of the modern university, suggesting that the production of knowledge and the training of students are commodifiable services in a pseudo-competitive market. However, this perspective is fundamentally opposed to the realities of research

[101] https://www.cnrs.fr/fr/actualite/rapport-gillet-la-vision-dantoine-petit

[102] In bureaucratic newspeak, the "visionary" is someone who exceeds the expectations placed on him "a priori." To extend the animal analogy, the visionary is a draft horse that plows its furrow with remarkable vigor. This is a rather strange definition of vision being referred to here: a vision with blinders focused solely on the furrow from which it cannot stray. This is far removed from the original concept of one who perceives the deeper reality of things and/or has foresight into the future.

and teaching. Such a clash of logics results in a loss of meaning in the daily work of teachers and researchers[103].

In Hobbes' classical political theory, the state of nature implies a war of all against all. In the research realm, this natural state has seen the emergence of fiefdoms, marked by competition for prestige, alongside spontaneous forms of large-scale collaboration and self-organization. The reformation of the research world engenders a war of all against all, leading to competition among individuals or groups for funding and resources, as well as a form of perpetual control via evaluations and audits. This generates considerable stress and the feeling of bureaucratic harassment[104] (Alberts *et al.*, 2014; Nicholls *et al.*, 2022; Hammoudi Halat *et al.*, 2023; Brazil, 2024). Scientific journalist Shannon Hall (2023) refers to this distressing environment as the "toxic culture of research." The consequences of this unhealthy atmosphere include a significant prevalence of depression, with severe forms leading to burnout and even suicide, contributing to a wave of resignations affecting faculty across all educational levels (Schmiedehaus *et al.*, 2023). Some professors, such as Marco Lashuel (2020), a former neuroscience professor at EPFL, have recounted how hyper-competition within academia can undermine one's health, even for well-established scholars.

Teachers and researchers are not the only ones suffering from the authoritarian shift of the new university. Among young people, the 15-24 age group is the most vulnerable in terms of mental health:

- Suicide is the second leading cause of death (just under 20% of deaths in this age group within the European Union[105], compared to 1% for the general population) after accidents, with young men being particularly affected by suicide.[106]
- Approximately one-third of students report feeling anxious, with 10% suffering from severe anxiety (Chi *et al.*, 2023). Doctoral students are particularly at risk. A meta-analysis by Emily Satinsky *et al.* (2021) shows that 24% of doctoral students experience depression, with this rate remaining relatively constant across different countries. This has led Teresa Evans *et al.* (2018) to describe it as a mental health crisis among doctoral students. The causes of depression are highly diverse. They include general factors observed in the broader population, but Hazell *et al.* (2020) have identified specific causes directly related to the doctoral work experience, such as feelings of isolation in a hostile environment, personal sacrifice, poor thesis supervision, pressure to publish, and the cult of the super-performing researcher. Increased feelings of competition are often cited as the most frequent cause of anxiety (Curran & Hill, 2019). The number of students suffering from anxiety or depression has risen sharply over recent years (Lipson *et al.*, 2019), but this trend is difficult to analyze since the general population is also reporting similar issues; furthermore, psychological monitoring has improved over the

[103] Numerous testimonies from professors at all educational levels describe the absurd nature of reforms and the resulting loss of meaning in teaching caused by the contradictory demands of the educational or academic system (Llovet Pomar, 2011; Garcia, 2022; Gay, 2024). This is also evident in the analysis conducted by Alyssa Dunn *et al.* (2017) and her colleagues, based on resignation letters from teachers, reflecting themes of lost purpose, feelings of abandonment, distrust of hierarchy, and changing curricula

[104] One can refer to "bureaucrature," to borrow the words of the mayor of Saint-Raphaël, Frédéric Masquelier (2022).

[105] https://ec.europa.eu/eurostat/statistics-explained

[106] The gap between young men and young women was threefold in the early 2010s but appears to be narrowing, as boys are experiencing a lower suicide rate, while there is a notable increase in suicides among women.

years[107], and the rising rates of depression may reflect better detection of cases.

Universities have taken responsibility for psychological support, but it can only be noted that they act as arsonists while trying to extinguish the flames of the hyper-competition they have created, which negatively impacts individuals' health.

4.5 Rise of Inequalities

One of the major criticisms of the university system before 1968 was that it was too elitist and favored the social reproduction of elites (according to Pierre Bourdieu). The massification of higher education was supposed to change this situation by allowing access to higher education for all social classes. In the United States, the criticism was even stronger, as higher education seemed off-limits to students of African or Hispanic descent until the end of the 1960s, when, in the wake of the Civil Rights Act of 1964, U.S. universities began to implement affirmative action to increase the number of Black and Hispanic students[108].

The results of anti-inequality policies appear very mixed fifty years later. As summarized by Steta (2019), French universities concentrate all inequalities: "While French society is increasingly fraught with tensions, it would be dangerous to allow universities to become machines for transforming hope into frustration," since for disadvantaged classes, broader access to higher education has been accompanied by a devaluation of degrees and the proliferation of programs with no professional prospects. [af] The Gordian knot that the system believed it could cut lies in the contradiction between accommodating a large number of students, maintaining quality teaching and research, and the job market's ability to offer positions related to the degrees obtained. In the official discourse, this contradiction could be resolved, or at least largely mitigated, by redefining merit. Previously, merit referred to the recognition of superior intellectual qualities, whether through culture, mindset, analytical ability, artistic sense, etc. The challenge is determining how to objectively evaluate these superior qualities and in what form they should be recognized. For a long time, universities have settled this issue: it is the diploma that certifies the level of education. According to the French poet and essayist Valéry (2011), this is where the problem lies:

> "Let's say it: the real objective of education is the diploma. I never hesitate to state that the diploma is the mortal enemy of culture. The more important diplomas have become in life (and this importance has only increased due to economic circumstances), the lower the yield of education has been. The more control has been exercised and multiplied, the worse the results have become. [...]
>
> "From the day you create a diploma, a well-defined control, you immediately see an entire system organizing itself to achieve this diploma by any means necessary, in contrast to your program. The goal of education is no longer to cultivate the mind but to acquire the diploma, which leads to a focus on the minimum required in studies. [...]

[107] https://www.rts.ch/info/societe/2025/article/crises-d-angoisse-en-hausse-chez-les-etudiants-les-ecoles-s-adaptent-28903014.html

[108] In 2023, the U.S. Supreme Court prohibited such measures following lawsuits filed by Asian American students against Harvard University.

> "The diploma gives society a phantom of guarantee and graduates a phantom of rights. The graduate is officially deemed knowledgeable: they carry this certification of momentary and purely expedient knowledge for life. Moreover, under the law, this graduate is led to believe that they are owed something. Never has a more detrimental convention to everyone—the state and individuals, particularly culture—been established."

The massification of higher education has exacerbated this issue of evaluating intellectual abilities. The responses to this problem have varied across countries and have evolved over time within each country, but one constant in the discourse remains: the higher education system claims to be meritocratic. A selection process occurs either at the entry of institutions or during the first year (entrance exams for French or Italian grandes écoles, standardized tests in the United States, preparatory year in Switzerland, etc.) (Garçon, 2011). The critique of this system is threefold:

- Selection is based solely on students' analytical abilities at a given age, which is far from being an indicator of their actual capabilities in the future. The American philosopher Michael Sandel (2020) has ironically commented on the track record of Western politicians, all graduates of the best schools, over the last few decades compared to previous decades. [ag]
- The meritocratic discourse creates a profound divide in Western societies by justifying socio-economic inequalities. In the Ancien Régime, the aristocracy justified its privileges by claiming superior hereditary qualities. Meritocracy, on the other hand, justifies its prerogatives by talent and the hard work required for higher education. According to this rhetoric, everyone is responsible for his success—and thus, by extension, his failure. In reality, success in education is largely conditioned by the socio-economic environment in which the student operates. In France, in 2023, the probability of accessing higher education is 51% for children of workers or employees versus 77% for other children[109].
- Before the massification of higher education, the education system (secondary and tertiary) was openly elitist, practicing stringent selection based on subjects that are now considered outdated by many (Latin, Greek, general knowledge, mathematics, etc.). This is how students aspiring to study medicine were sorted based on their mathematical abilities. The current system claims to provide equal opportunities for all, but in reality, selection occurs on a more or less hidden basis. This criticism is often directed at the French system *Parcoursup*, instituted in 2018.

It should also be noted that alongside the massification of higher education, there has been:

- The globalization of trade. Globalization has led to a decrease in the importance of agriculture and industry in the Western economy, while conversely, there has been an increase in jobs in the tertiary sector (services, banking, engineering, etc.), which require higher intellectual qualifications.
- The devaluation of manual labor, which has contributed to the overvaluation of intellectual work. "Intelligence" has become the key factor not only for selecting individuals in their educational paths but also in determining their social status. [ah]
- The loss of meaning in intellectual work. Philosopher Matthew Crawford (2016) and an-

[109] https://publication.enseignementsup-recherche.gouv.fr/eesr/FR/T448/le_niveau_d_etudes_selon_le_milieu_social/

> thropologist David Graeber (2019) pointed out that many workers in intellectual jobs have lost interest and a sense of purpose in their work. Many professions are "bullshit jobs," as Graeber noted. Industrial work led to the dulling of minds; workers, exhausted by grueling factory labor and the deafening noise of machines, left with empty minds. Tertiary work leads to another form of alienation: the emptiness of tasks, bureaucratic heaviness, minor bosses, and monotony result in "internal resignation." [110].

In the globalized Western world, a diploma is seen as the key to a socially successful life (in the eyes of others) and the possibility of accessing higher income. For many young people, obtaining a diploma is a race where it is not the most talented who win, but those with the most advantages (primarily familial). The labor market proves unable to absorb all graduates, leading to significant unemployment, with rates around 20% among youth[111], particularly in Southern Europe (France, Italy, Spain, Greece) and Northern Europe (Sweden, Finland), countries where manual labor has been most devalued. The situation is much better in Switzerland and Germany, where the youth unemployment rate[112] is around 7%.

The massification of education has also led to the proletarianization of teachers in many countries. In the early 20th century until the early 1970s, teachers experienced improved salary conditions, and their social status became elevated. A university professor or an holder of an aggrégation was a distinguished figure. The increase in the number of students and pupils led to a rise in the number of teachers, and thus an increase in educational budgets. However, these budgets never kept pace with the growth in the number of teachers and inflation rates. Consequently, there has been a gradual erosion of teachers' salaries. This phenomenon is well-documented in France, where long (but discontinuous) series of data spanning over sixty years are available. Figure 27 shows the evolution of the salary of a certified teacher (the first salary scale) since 1960, compared to the minimum wage (referred to as SMIC[113]). Essentially, the salaries of French teachers have been divided by a factor of 2.5 over fifty years. Here, I only present the salary curve for certified teachers (as this is the longest series available), but the salaries of aggrégation holders and university professors follow the same trend. In France, salary erosion has been accompanied by a loss of social status and authority. By bringing in a significant population from Africa without having properly planned an assimilation policy, France has seen its educational model collapse. The result is a massive departure of secondary school teachers and numerous vacant positions that remain unfilled; the standards for recruiting teachers have also declined. This issue is found elsewhere in Europe, but France is the country where the education system has suffered the most from a lack of investment.

The educational meritocracy has found its counterpart in research. With the reform of the university system, the term "excellence" flourished across Europe (Pol, 2012; Binswanger, 2014; Moore *et al.*, 2017). University rankings prompted the academic system to establish an evaluation of excellence based on supposedly objective criteria regarding the quantity and quality of scientific output. Funding requests, hiring processes, promotions—everything was evaluated through the lens of these criteria. As funding at the European level has hardly increased, the reform has resulted in height-

[110] https://www.letemps.ch/societe/brown-out-salaries-cherchent-un-sens-travail
[111] https://www.touteleurope.eu/economie-et-social/le-taux-de-chomage-des-jeunes-en-europe/
[112] https://www.sif.admin.ch/fr/newnsb/IiLL-YPjoFIE
[113] SMIC: *salaire minimum interprofessionnel de croissance* in bureaucratic language.

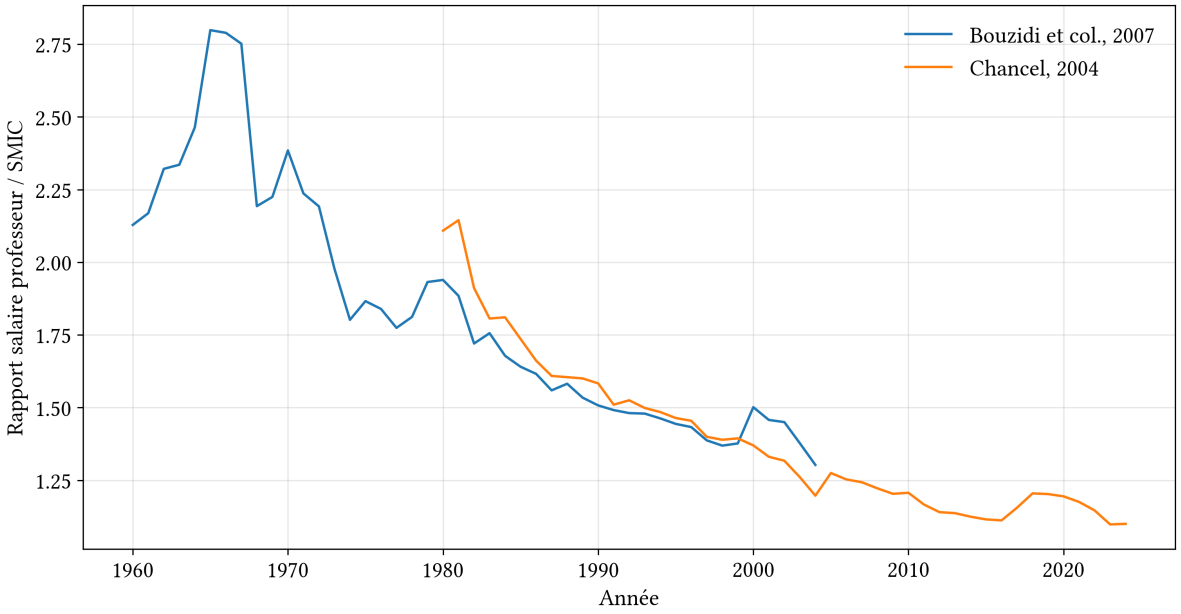

Figure 27 Evolution of the ratio between the salary of a certified teacher and the minimum wage (SMIC) in France. We have two data series: Bouzidi *et al.* (2007) and Lucas Chancel. Since the evolution is calculated in constant euros, there is always the challenge of accurately estimating the consumer price index. The SMIC is adjusted at least once a year according to inflation; during periods of high inflation, the SMIC can be reassessed multiple times within the year.

ened competition among universities to obtain the label of excellence, which guarantees financial resources. While some have emerged as winners, it also means that the majority of universities have come out as losers. The perverse nature of bureaucratic evaluation of excellence becomes evident each time a Nobel Prize is awarded or almost awarded. The paths of the fortunate laureates are not always glorious before their final recognition:

- Peter Higgs, the father of the eponymous boson and Nobel Prize winner in physics in 2013, admitted that he would be unable to secure a job at the university today given the new direction of the academic system[114].
- In 2018, it was Donna Strickland's turn to receive the Nobel Prize in Physics, and she revealed that she had not been appointed as a full professor despite her career achievements[115].
- In 2023, neurobiologist Katalin Karikó, Nobel Prize winner in Medicine, disclosed that her promotion to professor had been denied and that for a long time, she had to work as a mere researcher at the University of Pennsylvania[116]..

Researchers generally do not speak openly about the challenges of career advancement, but occa-

[114] https://www.theguardian.com/science/2013/dec/06/peter-higgs-boson-academic-system
[115] https://en.wikipedia.org/wiki/Donna_Strickland
[116] https://www.thedp.com/article/2023/10/penn-katalin-kariko-university-relationship-mistreatment

sionally, documented testimonies can be found, such as Marie Fagard's account on her husband's experience as a linguist at CNRS, which she later removed from her blog on Médiapart[117]. The old university system was notorious for fostering nepotism within laboratories overseen by established figures. The new system has not corrected this issue; it has merely transformed it. Networking has become the new plague in recruitment, and its impact is amplified by the generalization of a cosmopolitan elite's networking system. It is increasingly concealed under the guise of adhering to established standards of excellence, which are largely bureaucratic and whose complexity serves as a strong deterrent to transparency. [ai] However, the greatest danger lies not in this, but in the standardization of research profiles. As soon as quantitative criteria for excellence are established, candidates tend to shape their research to conform to them. The system thus becomes mediocratic. Unconventional paths, deviations from the expected profile (such as fewer articles, the exploration of new themes, or challenging accepted theories), or a lack of funding from third parties (such as agencies or industry partners) become seen as shortcomings. The increasing precariousness of newly minted PhD graduates feeds into a pool of researchers and educators who are at the mercy of their employers[118]. The internationalization of recruitment exacerbates this problem; one might borrow from Marx to say that young researchers constitute the reserve army of the system.

The system, not being particularly concerned with inconsistencies, claims on one hand to promote excellence and competition while on the other to ensure equal opportunities and correct representation distortions. If the distribution of teachers and researchers according to their sex or "race" (in the U.S. system) does not reflect the demographic composition of the country despite encouragement measures, it suggests that powerful biases must be at play to explain such a gap. It is always surprising to see that such a specious argument still prevails in 2025. [aj]

In recent years, measures aimed at imposing sex parity in recruitment or candidate selection have multiplied. Studies have shown that women now receive a significant boost. For example, Williams & Ceci (2015) found that with equal credentials, a woman has twice the chance of being hired as a man in the fields of sciences, engineering, and mathematics; more recently, Card *et al.* (2023) found that with equal qualifications, a woman has a 3 to 15 times greater chance of being admitted to the National Academy of Sciences than a man.

The most insightful professors complain about the assistance that compromises the consistency of procedures. Thus, in her acceptance speech at the Academy of Sciences, French mathematician Laure Saint-Raymond stated[119]:

> "Currently, the only real efforts made to broaden horizons are those in favor of parity, and it must be said that they are not always very successful. At the forefront of the false 'good ideas' is the imposition of quotas in all committees (which has the immediate consequence that women are much more often called upon for administrative tasks) and the increasingly strong pressure on hiring. Even within our academy, there are numerous incentives to elect women. It is fortunate that we do not know the content of the debates that preceded our election, but for women, there remains doubt about

[117] blog of Médiapart

[118] https://www.lemonde.fr/campus/article/2024/10/22/recours-massif-aux-enseignants-precaires-la-realite-c-est-que-l-universite-n-a-plus-les-moyens-de-fonctionner_6357910_4401467.html

[119] Discours de réception à l'Académie des sciences, « La science dont je rêve », 29 mai 2018.

being here to improve the statistics..."

The same sentiment is echoed by Canadian Janice Fiamengo, a former professor of English at the University of Ottawa and a fierce commentator on the failings of the North American university system:

> "It is hard to see what is glorious about admitting (at least implicitly) that, a century after achieving legal and political equality with men, women are still incapable of competing with them in terms of merit, and that the government must step in by imposing quotas and exclusions."

This touches on one of the deep inconsistencies of the current system that claims to promote excellence through competition[ak]. There are two possibilities:

- Either we do not acknowledge any performance differences between the sexes, in which case competition should be organized without restrictions. This is practiced in mixed sports such as equestrianism.
- Or we acknowledge performance differences and organize competition into different categories. This is the case in athletics.

One of the most emblematic cases is that of Alessandro Strumia, a physics professor at the University of Pisa and a visiting researcher at CERN. In 2018, he participated in a seminar titled "High Energy Theory and Gender" at CERN, where he presented a bibliometric analysis showing that female physicists do not experience discrimination throughout their careers and that they receive fewer citations than their male counterparts of the same age as they progress in their careers. Strumia's seminar led to an unprecedented witch hunt in terms of its scale and virulence, culminating in the end of his status as an associate researcher at CERN, a disciplinary investigation at the University of Pisa, and relentless attacks in the media that he details on his blog[120]. Following this, he deepened his bibliometric analysis and published his results (Strumia, 2021). His article attracted numerous comments, including from physicist Sabine Hossenfelder,[121] who stated that she replicated Strumia's results. To this day, Strumia's analysis has not been refuted, but he has been publicly condemned and ostracized. The shadows of Galileo and Giordano Bruno now hang over CERN.

4.6 The Gilded Ages of Science

When the university became a business selling education and knowledge, it also had to adopt the marketing methods popular among large commercial enterprises. It is not just about production; it is also essential to promote the product to give the buyer the desire to purchase.

One of the initial developments in university reform was the establishment of public relations offices and the use of press releases. German-speaking journalist Marcel Hänggi recounts[122]:

> "This evolution began in the 1970s in the field of biomedical sciences. A Swiss researcher played a central role: Charles Weissmann succeeded in producing interferon,

[120] https://alessandrostrumia.home.blog/gender-talk-at-cern/
[121] https://backreaction.blogspot.com/2018/10/gender-bias-in-academia-case-strumia.html
[122] http://www.mhaenggi.ch/texte/wissenschaft-als-marketing

> an important medical substance, at the end of 1979 at the University of Zurich. Instead of sharing this achievement with the scientific community, as is customary, he organized a press conference and managed to make headlines in international media. When he was later asked why he acted this way, he replied that he wanted to 'achieve maximum impact' for Biogen, the company that had patented the process and with which Weissmann was involved. The reactions from his colleagues were very strong. A scientific conference was hastily organized to criticize his attitude, and the U.S. Congress held hearings on the consequences of the commercialization of science. Today, Weissmann's approach would be considered normal."

Universities used to have a public relations office that occasionally issued press releases. In 2020, Swiss higher education institutions employed 179 communication professionals, including 25 full-time equivalents at ETH Zurich and the University of Geneva, and 23 at EPFL, making it the leader in communication according to a survey by the online journal Heidi News.[123] The journal interviewed sociologist Urs Hafner, who dedicated a book to the communication strategy of universities:

> "With the new public management of the 1990s, rectors became CEOs, universities became more autonomous, they entered into general competition, and massively developed their communication to manage their reputation. The fact that science is merely a matter of reputation is concerning."

University press offices triumphantly announce any incremental contribution to research as a major breakthrough.

Scientists are not left behind. Building a career means knowing how to sell oneself, and to do this, one must appear innovative (the best way is to create one's own field or label a concept, regardless of prior existence), build a network of colleagues, occupy the media spotlight, and demonstrate charisma and leadership qualities; "learning to shine in difficult times" is the insightful advice from Kuchner (2011). Biologist Bruno Lemaitre (2016) has shown significant interest in the success factors of certain scientists. The proportion of charlatans, impostors, and well-established scientists despite their meager accomplishments suggests, according to Bruno Lemaître, that factors other than scientific talent are at play. He refers to these factors as the N-factor (N for narcissistic). A typical example he cites is biologist Niels Jerne (Lemaitre, 2016, pp. 93–98):

> "His idiotypic network theory was wrong; his selection theory was largely based on the work of others and could actually be judged redundant. He is credited for a number of peremptory statements, such as claiming that immunology has little to do with microbes and infectious diseases. [...]
>
> "Thus, he did in some way participate in the establishment of immunology as a major discipline that would later accumulate the highest number of grants. The fact that his science is more or less correct is a minor detail; the key point was his power to convince others that the field of immunology is important compared to other fields, such as molecular biology and microbiology. It could be said, therefore, that it was a good thing to give the Nobel Prize to Jerne, even if some of his theories were largely incorrect! [...]

[123] https://www.heidi.news/sciences/les-universites-suisses-ont-elles-encore-besoin-de-journalistes

> Let's come back to the immunologist Jerne and analyse the fascination he created around him. [...] Jerne has been called 'one of the most intelligent biologists of this century', 'a Leuwenhoek in theoretical biology', 'a living legend' and a 'dominant figure'. Anne Marie Moulin, a historian of immunology, speaks of Jerne's (incorrect) idiotypic theory as a 'Copernican revolution'. This is quite surprising when we know that most of his theories (when rigorously analysed) were quite imprecise."

Physicist Libero Zuppiroli (2008) illustrates the emergence of a new class of "managerial" professors by analyzing the curriculum vitae of a famous professor at EPFL. Besides his production of scientific articles, this professor is credited with 57 articles in two years, during which he gave 30 lectures at international conferences. He possesses phenomenal work capacity, as he is able to manage two laboratories located 700 km apart. According to Zuppiroli, this professor's curriculum vitae shows that there are now four keys to success: networking (these 57 articles involved 197 other scientists), the art of fundraising, enhancing research visibility through participation in conferences, and management.

Some bold individuals go so far as to compare the contemporary academic milieu to drug cartels, with their low-level operatives and powerful barons.[124] The predatory and narcissistic behavior of a few does not imply that all scientists conform to this model, but it significantly impacts scientific practices. Thus, self-aggrandizement has become a common practice in academic articles. Vinkers *et al.* (2015) found that the frequency of laudatory terms such as "innovative" or "unprecedented" in abstracts increased by 15,000% between 1974 and 2014.

Another consequence is the overproduction of articles. The 57 articles from the professor-manager cited by Zuppiroli pale in comparison to the frenzied output of some scientists capable of writing an article every five days on average (Ioannidis *et al.*, 2018), like the French immunologist Didier Raoult, who boasts an impressive record of over 3,500 articles and an h-index of 225.

The greatest danger does not lie in the marketing that permeates current scientific production. After all, if a researcher produces quality results, certain frivolities can be overlooked. The danger lies elsewhere—in the fabrication of results or entire research fields that appear scientific but are hardly so in reality. The transformation of the university has had the following unfortunate consequences, which I will detail below:

- misinformation,
- charlatans,
- gurus,
- the rise of pseudo-sciences,
- militant science, and
- new theologies.

[124] https://blogs.lse.ac.uk/impactofsocialsciences/2013/12/11/how-academia-resembles-a-drug-gang/

4.6.1 Disinformation

In recent years, traditional media have highlighted the fight against disinformation, fake news, and falsehoods. When speaking to the media, it is common for academics to deviate from the principle of objectivity that should guide their actions. Institutional communication is not free from biased statements that reflect vested interests, particularly the interests of university bureaucracy. Therefore, it is not surprising that:

- Swiss higher education institutions advocate for bilateral agreements with the European Union by raising the specter of brain drain.[125]
- The CNRS denies the existence of Islamo-leftism as a scientific concept[126] even though the term originates from its own researchers.[127]
- The Academy of Medicine[128] criticizes vaccination specialists who expressed skepticism about herd immunity during the COVID crisis.[129]

In his study of pseudo-rationalism, Bruno Andreotti (2020) argues that fallacious public discourses often come from senior managers, engineers, and young researchers, whose "inadequate scientific training has led them to never have been confronted with scientific research." He suggests that scientific disinformation primarily originates from individuals lacking the necessary background or experience. However, this divide between the knowledgeable and the unknowledgeable (or expert and non-expert) may not be the right explanation, as even experienced scientists can engage in disinformation.

There are indeed other reasons why an academic might choose to knowingly disinform when addressing a wide audience. One obvious reason is that the academic may advocate for a cause and, as a result, provide information they know to be false but which serves the cause they support. What was Professor Antoine Flahaut thinking when he recommended making one's own protective masks with toilet paper to safeguard against the COVID virus[130]? The reasons can be more subtle and difficult to pinpoint. Even among prominent scientists, cognitive dissonance, the difficulty of backtracking, or a lack of caution can lead to the expression of personal opinions that are not supported by the current state of scientific knowledge.

An example is provided by the dispute on the existence of an Indo-European people between Jean-Paul Demoule, a renowned archaeologist and emeritus professor at the Sorbonne University, and the scientific community. In his popular science books (Demoule, 2014, 2022), Professor Demoule has dedicated considerable time to discussing migrations, which he views as a major characteristic of humanity, and the ideological appropriation of certain theses by the nationalist right. He specifically considers the notion of an Indo-European people to be a myth lacking archaeological evidence, serving as a support for the idea of an indigenous population. Demoule's thesis is particularly marginal as it has never been published in scientific articles but only in popular books and articles; it funda-

[125] Grégoire Baur, In Switzerland, the brain drain has begun, *Le Temps*, 11 December 2022
[126] https://www.cnrs.fr/fr/presse/l-islamogauchisme-nest-pas-une-realite-scientifique
[127] https://www.liberation.fr/debats/2020/10/26/aux-sources-de-l-islamo-gauchisme_1803530/
[128] https://www.academie-medecine.fr/ne-pas-renoncer-a-limmunite-collective/
[129] https://www.theguardian.com/world/2021/aug/10/delta-variant-renders-herd-immunity-from-covid-mythical
[130] https://www.tdg.ch/des-experts-suisses-se-disent-en-faveur-du-port-du-masque-639249802310

mentally diverges from what the scientific community currently regards as the most plausible thesis. Archaeological, genetic, and linguistic evidence converges to validate the theory put forward by the American archaeologist Marija Gimbutas regarding a significant migratory wave (the Yamnaya culture) that occurred around five thousand years ago, which contributed to a large part of Europe's genetic and linguistic characteristics (Lazaridis *et al.*, 2014; Haak *et al.*, 2015; Pellard *et al.*, 2018; Bjørn, 2024; Antonio *et al.*, 2024; Lazaridis *et al.*, 2025). The demographic blending since this wave occurred through internal mobility (with rare external contributions), and from a genetic perspective, the European population has remained stable. Likewise, most European languages derive from a common, older language rather than resulting from the homogenization of local dialects through contact. The conversation between Jean-Paul Demoule and science journalist Mathieu Vidard [131] is a surprising mix of accurate facts, exaggerations, and falsehoods. [al]

The science journalist Laurent Foiry (2024) has focused on scientific conspiracy theories, particularly "viro-denialists" (those who deny the existence of viruses). An interesting case is Andrew Wakefield, who was a professor of medicine at University College London. In 1998, he published a study in the prestigious journal *The Lancet* linking the measles vaccine to autism in children. It was the investigation by journalist Brian Deer that revealed the study was fraudulent and that the evidence had been fabricated. Wakefield lost his job and was subsequently struck off the UK medical register, yet he earned several million pounds selling his autism detection tests. Andrew Wakefield's motivation appears to have been primarily financial. The misinformation he continued to spread has contributed to vaccine skepticism, a distrust that was heightened during the COVID pandemic.

4.6.2 The Pitchmen

One consequence of the commercialization of public research has been the emergence of charismatic scientists capable of selling expensive projects. This phenomenon is not new in itself; Bruno Lemaitre (2016) traced the lives of several great scientists and showed that self-confidence, a heightened form of narcissism, and the ability to captivate others were decisive assets in the careers of certain scientists, particularly when it came to attracting funding and students. With the new university model, we are witnessing an increased presence of such profiles.

In 2005, South African biologist Henry Markram arrived at EPFL with a grand dream: to replicate[132] the workings of the brain using a computer. He believed that *in vivo* neurological studies were too limited to yield decisive progress. The goal was now to conduct biology *in silico*. Markram's dream was not only to understand how neurons interact but also to study the emergence of consciousness from neuronal exchanges. In 2005, he launched the Blue Brain Project, which aimed to achieve a complete replication of the brain by 2015 (Markram, 2006). Markram used vivid analogies to describe the new momentum he wanted to inject into neurobiology: it was a new way of doing science[133], and the final result would be "as significant as man's first step on the Moon"[134] (sic). He intended

[131] https://www.radiofrance.fr/franceinter/podcasts/la-terre-au-carre/la-terre-au-carre-du-mercredi-05-novembre-2025-6884901

[132] Markram insisted that he wanted to replicate the brain, not just create a simulation that merely imitates.

[133] At the same time, Stephen Wolfram, inventor of the Mathematica software, expressed similar ideas with the cellular automata he described in his book, A New Kind of Science.

[134] One recalls J.F. Kennedy's speech in 1962 announcing the first lunar landing before the end of the 1960s: "We choose to

to create "the new supertechnology of the 21st century" [135]. The criticisms of such ambition were numerous and sometimes fierce (Waldrop, 2012), but Markram dismissed them with a wave of his hand: he proposed a radically different approach, and he felt it was normal to encounter resistance and emotional responses to the scientific revolution that was unfolding [136].

Markram's persuasive power was impressive, as he managed to convince not only the Confederation to fund the Blue Brain Project[137], but also the European Union to support the international Human Brain Project, one of the two flagship projects of the European Union, with funding potentially exceeding one billion euros over 10 years. This was a remarkable achievement, and to do this, he had to unite different research teams with varying themes, methods, and objectives (Destexhe, 2021); Markram presented himself as a visionary with great persuasive power, bordering on megalomania—qualities that, while they did not eliminate doubts among scientists, appealed to the political decision-makers of the European Commission.[138] American neuroscientist Christoph Koch remarked in 2011 that Markram had two personalities: "one is a fantastic, sober scientist... the other is a public-relations–minded Messiah" (Abbott, 2020).

The project began in October 2013 and brought together over 500 scientists from across Europe. However, enthusiasm for the project waned within just a few months. The scientific direction led by Markram faced intense criticism internally, leading to a revolt from several hundred scientists who demanded his removal from leadership after he decided to eliminate cognitive neuroscience from the project and shift its focus towards computational modeling. A mediator was appointed, and in 2015, a new director, Christophe Ebell, was designated, leading to a revision in governance (operational management shifting from EPFL to the University of Jülich) (Frégnac & Laurent, 2014). Governance of the project remained challenging, and Ebell was compelled to resign in 2018.[139] Numerous critiques emerged describing the bureaucratic fiasco: ego conflicts, conflicts of interest, poorly defined strategies, antagonistic objectives, overly optimistic timelines, bureaucratic burdens, lack of transparency, poor communication, excessive centralization, etc., [140] to the extent that the project became a textbook example of the challenges faced in managing large European scientific initiatives (Rüland, 2023). Ultimately, the project, initially budgeted at over one billion, received only half of the expected funding (€607 million, with €406 million from the European Union) (Naddaf, 2023).

Scientifically, the results fell short of the hopes placed in 2013[141]. Certainly, many articles were pub-

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go to the Moon because it is hard."

[135] Henry Markram, Ich erschaffe die Supertechnologie des 21. Jahrhunderts, *Tages Anzeiger*, 4 June 4 2011.

[136] Henry Markram was followed for a decade by Noah Hutton, a director of scientific documentary films (Abbott, 2020). This resulted in the documentary *in silico*, which chronicles the research led by Henry Markram and his collaborators during the decade from 2010 to 2020, the hopes raised in 2009, the criticisms of the project, the uncertainties regarding the possibility of meeting the challenge within the given timeframe, and the frustration over failures and internal conflicts.

[137] with funding of 22 million francs per year from 2005 to 2024 according to https://bbp.epfl.ch/bbp/research/domains/bluebrain/index.html%3Fp=7604.html.

[138] https://www.scientificamerican.com/article/why-the-human-brain-project-went-wrong-and-how-to-fix-it/

[139] Fabien Goubet, Une nouvelle crise secoue le Human Brain Project, *Le Temps*, 22 August 2018.

[140] https://forbetterscience.com/2017/02/22/human-brain-project-bureaucratic-success-despite-scientific-failure/

[141] According to Frégnac (2023), "The flagship projects were meant to be visionary endeavors that would revolutionize conceptual knowledge, address challenges seen as on the brink of feasibility at the time, and generate disruptive technologies. In this context, the priority of the HBP was to impose a paradigm shift that would transform how we consider the brain

lished, but no major results were achieved, as Fred Wolf admitted to Miryam Naddaf (2023). As Yves Frégnac (2023) points out, megaprojects reflect the desire of eurocrats to develop bold, high-visibility initiatives and the ambition of charismatic scientists to push boundaries. Excess is the norm. I could borrow from Tertullian and say they believed because it was impossible, and the will to believe can sometimes override reason. French neuroscientist Yves Frégnac has provided several insightful analyses regarding the scientific and technical difficulties posed by such large projects: what was lacking in leading a flagship project like the Human Brain Project was modesty, honesty, insight, and an evaluation of successes and failures; in the absence of such exemplarity, there is a significant risk of dampening expectations for major projects, ultimately discrediting the field and leading to a "funding winter" (Frégnac, 2023).

While in many respects, the large projects led by Henry Markram represent specific cases that may not be indicative of all large initiatives, the fierce competition among scientists and the bureaucratic management of research tend to promote the emergence of scientists who sell their projects beyond reasonable doubt. On a smaller scale, it is common to observe similar behaviors among scientists announcing paradigm shifts, revolutions, and significant breakthroughs, where the actual results are, in fact, quite modest and do not represent a break from existing knowledge. The grandiosity of press releases reflects the eagerness of universities to publicize their research.

4.6.3 The Gurus

It may seem strange to speak of a scientific guru since science is based on argumentation rather than belief. However, as Dan Sperber (2010) has shown, even in science, authoritative arguments intertwine with rational arguments and can take precedence when the person's aura is considerable. Readers may find major 20th-century philosophers like Martin Heidegger difficult to understand but attribute this misunderstanding to their own inadequacies rather than a lack of clarity from the author. The problem arises when schools of thought form and attract a multitude of researchers. Even among second-tier thinkers, a lack of clarity and intelligibility can be misleading. According to Sperber (2010), "the obscurity of respected masters is not just a sign of the depth of their thinking, but a proof of their genius. Left on their own, admiring readers interprets one recondite passage after another in a way that may slowly reinforces their admiration (or else render them wary)." Dan Sperber emphasizes the dynamics of belief: it is precisely because there exists a community that implicitly or explicitly shares views on a subject that those belonging to that community trust a leading thinker. Gurus and impostors take advantage of this effect to assert themselves. Even when unmasked, gurus continue to fascinate a segment of their followers.

An interesting case is the French philosopher Bruno Latour, who was originally trained as a theologian and later became a sociologist of science. In the latter part of his career, he turned his attention to ecology, which greatly increased his notoriety. He is the most cited French sociologist abroad; his book "Laboratory Life: The Construction of Scientific Facts" has received more than 25,000 citations according to Google Scholar. However, he was early on labeled as an impostor by Sokal & Bricmont (1997) for flaunting physical concepts he did not understand and, more seriously, for poorly mastering the concepts of the sociology of knowledge that he claimed to renew, as demon-

in terms of science and applications."

strated by the controversy with David Bloor (Bloor, 1999; Latour, 1999). Latour's ambition was to deconstruct concepts, initially targeting scientific facts. In 1998, he published a popular science article in the magazine *La Recherche*, arguing that Pharaoh Ramses II could not have died of tuberculosis as scientists claimed, because the bacterium of tuberculosis was only discovered 3,000 years after Ramses II's death. One might have thought it a parody, as produced by Georges Perec[142], but it was by no means a parody[143]. Bruno Latour inspired a wave of enthusiasm in some circles, which critical minds like Jérome Lamy[144] portrayed as devout followers:

> "In this heavy atmosphere of devout religiosity, the Master's words are collected, discussed among exegetes, anathemas are pronounced, and the Author's foresight is celebrated. [...] The idea that one enters the Latourian corpus as one enters a religion is surprisingly resonant [...] Marx and Bourdieu are thus old masters; it is time to turn to a new master, Latour. What is surprising is not that doctoral students feel the need to engage with canonical authors (this is one aspect of entering the academic world), but this insistence on the desire for a pastor leading his flock toward a sort of revealed truth."

The more nuanced critics, such as Nathalie Heinich, saw him as a "theorist, even a prophet, who undeniably practices the art of captivating his readers" (Heinich, 2025). Toward the end of his career, he focused on ecological movements and the awareness of climate change consequences. However, his discourse on ecology was surprising, where the theological character prevailed (Lamy, 2017; Cérézuelle, 2019; Jouvenet, 2019; Stamenkovic, 2020; Flipo, 2025). Thus, Latour questioned the separation between nature and society, suggesting that since nature does not exist, there is no need to protect it; instead, one must bring forth the new world (Latour, 2010):

> "It is at this point, it seems to me, that the great religious tradition must assist ecological movements, whose preaching can only lead to a desert. For those who have incarnated in the created world to transform it completely, a far different lesson is needed than 'decrease and diminish!' Since there is no 'nature' to protect, but rather a Creation to continue, we can take from the dogma of the Incarnation this fundamental lesson: where sin was, there too is Redemption."

As the French philosopher Dany-Robert Dufour summarized, "Latour long advanced masked, without mentioning that his Christianity supported his thesis. [...] In this Latourian sense, capitalism is an opportunity; it has allowed for the acceleration of technical progress. It is an opportunity because technology does not destroy the world; it spiritualizes matter" (Dufour, 2021, p. 93). Bruno Latour was an heir to Catholic intellectuals like Fathers Dominique Dubarle and Pierre Teilhard de Chardin, who viewed technology as a means to achieve parousia (Faes, 2017; Charbonneau, 2025). It is not surprising that Latour was friend with other university icons of Christian orientation, such as Donna Haraway (University of California, Santa Cruz), creator of feminist epistemology and advocate of transhumanism, wherein cyborgs will transcend sexual duality (Garcia, 2015), or Timothy Morton (Rice University), who sees nature as "the ultimate capitalist fantasy" (Morton, 2019).

[142] French writer Georges Perec humorously mocked the amphigoric style of scientists in a pastiche article where he described the effect of throwing tomatoes on a singer's vocalizations (Pérec, 1980).

[143] https://www.lahuttedesclasses.net/2022/11/philippe-descola-bruno-latour-et-ramses.html

[144] https://zilsel.hypotheses.org/1199

If academic gurus are honored, it is because jargon has become the norm. As English psychologist Michael Billig (2013) ironically noted in his book "Learning to Write Badly: How to Succeed in Social Science," the abundance of gibberish in social sciences is not a random accident but the result of selection among students: students are not required to understand social science concepts but rather to handle the language of social sciences. Drawing on the work of sociologist Pierre Bourdieu, he observes that students learn to forget their mother tongue to acquire academic language, which possesses all the attributes of a dead language, full of neologisms, abstruse terms, abstractions, and grammatically heavy structures. A sociologist's success is assured if others subsequently adopt their phrases and neologisms.

4.6.4 Les pseudo-sciences

The distinction between science and pseudoscience is not an easy task. Alchemy, astrology, phrenology, and racial theories were once considered sciences alongside chemistry, astronomy, biology, and genetics. The great Newton was interested in alchemy and the philosopher's stone (Rivière, 2013), and even today, Nobel laureates like the American biochemist Kary Mullis[145] have surprised many with positions that contradict scientific attitudes.

There is a genuine difficulty in distinguishing between a science and a pseudoscience[am]. A significant number of theories—such as mesmerism (animal magnetism), intelligent design (creationism), spiritism, extrasensory perception, and ether theory—have had their moment of glory and are now mostly forgotten, at least by the vast majority of the academic community. Their histories can be surprisingly intriguing. For example, the botanist Joseph Banks Rhine personally and skeptically explored spiritism before launching a research program on extrasensory perception (clairvoyance, telepathy) and telekinesis[146] at Duke University, which garnered some interest among American academics; within a decade, around fifty universities had similar research programs. Through several experiments, Rhine demonstrated that certain people could guess the image on a card that was hidden from them. To show that this result was not due to chance, Rhine extensively used statistical tools[an].

Rhine created a scientific journal dedicated to a new branch of psychology focused on the brain's supernatural abilities, which he called *parapsychology*[147]. While interest in this research topic has waned over the decades, it has not been forgotten. In 1974, Targ & Puthoff (1974) managed to publish an article in the journal Nature that demonstrated the brain's capacity to transmit information. Renowned physicists such as Professor Brian Josephson from the University of Cambridge (Nobel Prize winner in physics in 1973 and creator of quantum mysticism[148]) endorsed parapsychology and vehemently criticized those who sought to discredit it. More recently, in 2011, Daryl Bem, a psychol-

[145] Nobel Prize winner in chemistry in 1993, Kary Mullis was open about his beliefs in encounters with extraterrestrial beings (in the form of a raccoon, in his case) and in paranormal phenomena. He is known for his controversial statements regarding the absence of a link between the HIV virus and AIDS, as well as the non-existence of the ozone hole (Robson, 2020).

[146] Telekinesis is the ability to move objects by the mere will of the mind.

[147] The "Journal of Parapsychology," initially edited by Professor Gardner Murphy of City College New York, still exists today.

[148] https://en.wikipedia.org/wiki/Quantum_mysticism

ogy professor at Cornell, published an article presenting experiments suggesting that some individuals possessed a gift of precognition. This article, which continues to divide the scientific community (Kekecs *et al.*, 2023), sparked a dual crisis—one significant enough to downgrade psychology to the status of pseudoscience (Chambers, 2019). The most visible aspect of this crisis is known as the replication crisis, as the controversial experiments were only partially (to varying degrees) reproducible. The second, more technical aspect involved the use of statistics as tools for validating results.

4.6.5 Militant Research

The development of pseudo-sciences is closely linked to universities, as universities do not prohibit any research, no matter how strange it may appear initially. In 1905, the theory of relativity must have seemed eccentric to many physicists, just as today string theory, which claims to synthesize relativity and quantum mechanics, may seem odd. Therefore, the term "pseudo-science" should not necessarily be seen as pejorative. In most cases, the researchers involved were sincere actors seeking to explore alternative paths.

Militant research is a different endeavor. In the philosophy and sociology of science, two characteristics of scientific research have been discussed:

- Neutrality (axiological[149]): neutrality implies that the researcher makes an effort not to pass value judgments on the objects, facts, or observations they manipulate; in other words, they do not take sides. In practice, this stance is neither sustainable nor desirable. In societal debates, scientists are precisely asked to take a stand and clarify their choices. In their daily research practice, scientists may also conclude that theory X is better than theory Y based on intuitive considerations or personal stances, thus incorporating a certain level of subjectivity. For example, a physicist committed to experimental validation may judge string theory as esoteric and therefore decide not to linger on it.
- Objectivity is a scientific ideal that aims to make methods and results (and even the researchers themselves) free from personal subjectivity (bias, interest, or personal perspective, value judgment, etc.). It is a fundamental value of modern science, as any scientific approach strives to abstract from the particular conditions, especially from the subjectivity of the individuals that give rise to it. This value has also been criticized, not for what it means or implies, but because it may be practically inaccessible[150].

Militant research tends to produce a plausible narrative by sacrificing both scientific neutrality and objectivity whenever it seeks to present facts in a distorted manner or disregards reality. This can be a rhetorical means of formulating a theory by stripping it of all material contingency. Thus, the philosopher Jean-Jacques Rousseau began his discourse on the origin of inequality by stating, "Let us begin by dismissing all facts," as he intended to find this origin "not in the books of [his] fel-

[149] The German sociologist Max Weber first spoke of axiological neutrality in his book "Science as a Vocation" (1904). In both French and English, it is customary to translate the German term *Wertfreiheit* used by Weber as "axiological neutrality" (derived from the Greek ἄξιος, meaning value here), but as Aurélien Berlan (2023) points out, the meaning of the German word is more accurately "what is devoid of value.").

[150] Reiss, Julian and Jan Sprenger, Scientific Objectivity, *The Stanford Encyclopedia of Philosophy*, 2020, Edward N. Zalta (ed.).

low men, who are liars, but in nature, which never lies. Everything that comes from it will be true. The only falsehoods will be what I have unconsciously mixed in" (Rousseau, 2009, pp. 159–159). Centuries later, another major philosopher, Michel Foucault, implied that he could distance himself from historical facts if it served his cause (Foucault, 1994, p. 805):

> "I am simply not a historian, and I am not a novelist either. I engage in a form of historical fiction. In a way, I know very well that what I say is not true. A historian might very well say about what I have written: 'This is not the truth.' To put it differently: I have written extensively about madness in the early 1960s—I produced a history of the birth of psychiatry. I am fully aware that what I have done is historically biased and exaggerated. Perhaps I have overlooked certain elements that contradict me. However, my book has influenced how people perceive madness, and thus, my book and the thesis I present in it hold a certain truth in today's reality.
>
> "I attempt to provoke an interference between our reality and what we know of our past history. If I succeed, this interference will have real effects on our present history. My hope is that the truth of my books emerges once they are written—and not before.
>
> "As I do not express myself very well in English, the kind of remarks I make here will lead people to say: 'You see, he is lying.' But allow me to rephrase this idea. I wrote a book about prisons. I tried to highlight certain trends in the history of prisons. One might criticize me for only presenting 'one trend' and argue that what I say is not entirely true. Yet, two years ago in France, there was unrest in several prisons where inmates revolted. In two of these prisons, the prisoners were reading my book. From their cells, some inmates were shouting the text of my book to their fellow inmates. I know that what I am about to say is bold, but this is evidence of truth—a tangible political truth that began once the book was written. I hope that the truth of my books lies in the future."

Nowadays, the boundary between authentic research and activist research is blurred, as activists adopt scientific methods such as experimentation and statistical analysis, but they twist them to advocate for their perspective.

An interesting case is provided by the use of association tests in social psychology to study mental predispositions (referred to as "attitudes" in psychology, which includes biases, prejudices, feelings, and affects). Measuring these predispositions has proven to be a thorny issue, especially regarding taboo subjects, for example, attitudes toward Black individuals in American society. Researchers developed cognitive tests, the most well-known of which is the Implicit Association Test (IAT), developed at Harvard University (Greenwald *et al.*, 1998; Banaji & Greenwald, 2016), which involves:

- Quickly displaying cards in front of the participant.
- Measuring reaction time.

This test achieved colossal success within activist research circles, companies selling psychometric tests, media, and certain so-called progressive political environments because it was believed to highlight negative biases against certain communities (e.g., Black individuals, homosexuals, etc.). Scientifically, a moralizing perspective underpinned the work of Anthony Greenwald, Mahzarin Banaji, and their collaborators: if inequalities persist in American society, it is because of the prej-

udices generated by our unconscious. The IAT website[151] clearly states, "When we relax our active efforts to be egalitarian, our implicit biases can lead to discriminatory behavior, so it is critical to be mindful of this possibility if we want to avoid prejudice and discrimination." The scientific relevance of the test has been widely debated, and it has been shown that the IAT has very low predictive ability regarding any discriminatory behavior (Arkes & Tetlock, 2004; Fiedler *et al.*, 2006; Blanton *et al.*, 2009; Carlsson & Agerström, 2016; Mitchell & Tetlock, 2017; Jost, 2019; Gawronski, 2019; Forscher *et al.*, 2019; Corneille & Hütter, 2020; Levy Paluck *et al.*, 2021; Brownstein *et al.*, 2020; Machery, 2022). In a recent roundtable on the subject, philosopher of science Édouard Machery summarized the situation as follows [152]:

> "The recent history of the implicit association test is just the most recent episode in this sad history of irrational exuberance followed by disappointment. We were told that the IAT measures a novel type of attitude—mental states that are both unconscious and beyond intentional control, which we've come to know as "implicit attitudes"—and that people's explicit and implicit attitudes can diverge dramatically: As we've been told dozens of times, the racial egalitarian can be implicitly racist, and the sexist egalitarian can implicitly be a sexist pig! And law enforcement agencies, deans and provosts at universities, pundits, and philosophers concerned with the sad gender and racial distribution of philosophy have swallowed this story. [...]
>
> "It is now clear that there is precious little, perhaps no, evidence that whatever it is that the IAT measures causes biased behavior. So, we have a measure of attitude that is not reliable, does not predict behavior well, may not measure anything causally relevant, and does not give us access to the unconscious causes of human behavior. It would be irresponsible to put much stock in it and to build theoretical castles on such quicksand."

Despite the lack of scientific evidence regarding the validity of IAT tests, Greenwald and Banaji have extensively promoted them in the media to the extent that they overshadowed the rest of the research conducted in social psychology by less politicized researchers. The consequence has been that universities, companies, and administrations have spent millions of dollars to train their staff, select them based on their IAT scores, or impose campaigns against racial discrimination (Machery, 2022). Like other psychological assessment tests (such as the Myers–Briggs Type Indicator or the Rorschach test), the IAT will likely fall into obscurity, at least in academic circles, but the damage will have been considerable due to the harm inflicted on psychological research and the dissemination of false ideas about "implicit biases."

Many other fields have been affected to varying degrees by activist research. In biology, Professor Anne Fausto-Sterling from Brown University has argued that there are not two sexes but a continuum of sexes in her landmark book (Fausto-Sterling, 2000, p. 31):

> "The implications of my argument regarding a sexual continuum are profound. If nature actually offers us more than two sexes, it implies that our current notions of masculinity and femininity are merely cultural constructs. Reconceiving the category of

[151] https://app-prod-03.implicit.harvard.edu/implicit/faqs.jsp
[152] https://philosophyofbrains.com/2017/01/17/how-can-we-measure-implicit-bias-a-brains-blog-roundtable.aspx

'sex' calls into question aspects cherished by European and American social organization."

One can also witness even more perplexing conference content. For example, in February 2013, during the "queer days" conference organized by the University of Bordeaux, Rachele Borghi, a lecturer in geography at Sorbonne University, gave a talk that strayed far from what is typically understood as geography:

> "The anus as a laboratory. Post-porn has highlighted the anus as a laboratory for practices. A laboratory for democratic practices. Indeed, the anus is that space where one cannot differentiate between 'assigned female' or 'assigned male' individuals. Additionally, anal practices challenge the idea that penetration is solely a heterosexual (man penetrating a woman) and patriarchal practice."

Departments of humanities are particularly affected by activist research. In the name of a radical critique of society, researchers aim to enrich sociology, history, anthropology, or philosophy with new concepts to "deconstruct," "ungender," "demasculinize," or "decolonize" society (Heinich, 2021; Szlamowicz & Taguieff, 2024; Hénin *et al.*, 2025). The University Ethics Observatory [153] has begun to study the penetration of activist research into French universities, but it remains difficult to determine the extent to which the phenomenon has become prevalent. An examination of agency databases shows that activist research topics such as "Jeunes migrant·e·s d'Afrique subsaharienne face au VIH/sida : représentations et pratiques en matière de santé sexuelle" (in English: Young migrants from sub-Saharan Africa facing HIV/AIDS: representations and practices regarding sexual health", funded at 397 kF by the SNSF) [154] or "La prise en charge des violences conjugales par les professionnel·les du droit dans les marges du genre et de la sexualité" (in English: The handling of domestic violence by legal professionals at the margins of gender and sexuality, funded at 335 k€ by the ANR)[155] are frequently funded despite the supposedly competitive and excellence-oriented context claimed by these agencies.

4.6.6 Hyper-Politicized Science or New Theologies

While science and faith are two separate entities, there are times when they intertwine to create a new scientific theology, forging an unnatural alliance between scientific rationality and political considerations.

The most striking example is undoubtedly that of the German university system during the interwar period. Before Hitler's rise to power in 1933, Germany was a heavyweight in the realm of science, winning nearly all the Nobel Prizes in Chemistry and a substantial portion of the Nobel Prizes in Physics and Medicine; in 1932, 22% of all Nobel Prizes in these three scientific disciplines had been awarded to Germans (see figure 28). In comparison, the United States ranked fourth, closely contesting with Switzerland, far behind Great Britain and France.

After 1918, the German university system fell into a deep crisis with multiple roots. The classic causes

[153] https://www.decolonialisme.fr/nos-ouvrages-et-rapports/
[154] https://data.snf.ch/grants/grant/162382
[155] https://anr.fr/Projet-ANR-23-CE41-0008

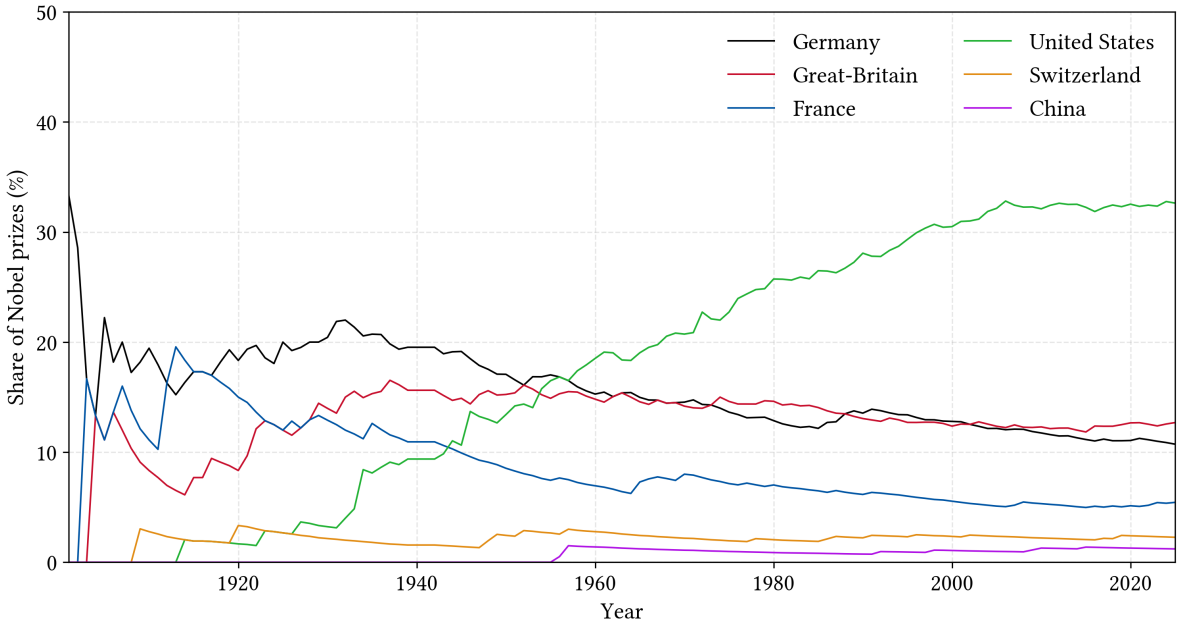

Figure 28 Evolution of the total number of Nobel Prizes in Physics, Chemistry, and Medicine for several countries relative to the number of prizes awarded from 1901 to 2025. Source: Nobel Prize Committee.

of university crises could be observed:

- The massification of universities, accompanied by a significant increase in student numbers, led to a devaluation of degrees.
- German society suffered from low social mobility.
- The cultural bourgeoisie, which held all university positions, clung to its last privileges even as it faced demotion and a loss of social status.[156]

Three additional causes were more specific to the German context of the time:

- The German university, once at the forefront of experimental physics from the 19th century, had also become the center for the new theoretical physics[157], which emphasized mathematics over experimental observation. This division was accompanied by rising anti-Semitism.
- Concurrently, universities were experiencing a profound spiritual crisis, significantly influenced by writings from Karl Jaspers and Oswald Spengler, who questioned the condition of modern humanity, the loss of transcendence, and the very idea of civilization.

[156] Christian Baechler, a French historian specialist of Germany, discusses the "proletarianization" of intellectual workers. After decades of improved salaries for academics, the economic collapse of Germany following World War I resulted in a dramatic drop in the salaries of academic and administrative elites, with average salaries halved between 1913 and 1923 (Baechler, 2021, p. 351).

[157] This new physics includes the theory of relativity developed by Albert Einstein and the quantum mechanics proposed by Max Planck.

- Anti-Semitism also played an increasingly important role in the politicization of universities. Students and some professors accused Jews of being overrepresented in intellectual professions.[158]

German academics viewed the emergence of the democratic system of the Weimar Republic with suspicion and, overwhelmingly, welcomed the Nazis' rise to power in 1933, despite Hitler's anti-elitist rhetoric. Student associations exhibited even greater disdain for the Republic and sympathy toward the Nazis. For the German academic elite, Nazism represented the renewal that Germany needed. In November 1933, just before the legislative elections, several rectors, notably the philosopher Martin Heidegger, along with hundreds of professors, urged people to vote for the Nazis. However, the Nazis were hardly in favor of the university system; in fact, in the five years following Hitler's election, 40% of university positions were eliminated after the enactment of the law on school and higher education overcrowding (April 1933) and the racial laws (September 1935). Approximately 3,000 scientists (including around twenty Nobel laureates) fled Germany[159]. There was a significant overrepresentation of academics among Nazi leaders, especially among Schutzstaffel (SS) officers, with about half being university graduates and a quarter holding doctoral degrees (Baechler, 2021, pp. 491-492). Two prominent examples of the involvement of academics are Professor Konrad Meyer-Hetling[160] and Carl Clauberg[161].

For activist scientists, the advent of the Nazi regime provided an opportunity to establish "engaged science," which sought to adapt scientific research to the new doctrinal demands, focusing on keywords such as race, people, space, and land (*Rasse*, *Volk*, *Raum*, and *Boden* in German) (Baechler, 2021, p. 507). In physics, two prominent German physicists, Nobel laureates Philipp Lenard and Johannes Stark, aimed to "Aryanize" theoretical physics by eliminating all Jewish elements, specifically Einstein's theory of relativity[162]. The theory of relativity was not attacked by ignorant individuals, but by prestigious scientists and not based on scientific arguments, but rather on political considerations. Lenard and Stark were early Nazis and quickly expressed their allegiance; in 1924, following the failed coup in Munich, they wrote an article titled "Hitlergeist und Wissenschaft"[163] in the Großedeutsche Zeitung (Lenard & Stark, 1024, p. 9) :

> "He and his comrades in the struggle appear to us as God's gifts from times of old when races were purer, people were greater, and minds were less deluded. This we feel; and these divine gifts should not be taken from us. This thought alone should already be a solid enough basis to hold the nationally-minded together toward their great goal:

[158] According to Christian Baechler, between 50% and 70% of students expressed sympathy for Nazism (Baechler, 2021, p. 385). The lowering of the voting age to 20 enabled many of them to vote in the 1933 elections.

[159] Most of the fleeing academics were Jewish; only a few, primarily converted professors, believed they could escape the racial laws. Only two non-Jewish professors refused to pledge loyalty to the Führer: Greek professor Kurt von Fritz and Swiss theologian Karl Barth. In fascist Italy, 13 professors (out of 1,200) refused to pledge loyalty to the Duce and were suspended (Milza & Bernstein, 1991, p. 272)

[160] He was a professor of agronomy at the University of Berlin before the war and a senior SS officer responsible for agrarian colonization programs in Eastern Europe.

[161] He was a professor of gynecology at the University of Königsberg and a general in the SS, who organized the mass sterilization of Jewish and Romani women in concentration camps.

[162] It should be noted that the reception of this initiative was mixed among the powerful and leading physicists, including Werner Heisenberg (Gordin, 2021, p. 33).

[163] Hitler's mind and science.

> Founding a new Germany, with Hitler 'beating the drum' , in which the German spirit is not just tolerated again to a certain extent and released from imprisonment, no, but in which the German spirit is protected, nursed, and assisted so that it can then finally thrive again and develop itself further for the vindication of the honor of life on our planet which is now dominated by an inferior spirit."

As English essayist Philip Ball (2020, p. 83) ironically summarized, this "story explodes the comforting myth that science offers insulation against profound irrationality and extremism." It is challenging to estimate the number of scientists who shared a similar almost religious fervor for Nazism. It is likely that many academics refrained from expressing opinions during these years and continued their research while adhering to the new rules, neither showing zeal nor resistance. Equally likely is that the German scientific community contained its share of fanatics, zealots, skeptics, indifferent individuals, and resigned ones. Nevertheless, one thing is certain: there was no opposition to the Nazis' takeover of the university system or to the incorporation of doctrinal elements into traditional sciences. It was under the Nazi regime that German science began a slow decline, which was exacerbated by the 1939–45 war, while American science experienced significant growth, elevating the United States to the forefront of scientific nations, particularly due to Jewish scholars who had fled to the U.S.

Most of our contemporaries assume that religion and science are two distinct realms fundamentally separated from each other. However, modern science, which emerged in the early 17th century, did not arise out of nothing; it inherited from the medieval scholastic tradition, observation, induction, logic, and the dialectical debate practiced by clerics between the 13th and 16th centuries. This heritage was enriched by Greek traditions and thinkers such as Averroes and Maimonides. The earliest modern scientists, like Copernicus and Galileo, were devout and sought to understand the order intended by God. Over time, modern science sought to establish itself as autonomous and to legitimize its claims through rational discourse supported by tangible and reproducible evidence. Modern science asserts that what is true is what conforms to observed reality; this definition differs from revealed truth, which does not require experimental proof.

The claim of modern science to reveal the truth has been questioned by numerous philosophers, sociologists, and sometimes even scientists.[40]

Among the recent figures was the mathematician Alexandre Grothendieck, considered one of the greatest mathematicians of the 20th century. At the moment when he was invited to the Collège de France to give mathematics seminars, he proposed a radical critique of scientific research. In a short article titled "The New Church," published in the dissident journal[164] "Vivre et Survivre," which he founded in August 1970, Grothendieck noted that modern science was taking the place that Christianity once held. He wrote:

> "People in general, although they are taught some of the most basic and ancient results of science, have always had little or no understanding of what science really is as a method. This ignorance has been perpetuated by all primary and secondary education, and even by a significant portion of university education that does not prepare for research; science is taught dogmatically, as a revealed truth. Thus, the power of the

[164] https://science-societe.fr/survivre/

> word 'science' over the minds of the general public has a nearly mystical essence and is certainly irrational. Science is, for the general public and even for many scientists, like black magic, and its authority is both indisputable and incomprehensible."

For Grothendieck, science is taught as a revealed truth, and very little effort is made to introduce students to the scientific method, that is, to critical thinking, curiosity, doubt, and analytical ability. He sees science as scientism, a new religion that claims to be based solely on reason. He argues that scientism is based on six myths:

1. Only knowledge formalized from reproducible observed facts or expressed mathematically is objective, valid at all times and places.
2. Truth is identified with scientific knowledge. Only what is scientifically verified is true, and vice versa.
3. Any system can be reduced to a set of irreducible elements whose interactions can be described quantitatively.
4. Science must be divided into distinct disciplines.
5. Only science, and the technology arising from it, can solve human problems.
6. Decisions must be made by scientific experts.

He concludes:

> "In most, if not all, countries of the world, under various disguises, scientism has established itself as the dominant ideology. As such, it provides the main justification and multiple rationalizations for the insane race toward the so-called 'progress', seen exclusively as scientific and technical progress (in accordance with the doctrine of scientism). This, in turn, is one of the main driving forces behind the religion of production and growth for their own sake. This insane race and growth have led to the current ecological crisis, of which we are only witnessing the initial stages, and to a major crisis in our civilization. Scientism, which has been a decisive force in bringing about these two crises, is completely incapable of overcoming them. It is unable to recognize the existence of a civilizational crisis, as that would mean questioning the scientistic ideology itself."

The French physicist François Lurçat—both a communist and a Christian—saw the indefinite expansion of science into all areas of life as the roots of a deep crisis in European civilization. Like many Christian intellectuals, he believed that the decline of religious sentiment (along with the idea of transcendence and the existence of questions outside the realm of science, such as the meaning of suffering in our lives) led to a view of science[165] as the matrix for all world interpretations. Gradually, throughout the 20th century, this conception of science as a principle organizing the intelligibility of the world fell into two pitfalls: politicization and excess. Science and knowledge do not coincide. He wrote (Lurçat, 1999, pp. 269–270):

> "Thus, on the side of the authentic sciences, we have the exercise of a rationality capable, in principle, of correcting its statements, questioning its concepts and theories

[165] the "authentic sciences," meaning physics and mathematics, in Lurçat's writings.

through their confrontation with empirical data, which often reserve surprises. These démarches are neither automatic nor instantaneous; they can be impeded by interests and passions. The current evolution of a science closely linked to political power, severely compromised by ideology, makes these processes increasingly laborious and uncertain. Nevertheless, they still exist.

"On the side of physicalist social sciences[166], the situation is different: what in the functioning of the authentic sciences represents deviations from their ideal norms is here elevated to a principle. The thought patterns of physics are systematically transposed into domains where they have no relevance. There is a refusal or an inability to take empirical data into account, or even to acknowledge it. Here, thinking dances to the tune of a glorious rationality celebrating its successes, but the lyrics of the song are merely stereotypes devoid of relevance, inarticulate babble, or even harmful absurdities. [...]

"A major example is that of the educational sciences, which have undertaken a systematic destruction of teaching practices [...]. These practices were grounded in empirical experience accumulated over centuries. The scientification of teaching scorns empirical practices; jealous of their effectiveness, it prefers to theoretically deny and practically destroy them. The result is that in democratic countries, illiteracy and ignorance are on the rise. Thus, science, in destroying the transmission of knowledge, undermines its own foundations. It must therefore be said that there is a suicide of science."

Somewhat surprisingly, the end of the 20th century saw a return to a form of Christian religiosity within the scientific institution, which had seemingly distanced itself entirely from it. I still lack the perspective to fully understand how the different currents of thought that contributed to this emergence are articulated, but here's what I can say:

- There is a long tradition of philosophical self-critique in the West (Dewitte, 2008). Starting in the 1960s, and concurrently with the social movements that led to the protest events of May 1968, a fiercer critique of power dynamics within society emerged. These dynamics are described as induced by social structures and institutions meant to regulate society (such as prisons, according to philosopher Michel Foucault). Several philosophers and sociologists have sought to reveal these power relations that underpin Western society. In its most radical form, this emphasis on domination relations is referred to as "deconstruction" (a term used by philosopher Jacques Derrida) or "postmodernism" (a term popularized by philosopher Jean-François Lyotard). It is likely that few intellectuals identify themselves as post-modernists, and thus the label of post-modern is better seen as a convenient way to group a set of theories that share a number of commonalities and clearly stand apart from a previously well-established Western tradition. [ap] According to Lyotard, postmodernism is characterized by the end of grand narratives (referred to as "metanarratives" in his writings) or myths that underpin modern societies; "scientific knowledge is a kind of discourse" (Lyotard, 1979, p. 11), which is true to some extent but has been taken too literally as an acknowledgment of the arbitrary and subjective nature of science, which becomes just one discourse among others. Taken to the extreme, Lyotard's critique has led to a form of advanced skepticism and then to relativism:

[166] In Lurçat's view, physicalism is the tendency of the sciences to mimic the mechanistic and mathematical perspective of Galilean physics.

if science is just another discourse, it carries no more truth than other discourses. The quote borrowed from Nietzsche[167] "There are no facts, only interpretations" perfectly illustrates the postmodern perspective.

Our era fixates on identity, that is, what an individual relates to[aq]. Until recently, identity was entirely inherited at birth: one was born with a certain sex, belonging to a specific social class, living in a particular place, and practicing a certain religion; this inherited identity often determined individuals' destinies. The modern era has shattered this notion of predestination, as individuals are encouraged to take control of their destinies and emancipate themselves from traditional forms of power. Modern theorists often speak of *agency*, defined as the individual capacity to act and choose one's life. A significant obstacle is sex, a biological given over which we have little control. Modern theorists have replaced it with gender, which originally referred to individuals' perceptions of their sexual condition, and the roles and characteristics society assigns to each sex (with sex being the biological layer and gender the social layer of our identity). Gender theory[168] envisions the possibility of defining oneself independently of one's sex. Other traditional characteristics of inherited identity have also disappeared or are on the verge of doing so: decline in religious practice, strong geographical mobility, the disappearance of major structured social classes (such as peasants, workers, and bourgeois) in favor of a multitude of different professional conditions, and individualism, which has rendered community belonging (to family, village, or homeland) secondary.

- French anthropologist Emmanuel Todd argues that a declining religion does not completely disappear (at least for a time), but persists in a zombie-like form; this is the case with Protestantism in the United States and Northern Europe, which is said to be on the verge of extinction according to Todd (2024), yet its lingering form helps explain the evolution of these societies. This could explain why certain Christian themes – such as original sin inherited by all successive generations, penance, purification, and evangelical virtues – are once again prominent in the prose of social justice activists, and more surprisingly, are carried forward by some scholars—not only in the humanities— and the leading figures in the academic realm. The DEI (Diversity, Equity, Inclusion) doctrine can be seen as the new catechism. African American linguist John McWorther (2021) has specifically criticized the development of anti-racism, which he believes has become a religious dogma that he accuses of infantilizing Black Americans, forcing them to remain perpetual victims of "systemic racism" and White supremacy; anti-racism, being intolerant, reintroduces the crime of blasphemy – which leads to excommunication – and the hunt for heretics.

English writer G.K. Chesterton (1905, p. 31) remarked on the perverse nature of Christianity:

> "When a religious scheme is shattered (as Christianity was shattered at the Reformation), it is not merely the vices that are let loose. The vices are, indeed, let

[167] Posthumous Fragments, 7, late 1886–spring 1887

[168] Many supporters—but not all—reject the term "gender theory" and prefer "gender studies." However, in doing so, they conflate two different concepts. The term "theory" is not pejorative and does not necessarily imply that the theory is a homogeneous whole; "studies" refers to the activity of studying and does not correspond to a theory, which is a product of that study. In physics, the kinetic theory of gases encompasses a set of theories that share the common goal of deducing the macroscopic behavior of gases based on the description of molecular motion. Similarly, gender theory can be defined as the collection of theories explaining our perception of sexual characteristics, the roles attributed by society, and so on.

> loose, and they wander and do damage. But the virtues are let loose also; and the virtues wander more wildly, and the virtues do more terrible damage. The modern world is full of the old Christian virtues gone mad. The virtues have gone mad because they have been isolated from each other and are wandering alone. Thus some scientists care for truth; and their truth is pitiless. Thus some humanitarians only care for pity; and their pity (I am sorry to say) is often untruthful."

Looking back, we have witnessed some surprising developments. The initial, legitimate criticism of science by postmodern philosophers has legitimized a relativism in which scientific facts can be subverted. This is how Anne Fausto-Sterling (2000), a biology professor at Brown University, could seriously assert that there are not two sexes, but rather a continuum between the two poles of male and female. Similarly, Thomas Laqueur (1990), a history professor at Berkeley, explained that the distinction of two sexes is a recent invention, dating back to the 18th century; anthropologist Agustín Fuentes (Princeton University) adopts Laqueur's thesis and declares—stepping into postmodernism's inversion of standards—that claiming sex binary is "bad science. The production of gametes does not adequately describe the biology of sex in animals, nor does it define a woman or a man."[169] Such works—contradicting common sense and directly opposing the teachings of biology (Dawkins, 2025) bolster the claims of some gender theory proponents who argue that sex is therefore a social construct assigned at birth. [ar]. Claiming the existence of two sexes can be perceived as a serious offense (blasphemy) in American academia, potentially leading to the expulsion of the blasphemer. Biology professor Carole Hooven from Harvard was pushed to resign in 2023 for asserting that there are only two sexes (Hooven, 2023).

We can isolate the elements of the new doctrine of "social justice," which aims to revolutionize Western societies[as]:

- All humans are equal and possess the same physical and intellectual capabilities. If a particular group is underrepresented relative to its demographics, if its performance is lower, or if its income is less than that of other groups, it is because this group is a victim of discrimination. When the law is insufficient to eliminate these discriminations, there are underlying causes (termed *systémiques* by activists) that are never explicitly stated but are manifested through unconscious mechanisms (biases and stereotypes)[170]. Through personal asceticism, individuals from a non-discriminated group can recognize the benefits (termed *privileges* by activists) they enjoy and correct their discriminatory attitudes toward marginalized groups or, better yet, repent for their "privileges." Individuals from a discriminated group, in turn, should have social privileges such as reserved jobs. Reverse discrimination is referred to as *positive*.
- All human groups have equally significant contributions to science and the arts. If the contributions of a given group are not acknowledged, it is because that group is a victim of a form of cultural imperialism that activists call *colonialism*. Just as the countries of Asia and Africa occupied by European (and American) powers until the mid-20th century liberated themselves from European dominance, it is possible to free oneself from Western cultural oppression by

[169] https://www.scientificamerican.com/article/heres-why-human-sex-is-not-binary

[170] These unconscious mechanisms cannot be studied directly, but only through experiments known as "implicit association," which are akin to Adam Smith's idea of the "invisible hand" used to justify market self-regulation, where individual interests are guided by an invisible hand to serve the common good.

decolonizing disciplines and minds.

Paradoxically, in a society marked by hyper-individualism (Lipovetsky, 1989), it is group membership that serves to explain any inequality. Universities and media outlets continuously hammer that women experience wage discrimination due to their sex, without ever examining on an individual level whether this explanation holds true.[at]

They care little that it is a myth that has been discredited for many years (Farrell, 2005) and that scientific studies investigating the issue explain why and how individual choices can create differences at the group level without resulting in discrimination[171].

The new doctrine surrounding identity and social justice has been developed in universities' humanities departments[au], it then spread to the North American humanities departments, eventually becoming endemic throughout the academic environment in the 2000s, before infiltrating federal administrations and private companies. Antiracism had become the new creed. The doctrine spread to the rest of the Western world in the 2010s. It matters little that the doctrine of social justice was originally a response to issues of inequality between communities in the United States and, as such, is of limited relevance to problems faced in other Western countries. European universities began to impose the "Diversity, Equity, Inclusion" (DEI) agenda at the time when the United States was reflecting on more than a decade of it—a controversial legacy that led many universities to reconsider their positions.

Donald Trump's rise to power in 2025 accelerated the retreat from the DEI doctrine, but even before he won the elections, the program was under fire for its cost, ineffectiveness, and ideological bias.[172]

The doctrinal version of postmodernism fosters a mystique centered on hunting the (White) male, who is condemned to be the culprit for all the world's misfortunes. This hunt spares no discipline, even those far removed from societal issues. Thus, in my field of specialization (fluid mechanics and hydraulics), I have found some striking examples. The Belgian-French psychoanalyst Luce Irigaray developed an analogy between, on one hand, fluids and women, and on the other hand, solids and men. Why? Because women have a body from which fluids flow, while men possess a solid and protruding body. What is the consequence? Just as women have been excluded, fluids have also been excluded. Irigaray (1977, p. 163) writes:

> "the historical delay in the mathematical treatment of fluids compared to that of solids raises the same type of question: why has solid mechanics prevailed over fluid mechanics, and what complicity does this order of things have with rationality?"

It is of little significance to her that fluid mechanics predates solid mechanics and that both share the same conceptual foundation (the mechanics of continuous media). English literature professor Katherine Hayles (1992) revisited Irigaray's thesis. In her lengthy article, she initially seems to aim to refute Irigaray's terse remarks by providing historical context for fluid mechanics, but ultimately ends up supporting Irigaray (without offering any evidence). [av]:

[171] For instance, Uber drivers earn 7% more than female drivers because they work at night and accept longer rides (Cook *et al.*, 2021).

[172] The compact that the Trump administration proposed to universities largely echoed suggestions made by nonpartisan organizations such as *Heterodox Academy* and the *Foundation for Individual Rights and Expression*.

> Most of her major themes [those of Irigaray] have been corroborated by this analysis—the subtexts in mathematical theories that connect them with the gendered construction of body experience; the relation between scientific objectivity and the exclusion of the feminine from masculinized arenas of discourse; the centrality of a male imaginary, particularly male lineage, to a science concerned with flow; and the interaction between feminine subjects and the erasure or marginalization of women within the history and practice of hydraulics.

The symbolism of fluids as a feminine element also allows Jennifer Mateer to provide a feminist interpretation of dams. Mateer (2021, p. 134) explains that dams manifest the desire expressed by "capitalism and patriarchy" to establish male dominance over water (thus over women and nature):

> "Such progress [dams] is naturalized through the prevailing human-nature dualism that advocates male dominance over nature–an ideology that presents domination as a triumph of human ingenuity in engineering and technology. These discourses are woven with references to the feminization of water and nature in general."

It is not only my field that is affected by postmodern critique. Calls to eradicate White supremacy and patriarchy are becoming widespread in the sciences, technology, engineering, and mathematics. Australian sociologists Meredith Nash and Robyn Moore[173] call for an end to male and White supremacy in Antarctic exploration, from which women have been excluded. They argue that this exclusion makes sense considering that Antarctica has been described

> "The portrayal of Antarctica as a female body that must be mastered and penetrated by men is central to Heroic Era narratives of the continent. Given this framing, it is unsurprising women were long denied access to Antarctica."

Max Liboiron (2021), a Canadian environmental sociologist, calls for the decolonization of geosciences by treating scientific knowledge and Indigenous knowledge as equals.

One might think that mathematics, pure abstractions of the mind, are immune to postmodern theories. This is not the case. Laurie Rubel, a mathematics professor at Brooklyn College (City University of New York), claims that "mathematics reeks of White patriarchal supremacy" and recommends using "queer theory" to combat patriarchy and deconstruct mathematics.[174] Is this an isolated attack? Not at all. The prestigious journal Nature (2023) proclaimed that "we have nothing to fear from a decolonization of mathematics," and the Quality Assurance Association for Higher Education in the UK called for every English university to present a decolonized mathematics curriculum (Armstrong, 2025). Indeed, postmodernists argue that modern mathematics has a "problematic" history: most results are attributed to Western male mathematicians, with insufficient recognition of external contributions (Battey & Leyva, 2016; Aikenhead, 2017). This accusation is strangely resonant, considering that modern mathematics stems from a long tradition that dates back to at least the earliest Mesopotamian civilizations—a legacy enriched by the contributions of Greeks, Indians, and Arabs, among others. The history of mathematics has consistently showcased this long tradition and its multiple influences (Borovik, 2023; Klainerman, 2023).

[173] https://theconversation.com/White-continent-White-blokes-why-antarctic-research-needs-to-shed-its-exclusionary-past-154944

[174] https://www.professorwatchlist.org/professor/laurierubel

Postmodern activists also assert the need to decolonize physics. For example, American astrophysicist Chanda Prescod-Weinstein (2020) (University of New Hampshire), who identifies as a Black queer woman, also critiques physics as a temple of White supremacy[175]. In her critique, she states[176]:

> "White empiricism is the phenomenon through which only white people (particularly white men) are read has having a fundamental capacity for objectivity and Black people (particularly Black women) are produced as an ontological other. [...]
>
> Because white empiricism contravenes core tenets of modern physics (e.g., covariance and relativity), it negatively impacts scientific outcomes and harms the people who are othered. White empiricism comes to dominate empirical discourse in physics because whiteness powerfully shapes the predominant arbiters of who is a valid observer of physical and social phenomena."

Physicist Amy Robertson (Seattle Pacific University) intended to demonstrate in an article published in the journal Physical Review Physics Education Research (published by the prestigious American Physical Society) how the use of the Whiteboard entrenches White supremacy in physics education (Robertson & Hairston, 2022). After receiving a multitude of emails highlighting the absurdity of Robertson's claims, the journal's editors expressed their full support for the author and blocked all comments (even constructive ones) on the article (Reichhardt *et al.*, 2023).

4.7 Political Polarization

4.7.1 Increased Polarization within Universities

One of the consequences of the politicization and the emergence of the doctrine of "diversity, equity, and inclusion" has been the political polarization of American universities. The wave of antisemitic protests that swept through the most prestigious universities, including Harvard, following the October 7, 2023 attacks on Israel is just one of the most recent illustrations of the strong political divisions within these institutions.

This polarization is further evidenced by cases of professors being fired or pressured to resign. The *Foundation for Individual Rights in Education* (FIRE), which advocates for freedom of speech, has documented all instances of employment contract termination over the last twenty-five years due to political attacks (see figure 29). While in the 2010s there were few political attacks against professors, and these attacks came from both progressive and conservative sides, there was a noticeable shift during that decade, with a significant increase in the number of attacks (a tenfold increase over ten years), primarily orchestrated by the progressive camp. However, 2022 marked a turning point, as conservatives became the most aggressive. With Donald Trump taking office in 2025, all subsequent attacks originated from the Republican camp.

[175] Her article sparked extensive commentary on social media. Only physicist Alan Sokal (2023) dared to critique this discourse, which resembles more a pastiche than a scientific article. Interestingly, even Sokal's style exhibits the tics of political correctness: capitalizing "Black" while using lowercase for "white," adopting feminine forms for neutral terms, etc.

[176] I have maintained the capitalization used by the author: Black and white.

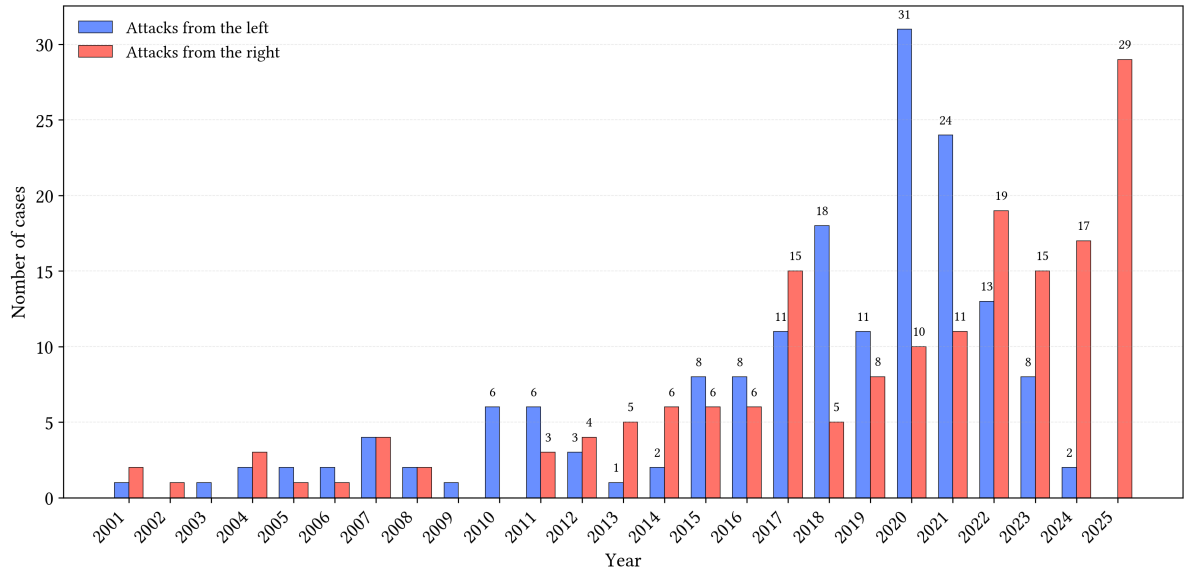

Figure 29 Evolution of the number of attacks against academics that led to their dismissal or resignation in the United States since 2001. Source: https://www.thefire.org/research-learn/scholars-under-fire.

The motives behind these attacks often remain petty. Two examples from 2025:

- In November 2025, Melissa McCough was dismissed from Texas A&M University for stating in class that there are more than two genders in her English faculty course.[177]
- At the University of Cambridge, philosopher Nathan Cofnas was pressured to resign due to allegations of racism from students following an article he published on his personal blog.[aw] Though the University of Cambridge found no charges against Cofnas, the atmosphere of mistrust fostered by Emmanuel College led him to resign. He had been cleared of all suspicion after an investigation by the University of Cambridge.

4.7.2 Causes of Political Polarization

There are multiple causes for the pronounced increase in polarization in the United States:

- The predominantly Democratic voting by faculty. Psychologist Jonathan Haidt (himself a Democrat) has warned about the lack of diversity in political opinions expressed by professors[178], and the greater intolerance of Democrats towards opposing ideas (Haidt, 2012). This is why he founded the Heterodox Academy in 2016 and advocates for a plurality of opinions. The distrust expressed by Republican voters towards universities largely stems from the perception that universities are bastions of progressivism (Gligorić *et al.*, 2025).
- The rise of social media, which has enabled mobbing against academics deemed guilty of sex-

[177] https://www.nytimes.com/2025/11/21/us/texas-am-professor-gender-lesson-panel-ruling.html
[178] https://www.insidehighered.com/views/2011/08/05/post-partisan-university

ism, harassment, racism, etc.

- The implementation of "Diversity Equity Inclusion" (DEI) programs, which, despite their commendable goals, have created a toxic climate in American universities.

The vast majority of American universities have implemented DEI programs; in 2020, 77% of American universities had established such programs (Gavrila *et al.*, 2025), and the number of staff associated with DEI offices is substantial, averaging 3.4 DEI positions for every 100 faculty positions[179], with the University of Michigan leading with 163 DEI positions at a cost of $250 million since 2016[180]. The DEI doctrine faces three critical paradoxes:

- Diversity: The DEI doctrine promotes diversity, but only based on certain identity criteria (gender, race, sexual orientation) that have no relation to intellectual activities. At the same time, this doctrine rejects any dissenting opinion, implying a dislike for diversity of thought (Haidt, 2012; Duarte *et al.*, 2015). The DEI doctrine claims that ethnic and sexual diversity contributes positively to performance, but meta-analyses reveal the contrary, which explains the recruitment choices of large companies (Bell *et al.*, 2011; Schneid *et al.*, 2015). It is clear that American science and technology owe much to foreigners, as highlighted by Friedman & Vlady (2024) and Putnam (2007), but it is primarily a few ethnic groups (Jews, Chinese, etc.) that are linked to significant successes. Antisemitic hatred is largely due to the achievements of Jews in various fields (science, literature, music, business, finance, etc.), which has fueled the belief in the existence of a Jewish lobby or even a Jewish conspiracy to justify their successes. The Swedish physicist Jan Charles Biro[181] pointed out the disproportion between the number of Nobel Prizes in Physics awarded to Jews (20%) and their demographic weight (0.15% globally), while Muslims, who constitute 24% of the world's population, have only received one Nobel Prize (the Pakistani Abdus Salam, who spent his entire career in Great Britain, in Physics).
- Equity: The DEI doctrine promotes equity. Noting inequalities between groups of individuals attributed to latent discrimination (called "systemic"), it seeks to correct these by imposing fundamentally unequal and discriminatory rules. It is difficult to understand the logic behind implementing equal measures in the name of equality. The deception is hidden under positive-sounding names (such as "positive action" in English or the oxymoron "positive discrimination" in French). This inequality led Asian students to challenge major universities like Harvard in front of the Supreme Court[182].
- Inclusion: The DEI doctrine aims to create an environment where everyone feels included, particularly by ensuring the absence of discrimination, aggression, harassment, etc. Generally speaking, fragmenting a population into distinct communities leads to a significant decline in social capital, meaning reduced ability to forge social ties with neighbors regardless of their

[179] https://www.heritage.org/education/report/diversity-university-dei-bloat-the-academy

[180] Nicholas Confessore, The University of Michigan Doubled Down on D.E.I. What Went Wrong?, *New York Times*, 16 October 2024.

[181] https://www.lemonde.fr/idees/article/2011/04/07/un-nouveau-revisionisme-le-prix-nobel-et-les-juifs_1503985_3232.html

[182] In June 2023, the U.S. Supreme Court prohibited universities from "positively" discriminating against students during admissions.

background; San Francisco, the most cosmopolitan city in the U.S., is also where trust among individuals is notably low (Putnam, 2007). The DEI doctrine has intensified the division of a student and staff community living on the same campus into a mosaic of separate groups and legitimized the struggle of some of these groups to obtain compensation or privileges. Given the authoritarian drift of the university, the rise of a petty and sprawling bureaucracy, and a politicized institutional discourse, many professors feel detached from collective life; evidence of this is the very low participation in collective consultation bodies (often less than 10%). It is also challenging to conceive of inclusion as an attractive and desirable aspect of campus life when the tone of official speeches is consistently aggressive and when articles denounce White supremacy, latent racism among White individuals, patriarchy, etc., all phenomena purported to explain the underrepresentation of certain categories. Although these theories of systematic discrimination lack any sociological basis, they are echoed in institutional discourses[183]. One can refer to the articles by Prescod-Weinstein (2020), Callwood *et al.* (2022), Reyes *et al.* (2022), Moreau *et al.* (2022), and Dancy & Hodari (2023) for insights into the violent claims in academic articles and the introduction of stereotypes that caricature entire segments of the population (it is rather ironic to complain about biases and stereotypes while generalizing alleged behaviors to an entire part of the population).

Friedman & Vlady (2024) question how such a noble program as the DEI doctrine ends up being so hated. It is likely that, despite its commendable initial intentions, the program was based on a flawed diagnosis of the causes of economic inequalities in the United States, and that the solution, whose ethical principle is questionable, was doomed to fail from the very beginning (Levy Paluck *et al.*, 2021; Devine & Ash, 2022). Affirmative action was implemented over 60 years ago[184], yet it has not led to any significant economic change for Black and Latino populations. While there are numerous critiques of the DEI doctrine and its negative impact, there is very little discussion of the areas it may have improved (Mogilski *et al.*, 2025). In the United States, the University of California mandated[185] :

- Candidates for professor positions must provide proof of their commitment to and belief in the DEI program.
- Current professors must integrate an anti-racist perspective into their courses.

This mandatory requirement caused considerable uproar, particularly because it resembled a form of allegiance reminiscent of dark times[186] (Thompson, 2019; Brint & Frey, 2023). As summarized by Brint (2025), there was a backlash even before Donald Trump's rise to power due to harsh criticisms regarding:

- The imposition of a foreign doctrine on the usual imperatives of research and teaching[187].

[183] https://www.thefp.com/p/dei-national-science-foundation-grants-report

[184] Affirmative action began in 1965 when President Johnson signed an executive order as the United States was shaken by the struggles for true civil rights. In 1954, the U.S. Supreme Court ended the discrimination faced by Black American students (Brown v. Board of Education).

[185] https://www.lemonde.fr/idees/article/2023/10/17/tout-professeur-qui-declare-ne-pas-etre-raciste-est-dans-le-deni-selon-le-nouveau-reglement-en-vigueur-dans-des-universites-de-californie_6195009_3232.html

[186] In the 1950s, during the McCarthy era, professors were required to take oaths affirming they were not communists and pledging loyalty to the United States.

[187] The account provided by Susan Carlson (2024) – the Vice Chancellor of the University of California responsible for the

- The colossal cost of the DEI program, which Brint (2025) estimates to be between $500 million and $750 million per year just for the University of California.
- The progressive political orientation and the conformity to a new faith, characterized by repentance and submission.

4.7.3 Reaction Against Diversity Programs

Several voices have emerged calling for the dismantling of DEI programs, such as mathematician Abigail Thompson (2025) (professor at the University of California, Davis) and psychologist Steven Pinker (Harvard University). The latter wrote an op-ed in the Boston Globe[188] following the testimony of Harvard President Claudine Gay before Congress in December 2023, in the wake of antisemitic protests at Harvard and other major U.S. universities. Pinker notes that Gay has exhibited inconsistent messaging. She strongly condemned any racial discrimination on her campus when she was dean and later president, but this struggle against discrimination did not extend to Jewish students, who have long faced antisemitism and were harassed by pro-Palestinian students in 2023. Pinker wrote:

> "Universities have become intellectual and political monocultures. Seventy-seven percent of the professors in Harvard's Faculty of Arts and Sciences describe themselves as liberal, and fewer than 3 percent as conservative. Many university programs have been monopolized by extreme ideologies, such as the conspiracy theory that the world's problems are the deliberate designs of a white heterosexual male colonialist oppressor class. (The appalling antisemitism infesting college campuses grew out of the corollary that Israelis, and by extension Jews who support them, are a party to this conspiracy.) Vast regions in the landscape of ideas are no-go zones, and dissenting ideas are greeted with incomprehension, outrage, and censorship. [...]
>
> "Many of the assaults on academic freedom (not to mention common sense) come from a burgeoning bureaucracy that calls itself diversity, equity, and inclusion while enforcing a uniformity of opinion, a hierarchy of victim groups, and the exclusion of freethinkers. Often hastily appointed by deans as expiation for some gaffe or outrage, these officers stealthily implement policies that were never approved in faculty deliberations or by university leaders willing to take responsibility for them."

The arrival of Donald Trump clearly signaled the end of DEI programs. Of the approximately 6,000 colleges and universities in the United States, only 10 signed the letter of protest against the Trump administration's policies[189], and only a few universities, including Harvard, refused to comply with the new government's requirements. Most announcements made by President Trump were even welcomed by Democratic professors,[190] as the sentiment that DEI doctrine was excessive prevailed. Some professors found the measures to be sensible, but too vague, potentially opening the door for

DEI program – during her long tenure, which faced resistance (that she lamented), speaks volumes about these top-down initiatives.

[188] https://www.bostonglobe.com/2023/12/11/opinion/steven-pinker-how-to-save-universities-harvard-claudine-gay/

[189] https://www.aacu.org/newsroom/a-call-for-constructive-engagement/

[190] https://inquisitivemag.org/articles/back-in-the-day/changing-as-the-world-changes/

conservatives to take control of universities[191] or even to an outright attack on academia[192]. What did the Trump administration say in its "Compact for Academic Excellence in Higher Education"?[193]

This compact calls for (1) an end to discrimination in hiring and a preference for standardized tests in student selection, (2) the promotion of a free marketplace of ideas, (3) no discrimination against staff based on their opinions, (4) the guarantee of institutional neutrality, and (5) the assurance of physical safety and equal treatment for students. All these points stem from proposals made by several nonpartisan organizations such as Heterodox Academy. In his op-ed in the Boston Globe, Steven Pinker (an openly Democratic voice) had already proposed a five-point reform for universities:

> "A fivefold way of free speech, institutional neutrality, nonviolence, viewpoint diversity, and DEI disempowerment will not be a quick fix for universities. But it's necessary to reverse their tanking credibility and better than the alternatives of firing the coach or deepening the hole they have dug for themselves."

The Trump administration faced criticism for its anti-scientific positions, particularly due to:

- The climate-skeptical views of Donald Trump and several Republican officials.
- Comments from Vice President James D. Vance against higher education, where he echoed Nixon's quote[194] stating that "universities are the enemy".
- The attitude of Health Minister Robert F. Kennedy Jr., who is accused of spreading misinformation about mRNA vaccines[195] and attacking scientific journals[196].
- Budget cuts in financial support for research and universities. This is a persistent myth, at least until 2025, as the figures (see Figure 4) do not indicate a decrease in overall funding, and Republicans tend to be more generous than Democrats on average (Furnas *et al.*, 2025).

European media extensively echoed these "attacks on science." French Foreign Minister Jean-Noël Barrot supports Harvard against the Trump administration[197], while French President Emmanuel Macron predicts a brain drain and invites researchers to relocate to France[198]. Science journalist Stéphane Foucart expresses concern about the situation[199]: "*Now, it is science itself that is being hindered [...]. We are in an unprecedentedly grave situation, and I believe that in Europe, we are struggling to comprehend what is happening.*" Strangely enough, Europeans are seldom concerned about the attacks on science coming from the academic community itself, as physicist Lawrence M. Krauss (2025) points out, the majority of attacks originate from within the university, not from the

[191] https://goodscience.substack.com/p/a-compact-between-universities-and
[192] https://www.universityworldnews.com/post.php?story=20260116140044901
[193] https://en.wikipedia.org/wiki/Compact_for_Academic_Excellence_in_Higher_Education
[194] https://bryanalexander.org/politics/the-professors-are-the-enemy-j-d-vance-on-higher-education/
[195] https://theconversation.com/how-rfk-jr-s-misguided-science-on-mrna-vaccines-is-shaping-policy-a-vaccine-expert-examines-the-false-claims-263027
[196] https://sante.lefigaro.fr/apres-les-vaccins-l-administration-trump-s-en-prend-aux-grandes-revues-scientifiques-20250528
[197] https://www.lefigaro.fr/international/la-france-soutient-harvard-et-les-universites-americaines-face-au-controle-gouvernemental-20250614
[198] https://www.lefigaro.fr/sciences/macron-invite-les-chercheurs-du-monde-entier-a-choisir-la-france-et-l-europe-et-leur-donne-rendez-vous-le-5-mai-20250418
[199] https://www.rts.ch/info/suisse/2025/article/et-si-la-suisse-offrait-l-asile-scientifique-aux-cerveaux-americains-28821839.html

Republican camp.

4.8 Financial Cost

One of the most paradoxical aspects for researchers is their financial situation: although governments have injected varying amounts of public money into research and higher education, researchers and educators find themselves much more disadvantaged than they were twenty years ago. In the case of my own laboratory, the funding (operating budget and salary envelope) has decreased by more than 30% over the past 20 years. What explains the sentiment expressed by many academics?

- In principle, the increase in the budget allocated to research has largely been reserved for funding agencies, which are supposed to distribute this money based on the merit of the applications received. In practice, the failure rate for funding requests is high (between 65% and 85% of applications are rejected, see § 3.6), meaning that a significant amount of time spent preparing proposals is wasted each year.
- Bureaucracy has been the fastest-growing sector in academia since the early 2000s (see § ??). Therefore, a portion of the money goes into bureaucracy. For large projects, such as the Human Brain Project funded by the European Union and the Swiss Confederation, the management cost has been around 8% of the allocated funds (Frégnac, 2023).
- As research becomes more specialized, research equipment becomes increasingly expensive, both in terms of investment and operating costs. For instance, considering the two future colliders at CERN, whose construction is expected to begin in 2030, the construction cost is currently estimated at 35 billion francs[200] (Billeter, 2025), and their electricity consumption will be equivalent to that of 700,000 residents (or 8% of the Swiss population). This represents the most expensive scientific instrument on European soil.

The pharmaceutical industry is probably the example that sheds light on the issue of rising costs in relation to the new contributions of research. The pharmaceutical industry has long excelled in the financial profits it could generate (with a gross margin of around 76% for the 35 largest companies, which is double the gross profit margin of companies in the S&P500, with a net margin of 14% for the pharmaceutical industry compared to 7% for the S&P500) (Ledley *et al.*, 2020). It represented a market worth $1,291 billion[201] in 2021. In the early 1960s, the pharmaceutical industry made profits about twice what it invested in research and development (OECD, 2023). Thus, there was a golden age for the industry during which investments in research translated into significant profits.

This is no longer the case:

- Indeed, the financial cost of developing new drugs has significantly increased: in 2013, the average development cost was approximately $1.3 billion per drug, which rose to $2.23 billion in 2024 for the cohort of twenty companies analyzed by Deloitte[202] in 2020.
- The cost of failures (drugs whose development is halted during study due to inefficacy or

[200] The current collider cost approximately 9 billion francs.
[201] https://www.oecd.org/en/publications/oecd-health-working-papers_18152015.html
[202] 15th annual report from Deloitte « Measuring the return from pharmaceutical innovation »

toxicity) amounts to $7.7 billion.

- The internal rate of return[203] decreased from 25% in 1993 to 5% in 2024 (see figure ??), which is lower than the cost of capital[204], indicating a significant drop in profitability for pharmaceutical companies, which are only able to maintain large profit margins by increasing drug prices and focusing on best-selling drugs (oncology, obesity, etc.) (Grabowski, 2011; OECD, 2018). This context helps to explain the recent calls from Roche[205] and Novartis[206] for the Confederation to allow an increase in drug prices in Switzerland.
- The strategy of pharmaceutical groups must take into account constraints on a global scale: development occurs in countries like Switzerland with a highly educated population, but production takes place in countries like India with low labor costs. This strategy is far from optimal in financial terms[207].

Here is what Kelvin Stott, the CEO of Amporin Pharmaceuticals (Basel), wrote:[208],

> "Return on investment in Pharma R&D is declining because that is precisely how we prioritize investment opportunities over time. In essence, drug discovery is rather like drilling for oil, where we progressively prioritize and exploit the biggest, best, cheapest and easiest opportunities with the highest expected returns first, leaving less attractive opportunities with lower returns for later. Eventually, we are left spending more value than we are possibly able to extract.
>
> "What we have here is an industry that is entering a vicious cycle of negative growth and terminal decline as its fundamental business model has run out of steam by the Law of Diminishing Returns: Diminishing R&D productivity and return on investment leads to diminishing growth in sales. Eventually, growth turns negative and sales start to contract. Decreasing sales then limits the amount of money available to invest back into R&D, which causes sales growth to decline even further. And so on, until the industry is gone altogether."

A part of private research is funded by public funds, either in the form of subsidies or indirect financing through tax credits[209]. France is the most generous country regarding tax credits: 36% of the funds allocated by the private sector are reimbursed as a tax credit, and 60% of public spending dedicated to innovation is actually corporate tax relief[210]. A major company like Sanofi had a revenue of €41.1 billion in 2024 and allocated €7.3 billion to research (17.7%). The net profit was €5.56

[203] This rate is an estimate of the return on the sum invested in research and development, excluding external factors such as inflation or the cost of capital (hence the term *internal*).

[204] 7.82% in 2025 according to https://pages.stern.nyu.edu/~adamodar/New_Home_Page/datafile/wacc.html

[205] https://www.rts.ch/info/economie/2025/article/roche-exige-des-prix-plus-eleves-pour-les-nouveaux-medicaments-en-suisse-29097299.html

[206] https://www.rts.ch/info/economie/2025/article/les-prix-des-medicaments-en-suisse-sont-trop-bas-estime-le-patron-de-novartis-29004298.html

[207] https://www.letemps.ch/economie/pharmas-medtech/la-suisse-peut-elle-etre-le-cerveau-de-la-pharma-sans-produire-de-medicaments-attention-danger-repond-l-industrie

[208] https://www.linkedin.com/pulse/pharmas-broken-business-model-industry-brink-terminal-kelvin-stott/

[209] The law provides a tax credit of 30% for up to 100 million in research and development expenses, and then 5% for amounts exceeding 100 million.

[210] https://taxfoundation.org/data/all/eu/rd-tax-incentives-europe/

billion (13.5% of revenue). Its market capitalization was €113 billion as of December 31, 2024. The research tax credit is around €100 million.[211]

The issue of research costs is thus essential but overlooked. An analysis of the return on investment should lead public decision-makers to question the benefits that society as a whole derives from massive funding of both private and public research. Questions surrounding return on investment are rarely addressed publicly. Along with economic costs, there is also an ecological cost—again, the disastrous ecological impact of the CERN collider project (Billeter, 2025) or the massive use of laboratory animals for clinical trials and biological research should raise ethical concerns.[212] Analysis of parliamentary reports shows that it is generally global budget constraints that set budgetary limits and not a cost/benefit analysis.

4.9 Acceleration

4.9.1 Productivism

A notable fact in recent decades is the considerable increase in the number of scientific articles. This increase (currently around 6% per year) is the result of several processes:

- the rise in the number of researchers,
- the pressure on researchers to publish more articles to demonstrate their productivity,
- the greater availability of scientific journals, and
- the electronic format of publications that facilitates dissemination.

An example of the phenomenal increase in the number of articles is illustrated in Figure 30. It shows the evolution of the number of scientific articles (in journals or conference proceedings) related to avalanches over 170 years (1855–2025). The numbers are staggering: there were 100 articles in the 1960s, 1,000 articles in the 1990s, and currently just over 10,000 articles. This also means that about 300 articles are published each year on the subject, even though it is a highly specialized field involving only a few dozen researchers worldwide. As a result, it becomes challenging to keep track of developments in a scientific domain experiencing such indefinite expansion.

This increase is associated with a number of problems I have already discussed earlier (see § 4.2.4), namely the lack of validation of studies due to the pressure to publish, the low reproducibility of many studies, and fraud (plagiarism, falsified or truncated data). The acceleration in the number of publications raises additional issues:

- The weak consolidation of results. There is a plethora of research leading to partial results, with insufficient efforts to converge the state of the art towards a consolidated body of knowledge. Several reasons contribute to this:
  - It is more difficult to publish an article on the replication of results than one presenting

[211] https://www.publicsenat.fr/actualites/economie/au-senat-audition-tendue-de-sanofi-qui-juge-que-les-aides-publiques-sont-extremement-utiles-pour-la-competitivite

[212] In France, laboratories used 1.8 million animals—primarily mice—for experimentation in 2022, a reduction from the 4.5 million animals used for medical experimentation in 1984.

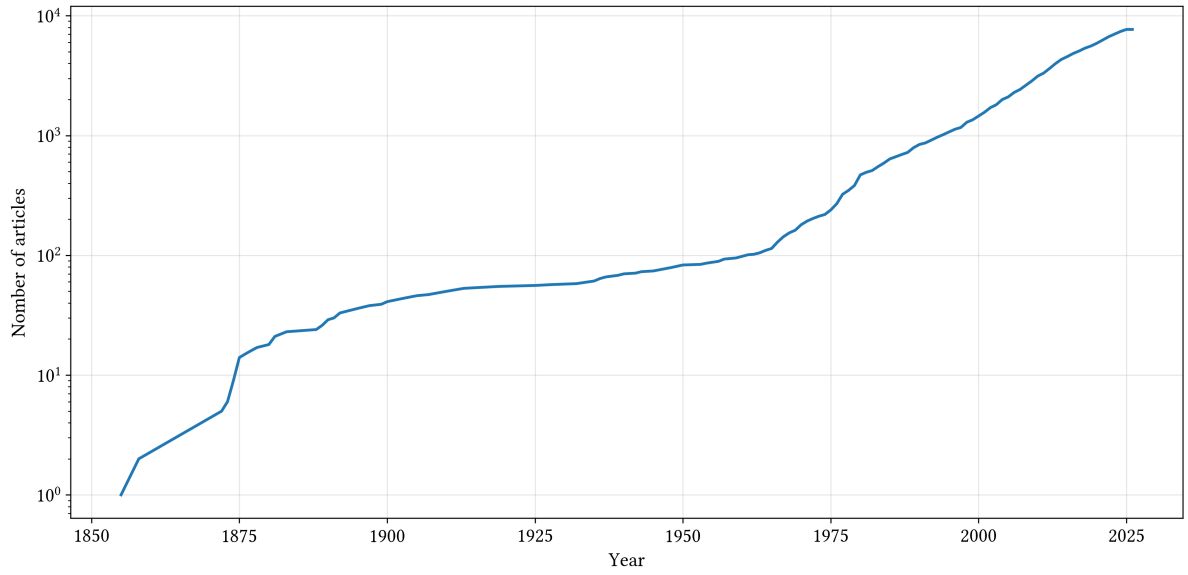

Figure 30 Evolution of the number of articles with the keyword "snow avalanche." Source: OpenAlex open catalog.

new findings,

- Researchers are valued more for producing articles than for writing monographs,
- The difficulty for a single individual to digest a colossal amount of information (i.e., to be aware of it, form a critical opinion, and synthesize it).

- The lack of an overview. Hyper-specialized researchers must delve into very specific questions without sometimes being able or willing to consider other issues. The era of universal geniuses capable of revolutionizing multiple fields (think of Einstein, von Neumann, Landau, Turing, or Kolmogorov) also seems to have passed (Simonton, 2013). It is also very challenging to anchor theories within a single framework. Fluid and solid mechanics were reconstructed within the same conceptual framework (the mechanics of continuous media) in the 19th century, which required reflection on several common concepts despite the evident differences between solids and fluids. It is becoming increasingly difficult to propose an integrated vision of concepts.
- Trends and fads. There are also trends when a new technique appears and tends to invade scientific disciplines. For example, in geophysics, there has been a trend towards fractals, self-organized systems, wavelet decomposition, deep learning, etc. These techniques and concepts are used to revisit some old problems or explore new questions. Young researchers are generally more interested in exploring the contributions of artificial intelligence than in working on an already established technique, even if it means developing very complex tools when simple solutions already exist.
- The persistence of erroneous results. It is possible to keep an electronic record of any result. Even if a result has been proven incorrect afterward, or worse, even if it is fraudulent, it will

continue to exist and be cited. For example, 19th-century engineers believed that the increase in flooding during that century was due to deforestation in the Alps; we now know that climate change (the end of the Little Ice Age) was the cause of the major floods that affected Europe and that forests do not prevent the intensity of these catastrophic floods (Andréassian, 2004; Calder & Aylward, 2006). However, the idea that reforestation is a solution for flood prevention is still widely held by foresters.

- Artificial productivism. According to Chavalarias & Huneman (2020) and Binswanger (2014), the publication race established by the new university has led to:
  - an increase in cases of plagiarism,
  - fragmentation of articles (splitting one article into several, sometimes redundant, articles to increase the total number of publications),
  - opportunism (targeting scientific themes that lend themselves quickly to publications),
  - haste (rushed articles), and
  - reduced scientific collaborations.

  In the dystopian novel "The Blazing Heights," Soviet logician and dissident Alexander Zinoviev (1976, p. 487) explained that Soviet society could produce as many doctors as needed to meet sudden demands from the leaders:

  > "Research had been forgotten. We made an effort to rectify this oversight. There was a special meeting. The imperative decision was made to increase, improve, and correct. Then we moved on to concrete measures: 1) increase the number of graduate doctors and PhDs, 2) enhance the training of researchers and the theoretical and scientific level of theses; 3) increase the number of publications devoted to current scientific events, etc. As soon as it was said, it was done."

- Lack of perspective. Some scientific fields (genetic engineering, artificial intelligence, etc.) are progressing at such speed that it becomes impossible to take a step back and assess the significance and dangers posed by the latest advancements. The Asilomar conference in 1975 was the first call for a moratorium on genetic research (DNA modification of bacteria) (Chevassus-au Louis, 2025). Recently, the *Institute for the Future of Life* called for a pause in research on artificial intelligence[213], which has had no effect. Regulating research and implementing safeguards seems impossible today (Graner, 2022). Since technology is shaping the future of our societies entirely, it would be good for citizens to have a say (Barbin, 2025), but in practice, technology is imposed.

4.9.2 Paradigm Shift or Singularity?

The abundance and fragmentation of scientific results raise broader philosophical issues that can be outlined, but are likely still only conjectures at this point:

[213] https://en.wikipedia.org/wiki/Pause_Giant_AI_Experiments:_An_Open_Letter

- In their analysis of the scientific singularity of the West[214], several scholars have drawn a connection between the emergence of the alphabetical writing system[215] in Greece in the eighth century BCE and the development of Greek philosophy (or the broader Greek miracle).
- Similarly, the advent of the printing press in Europe in the 15th century combined with the use of paper (instead of parchment made from animal hides) facilitated the mass dissemination of books, most notably the Bible. Some associate the creation of printing presses with the scientific revolution of the 16th and 17th centuries.
- Régis Debray (2000) has attempted to synthesize reflections on the interactions between technology (alphabet, printing) and knowledge. He introduced the concept of *mediology* (the study of media) to illuminate how the medium has shaped our way of thinking[216]. He distinguished four distinct periods:
    1. The logosphere when all knowledge was transmitted orally.
    2. The graphosphere when knowledge could be disseminated through writing (from the 5th century BCE for the Mediterranean world).
    3. The videosphere when knowledge could be transmitted through recorded images and sounds.
    4. The hypersphere when knowledge is digitized, stored, and transmitted electronically.

    These media do not succeed one another in time, but rather complement and interlock somewhat like Russian nesting dolls.

If we think that the ongoing technological change can alter knowledge and ways of thinking, we must clarify how knowledge and thought will manifest. According to the French philosopher Jean-François Lyotard, it is indeed the dematerialization of information and its electronic transmission that mark the beginning of the era he calls postmodern. He argues that this technological transformation signifies the emergence of multinational information control societies, which will hold true power. This thesis has been echoed by Cédric Durand (2023), an economist at the University of Geneva, who believes that the creation of multinationals controlling information flows signals the return of a feudal age. The German philosopher Peter Sloterdijk (2000, p. 14) expressed an even grimmer view, observing that:

> "Today, new media of politico-cultural telecommunications have taken the lead in this movement; they have modestly reduced the scope of friendships formed in writing. We have left the era of modern humanism, considered a model of education, because we can no longer maintain the illusion that large political and economic structures could be organized according to the amicable model of literary society."

[214] David Cosandey (2007) states that a multitude of factors, as varied as the intertwining of lands and seas and the rivalry between nations, contributed to the success of the West.

[215] The Greeks borrowed the alphabet from the Phoenicians and improved it by adding vowels. The very name "alphabet" – composed of the first two letters of the Semitic alphabet, aleph and beta – acknowledges this borrowing.

[216] The impact of the information medium on thought had already been addressed by Plato in Phaedrus [275], when the Egyptian king Thamous tells the god Theuth, who gave writing to humanity: « *Because they will rely on writing, people will seek to remember externally, through foreign imprints, rather than from within and the depths of themselves. [...] You give your disciples the presumption that they have knowledge, but not knowledge itself.* »

He believed that the postmodern era (which he refers to as post-literary) marks the end of humanism and the significance of writing in the education (which he calls domestication) of humanity, thus leading to a regression towards a state of bestiality.

Other researchers, such as American engineer Ray Kurzweil and Swedish philosopher Nick Bostrom, foresee such an acceleration of technology that we may reach a singularity within a few years, meaning a radical transformation of the human condition with the emergence of a superintelligence. Among the main consequences of the singularity are:

- The creation of cyborgs and human-machine interfaces. This involves discussions of augmented humans or post-humans.
- The creation of digital twins where the mind could be transferred to machines, ensuring indefinite life (assuming one believes in the duality of body and spirit, this is one of the few oppositions that has escaped post-modern deconstruction), and quantum computers.
- An increase in innovation capacities across numerous fields (gene therapy, neurotechnology, creation of new molecules, etc.), allowing us to envision the eradication of many scourges (disease, poverty, ecological crisis).
- Colonization of planets and space travel.
- Geoengineering to influence Earth's climate.

4.9.3 Technological Accelerationism

The new university has prioritized innovation to the extent that some faculties resemble research and development departments more than academic research centers. Even in institutional discourse, innovation has become the watchword that overshadows the two historical missions (teaching and research). Everything is measured through the lens of growth: growth in the number of patents, articles, funding, student enrollment, and more.

The term "acceleration" is rarely mentioned. It remains on the periphery of official discourse. A few prominent figures from the academic community and the business world have discreetly established the Gesda foundation with financial support from the Confederation and the Canton of Geneva. The foundation's goal is to proactively anticipate major changes in various scientific and technological fields in the "era of great scientific acceleration"[217].

Peter Brabeck-Lemathe (2020, pp. 232–236), former CEO of Nestlé and president of the Gesda foundation, shares the following perspective:

> "I was very curious to explore a new sector, especially since my introduction to this matter coincided with the launch of the new 5G technology, absolutely necessary to fully leverage the Internet of Things (IoT). Once again, the technology is ready; it exists, but the public is not easily accepting it. This same public that, at the beginning of the 19th century, feared that the speed of trains would make passengers' hearts stop! [...]
>
> "The Swiss government asked me to become the president of a foundation that the

[217] https://www.gesda.global/summit/summit-2024/

State Council, in collaboration with the Canton and the City of Geneva, created: GESDA, Geneva Science and Diplomacy Anticipator. The idea of this foundation is to observe, through the eyes of the world's best scientists, what is happening in laboratories in terms of scientific and technological developments and what conditions are necessary for these technologies to be effectively applied for the well-being of humanity. We are not discussing what exists; we are trying to foresee what will exist in ten or twenty years. [...]

"Since we have realized that many technologies are ready but not accepted by society, we must establish multilateral references to apply all these improvements that could make our lives easier and protect the planet one day. Our Council, composed of renowned scientists and politicians, has identified three essential points that guide our work:

- "What is a human being? We already have cyborgs, cameras implanted in brains, and cloned children... Where does humanity end? Where does the machine begin?
- "How will we live together? Will democracy as we know it withstand systems like those in China or Russia? How will we express ourselves when technology allows us to eliminate parliaments and replace them with direct voting?
- "How do we find a balance between human well-being and the health of our planet Earth? [...]

"Another focus of the Geneva foundation is everything concerning the consequences of technology on the brain. Today, we can already create small implants that modify an individual's way of thinking... Perhaps this is the solution to certain mental illnesses, unless, from a more troubling perspective, some malicious individuals exploit this to reprogram the minds and intelligence of others. In short, everything related to augmented humanity will offer a vast field of research in the near future. We are also passionately and vigilantly addressing issues of ecological regeneration, synthetic biology, decarbonization, and regenerative agriculture. Indeed, all these new elements can find sustainable solutions through technology. Our role is to try to foresee which ones. Lastly, the relationship between science and diplomacy is examined. Today, a conflict inevitably leads to negotiation or confrontation. Will new technologies be able to shape conflicts, create algorithms, and provide objective solutions? It could mean the end of wars."

The excerpt from Peter Brabeck-Letmathe's autobiography is interesting as it reveals the intricacies and stakes of technological acceleration. Brabeck-Letmathe attended business school and, therefore, lacks any scientific background. He spent his entire career at Nestlé, surprisingly becoming the CEO of the agribusiness giant at the age of 52. In the excerpt from his autobiography, he discusses:

- The irrationality of the public that refuses technological advances out of fear. He recalls the irrational fear people supposedly had when the train appeared in the 19th century, one of many urban legends that technophiles like to propagate, as noted by technology historians

Jean-Baptiste Fressoz[218] or Bernward Joerges (1994).

- The necessity of educating society by explaining that these are not entirely new concepts but rather "improvements that would make our lives easier and preserve the planet." How could one refuse something that would simplify life and save the planet?
- The idea that technology serves the well-being of humanity. This is true, but the opposite is equally valid. Technology enabled the slaughter of 1914–18 and the barbarity of 1939–45 (to name just the deadliest examples). It has also significantly reduced mortality rates thanks to advancements in medicine and agriculture.
- Brabeck-Letmathe envisions a technological future populated by cyborgs, man-machine hybrids, and cloned children, suggesting the need for a renewed democratic structure.
- Cutting-edge technology will offer solutions to problems that earlier technologies have created.
- Ultimately, the most beautiful promise is the end of war. Survivors of the industrial slaughter that was World War I also believed in the promise of "the war to end all wars."

The Gesda foundation is not unique. There are other foundations and institutions worldwide exploring possible futures. Some examples include:

- In Grenoble, the Minatec and Clinatec hubs explore applications of nanotechnology and biomedical research. Funded by the Atomic Energy Commission[219], this initiative raises numerous questions about the purpose of the research.[220]
- The now-defunct Future of Humanity Institute, hosted by the University of Oxford from 2005 to 2024 and led by philosopher Nick Bostrom, focused on the implications of technological developments in daily life.[221]
- The private Future of Life foundation aims to mitigate risks associated with artificial intelligence by funding specific research.[222]
- The private Coefficient Giving foundation (formerly the Open Philanthropy Project) supports broader research initiatives (Alzheimer's disease, obesity, pandemics).

4.9.4 Technocritique

It must be acknowledged that technology and capitalism have been remarkably effective in increasing the standard of living since the Ancien Régime. Although the situation is far from perfect locally, one can assert that both have significantly contributed to reducing poverty, famine, and risks from natural disasters (such as floods or earthquakes).

[218] https://www.lemonde.fr/economie/article/2020/09/23/entre-lampe-a-huile-et-chemins-de-fer-une-histoire-des-techniques-falsifiee-a-la-cote-au-gouvernement_6053237_3234.html

[219] In France, the Atomic Energy Commission (CEA) is not strictly a military research center, but it has several sites entirely dedicated to military research.

[220] https://www.piecesetmaindoeuvre.com/necrotechnologies/clinatec-le-laboratoire-de-la-contrainte

[221] https://asteriskmag.com/issues/08/looking-back-at-the-future-of-humanity-institute

[222] https://en.wikipedia.org/wiki/Future_of_Life_Institute

However, these gains have come at a heavy cost: disruption of ecological systems, massive pollution, destruction of landscapes, climate alteration, and so forth. For instance, in agriculture, the 20th century saw a shift from extensive farming (based on crop rotation, fallowing, and land fertilization) to intensive farming (which relies on fertilizers, pesticides, fungicides, the selection and genetic manipulation of species, irrigation techniques, and mechanization). Yields increased substantially after World War II. In France, for example, wheat yields rose from 1 t/ha in 1950 to approximately 7 t/ha in 2000, remaining around that level since then[223]. With the exception of Sub-Saharan Africa[224], agricultural yields have improved at rates well above the population growth rate. However, stagnation in yields has been observed since the early 2000s. The ecological cost of the "Green Revolution" is significant:

- Destruction of soil life, reducing it to mere substrates.
- Pollution of groundwater.
- Energy costs associated with fertilizer production.
- Harm, or even destruction, of local flora and fauna.
- Soil erosion.

A search for methods to mitigate the negative impact of intensive agriculture is now underway, aided by new technological advancements. Indian economist and Nobel laureate Amartya Sen has offered a critical perspective on the Green Revolution: he argues that famines, food shortages, and malnutrition typically arise not from food scarcity but from inequality in access to resources. The Green Revolution addressed the symptoms without tackling the root causes.

Thus, technology is once again being called upon to remedy the damage caused by technology. Environmental history shows that humanity has always displayed ingenuity in finding technical solutions. Consider heating: under the Ancien Régime, city dwellers used wood for heating, which was expensive and caused significant pollution while increasing fire risk. With urban populations rising and wood shortages in the 19th century, coal seemed to be the solution, yet it resulted in severe pollution (the notorious *smog* in the British capital, which caused thousands of deaths in certain winters, such as the 12,000 deaths in December 1952 in London). The transition to different technologies (central heating, electric heating, etc.) has dramatically improved air quality in major metropolitan areas (McNeill, 2010).

Technophiles acknowledge that while technology creates problems, it also provides solutions. The issue is that the scale and severity of these problems increase with technological advancements. For instance, despite water purification standards, a small portion of agricultural inputs ends up in drinking water at non-toxic concentrations; however, we know little about the issues caused by the accumulation of chemicals in organisms.

Medicine also poses significant problems. When the coronavirus emerged in 2020, questions regarding its origin arose. The notion that it may have been created in a laboratory in Wuhan was initially dismissed as a conspiracy theory, but over time, evidence accumulated, lending credibility to such

[223] https://www.academie-agriculture.fr/publications/encyclopedie/reperes/0102r02-evolution-du-rendement-moyen-annuel-du-ble-france-entiere

[224] https://ourworldindata.org/yields-vs-land-use-how-has-the-world-produced-enough-food-for-a-growing-population

a hypothesis. French biophysicist François Graner[225] documented the history of experiments aimed at genetically modifying viruses to make them more transmissible or virulent, a process known as "gain of function." Virologist Marc Lipsitch (2018) from Harvard University had warned as early as 2018 about the dangers of creating "potentially pandemic and novel flu strains." The severity of issues related to genetic manipulation of viruses became public awareness, raising questions about the wisdom of continuing such dangerous research[226]. [ax]

4.9.5 Acceleration as a Societal Project

Technological acceleration has become a field of research for philosophy. Nick Land, a philosophy professor at the University of Warwick in the 1990s, was interested in cybernetics and artificial intelligence; he studied how technological advancements can reshape society[227]. Classified at the far left at that time, Nick Land believed that one must accelerate beyond capitalism until reaching a tipping point, which would allow for its overthrow.

This thesis was revisited in the 2010s in the "Accelarationist Manifesto" by philosophers Williams & Srnicek (2014):

> "Far from being a thinker attempting to resist modernity, he strove to analyze it in order to intervene more effectively, understanding that, despite all its exploitation and corruption, capitalism was the most advanced economic system of its time. Its achievements did not need to be overthrown to return to a former state, but accelerated beyond the constraints of the capitalist value form. [...]
>
> "We believe that within the current left, the most significant divide separates those who cling to a political folklore nourished by localism, direct action, and inflexible horizontalism from those who outline an 'accelerationist' politics unreservedly attuned to a modernity characterized by abstraction, complexity, globality, and technology. We seek to accelerate the process of technological evolution. However, we do not promote any form of techno-utopianism. Never believe that technology will suffice to save us. It is certainly necessary, but never sufficient without socio-political action. Technology and society are intimately linked, and the transformations in one enable and reinforce transformations in the other. While techno-utopians advocate for acceleration believing it would automatically supersede social conflicts, we argue that technology should be accelerated to help us win these social conflicts. [...]
>
> "The exaggerated privilege currently granted to democracy-as-process must be abandoned. The fetishization of openness, horizontality, and inclusion, which character-

[225] https://www.piecesetmaindoeuvre.com/documents/devons-nous-arreter-la-recherche

[226] Dystopian novels and films, such as Stanley Kubrick's "Dr. Strangelove" about nuclear apocalypse or "2001, A Space Odyssey" about space travel and supercomputers, Terry Gilliam's "12 Monkeys" about a deadly virus wiping out part of humanity, Steven Spielberg's "Jurassic Park" where dinosaurs are recreated from their DNA, James Cameron's "Terminator" concerning technological singularity and the takeover by an artificial superintelligence (Skynet), and Ridley Scott's "Blade Runner" about androids, have illustrated the risks associated with technologies that have spun out of control.

[227] The movement of thought was named "accelerationism" by Benjamin Noys.

> izes much of today's radical left, condemns it to inefficiency. Secrecy, verticality, and exclusion also have their place in effective action (even if such a place is not, of course, exclusively assigned). [...]
>
> "We assert that only a Promethean politics of maximum control over society and its environment can address global problems or achieve a victory over capital."

Other activists who identify as anarcho-transhumanists oppose what they consider a hierarchical (and thus liberty-restricting) view of the accelerationist manifesto. The physicist William Gillis (2021) sees technological acceleration as a means to achieve maximum freedom and, thereby, transcend humanity:

> "The idea underlying anarcho-transhumanism is simple: we should seek to extend our physical freedom just as we seek to extend our social freedom. Anarcho-transhumanists view their stance as a logical extension or deepening of anarchism's existing commitment to maximizing freedom. The term 'morphological freedom' is widely used by various types of transhumanists to refer to the positive freedom to alter one's body or material conditions. [...]
>
> "The only defining precept of transhumanism is that we should have more freedom to transform ourselves and our environment. Transhumanism thus challenges essentialist definitions of the 'human' and is sometimes presented as part of a broader discourse of feminist and queer theory that engages with cybernetic identities and 'inhumanisms'. Transhumanism can be seen either as a radical critique of humanism or as an extension of specific humanist values beyond the arbitrary category of the 'human' species. Transhumanism invites us to question our desires and values beyond what is, by neither accepting the authority of arbitrary social constructions like gender nor a blind fidelity to the way our bodies currently function."

Becoming dependent on technology is viewed as a means to liberate oneself from biological determinism.

Not only those who position themselves in the anti-capitalist camp aspire to technological acceleration. Just as there is an anarcho-transhumanism, there is also an anarcho-capitalism, of which philosopher Murray Rothbard (University of Nevada) was a prominent figure. The irony of history is that Nick Land can also be found in this camp. After resigning from the University of Warwick in the early 2000s, he settled in China, where he became a science fiction novelist. In the 2010s, he shifted his political stance and developed anti-egalitarian and anti-democratic theses, still heavily relying on technology. Along with computer engineer Curtis Yarvin, he forged the concepts of the "Dark Enlightenment," which seek to oppose the ideas of emancipation, democracy, equality, and freedom promoted by the Enlightenment. This line of thought is the foundation of the neoreactionary movement in the United States, which has attracted some gurus from Silicon Valley (like Peter Thiel and Elon Musk) and politicians (in Donald Trump's circle). Mhalla (2024, p. 22) noted:

> Nick Land proposes some ideas that will become central among the ideologues of Silicon Valley: a return to hierarchy, a technocracy and private governance, with the state managed like a business (hence the obsession with efficiency that directly inspired DOGE's roadmap), and absolute capitalism where hypertechnologies and the economy

are to expand without moral or democratic limits.

5 Conclusions

The new university is undergoing a profound existential crisis. This crisis is particularly insidious, progressing stealthily like a silent illness spreading in a seemingly vigorous body.

The new university emerged in the 1990s, succeeding Humboldt University, which was grounded in Enlightenment ideology—specifically the belief in rationality, universalism, and human emancipation. While Humboldt University did not initiate the structural changes in society following the fall of the Ancien Régime, it accompanied these transformations. Individuals gained autonomy as they broke free from the social determinism of earlier societies: in the Ancien Régime, the environment into which one was born dictated one's entire life. Once freed from the grasp of traditional control structures (family, religion, community, and, to a lesser extent, social class), individuals gained political rights, with women achieving full emancipation from societal roles previously assigned to them. There has always been some degree of distance between the Humboldtian ideal and reality within Western societies, yet the majority of people embraced this ideal, and progress was made, albeit slowly, thanks to the role of the university. Humboldt University was also associated with significant scientific and technical advancements in the 20th century and served as a hub for major philosophical schools and the humanities.

The new university is founded on a mercantile vision of knowledge, its production, and its teaching. Humboldt University had two missions: teaching and research. The new university has added a third mission that overshadows the other two: innovation. In this regard, it has received substantial funding from governments, which were advised by experts that technological innovation is the engine of economic growth. The new university is managed like a corporation, with a CEO wielding significant power backed by a bloated bureaucracy. Where Humboldt University embodied an ideal of emancipation and understanding, the new university's sole obsession is generating revenue. While Humboldt University was rooted in regional or national contexts, seeking its own path, the new university has claimed a universal and global character. It has embraced globalism and serves the interests of a cosmopolitan elite committed to liberal ideas.

The new university has been entirely shaped to meet economic challenges, foremost among them being growth. In Western countries, growth (measured by estimates of gross domestic product) has been stagnant since the 1970s; yet, political and economic elites view it as a cornerstone of Western society. Political elites believed the promises of a knowledge society, a globalized world, and technoscience as a tool of power. They were indeed aware of the social, ecological, and climatic issues arising from a society constantly pursuing growth within a finite world. However, if technoscience had created these problems, they reasoned it could also solve them.

The new university has spawned its own philosophy, termed postmodernism, which has denied long-held truths (such as the definitions of man and woman) to celebrate new truths: a fluid world where one can choose his identity, where movement transcends earthly limits, and where traditional boundaries are abolished. Entire departments in the humanities have been ravaged by this new philosophy. The shared humanism dating back to the Renaissance has been deemed outdated and narrow. The foundations of posthumanism have been laid, where all technological extremes are considered. If prehistoric man could conceive of the idea of God from the depths of his cave, what could

we achieve today with our supercomputers[228]?

The decision to Americanize European universities nearly thirty years ago is curious upon reflection. European universities had no reason to be ashamed of their functioning and output compared to American universities, particularly Switzerland, whose model combining universities and dual education (alternating training) had proven highly effective. When scientific output was adjusted for size, Switzerland already held the top position, far ahead of the United States at that time (May, 1997; King, 2004). By replacing the old Humboldt model— which had survived several upheavals (notably massive enrollment after 1945 and the protests of May 1968)—with the American model, European universities effectively marked the market's encroachment on the last remaining aspects of social life that had previously escaped it; we had fully entered the era of the "total market" (Supiot, 2010). This was not only a fascination with the American model but also a desire to restructure the academic environment into a vast marketplace that guided the actions of European elites.

Founded on a promise of economic renewal, has the new university lived up to the expectations that experts placed in it? Twenty-five years have passed since the launch of the Reform, yet economic growth continues to decline. Experts are unequivocal: efforts must be intensified. Reform professionals are equally firm: new reforms must be initiated. It feels as if we are in Lewis Carroll's novel "Alice in Wonderland," where the Red Queen commands Alice to run faster just to stay in the same place. The race for growth resembles a bitter potion that has little effect aside from creating even more social, ecological, and climate-related problems.

As the Neue Zürcher Zeitung recently titled, "Switzerland is tired of growth:"[229]

> "The symptoms of fatigue are numerous: growth is increasingly associated with the stress of overpopulation, congestion, housing shortages, and overloaded infrastructure. Growth appears to be a threat. [...]
>
> "Economic growth has been greatly inflated by demographic growth for years. This demographic-driven expansion serves only to meet the growing demand of an increasing population. Raiffeisen Bank has calculated that 76% of economic growth between 2012 and 2022 was due to demographic changes."

The new university believed that simply copying the American university model would lead to the emergence of Silicon Valleys everywhere. It took this mimicry so far as to import the most fanciful ideas that sprouted across the Atlantic. Thus, it began to promote a fundamentally unequal policy in the name of equality, as has been done in the United States. The new university loves to talk about diversity, but it cherishes conformity above all else. Diversity is about bodies, not minds.

The consequences of the university reform vary by country. Switzerland has maintained its position thanks to strong financial support from the Confederation, but the economic returns have not met expectations, and signs of fatigue are evident. The financial burden on taxpayers has been significant. France held a leading role on the scientific stage in the 1990s; successive reforms have increased bureaucratic burden and intensified competition without increasing budgets allocated to research and higher education, despite France's commitments to the Europe 2020 program. The decline is

[228] This is the bold claim attributed to mathematician John von Neumann by Benjamin Labatut (2024, p. 259).
[229] Thomas Fuster, *Die Schweiz ist wachstumsmüde – und fremdelt mit sich selbst*, NZZ, 6 December 2025

severe[230], but official discourse continues to speak of excellence, competition, revolution, and transformation[231].

One can be astounded by the constant gap between the institutional discourse of the new university (excellence, valorization of science, the social role of universities, sustainable development, democracy, etc.) and the reality before our eyes. The decline of research is only masked by the frenzy of resources being implemented, and "excellence" now means conformity to current trends and expected productivity; entire areas of research suffer from low reproducibility, while pseudo-sciences and militant research develop, feeding delirious theories and nihilism; the new university sees itself as a demigod, destroying the old world to build a post-human one; it claims to love democracy, yet practices vertical power internally.

In the aftermath of May 1968, philosopher André Gorz (1970) wondered whether the university needed to be destroyed. There is no need; it is doing that itself.

[230] https://www.lemonde.fr/sciences/article/2021/09/28/recherche-les-raisons-du-declin-francais_6096227_1650684.html
[231] https://www.vie-publique.fr/discours/292294-emmanuel-macron-07122023-recherche-francaise

Notes

a. Lavisse expressed his critiques of his professors at every stage of his long journey from school to university. He wrote: "The first sort of higher rhetoric, where we prepared for the baccalaureate exam known as the license in letters, was a wasted year. I forgot all the dissertation topics given to us, except for one, on which we composed the exam for the license, which was 'Continuous eloquence bores.' I cannot recall which texts we explained. This gap in my otherwise faithful memory proves that we were saturated with hollow knowledge. My stomach could take no more" (Lavisse, 1902).

b. In a series of interviews, Saul Bellow elaborated on this theme of the university's failure to educate young people, meaning to teach them how to face concrete obstacles. He echoed a veteran who said, "nobody taught me anything concrete, because everyone had been educated from books and was the product of a long professional training, without really knowing anything about what truly matters" (Bellow, 1994, p. 215).

c. A neighborhood in Paris, the Latin Quarter, retains the memory of the time when the academic language was Latin. While Latin was mastered by scholars, this was far from the case for students. Archives contain manuscripts taken from the Bible, used by students of the University of Paris in the 12th century and annotated in French (Salvador, 2025). The need for Bible translations did not begin with the Reformation, but rather with the early days of the University, when it was necessary to make sense of the content of the Gospels and the Old Testament.

d. Turchin (2023) identified the overproduction of elites and the frustration of some of them as a major cause of the significant upheavals that periodically affect societies. Roger Chartier, a historian specializing in pre-revolutionary France, acknowledges this issue but believes it was just one of many causes that led to the French Revolution. The anti-feudal sentiment (often referred to today as "anti-elite discourse") had developed significantly in the years preceding the Revolution, as evidenced by the cahiers de doléances (Chartier, 1982, p. 207-215).

e. One remembers the skepticism Cardinal Richelieu harbored towards education. In his political testament, he wrote, "*Just as a body with eyes in all its parts would be monstrous, similarly a State would be if all its subjects were learned; there would be as little obedience as pride and presumption would be commonplace.*" Keeping subjects of the kingdom in ignorance seemed to the Cardinal a sound principle for conducting state affairs. Two centuries later, Bismarck expressed similar concerns about the rise of a "proletariat of graduates."

f. Although penicillin was discovered by Ernest Duchesne in 1897 and rediscovered by chance in 1929 by Alexander Flemming, significant efforts were required to develop an industrial production process. The study of penicillin's properties and the development of a large-scale manufacturing process necessitated teams of chemists, pharmacologists, and biologists at major academic centers (Oxford, Imperial College), as well as the diligent testing conducted by private laboratories in England (Imperial Chemical Industries, which was later dismantled and whose pharmaceutical branch gave rise to AstraZeneca) and America (Merck, Lilly, Squibb – now Bristol-Myers Squibb). Around the same time (mid-1930s), the biologist Gerhard Domagk from the German pharmaceutical company Bayer discovered the antibacterial effects of sulfamidochrysoidine, and the team around chemist Jacques Tréfouël, under the direction of Ernest Fourneau at the Pasteur Institute, obtained the active molecule (sulfonamide). One can mention the remarkable fate of Ernest Fourneau: about thirty years earlier, while working for the chemical company Poulenc (which became Rhône-Poulenc, then Sanofi), he had developed a cocaine substitute that could be used as a local anesthetic. Another highly successful medication was cortisone. While the role of cortisol in the body was identified by Professor Tadeusz Reichstein from the University of Basel in 1937, it was an American chemist (Lewis Hastings Sarett) working for the pharmaceutical giant Merck who proposed the first synthesis method for corticosteroids in 1947.

g. The Humboldt model was part of the Enlightenment project. According to Kant (1784), « *The Enlightenment is defined as the exit of man from the state of tutelage for which he is responsible himself.*» To lift humanity out of obscurantism, it is necessary to combat superstition and ignorance through the use of reason and science. Education is essential for independent thought and the emancipation of man. Kant (1784) was wary of state control over science:

> "I have dealt with the essential aspect of the Enlightenment, namely the exit of man from the state of tutelage in which he remains by his own fault, focusing primarily on religious questions, because regarding the arts and sciences, our sovereigns have no interest in acting as guardians for their subjects; especially since this kind of guardianship is not only the most harmful but also the most dishonorable of all."

h. The first nuclear power plant in Lucens experienced a serious accident during its launch in 1969. Subsequently, private operators preferred to work with light-water reactors imported from the United States. The Confederation signed the Treaty on the Non-Proliferation of Nuclear Weapons in 1969, marking the official end of the Swiss military nuclear program, but in practice, the Confederation did not halt research to develop nuclear weapons until 1988.

i. U.S. student debt amounts to 178 trillion dollars, which is 9% of the total U.S. debt. In total, 43.6 million U.S. citizens have taken out loans, with an average amount of 38 kUSD[232].

j. In Switzerland, two-thirds of young people opt for vocational training (apprenticeships alternating between school courses and periods in business for a duration of three to four years depending on the field) at the end of their compulsory schooling (around age 15). This path is recognized with a federal certificate of competency (CFC), and possibly a professional maturity certificate (which is integrated into the CFC or obtained after one or two additional years of study). Graduates with a CFC can continue their education in a higher school to obtain a federal diploma, while graduates with a professional maturity certificate can be admitted to specialized higher education institutions or universities if their grades permit.

k. The British voted for the conservative right by electing Margaret Thatcher, who launched a conservative political program coupled with a liberal economic agenda. Americans elected Ronald Reagan, who implemented a drastic tax reduction program to curb inflation and decrease unemployment. In 1981, the French seemed to opt for the opposite by electing socialist François Mitterrand as head of state. However, by 1983, he also chose to liberalize markets while maintaining a progressive social policy (Abdelal, 2009).

l. Francis Fukuyama proposed the hypothesis of the end of history (the fall of dictatorships in Spain, Greece, and Latin America, the collapse of the Soviet Union, the opening of China), meaning that democracy and market economies would establish themselves as dominant models, leading countries to reach a pinnacle of political evolution where conflicts between states would resolve and individual needs would be fully satisfied.

m. The *Organisation for Economic Co-operation and Development* (OECD) is an organization initially tasked with overseeing the implementation of the Marshall Plan for countries devastated by World War II. Since 1961, the mission of the OECD has been to serve as a platform for exchange and advice on economic development, with 38 states from the Western bloc as members.

n. Godin (2008, 2017) has shown the semantic shift of the word "innovation" and its current polysemy, as it is often unclear what users of the term really intend: creation, renewal, development of an idea until it reaches the market. Over the centuries and depending on the context, the word "innovation" has had radically different meanings. For instance, in the writings of Descartes, innovation refers to new ideas introduced in matters of religion that are harmful; here, innovation carries a negative connotation (Bontemps, 2023).

o. "Representative democracy" was viewed as a reason for the failure of universities, a hindrance to decision-making according to Aghion & Cohen (2004, p. 66).

p. I used data from the Ministry of Higher Education and Research, data from the Public Education Statistics, and the online table from the European Research Council listing all projects funded by the European Union since 2007. There

[232] www.bankrate.com/loans/student-loans/student-loan-debt-statistics/

is also a Wikipedia page listing the actions of the "Future Investments Program."

q. The Swiss law on equality[233] does not state that the underrepresentation of women is against the law. In fact, the law prohibits discrimination based on sex, but also adds that "measures aimed at promoting de facto equality between women and men do not constitute discrimination." If we interpret "equality in practice" as demographic parity, then the law suggests that positive discrimination is legal. The ambiguity of the text has allowed for various abuses. It is noteworthy that equality in practice is only demanded for certain positions (higher education, leadership, political roles). In predominantly female professions such as the judiciary or medicine, there is never any mention of "equality in practice" or the overrepresentation of women. Temporary compensatory measures may be used, but when these measures are still being implemented thirty years after the law was enacted, one could argue there is a problem. Feminists see this as a sign of systemic sexism, an explanation that struggles to gain widespread acceptance.

r. The immunology professor Bruno Lemaitre (EPFL) devoted a fascinating essay to narcissism in science. He noted (Lemaitre, 2016, pp. 3, 5):

> "Scientists are not always driven solely by a pure desire for truth, but rather, to use the term in its psychological sense, by a strong need to dominate and gain the recognition they consider to be their due and by a desire to flaunt their successes in front of their colleagues.[...]
>
> "Scientists with a high ego are better able to convince others of the importance of their research. This establishes a tacit relationship between the notion of the 'self-importance of the scientist' and the apparent 'objective importance of their research'. Scientists who have narcissistic traits possess additional advantages in science because although appearing objective and honest, they are networkers and thus well positioned to exploit the different facets of the research."

s. The great American historian Ernst Kantorowicz described the university as follows:

> "According to the oldest definitions, which run back to the thirteenth century, "The University" is the universitas magistrorum et scholarium, "The Body Corporate of Masters and Students." Teachers and students together are the University regardless of the existence of gardens and buildings, or care-takers of gardens and buildings. One can envisage a university without a single gardener or janitor , without a single secretary, and even—a bewitching mirage—without a single Regent. The constant and essence of a university is always the body of teachers and students.
>
> "From whatever angle one may look at the academic profession, it is always, in addition to passion and love, the conscience which makes the scholar a scholar. And it is through the fact that his whole being depends on his conscience that he manifests his connection with the legal profession as well as with the clergy from which, in the high Middle Ages, the academic profession descended and the scholar borrowed his gown. Unlike the employee, the professor dedicates, in the way of research, even most of his private life to the body corporate of the University of which he is the integral part. His impetus is his conscience. Therefore, if you demoralize that scholarly conscience, that love and passion for research and for teaching, and replace all that in a business fashion by strictly defined working hours, prescribed by the "employer," you have ruined, together with the academic profession, also the University! Only the culpably naïve ignorance on the part of malevolent Regents, not knowing what a scholar's life and being is, could venture to break the backbone of the academic profession—that is, its conscience—in order to "save the University," nay, to dismiss a scholar for that very conscience which makes him a scholar."

Ernst Kantorowicz was of Jewish and German descent. He fled Nazi Germany in 1938. After becoming a professor at the University of California, Berkeley, he refused to sign the loyalty oath required in 1949 by University of California President Robert Sproul, who aimed to combat manifestations of sympathy for communists, whether real or alleged, on his campus (Lerner, 2017, pp. 312–328). The forty professors who refused to take the oath were forced to resign. Kantorowicz was welcomed by Princeton University. Although he was radically anti-communist, Kantorowicz believed that a university professor should owe allegiance only to the truth and not to a political system. To justify his position,

[233] https://www.fedlex.admin.ch/eli/cc/1996/1498_1498_1498/fr

he wrote an essay titled "The Fundamental Issue" in 1950. The controversy surrounding the loyalty oaths resurfaced when California universities imposed charters on diversity, equity, and inclusion that faculty members were required to sign. Mathematics professor at the University of California, Davis, Abigail Thompson (2019) strongly protested in the editorial of the mathematics journal of which she was the editor, sparking fierce backlash from some readers who considered the promotion of diversity fundamental. She wrote:

> "Faculty at universities across the country are facing an echo of the loyalty oath, a mandatory "Diversity Statement" for job applicants. The professed purpose is to identify candidates who have the skills and experience to advance institutional diversity and equity goals. In reality it's a political test, and it's a political test with teeth.
>
> "What are the teeth? Nearly all University of California campuses require that job applicants submit a "contributions to diversity" statement as a part of their application. The campuses evaluate such statements using rubrics, a detailed scoring system. Several UC programs have used these diversity statements to screen out candidates early in the search process.
>
> "The diversity "score" is becoming central in the hiring process. Hiring committees are being urged to start the review process by using officially provided rubrics to score the required diversity statements and to eliminate applicants who don't achieve a scoring cut-off. Why is it a political test? Politics are a reflection of how you believe society should be organized."

At the time of writing, European media are alarmed by the attacks launched by the Trump administration against the university institution, yet curiously, they have been quite silent when university presidents implemented discriminatory policies in the name of social justice.

t. The journals under Nature are known for their forthright editorial stance, though this is not always the case. For instance, the journal *American Political Science Review* (APSR), published by the American Political Science Association (APSA), was, until the early 2010s, considered the leading political science journal based on impact factor[234], but its dominance has been progressively challenged, and in 2018, it was ranked 7th in its category. The journal faced other usual issues such as the predominance of White male authors among those published. In 2018, APSA received two competing proposals for a new editorial line for the years 2020–2024 (the term of a chief editor). One proposal, presented by political scientist John Gerring, sought to combat potential biases in article selection by implementing a triple "blind" process: the authors', reviewers', and editors' identities would remain unknown to each other throughout the process. The other proposal, presented by Professor Sharon Wright Austin, relied on affirmative action:

> "We will also use the desk-review phase as an opportunity to take affirmative action to address the patterns of descriptive and substantive under-representation in the APSR — particularly, though not only, of work by women and scholars of colour and scholarship addressing issues of race, gender, and sexuality. More specifically, we will adopt the policy recommended by the Women's Caucus for Political Science (WCPS), which suggests that no manuscript that falls under those criteria and that is not rejected for remit should be desk rejected."

This editorial proposal was approved by APSA, but nothing leaked into the editorials signed by the editorial team that called itself the "feminist collective." The issue was later revealed by a conservative site exposing the ideological drift of the journal[235]. APSA's decision was particularly strange given that there was no evidence of bias in article selection. In fact, White males were the predominant submitters and also faced the highest rejection rates. Professor Melissa Michelson commented on APSA's decision in *Inside Higher Education*[236]:

> "We are moving forward, not backward. Future of political science is diverse, inclusive and, increasingly, female."

This experience was not continued. In 2025, Monika Nalepa and John Gerring succeeded the "feminist collective" as

[234] The impact factor is a metric measuring the number of citations received by a journal over the past three years.

[235] https://www.goldwaterinstitute.org/policy-report/peer-review-gone-wild/

[236] https://www.insidehighered.com/news/2019/07/30/political-science-association-pleases-and-surprises-members-its-flagship

editors. The impact factor fell by 27% (from 8 to 5.8) between 2021 and 2024. The causes of the decline may vary, but it is likely that the ideological shift did not sit well with all authors and readers. The astonishing thing is that the APSR has been around for a century and gained its great notoriety despite the predominance of male White authors; the feminist collective questions why it chose to invest in this journal instead of creating its own if not to benefit from the reputation garnered in the past.

u. The sinologist Pierre Ryckmans, better known by his pen name Simon Leys (2014), recounted the following anecdote:

> "A few years ago in England, a brilliant and sprightly young Minister of Education visited a large and ancient university; he delivered a speech to the entire faculty, presenting new government education measures, and began with these words: "Gentlemen, as you are all employees of the university..." but a scholar immediately interrupted him: "Excuse me, Mr. Minister, we are not employees of the university; we are the university." There could be no clearer statement. The only employees of the university are the professional administrators, who do not "lead" the academics—they serve them."

In fact, the minister was correct: professors had become mere employees.

v. The recommendations page of the European Research Council (ERC) for ERC grant candidates does not contain the word science even once. Here are the qualities required according to the ERC for a good application:

> "What is my position in the field, particularly internationally? Am I capable (and do I want) to manage, with responsibility, a project of 5 (or 6) years with a substantial budget? Why am I the best/only person to carry out this project? What are my strengths? How can I be identified as a leader in my field (for the category of established researchers)?"

The ERC measures not the scientific scope of a candidate but their ability to manage resources and sell their project.

w. Research work is initially funded by public funds; peer review is conducted for free; and since the typesetting for the journal format is outsourced (at low cost) to India, authors must carefully proofread their articles, which can be tedious for mathematically dense content when the typesetter rushes their work. The profit margin is so great that the number of journals has multiplied. I am not only referring to so-called predatory journals and the emergence of new publishing houses like MDPI, Hindawi, or Frontiers, but also the strategy of major publishers like Elsevier and Springer, which diversify the number of journals into multiple variations. Thus, the journal Nature has now spawned 73 journals, from Nature Africa to Nature Water. This group charges some of the highest publication fees in the world (ranging from €4,000 to €12,690 for an open access article depending on the journal).

x. In France, for instance, a university president earns €180,000 per year, which is three times the salary of an exceptional class professor (Laillier & Topalov, 2022). While the real value of professors' salaries has decreased with university reforms, the president's salary is the only one that has significantly increased. Some presidents can earn much more; for example, Richard Descoings at Sciences-Po Paris earned €537,000 per year[237]. In Switzerland, the president of a federal institute of technology earns CHF 360,000 per year[238], which is about twice the average salary of a professor. In the United States, the salary gap is even wider. Some presidents earn more than 15 times the average salary of a professor ($115,000 in 2023 at large public universities, $160,000 at large private universities[239]) (Ginsberg, 2011).

y. Even renowned scientists have produced major contributions that attracted little attention for decades, only to gain late interest. This is the case of a theoretical paper by Alan Turing titled « The Chemical Basis of Morphogenesis », which lies at the intersection of biology and mathematics, published in 1952 just months before Turing's death. In the two decades following its publication, the paper received an average of two citations per year (Roth, 2011), but during the 1970s, it sparked significant interest regarding the possibilities it opened up for understanding how antagonistic mechanisms

[237] http://tempsreel.nouvelobs.com/l-enquete-de-l-obs/20130301.OBS0542/richard-descoings-le-fantome-de-sciences-po.html

[238] Federal Personnel Office

[239] https://www.aaup.org/reports-publications/aaup-policies-reports/topical-reports/annual-report-economic-status-3

(diffusion and chemical reaction) combine to create geometric patterns. It is now among the most cited papers in the field.

z. In his book "Tyranny of Metrics," Muller (2018) addresses the contemporary obsession with quantifying everything. Institutional authorities focus on metrics because:

1. They believe it is both possible and desirable to replace judgment with standardized numerical values that are supposed to be more objective.
2. Transparently displaying the evaluation grid allows the institution to better achieve its objectives.
3. This motivates staff to reach these goals (and penalizes those who resist). endenumerate Nevertheless, as Jerry Muller (2018, p. 25) emphasizes, sociological studies of organizations (Charles Goodhart's law) have shown that

> "The more any quantitative social indicator is used for social decisionmaking, the more subject it will be to corruption pressures and the more apt it will be to distort and corrupt the social processes it is intended to monitor."

Jerry Muller analyzes several reforms that have led to the imposition of metric-based evaluations. One example is the "No Child Left Behind" law, initiated by Bill Clinton and enacted under George W. Bush in 2001, which aimed to bring a large segment of youth, regardless of their ethnic, familial, or socio-economic background, to a university level. Although some aspects of the law found success, the central point—accountability of teachers and progress of students—remained largely unsuccessful. To improve indicators, teachers emphasized core subjects while neglecting others: students were given tricks to pass exams but not substantial knowledge. Despite the evident failure of the law, a reform was undertaken under President Barack Obama (with the "pay for performance" system rewarding teachers based on the progress of their students). The reform brought no change. The result was a significant departure of teachers to the private sector or retirement. Alain Supiot, a law professor at the Collège de France, remarked that we have entered a "total market" where everything is translated into a numerical form that determines value. The state began to manage its relationships with public entities through quantified objectives. The state demands allegiance to numbers, often ignoring part of the on-the-ground reality (Supiot, 2015, p. 209)

> "And the same causes continue to produce the same devastating effects on the actual performance of institutions subjected to governance by numbers. Reducing judgment to calculation leads to a gradual disconnection from the complexity of reality, in other words, substituting the map for the territory."

aa. In France, for instance, the Court of Auditors expressed concern over the low French participation in the European program and the modest return on investment (with France recovering just over half of what it contributes to the ERC) (Cour des comptes, 2025, p. 10):

> "The mechanisms encouraging researchers to apply for European funding must be strengthened to mitigate the adverse effects stemming from the abundant national funding highlighted by the Court's work. National funds, as provided for by the multiannual research programming law of December 2020 and the France 2030 program, are not coordinated with European policy. As a result, it is simpler and less risky to apply for funding from the National Research Agency (ANR) than for ERC-type project funding, and the outcomes of an application to France 2030 are more predictable than forming a consortium to apply for Horizon Europe's pillar 2. To mitigate these effects, European applications should be better integrated into researchers' career progression, while a principle requiring applications for European funds in relevant sectors before seeking national funding should at least be considered. Finally, more encouragement should be given to young researchers to utilize European credits, while also better analyzing the reasons for failures to capitalize on the acquired experience."

During his hearing before the Senate on October 29, 2025, regarding the finance bill for 2026, Minister of Higher

Education and Research Philippe Baptiste expressed at the end of his presentation[240]:

> "The latest ERC results are not good. Typically, in previous years, we had good success rates but not enough applications. So, like my predecessors, I harassed the universities and agencies saying, "You bunch of losers! Submit more!" and they diligently did so. [...]
>
> They submitted far more, but the success rates collapsed. Overall, I don't know if it's correlated or just a statistical factor that can be corrected, but this year is not good. We must continue to support them. [...]
>
> The universities are lagging behind on this issue, and that's not good. I apologize for being so blunt, but honestly, they need to mobilize on this matter. It's unacceptable that success rates are so low."

We should heed the minister's words, as the transcript from the Senate services does not accurately reflect his statements (most likely a remnant of bureaucratic modesty).

ab. For a historical example, one can cite numerous slaves in Rome or Greece, who, despite being in servile conditions, wielded considerable power (Ismard, 2015). In the Ottoman Empire, the Janissaries formed an elite body composed of freed slaves (of Christian origin) who held important positions in the Ottoman army and administration. Locally, they were able to seize power (as was the case with the Mamluks in Egypt). In Merovingian France, the mayor of the palace was the king's steward responsible for royal palace affairs. Gradually, successive mayors expanded their prerogatives. The position became hereditary, and in 751, the Mayor of the Palace, Pepin, deposed the last Merovingian king, Childeric III (Dumézil, 2013).

ac. The urban legend about the shortage of engineers is perhaps the oldest. Like the Loch Ness monster, it regularly resurfaces. Stephan (2012, p. 165) noted in this regard:

> "Shortages are often predicted by groups who have a vested interest in attracting more students to graduate school and into careers in science and engineering. [...]
>
> "Most of the assertions come from four groups: universities and professional associations, government agencies, firms that hire scientists and engineers, and immigration lawyers. All have a considerable amount to gain by an increase in supply: universities, for example, in terms of students (and lab workers); companies in terms of the lower wages associated with an increase in supply."

ad. Explicit and implicit knowledge are distinguished. Explicit knowledge can be clearly expressed in the form of rules, equations, theorems, principles, etc. Implicit knowledge is more vague; it is learned through contact with an educated person or by imitation. Learning a language requires explicit knowledge of grammar and vocabulary, but also implicit knowledge that can only be acquired through interaction with speakers (for example, to master pronunciation).

ae. German scholar Thomas Bauer posits that modern societies are increasingly allergic to ambiguity. By ambiguity, he refers to anything that is not defined unequivocally, which holds multiple interpretations, or that contains a degree of uncertainty or vagueness.

Thus, like other revealed religions, Islam is based on a text, the Quran, whose rules have been subject to various interpretations over time. Thomas Bauer emphasizes that Muslims historically held an ambiguous stance towards homosexuality: while it was generally frowned upon, Muslim society displayed a certain tolerance towards homoeroticism and homosexuality. It wasn't until the 1980s, with the rise of Islamist movements claiming to return to a certain orthodoxy, that all ambiguity on the issue was lifted, resulting in the end of the tolerance previously afforded to homosexuals.

Bauer suggests that a similar movement is at work in our societies. The rejection of ambiguity can lead to an increase in interpretations, resulting in a situation where ultimately all options are possible. This phenomenon is evident in contemporary art, which often consists of geometric abstractions open to all possible interpretations. The historian summarizes the loss of ambiguity in our societies (Bauer, 2024, pp. 59–60):

> "Obsession with truth, denial of history, and aspiration to purity are the three marks of intolerance to

[240] https://videos.senat.fr/

> ambiguity that form the basis of all fundamentalism. It is somewhat the fundamentalist drift of intolerance toward ambiguity. Everything is unambiguous, either entirely true or entirely false, and valid at all times. In principle, there are only two ways to escape ambiguity. Ambiguity does not exist (1) if something has only one meaning or (2) if something has no meaning at all. I call this second pole that of indifference, *Gleichgültigkeit*, literally equivalence. The word suggests several associations: when something has no meaning (in the sense of the English 'meaning'), then all interpretations are equally valid, literally *gleich gültig*. When all meanings are equivalent, the thing loses its significance, in the sense of importance, and can be considered with an indifferent heart or at most with vague curiosity."

af. In the United States, the reform based on discrimination has hardly changed anything. According to American economist Sowell (2006, pp. 371–380), the economic situation of Black families had significantly improved until the 1970s but has not evolved since then. He sees this stagnation as the result of a policy steeped in good intentions but disconnected from reality. Only the affluent Black class has benefited from the reform, gaining easier access to more prestigious universities and highly valued jobs. Sowell (2023) has documented numerous claims regarding the discriminations faced by Black Americans according to progressives. Michaels (2009) supported Sowell's view, arguing that the reform mainly served to obscure the real disparities between the rich and the poor. Journalist and Pulitzer Prize winner Chris Hedges summarized this as follows (Hedges, 2017, p. 111, 113, 114):

> The real purpose of these richly endowed schools is to perpetuate their own. They do this even as they pretend to embrace the ideology of the common man, trumpet diversity on campus, and pose as a meritocracy. The public commitment to egalitarianism alongside the private nurturing of elitism creates a bizarre schizophrenia. [...]
>
> The elite schools speak often of the diversity among their students. But they base diversity on race and ethnicity rather than on class. The admissions process, along with the staggering tuition costs, precludes most of the poor and working classes. [...]
>
> When my son got his SAT scores back as a senior in high school, we were surprised to find that his critical reading score was lower than his math score [...].
>
> And so we did what many educated, middle-class families do. We hired an expensive tutor from the Princeton Review—its deluxe SAT preparation package costs $7,000 —who taught him the tricks and techniques of standardized testing. The undergraduate test-prep business takes in revenues of $726 million a year, up 25 percent from four years ago. The tutor told my son things like "stop thinking about whether the passage is true. You are wasting test time thinking about the ideas. Just spit back what they tell you." His reading score went up 130 points, pushing his test scores into the highest percentile in the country. Had he somehow become smarter thanks to the tutoring? Was he suddenly a better reader because he could quickly regurgitate a passage rather than think about it or critique it? Had he become more intelligent? Is it really a smart, effective measurement of intelligence to gauge how students read and answer narrowly selected multiple-choice questions while someone holds a stopwatch over them? What about families that do not have a few thousand dollars to hire a tutor? What chance do their children have?

The American philosopher and Harvard professor Michael Sandel (2020) notes that the selection through standardized SAT tests has often been circumvented, either because the candidates' parents were significant donors or because they had corrupted the examiners. Many families, like that of Chris Hedge, pay for tutoring to prepare their children to succeed in the SAT tests. The journalist Golden (2005) also details other means—such as participation in sports—that enable wealthy families to secure a spot for their children at an elite university.

ag. In his book, Michael Sandel (despite being a Democrat) particularly targets Barack Obama, whom he believes suffers from an overconfidence in the power of a degree. Journalist David Brooks of the New York Times lauded Barack Obama's victory in 2008 as the establishment of a "valedictocracy," as President Obama surrounded himself with the "best and brightest," all of his advisors being from the Ivy League[241]. However, very quickly, Obama's choices seemed strange

[241] The term refers to the group of eight most prestigious private universities on the East Coast of the United States, including Harvard, Princeton, Yale, and Cornell.

to those who had viewed him as a new Roosevelt, promising a new "New Deal." As journalist Thomas Frank (2016), who sought to understand why working-class voters shifted to the Republicans while wealthy classes leaned Democratic, summarized:

> "Our modern technocracy can never see the glaring flaw in such a system. For them, merit is always synonymous with orthodoxy: the best and the brightest are, in their minds, always those who went to Harvard, who got the big foundation grant, whose books are featured on NPR. When the merit-minded President Obama wanted economic expertise, to choose one sad example, he sought out the best the economics discipline had to offer: former treasury secretary and Harvard president Larry Summers, a man who had screwed up time and again yet was shielded from the consequences by his stature within the economics profession."

In France, President Emmanuel Macron perhaps most clearly illustrates the gap between the image of superior intelligence portrayed by the media before his 2017 election (he was nicknamed the "Mozart of finance") and his record. Known for his cutting remarks that reveal an excessive confidence in his abilities and a lack of self-restraint, he stated in a speech to entrepreneurs shortly after his election: "*A train station is a place where you encounter successful people and people who are nothing. Because it is a place where we pass through. Because it is a place we share*" [242].

ah. Ironically, the neologism "meritocracy" (literally, the power of those who have merit) was popularized by Michael Young's dystopian novel "The Rise of the Meritocracy" (1958), which portrays English society in the near future, where aristocracy by birth has been replaced by an aristocracy of talent; power is held by individuals with superior intellectual capabilities; the working class consists of the foolish (dunces). The book echoes what Hillary Clinton said about Donald Trump's voters in 2016: "a basket of deplorables."[243] In France, a government spokesperson stated in 2018, "Wauquiez is the candidate of guys who smoke cigarettes and drive diesel cars,"[244] while President François Hollande referred to the poor as "the toothless."[245] Reality has largely mirrored fiction.

ai. Academics are well-positioned to observe the favoritism in recruitment and promotion within their institutions, yet this is a little-known fact among the general public. Occasionally, the media highlights the careers of certain professors who crave the spotlight and end up attracting attention to themselves. For instance, the career of historian Patrick Boucheron, a specialist in Italian medieval history, sheds light on the nepotism that is pervasive in academia. Journalist Paul Sugy[246] interviewed a professor from Sorbonne who commented, "He heads a vast mandarinate system. He acts powerful or insider, speaks to you in a hushed tone, shows that he knows things that he doesn't always really know, pretends to be aware of something that your ignorance wouldn't allow you to suspect, and claims to have read books he hasn't even opened." Sugy describes Patrick Boucheron's intense efforts to secure prominent positions—such as at the Collège de France, in editorial positions at Seuil, and on programs for Arte and Radio France. Indian professor Sanjay Subrahmanyam, who was a colleague at the Collège de France, remarked, "He was once more anxious and humble. Then he began to behave like a little mob boss, as if he were a mafia godfather: You have to kiss the ring like you would for a pope, ask for permission before doing anything; otherwise, he will persecute you!" Confident in his superiority and fond of power, he is accused of establishing a feudal system of which he is the overlord. After being ousted from Radio France and Arte, Boucheron accused his detractors of fostering an anti-intellectual climate.[247]

aj. Several times a year, we are presented with articles reminding us of the pay gap between men and women. These are always studies that broadly compare salaries without ever delving into the details. Studies that examine the specifics by

[242] https://www.lefigaro.fr/vox/politique/2017/07/03/31001-20170703ARTFIG00167-les-gens-qui-reussissent-et-les-gens-qui-ne-sont-rien-ce-que-revele-la-petite-phrase-de-macron.php

[243] https://en.wikipedia.org/wiki/Basket_of_deplorables

[244] https://www.lefigaro.fr/vox/monde/2018/10/29/31002-20181029ARTFIG00214-le-mepris-siderant-de-griveaux-pour-les-gars-qui-fument-des-clopes-et-roulent-au-diesel.php

[245] https://www.nouvelobs.com/politique/20161012.OBS9725/sans-dents-hollande-se-justifie-trierweiler-enfonce-le-clou.html

[246] Paul Sugy, Patrick Boucheron, le système mandarinal d'un historien militant, *Le Figaro*, 15 January 2025.

[247] Clémence Mary, Patrick Boucheron, Libération, 1st June 2023.

following the career paths of individuals provide very different explanations than those recycled by the media and the academic system. For instance, Cook *et al.* (2021) studied the earnings of male and female Uber drivers. Men earn 7% more than women, mainly because they are more willing to work at night and drive faster than women. In research, several studies show disparities between men and women in terms of publications (Madison & Sundell, 2024; Ha *et al.*, 2021; Strumia, 2021).

ak. In sports or cultural activities, parity is rarely the norm. The (Swiss) Federal Office of Sports shows, for example, that sports like equestrianism are very female-dominated (73%), while others like hockey are predominantly male (93%) in Switzerland[248]. Since equestrianism is a mixed sport, women and men compete together. Men's show jumping is entirely dominated by males, while dressage is dominated by females, and in comprehensive events, there are as many men as women at the world elite level[249]. It is also interesting to look at sports like climbing, where it is said that girls perform at the same level as boys[250]. According to ?, "female climbers are among the best in the world, regardless of sex, a trend seen in no other major sport. However, while they represent about 40% of participants, they account for only 3% in the ranking of top climbers."

al. Demoule's two books Demoule (2014, 2022) on migrations are quite remarkable to read, as they combine pages full of critical analysis of European settlement theories, considerations on the ideological motivations behind these theories and their political appropriations, along with a notable comprehensive vision of erudition and clarity. For instance, there is a genealogical study of Alain de Benoist's Nouvelle Droite inserted between two chapters. It should be noted that one of Demoule's longstanding obsessions is to demonstrate that no Indo-European people exist. He explains that it was linguists who, since the late 18th century, devised the theory of a great east-to-west migration during the Neolithic to justify the linguistic proximity of most languages spoken in Europe, Iran, and India. For Demoule, the problem with this theory is that it primarily serves to justify the historical link between nation and ethnicity. Thus, the Nazis intended to prove the existence of a homogeneous Aryan people originating from northern Europe, from which the Germans descended. He seeks to combat the political appropriation of his subject of study, even if it means falling into biased ideology himself.

Demoule points out the weaknesses of the Indo-European people theory, particularly the lack of irrefutable archaeological evidence, contradictions, and the existence of alternatives to this theory. He argues that language can spread through mere contact without population exchange (much like English has spread today without the Anglo-Saxons needing to colonize the entire planet); similarly, genetic proximity between populations can be explained by the exchange of women, a fact well-documented by anthropologists.

However, this alternative theory has been dismantled by both linguists and paleogeneticists, who have shown that only a massive migration over a short period can explain the genetic data of ancient populations and their linguistic heritage. Today, the most plausible theory is that of American archaeologist Marija Gimbutas regarding a large-scale migration from the "kurgan culture" (known as Yamnaya or Yamma, which is the Russian or Ukrainian name) from present-day Ukraine around 3300 BCE (Lazaridis *et al.*, 2014; Haak *et al.*, 2015), although the details of this significant migration remain actively discussed (Furholt, 2021).

Jean-Paul Demoule struggles to acknowledge the significance of these new discoveries. Demoule (2014, p. 400) warns that "it is probable that continuously advancing biological analysis techniques will yield important results in the future. However, they must not only serve obsolete and oversimplified historical models, or be politically biased." Thus, to summarize his point, new methods are only valid to the extent that they do not support theories he finds inappropriate. While he provides a detailed and well-founded critique of Marija Gimbutas's theory, he also seeks to discredit her by noting that she advocated for the thesis of primitive matriarchy and had associations with Alain de Benoist.

Interestingly, after contesting the existence of a significant migratory wave from the Pontic steppes, Demoule posits that contemporary France has been the site of a continuous mixing of populations since antiquity: Greeks, Romans, Germans, Vikings, etc. He ironically suggests that there have been many "great replacements" (a concept he intends to

[248] https://www.baspo.admin.ch/fr/sport-suisse

[249] https://fr.wikipedia.org/wiki/Classements_mondiaux_de_la_Fédération_équestre_internationale

[250] In Le Monde, there are several articles dedicated to female performances, including one about the Slovak climber.

downplay by showing that intermixing has been ongoing and that there is no indigenous people). However, he fails to recognize that these population movements often involved small numbers of people (merchants, warriors) who were ethnically similar in most cases. The situation is vastly different from, for example, the conquest of Central America by the Spaniards, which resulted in brutal colonization leading to the imposition of Spanish language and the predominance of Spanish genes in Y chromosomes[251].

am. An old problem in the philosophy of science—known as the "demarcation problem" is to find objective and general criteria that can distinguish between science and pseudoscience. Karl Popper believed he found a reliable criterion with the concept of falsifiability: instead of assessing a theory's relevance through experimental verification, Popper suggested asking proponents of a theory if there exists an observation that could potentially refute it. If no such observation exists, then the theory cannot be considered scientific (Gordin, 2021). The issue quickly became apparent: Popper's criterion would lead to the acceptance of a multitude of ridiculous claims as scientific. Thus, Laudan (1983) writes:

> "Karl Popper's 'falsificationist' criterion [...] leaves ambiguous the scientific status of virtually every singular existential statement, however well supported (e.g., the claim that there are atoms, that there is a planet closer to the sun than the Earth, that there is a missing link), it has the untoward consequence of countenancing as 'scientific' every crank claim which makes ascertain ably false assertions. Thus flat Earthers, biblical creationists, proponents of laetrile or orgone boxes, Uri Geller devotees, Bermuda Triangulators, circle squarers, Lysenkoists, charioteers of the gods, perpetuum mobile builders, Big Foot searchers, Loch Nessians, faith healers, polywater dabblers, Rosicrucians, the-world-is-about-to-enders, primal screamers, water diviners, magicians, and astrologers all turn out to be scientific on Popper's criterion - just so long as they are prepared to indicate some observation, however improbable, which (if it came to pass) would cause them to change their minds."

an. The mathematician Martin Gardner, who had undertaken a crusade against science charlatans, cited Joseph Banks Rhine as an example of a scientist who had strayed into a dead end and, despite his scientific expertise, had persisted. This is how Gardner (1957) described him in the preface to his chapter on parapsychology:

> "It should be stated immediately that Rhine is clearly not a pseudo-scientist to a degree even remotely comparable to that of most of the men discussed in this book. He is an intensely sincere man, whose work has been undertaken with a care and competence that cannot be dismissed easily, and which deserves a far more serious treatment than this cursory study permits. He is discussed here only because of the great interest that centers around his findings as a challenging new "unorthodoxy" in modern psychology, and also because he is an excellent example of a borderline scientist whose work cannot be called crank, yet who is far on the outskirts of orthodox science."

Psychology is not the only field where results challenging common sense have triggered intense controversies. In 1953, chemist (and Nobel Prize laureate) Irving Langmuir delivered a lecture addressing several errors in physics where scientists stubbornly clung to their results despite doubts surrounding them. He discussed "pathological science" (Langmuir, 1989):

> "The characteristics of this Davis–Barnes experiment and the N-rays and the mitogenetic rays, they have things in common. These are cases where there is no dishonesty involved but where people are tricked into false results by lack of understanding about what human beings can do to themselves in the way of being led astray by subjective effects, wishful thinking or threshold interactions. These are examples of pathological science These are things that attracted a great deal of attention. Usually hundreds of papers have been published upon them. Sometimes they have lasted for fifteen or twenty years and then they gradually die away."

ao. This is a topic worth exploring, as it seems that writers were among the first to warn of the transformation of science into a new form of theology. In his 1930 article "Regard vers les savants," Vaudois writer Charles-Ferdinand Ramuz (2023, pp. 75–84) wrote:

[251] https://news.harvard.edu/gazette/story/2025/09/claims-of-pure-bloodlines-ancestral-homelands-dna-science-says-no/.

> "One says that faith is disappearing: shouldn't we say, more accurately, that it has shifted, and that it shifts further each day, having simply changed its object? It has left the dogmas and articles (so-called articles of faith) of revealed religions to latch onto science and its supposed truths, yet it hasn't changed its nature, which is by no means scientific; rather, it is entirely sentimental, rooted in fear and driven by desire. It has clung to the relative without losing its absolute needs, resulting in a kind of confusion among categories or kinds that should ultimately, it seems, lead to catastrophe sooner or later. For instance, consider the role that medicine (or the doctor) plays in modern society. Entire regions (in France or elsewhere) are now without priests because no one is left to provide for their subsistence; it is the doctors who have replaced them.
>
> "The tragedy of contemporary society as a whole is that it is asking science for what science will undoubtedly never be able to provide—what, in any case, it cannot currently deliver. Will society realize this in time? Will it persist in its error? Moreover, more often than not, it does not even turn to true science, but rather to all the 'substitutes' it can imagine, preferring them to real science; to all the pseudo-sciences, to all the half-baked sciences, to all the semi-experts, to all the false scholars that one might find. We, the honest ones, know precisely nothing, yet we do not pretend to know anything; perhaps despite everything, this is a form of superiority. It allows us, in any case, to observe our surroundings.
>
> "Let us be clear that here we are often not dealing with scientists but merely technicians. This means that within a more or less complete system they are nevertheless taught—subject to change every ten years—the university primarily transmits techniques (while refining them). As long as society refers to them only when it needs a bridge (which they've learned to build very well), it remains in its role. As long as they diligently build their bridge, they remain in their noteworthy role. But isn't it precisely the case that society continually steps out of its role, and they do too—believing they know everything the more they actually know less, aspiring to explain everything the more they are truly only able to explain a small part of it?
>
> "The great tragedy of the modern world is that, in seeking the truth and the whole truth, it turns to science, which, when sincere, can only provide a fraction of the truth.
>
> "What weighs heavily on us as we begin this century is less science itself and the idea it has of itself than the idea we have of its powers. It can do something, yet we imagine it can do everything. That is why it is everywhere (or rather, the representations we have of it). Its prestige is so great that it casts a shadow on all our disciplines, methods, and ways of speaking and acting. Everything must become science—or it will cease to be."

In the 1930s, the Austrian writer Robert Musil launched a fierce attack on science in his unfinished novel "The Man Without Qualities" (Musil, 2004, t. 1, pp. 409–410):

> "Now we must add a few words about a smile, specifically, a smile of men, accompanied by the necessary beard for this human activity called smile-in-beard: this is the smile of the scholars [...]; they were men in whom a certain tendency towards Evil lurked, like fire beneath a cauldron.
>
> "Of course, this observation may seem paradoxical, and a university professor confronted with it would probably reply that he simply serves Truth and Progress, wishing to know nothing else: this is the ideology of his profession. All professional ideologies are obviously noble; hunters, for example, far from calling themselves 'butchers of the forests', proudly proclaim themselves 'Official Friends of Animals and Nature', just as merchants uphold the principle of honorable profit and, in turn, thieves adopt the god of merchants, namely the distinguished promoter of universal harmony, the international Mercury. Therefore, one should not place too much importance on the form that any activity takes in the consciousness of those who practice it.
>
> "If one inquires, without any bias, how science has arrived at its current form (an important question from all points of view since it dominates us and even the illiterate is not exempt from it, learning to live amid countless scientifically produced objects), one obtains a very different picture. According to reliable traditions, it was during the 16th century, a period of intense spiritual activity, that man, having renounced the attempt to violate the secrets of nature as he had for twenty centuries of religious and philosophical speculation, settled merely for exploring its surface in a manner that can only be described as 'superficial.'

> The great Galileo, for instance, who is always the first mentioned in this regard, renounced understanding why nature intrinsically abhors a vacuum to the point that it compels a falling body to traverse and fill space after space until it finally reaches the ground; instead, he contented himself with a much more banal observation: he simply established at what speed this body falls, which trajectory it follows, how much time it takes to cover that trajectory, and what acceleration it undergoes. [...]
>
> "One can initially recall the singular preference of scientific thought for these mechanical, statistical, and material explanations, which seem to have had the heart removed. To see kindness merely as a particular form of selfishness; to relate the movements of the heart to internal secretions; to observe that man comprises eight or nine tenths of water; to explain the famous moral freedom of character as an automatic appendage of free trade; to reduce beauty to good digestion and the proper state of fatty tissues; to boil procreation and suicide down to annual curves that reveal the forced nature of what was believed to be the result of the freest decisions; to sense the affinity between ecstasy and mental alienation; to place the mouth and anus on the same level, since they are the oral and rectal extremities of the same thing...: such ideas, which indeed reveal to some extent the tricks of human illusionism, always enjoy a sort of favorable bias and are considered particularly scientific. It is undoubtedly the truth that one loves in them; but surrounding this naked love, there is a taste of disillusionment, constraint, inexorability, cold intimidation, and dry admonitions, a malignant bias, or at least the involuntary exhalation of analogous sentiments."

In the introduction to his (also unfinished) work on the crisis of European sciences, the German philosopher Edmund Husserl noted (Husserl, 1976, p. 10) that the problem of modern science is that it can describe the world but not explain the meaning of things:

> "In the distress of our lives, — this is what we hear everywhere — this science has nothing to tell us. The questions it excludes by principle are precisely the questions that are most pressing in our unfortunate time for a humanity abandoned to the upheavals of fate: these are the questions concerning the meaning or absence of meaning of all this human existence."

ap. This is how American literature professor Ihab Hassan loosely defined postmodernism as a collection of disparate, sometimes opposing trends—yet postmodernism thrives on tensions between seemingly opposing ideas, such as the contestation of the modern world and its mere continuation—across a broad spectrum of intellectual and artistic activities, manifesting as a social phenomenon with globalization. Hassan (1982) coined the term "indeterminance" – a portmanteau of "indetermination" and "immanence" – to characterize postmodernism, as he believed it prefers what is indeterminate, ambiguous, and discontinuous, rejecting any notion of transcendence. He provided numerous examples of opposition between modernity and postmodernity. For instance, where modernity speaks of "roots," postmodernity prefers "rhizome," referring to an interconnected network of stems beneath the ground. French philosophers Deleuze & Guattari (1980) used this imagery to describe a society without a center, without roots, without vertical structuring—yet interconnected, diffuse, and flexible. The irony is that at the time these two authors were depicting their anti-capitalist counter-society, capitalism was transforming: it was becoming diffuse, decentralized, dematerialized, transnational, interconnected, and globalized—much like the internet, which emerged around the same period.

For Lyotard (1979), it is the technological revolution driven by computerization that marks the shift to the postmodern era. With computers, information is something that can be produced, stored electronically, disseminated instantly, and sold like any other production good. In the past, capital resided in land ownership (under the Ancien Régime), then in industrial tools (in the 19th and early 20th centuries), but it has now become immaterial and revolves around the mastery of information.

Sociologists like Christopher Lasch and philosophers like Gilles Lipovetsky define post-modernism as a rejection of social determinism, authority, and the affirmation of individual values. Thus, Lipovetsky (1989, p. 15–16) writes:

> "The post-modern society is characterized by mass indifference, a sense of repetition and stagnation, where private autonomy is taken for granted, where the new is welcomed as the old, where innovation is trivialized, and where the future is no longer seen as an inevitable progress. [...]
>
> "The post-modern culture is decentralized and eclectic, both materialistic and psychological, pornographic and discreet, innovative and retro, consumerist and ecological, sophisticated and spontaneous, spectacular

and creative; and the future will likely not have to choose between these trends but will instead develop dual logics, the flexible coexistence of antinomies. [...]

"This is post-modern society: not the beyond of consumption, but its apotheosis, its expansion into the private sphere, into the image and evolution of the self, destined to experience accelerated obsolescence, mobility, and destabilization. Consumption of one's own existence through the multiplied media, leisure, and relational techniques generates a technicolor emptiness, existential floating through and by the abundance of models, even if they are adorned with conviviality, ecological concerns, and psychological insights."

aq. The French philosopher Jacques Derrida is associated with the deconstruction of the dichotomies that form the foundation of Western culture: masculine/feminine, body/mind, culture/nature, reason/emotion, good/evil, etc. According to Derrida, these dualities always express a relationship of domination. He calls for the overcoming of these oppositions by creating ambiguity; for example, androgyny allows for blurring the lines between the masculine and feminine poles, thereby combating male dominance. Following in Derrida's wake, many authors within the postmodern movement seek to abolish all conventional references. Some examples include:

- The post-human is an attempt to create a hybrid being (cyborg, enhanced human, bionic person, etc.).
- Post-feminism denies sexual division. In the essay "The Straight Mind," derived from a lecture given in 1978, lesbian author and activist Monique (Wittig, 1992) (a professor of French literature at the University of Arizona) initiated a radical critique of sexual division by asserting that lesbians are not women; for her, both categories are merely social constructions. This message is further conveyed by her follower Judith Butler (2005), a professor of comparative literature at the University of California, Berkeley, and a lesbian activist, who expands upon this idea by considering that gender is fluid (a sexual identity based on the denial of identity, which requires remaining identical to oneself) and is manifested through daily actions[252].
- Anti-speciesism denies the categories and the particular role played by humans in the animal kingdom; humans are part of the "living." Peter Singer, a philosopher and professor of bioethics at Princeton University, has popularized the idea of speciesism, which, like racism and sexism, carries discrimination against "non-human animals."
- The nation-state, a creation of European elites in the 19th century, is criticized by postmodern elites who look toward a cosmopolitan and connected world. The same criticism applies to European colonialism, which peaked in the early 20th century, leading to the collapse of European empires after World War II, followed by reversed colonization.
- The societies of the Ancien Régime and those of the Industrial Revolution were structured into social classes. Postmodernists aim to abolish these class distinctions in favor of categories described as minorities: women[253], "racialized" individuals, people belonging to the LGBTQ+ categories called sexual minorities, people with disabilities referred to as "persons with disabilities" (likely to avoid reducing them to their impairments, which in this specific case is an unchosen identity element), etc.

ar. The sterile debate surrounding sexual binary is a prime example of the intellectual decay among many academics. Biology is rich in rules that are generally upheld, but which also have exceptions. For instance, a general rule in the classification of living organisms (taxonomy) is that individuals from distinct species cannot reproduce with one another; this applies to monkeys and humans, for example. However, there are exceptions, such as donkeys and horses, which can mate to produce hybrids (mules and hinnies), typically sterile. One might argue that classifying organisms into species is irrelevant due to hybridization cases, but overall, classification remains stable, and exceptions do not challenge general

[252] I could have categorized Butler with the same status as Bruno Latour among 'gurus.' She shares with him a vague and jargon-filled style, full of convolutions meant to disguise the absence of structured thought (Nussbaum, 2003). She has exerted considerable influence (sometimes referred to as the "Pope of Gender") and has widely disseminated post-feminism.

[253] who make up just over 50% of the population; "minority" here should be understood as "powerless" rather than as an indication of population share.

rules. Sex is also complex among mammals, being defined at the levels of chromosomes, gametes, and genitalia (Quintana & Pfaus, 2024). Generally, there is alignment of sexual characteristics across these levels, with low variability (according to some estimates Sax (2002), 99.98% of the human population falls into the male or female category), making sexual binary the biological norm. One example is the controversy between Sambuddha Banerjee (and his students) from East Carolina University and John Landrum from the University of Florida (Reyes *et al.*, 2022; Banerjee & Reyes, 2024; Landrum & Lichter, 2024). In a typical postmodern article aiming to "dismantle White supremacy in chemistry" (a point he never fully addresses, save for the abstract), Banerjee begins with an example of a student protesting a teacher who corrected him in class for associating XY chromosomes with males. According to Banerjee, this reaction "masks scientific ignorance" (sic). In response to Landrum's reminders about sexual binary (Landrum & Lichter, 2024), Banerjee & Reyes (2024) bluntly states:

> "This denial of scientific facts in favor of personal beliefs and teacher dogmas is responsible for the poor education of generations of students in science, technology, engineering, and mathematics, leading to the politicization of science."

In a reversed world, it is Banerjee who claims to be offended by attacks on scientific truth. From my readings and listenings of authors who share Banerjee's ideas, I find that many exhibit similarities:

- They present themselves as scientists or people grounded in science.
- They do not provide arguments to support their claims but refer readers or listeners to articles (this is typically a scenario of the man who saw the man who saw the bear).
- They employ keywords such as "White supremacy," "patriarchy" (hétéronormativité in Banerjee's terms), "oppression," "systemic racism," without ever clarifying the link to the topic at hand (in this case, chemistry education).

as. Revolutionary impulses can come from all social classes. The French Revolution was primarily driven by the Third Estate, specifically the petty bourgeoisie, against the dominant class (the aristocracy and the wealthy bourgeoisie aspiring to the nobility of the robe). The same applies to early socialism (in the 19th and early 20th centuries), which included self-taught individuals (like Proudhon and Fourier), disgraced bourgeois (like Marx), and dissident aristocrats (like Count Saint-Simon or Prince Kropotkin). Christianity is perhaps one of the rare cases of a societal revolution imposed by the ruling class. Post-modernism emerged in universities and permeates the institutional discourse of the four centers of power according to Trigano (2012): finance, academia, the judiciary, and the media.

at. Wage disparities are always evaluated at the level of entire groups, purportedly reflecting discrimination against women. Every year, like the rest of the media, RTS engages in relentless reporting without ever attempting to delve deeper than a simple observation made from aggregated data. Thus, in 2025, as in previous years, RTS states unequivocally that the wage gap between men and women is substantial—27% in Geneva[254] and 12% across Switzerland[255]. RTS certifies that wage gaps are largely unexplained[256].

Each year, Switzerland witnesses numerous demonstrations demanding wage equality on International Women's Day[257]. RTS reminds us that "gender equality" is threatened by a masculinist offensive[258]. Finally, every November, RTS proclaims that the wage gap is so pronounced in Switzerland that it implies women effectively work for free starting in late

[254] https://www.rts.ch/info/suisse/2025/article/journee-des-droits-des-femmes-mobilisation-et-revendications-en-suisse-28815408.html

[255] https://www.rts.ch/info/economie/2025/article/ecart-salarial-hommes-femmes-en-suisse-jusqu-a-23-de-difference-en-2024-28926773.html

[256] https://www.rts.ch/info/suisse/2025/article/ecart-salarial-en-suisse-les-femmes-mariees-penalisees-surtout-les-meres-28980059.html

[257] https://www.rts.ch/info/suisse/2025/article/greve-feministe-en-suisse-des-milliers-de-personnes-manifestent-notamment-pour-l-egalite-salariale-28914323.html

[258] https://www.rts.ch/info/suisse/2025/article/egalite-des-genres-enjeux-et-defis-actuels-selon-stephanie-lachat-28772408.html

October[259].

Institutions of higher education in Switzerland have taken these issues seriously, establishing "equality offices" (a delightfully Orwellian term for agencies designed to promote positive discrimination); the work of these offices appears to be substantial since, twenty-five years after their establishment, the wage gap has only partially decreased.

In the theory of social justice, there is a hierarchy of systemic victims. Belonging to two identity groups implies double discrimination[260]. This might seem logical, but it becomes apparent that the proposition is flawed. According to this perspective, a Black woman would suffer from a double curse: being female and being Black. Therefore, if we were to adopt this viewpoint, one would have to acknowledge that Malia Ann Obama, daughter of Barack and Michelle Obama, merits considerable recognition for having attended Harvard—like both of her parents—despite her sex and skin color, and that her situation is far less enviable than that of a White person from Cleveland or Detroit.

au. For American philosopher John Searle (1993), humanities departments were the weak link in American universities, with selection criteria for professors significantly lower than those used elsewhere:

> "Historically, part of what happened is that in the late 1960s and 1970s a number of young people went into academic life because they thought that social and political transformation could be achieved through educational and cultural transformation, and that the political ideals of the 1960s could be achieved through education. In many disciplines, for example, analytic philosophy, they found the way blocked by a solid and self-confident professorial establishment committed to traditional intellectual values. But in some disciplines, primarily those humanities disciplines concerned with literary studies—English, French, and Comparative Literature especially—the existing academic norms were fragile."

av. Having trained as a chemist before turning to English literature, Katherine Hayles has shown a keen interest in epistemology, particularly in the development of modern techniques. Like Donna Haraway, she envisions computers and human-machine interfaces as the future of humanity. Additionally, she aims to revisit the history of science from a feminist perspective. In her essay on chaos, Hayles (1990) criticizes science journalist James Gleick, whose book on chaos popularized mathematical concepts related to the emergence of chaos. What does she accuse him of? In his book, Gleick does not reference a single woman. She acknowledges that it is possible that no woman played a significant role in these mathematical works.

> "On the one hand, Gleick can scarcely invent them where they do not exist. Perhaps even more than most sciences, chaos is heavily dominated by men, especially in America. On the other hand, the exclusion of women in Gleick's text goes beyond the acknowledged scarcity of distinguished women scientists. It pervades the entire depicted world."
>
> "In validating chaos as a scientific concept, Gleick seems to have found it necessary to expunge the female from his world. Why? I can of course only speculate about the psychological and cultural dynamics underlying this exclusion. Nevertheless, certain aspects are sufficiently clear as to be almost obvious. In the Western tradition, chaos has played the role of the other—the unrepresented, the unarticulated, the unformed, the unthought. In identifying with chaos, the scientists that Gleick writes about open themselves to this otherness, and they perceive their intercourse with it as immensely fructifying—for their work, for their disciplines, and for them personally. But otherness is also always a threat, arousing the desire to control it, or even more extremely to subsume it within the known boundaries of the self, thus annihilating the very foreignness that makes it dangerously attractive. [...]
>
> Representations of actual women and of activities closely associated with them are rigorously excluded from the depicted world. Paradoxically, this exclusion facilitates the incorporation of the feminine principle of chaos into science. By admitting the feminine as an abstract principle but excluding actual women, Gleick attains control over the polysemy of chaos, striping it of its more dangerous and engendered aspects. As a result, chaos is admitted into the boundaries of scientific discourse, but science remains as

[259] https://www.rts.ch/info/suisse/8148284-les-suissesses-travaillent-gratuitement-depuis-le-21-octobre.html
[260] Activists refer to this as *intersectionality*.

monolithically masculine as ever."

aw. Cofnas wrote a lengthy piece discussing the shortcomings of the right in Anglo-Saxon countries, criticizing it for not addressing the root of the problems. He argues that the thesis claiming all humans are equal in abilities is a lie, urging the right to be realistic and transparent about racial inequalities.[261] He specifically critiques conservative Christopher Rufo's idea of implementing a merit-based system without regard to race, suggesting it would lead to the near-total exclusion of Black individuals from elite positions outside of sports and entertainment. This statement sparked significant controversy, prompting Emmanuel College, where Cofnas taught, to terminate his contract. The college stated:[262]

> "Dr Nathan Cofnas published a blog which provoked considerable controversy and prompted a significant number of complaints which the University, as his employer, was duty bound to investigate. A rigorous inquiry concluded that his published views, while seen by many as offensive, did not breach the law and did not contravene University regulations designed to uphold free speech.
>
> "The University is committed to addressing racism, discrimination and harassment, and strives to be a welcoming place to people from all backgrounds. At the same time, the University must secure and promote freedom of speech and provide an environment for open and sometimes robust debate. This can be a difficult path to navigate, particularly when arguments, while remaining within the law, cause deep offence."

Professor Peter Singer from Princeton defended his colleague, despite their political differences, as Singer belongs to the radical left. He remarked that for Emmanuel College,[263]

> "freedom of speech does not include the freedom to challenge DEI policies, and challenging them can be grounds for dismissal. This is an extraordinary statement from a graduate institution."

ax. Early in the 20th century, scientists have warned about technological risks. A few emblematic examples from the 20th century include:

- In 1914, mining engineer Louis de Launay pointed out the finiteness of mineral resources and the risk of climate impact from massive industrial gas emissions (Launay, 1914).
- In 1962, American biologist Rachel Carson published "Silent Spring," which described the devastation caused by insecticides among bird populations. She was fiercely attacked by major U.S. chemical industries, facing classic discrediting tactics such as ad hominem attacks, counter-studies, data falsification, denial of the problem, and subsequent minimization of effects (Foucart *et al.*, 2020).
- In 1972, the Club of Rome, an offshoot of the OECD, commissioned professor Dennis Meadows (MIT) and his team to study the future of humanity (Schmelzer, 2017). They published their report on the limits to growth in 1972, which gained significant media attention. However, it was largely dismissed after the first oil shock in 1973. The report continues to be mocked for its perceived pessimistic predictions.

Despite some government actions addressing the most pressing issues, it can't be said that these voices were heard. The root problem—a growing population and increasing human activity—remains. To assuage its conscience, the United Nations commissioned its own report on the environmental crisis (the Brundtland report published in 1987), which introduced the concept of "sustainable development," a pleasant oxymoron suggesting continuity in the status quo, hoping that technology would provide adequate solutions to correct all problems. This is how the European Union aims to promote the energy transition by banning fossil fuels in favor of renewable energies. In practice, there is no transition from one energy source to another; there is simply an addition of sources (Fressoz, 2024).

[261] https://ncofnas.com/p/why-we-need-to-talk-about-the-rights
[262] https://afcomm.org.uk/2025/10/03/cambridge-clears-academic-in-race-row-citing-new-free-speech-protections/
[263] https://www.japantimes.co.jp/commentary/2024/05/07/cambridge-support-free-speech/

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