

The Twilight of the Bourgeoisie in Art and Science. Major Trends in the Decline of Capitalist Society

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DINUŠ, P.: The Twilight of the Bourgeoisie in Art and Science. Major Trends in the Decline of Capitalist Society
Philosophica Critica, vol. 8, 2022, no. 2, ISSN 1339-8970, pp. 48-73.

The article discusses some of the trends in the decline of art and science in capitalist society. The author focuses on these trends in the historical context, from the imitation of ancient models through the individualism of romanticism, realism, formalist experimentation, subjectivism, pessimism and the hopelessness of modernity, to the current exhaustion of „high culture“. It explores the course of natural sciences from the dismantling of the Ancient-Medieval idea of the world and the emergence of modern experimental methods up to the stagnation in the evolution of natural sciences and their limited development since the 1960s. The author believes that the culmination of conceptual and content degeneration of bourgeois art and science came as a result of their post-World War II geographical shift from European centres to the United States.

Keywords: Art – Science – Bourgeoisie – Capitalism – Decline

Introduction

In the early stages of its mode of production in the 15th and 16th centuries, the bourgeoisie began to build a technology-based civilization with a pseudo-ancient culture that negated the „Gothic“ world of the Middle Ages with its cathedrals, legends, chants and mysteries. In doing so, it subscribed to the heritage of the Greco-Roman world with Antiquity becoming its inspiration source, while shielding itself with its legacy, which it began to transform. The bourgeoisie deserves credit for restoring many institutions of the ancient world (theatre, museum, grammar school, lycée, academy) in their new forms, which, in the 19th century, became part of the life of society not only in the European continent. On the other hand

(with the exception of the brief Jacobin dictatorship in France in the late 18th century), it never rejected the Church or Christianity, which, being in opposition to Ancient civilisation, played a crucial part in shaping the medieval world. Religion remained the main bourgeois ideology because it sanctified and justified capitalist relations of production, as had also been the case during feudalism.

In art, the bourgeoisie deliberately turned to Antiquity. By copying ancient models, it broke up with the past artistic development. In contrast to Byzantium, adopting ancient art models in Western Europe was a revolutionary event, which allowed it to get ahead of the rest of the world.¹ Even Baroque, Romanticism or Neo-Romanticism could not eliminate the influence of Antiquity mediated by the Renaissance. The bourgeoisie, with its sense of historicism, kept being obsessed with both the form and the content of ancient culture in fine arts, literature and especially in theatre far into the 19th century. Nor did its influence disappear in the 20th century, when it was largely resurrected by fascism.

Similarly, of all the heirs of Hellenistic natural sciences, only Western Europe was able to contribute to scientific progress. While it is true that the Islamic world, especially in the 8th-13th centuries, experienced an unprecedented development in many areas of science, which, in many respects, still serve as the building blocks of our current knowledge, the lands of Islam sterilized science by the existing doctrine of two truths (higher spiritual and lower intellectual), its advancement being curbed and overruled by religious teachings.² In Western European Christianity, the dispute between the two truths continued until under the impact of economic change (the collapse of feudalism and the rise of capitalist relations of production), the entire Greek concept of the world was destroyed and replaced by another.³ Thus, the heritage of Antiquity in Europe did not pass to medieval scholasticists but rather to new scientists, who came up with their own way of reconciling faith and reason. They enriched science, now regarded as natural philosophy, with a new system based on experiment and mathematics. It drew on the mechanics derived from

¹ In economy, Western Europe was unable to outrun the other countries until the end of the 18th century, when it introduced the steam engine into industrial production.

² The Islamic world lost its intellectual momentum in the 16th century. India turned into a battleground due to the wars between the waves of Islamic invaders, and also as a result of Hinduism, formalised into a rigid system of castes, which provided stability at the expense of any possibility of progress. China, in its turn, maintained a system of government that prevented it from combining theoretical learning with practical applications.

³ John Desmond Bernal, *Science in history* (London: Watts & Co., 1954), 227.

Aristotle, and as such was an expression of the European antithesis, albeit to a large extent not really original, because the main concept of modern science – heliocentrism – had already been formulated by the ancient Greeks (Aristarchos). In Bernal's words, the new science was directly borrowed from classical civilisations; by adopting and revising their methods, people of the new era could rebut their predecessors' views and surpass their achievements.⁴ The European advances in science were largely influenced by the Italian Renaissance (paradoxically enough, in Italy itself, this influence only became apparent in the early 17th century), by the bourgeois revolution in the Netherlands, England, and ultimately in France. Aristotelianism became outdated in astronomy and physics as early as the 17th century, while in biology, it was abandoned only as late as in the 19th century. In some ways, science is still struggling with the consequences of the legacy of Antiquity.

Western Europe remained the hub of development in art and science for centuries. Its age-old dominance also in capitalist economy and politics ended with the defeat of fascism. Following World War II, the bulk of activity in art and science was shifted to the United States, which spent huge sums of money to support them. This ended the dominance of Western Europe. The U. S. financial oligarchy received a major incentive through the success of the nuclear weapons development project; the pace of progress in science and research was further accelerated as a result of the Soviet Union's achievements in the field of missile technology (the so-called Sputnik crisis in the USA).

The transfer of "high art" to the United States prompted the development of art trade, often for speculative purposes, while artists turned into the most highly valued commodity. However, the typical features of the conceptual and artistic decline of bourgeois art, which culminated in the United States after 1950, had been apparent since the first half of the 20th century. The ideology of imperialism, together with individualistic ethics, distorted the essence of art, its content and forms.

While by the mid-20th century, we could still trace some development in science and art in the bourgeois world of Western Europe, these went on decline after the nerve centre of the global capitalism had moved to the USA. Today, the bourgeoisie cannot boast any basic research that would lead to revolutionary discoveries in pure science. Success in research is mostly manifest in applied science, leading to reforms only in the technological applications of science. Applied science in technology and industry, but also in medicine, chemistry and physics, has undermined pure

⁴ Ibid., 260.

science. Since the early 1960s, the importance of fine arts has gradually faded as well. Music, ballet, literature and theatre live from the past. The great bourgeois art is exhausted. All that has remained is an empty vessel.

Art

Not East-European nations alone are known for emulating, attempting to catch up or even outdo foreign - in their case Western - models. Not they alone typically struggle with „coping with the past“. Feudal and capitalist Western Europe, too, emulated, attempted to catch up with, and even outdo the ancient Greco-Roman world. It had to deal with the heritage of Antiquity. The Carolingian Renaissance mimicked ancient education, Carolingian art intentionally used specimens of ancient fine arts as templates. The Ottonian Renaissance imitated Roman models, and the Ottonian art followed on from the artistic tradition of the Roman Empire. The Italian Renaissance, which spread throughout Europe, deliberately turned to the ancient cultural heritage. While the Carolingian and Ottonian Renaissance served the needs of the state apparatus of the feudal state, supported imperial ideology and was utilised as an instrument of feudal expansion, the European Renaissance as an epoch of cultural and conceptual development, entailed by the disintegration of feudalism and the rise of capitalism, served the needs of the emerging bourgeoisie. In these renaissances, the West broke even with antiquity intentionally and purposefully with more or less emphasis. This process did not end with the Renaissance; it continued even after its demise during Baroque, Classicism, Neoclassicism and Neo-Humanism, through the 19th and 20th centuries, and it continues to this day. The cult of ancient artistic and real-life ideals was most salient in Italy, France and Germany. Marx addressed this subject in his work *Fundamentals of the Critique of Political Economy*, saying that, unable to explain and appreciate the significance of (its own) capitalist production and wealth, the bourgeoisie escaped into Antiquity.⁵

Byzantium, Western Europe and the Arab Empire all drew on the legacy of Antiquity. However, only Western Europe was able to utilise and develop it in such a way that allowed it to overtake the rest of the world. The thriving Western European science, fine arts, literature, theatre and philosophy were all defined by this legacy. Without it, they would be unthinkable. Only music evolved independently, even though the groundwork for

⁵ Karl Marx, Základy kritiky politickej ekonómie (The Fundamentals of the Critique of Political Economy). In Karl Marx and Friedrich Engels, *Vybrané spisy v piatich zväzkoch*. Zväzok 2 (*Selected writings in five volumes*. Volume 2), (Bratislava: Pravda, 1977), 404.

the proper development of European music culture and theory, too, was laid by ancient Greek music.⁶ Eventually, Western Europe surpassed classical antiquity in technology and in science, determining the technocratic nature of Western civilization. On the other hand, it never surpassed antiquity in culture (with the exception of music), which has remained an unattainable ideal for Western Europe. Just as the visual art of the Renaissance imitated ancient art, the literary humanism of the Renaissance, which prepared the ground for the development of Western European literature, imitated the ancient literary content and form.

In the late 16th century, during the economic and political rise of the revolutionary bourgeoisie, there was a period of late but powerful flourishing of the English Renaissance in poetry and especially in drama.⁷ During the late Renaissance, the theatre experienced a boom never to be matched again in the British Isles.⁸ Shakespeare's greatness lay in his ability to almost equal the artistic value of ancient drama. In the new conditions, he was able to best interpret its artistic principles and methods. The late English Renaissance was brought to a close by the epic of Milton, an ardent advocate of the bourgeois revolution. Yet, the general tone of the 17th century literature was no longer set by England but by absolutist France. The literary source for its classicist work was again Antiquity. Classicism saw in it an unsurpassed benchmark of perfection. The humanism of Molière's work was close to the Renaissance worldview. With its democratism and

⁶ The Renaissance gave rise to the creation of the genre of opera, inspired by the ancient drama. The genre was created in an effort to restore the Greek tragedy in its entirety. This effort remained the leading motive for the reform of the opera in the works of Gluck and Wagner. Italy has maintained its leading position in the world of opera since its very inception. The Italian opera reached its peak in Rossini's works. After a period of decline, Verdi restored it back to its greatness.

⁷ In the same period, the Spanish Renaissance flourished, especially in drama and prose. The most prominent author of the Spanish Renaissance literature, Cervantes, died in the same year as Shakespeare (1616), but the decadent Baroque found its way only into Cervantes' work. Since the Renaissance in Spain did not reflect the onset of capitalist social relations to the same extent as in England, towards the end of the 17th century, Spanish literature fell into a deep sleep, from which it did not awake until the 20th century.

⁸ In 1642, under the influence of the Puritans, theatres in England were closed. The restoration of the monarchy (1660) brought about the establishment of the classicist drama. Yet, by the end of the 18th century, the development of theatre was hampered by a censorship law, by which the victorious British bourgeoisie defended itself against criticism by the Enlightenment thinkers and the influence of deeper the French Revolution. A new boom came only with the penetration of deeper social-critical or truly socialist ideas, especially into Shaw's work.

realism, it went beyond the confines of court classicism. On the other hand, it did not counter the rigidity of classicism and its aesthetics by offering a new path of literary development. This new avenue was only opened by Pre-Romanticism (sentimentalism). It was an expression of the desire for new life relations liberated from feudalism and absolutism, and also of the rise of bourgeois culture in 18th century England; hence its subjectivism, emotionality, the search for a new poetics in nature, folklore and antiquity in opposition to classicism. Pre-Romanticism reached a literary peak in German classics (Goethe, Schiller). By striving for a harmonious, creative individual inspired by the ancient ideal, it merged with Neo-Humanism and its Greek and Shakespearean cult.

Pre-Romanticism paved the way for long-standing and thriving Romanticism in 19th and 20th century art. To a large extent, it was a rebellion against Antiquity. Ancient ideas were supplanted with national specificity, folk art, nature, and medieval mysticism. Romanticism resurrected and vindicated Gothic. The idea of the harmonious perfection of Antiquity melted away with the consolidation of bourgeois social relations. The feudal estate system, with its relative stability, gave way to free capitalist competition. A romantic hero faced the contradictions of capitalism by escaping into fantasy, the idealized past, distant lands or, on the contrary, by attempting to transform the world by rebellion against social conventions, by refusing to obey the law. The sense of rebellion, revolt, resistance to the official world, pursuit of creative independence from tradition, would become the defining motive for the development of literary, visual and musical art, which would survive the 19th century. Romanticism inaugurated a new relationship between man and life, society and the world, which would evolve in various artistic currents until the mid-20th century. Objectivism was suppressed with subjectivism, materialism with idealism, rationalism with irrationalism. In art, it unleashed the power of artistic imagination, forging its way into the early, high and late Romanticism as well as into Neo-Romanticism as a reaction to Naturalism late in the century. What is more, without the influence and inspiration of Romanticism, symbolism, impressionism, decadence or the modernist avant-garde of the first half of the 20th century would be unthinkable.⁹ Romanticism-based art was subjectivist and individualistic, directly responding to the

⁹ In addition to fine art, music best demonstrates the vital force of Romanticism. Romanticism persisted not only throughout the 19th century; music bore its signs until the 1950s. This was largely due to Neo-Romanticism, associated with the establishment of national music schools. In the history of music, Romanticism was only countered by Italian Verism (introduced by Bizet's *Carmen*), Neo-Classicism (preceded by Brahms's symphonic work following

new socio-economic realities of the capitalist social order. On the other hand, a romantic return to the past imbued the official art of the bourgeois 19th century with its academicism and eclectic new-style historicism.¹⁰ Painting and sculpture broke this spell by Impressionism, while architecture remained in the impasse of historicism until the early 20th century. Civilizational progress on the one hand and prevailing historicism on the other were one of the major contradictions of the 19th-century bourgeois rule.

The victory of Romanticism brought about a break with realism in art, a temporary defeat of the principles of creative realistic representation of the world, which have always existed in artistic creations (ancient Greek tragedy, Shakespeare's and Molière's plays, Rembrandt's paintings, English realistic 18th-century prose and other artistic expressions). In the 19th century, the idealistic domination of Romanticism in France, England and Russia was opposed by a new, socially and critically oriented Realism, which originated and developed amid the contradictions of bourgeois society. It expressed the orientation of literature and fine arts towards objectivity, towards non-idealized, methodical observation and depiction of reality. The best aspects of Realism, which, in the 19th century, actively sought true knowledge and true reflection of reality, evolved through revealing the alienating effects of repulsive capitalist conditions. Bourgeois society is at odds with the true interests and needs of man – this truth was first revealed by critical realism in its homeland, France, in the facts and contexts of its novels and short stories. Hence, it remained impotent in castigating and portraying forces that would reveal the prospects of resolving the class contradictions of capitalism. Balzac, the greatest of the greatest critical realists, sought support in the monarchy and in Catholicism. This incompetence, later associated with the influence of positivism, triggered a crisis of French critical realism, which led from Flaubert to Zola's „scientific“ novel – a naturalistic concept of literature as an impartial mirror, a perception of man as mainly a biological being, causing the retreat of realism from the forefront of French literature to its fringes. Since then, realism in French literature has never regained the status it had in the 19th century.

The struggle between romantic and realistic currents in 19th-century art, which broke out mainly in France, England, Russia and partly in Germany, was sparked by the social setting in these countries as a result of

Beethoven), expressionism with its dodecaphony, and the works of socialist composers.

¹⁰ In the buildings of theatres and museums, the bourgeoisie worshiped antiquity, in the buildings of town halls and churches, it bowed to the Middle Ages.

the bourgeois-democratic revolutions in France and Germany and bourgeois-liberal reformism in England. Following the defeat of the revolution of 1848-49, the idealistic concept of „art for art’s sake“, the reactionary cult of „pure art“ of the Parnassianists and Symbolists prevailed in French poetry. The path to pure art, Parnassianism, to the Cursed Poets, to Neo-Romanticism and Decadence was foreshadowed by the romantic demands of the freedom of art and of the author’s subject. The symbolists’ aversion towards post-1848 society led them to a futile protest and escape into individualism, idealism and aestheticism.¹¹ In the theatre, the romantic revolt was replaced by reconciliation with bourgeois relations. In prose, critical realists remained mere chroniclers and critics of bourgeois society.¹² They did not set any positive social ideal before humanity, or find any positive prospects, and failed to see the way out in the revolutionary struggle.¹³ Rather than resolving this crisis by turning towards Naturalism late in the 19th century, critical realism gave way to sophisticated decadence and complex individualist psychologisation,¹⁴ while literary impressionism was marked by extreme individualism and subjectivism¹⁵.

Unlike the romantic currents in other countries, German literary romance did not create a type of revolutionary hero. In addition to discovering the values of folk poetry, it was dominated by reactionary views on the need to escape into the realm of art, Catholic mysticism and the Middle Ages. The progressive revolutionary-democratic literature of

¹¹ The objectivist poetry of Rimbaud, a participant in the Paris Commune, found it difficult to free itself from the curse.

¹² Under the influence of positivism, critical realists of the latter half of the 19th century sought to objectively portray social processes, human relationships and characters through sensory verification and proof of experience. Yet, the writer became only an impartial observer and narrator of facts.

¹³ Unlike the greatest representatives of literary realism, outspoken critics of the repulsive reality of the life of the French bourgeoisie from the ranks of visual artists actively participated in the Paris Commune (Courbet, Daumiere, Dalou). The Belgian sculptor Meunier combined his work with joining the life and struggle of the French proletariat.

¹⁴ The historical limitations of critical realism could only be overcome by authors who dedicated their work to the struggle of the working class early in the 20th century.

¹⁵ Impressionism in the fine arts, which sought to capture immediate sensory impressions under the influence of positivism (especially visual and auditory experiences), limited art to the area of an individual’s sense of moodiness. The resistance to rigid academicism and closed studio painting of the 19th century, the introduction of art into the stream of life and sunny countryside, was undoubtedly significant, sound and sensible in Impressionism. However, the features of subjectivism and aestheticism caused it to depart from progressive realistic positions and tied it with the decline of bourgeois culture.

Young Germany was hampered by the defeat of the bourgeois-democratic revolution. After 1849, the depression and resignation of the German bourgeoisie manifested itself in a new retreat from reality (into nature, art, the author's inner world or into the past). The bourgeois drama of the latter half of the 19th century bore the stamp of the defeat of revolution and reconciliation with reaction. Thematically, national and social problems were no longer a priority, being replaced by historical-philosophical and aesthetic theories. Most of Wagner's musical dramas were composed in this spirit (with the exception of the opera *The Master-Singers of Nuremberg*). With its irrationalism, voluntarism and nationalism, German Neo-Romanticism actually paved the way for fascism, while Realism of the latter half of the 19th century fell out of favour in Germany, only to reappear in the German-language Swiss literature. Germany itself was dominated by the writings defending the existing order of the „Second German Empire“. German realist literature mostly prevailed in the 20th century.

English Romanticism, filled with the revolutionary pathos, found its expression in the works of its best representatives, while the poetry of Chartism expressed the revolutionary ferment of the proletarian movement in the most advanced capitalist country. Despite the later influence of idealistic, romanticist poets, the leading role in English literature was assumed by critical realists, who – unlike in France – retained their significance even during modernism and individual psychological analysis of the 20th century. In their protest against the ruling bourgeois society, its institutions and views, critical realists (particularly Dickens influenced by Chartism) were joined by Neo-Romantic artists and art critics – representatives of the „aesthetic movement“ led by Ruskin and the first class-conscious socialists. The idealist Neo-Romanticism of the English school arose as a result of sharp criticism of capitalism from the positions of Carlyle's reactionary Romanticism, which, in the pre-1848 period, proclaimed the need to return from capitalism to idealized feudal social conditions.¹⁶ With his critique of capitalism, Ruskin, too, was rather close to „feudal socialism.“ Despite this reactionary focus, English Neo-Romanticism gave birth to one of the most class-conscious revolutionary socialists – Morris. He overcame utopian views on art as the main tool of peaceful transformation of society, seeing that the antagonism of classes occasioned by the capitalist system was a natural and inevitable instrument of its destruction. In his work and political activity, he formulated the revolutionary principles of breaking up the bourgeois system of exploitation and social

¹⁶ Carlyle's reactionary, idealistic notions of „feudal socialism“ were criticized by Engels in the *German-French Yearbooks* (1844).

oppression through the concerted discontent of the masses. However, he mostly remained a „socialist of emotion“ (Engels), bringing to the socialist movement a passionate belief in the human capacity for comradeship and the creation of beauty; he was not one of the political opportunists, represented in the English workers' movement by *the Fabian society*, with its political liberalism and positivist sociology.

The West is prone to believe that, due to their backwardness and barbarism, East European countries are incapable of progress and independent creation, only of blind imitation and adoption. True, the Eastern European nations, which lay behind *the Roman Limes* and which were later the target of attacks by the Avars, Mongols and Turks, did not have the historical opportunity to draw on the heritage of the ancient world to the same extent as did Western European nations. Their culture was mostly represented in literature, which only rarely reached a high artistic level. Usually, a brief period of flourishing was followed by a longer period of decline or stagnation, the outworn literary trends held on tenaciously, and the new ones set in with a significant time lag. In a number of East European countries, Romanticism remained a lively form of literary expression until the last quarter of the 19th century, when it was briefly replaced by Critical Realism, to be supplanted by literary modernism in the early 20th century, which was supposed to help East Europeans to catch up with the West in art and culture – all this as a belated reflection of the advanced Western European literature, whose development began in the Renaissance.

The economic and thus also political and cultural lag of Eastern Europe resulted from an uneven development of capitalism. By the mid-19th century, major West European countries had completed the industrial revolution, while the bourgeoisie rose to power as a result of bourgeois-democratic revolutions, creating the capitalist system and sparking the revolutionary working class movement. In East European countries, social and historical conditions were different, with feudalism still in existence up until the mid-19th century. The transition to capitalism did not take place until the second quarter of the century. As the proletariat was only being constituted as a social class, peasantry was the main force of the liberation movement levelled against the feudal-monarchist establishments.

The harsh social and economic conditions in East European countries, the frequent intertwining of capitalist exploitation with feudal exploitation and national oppression, the disparities between different classes and social strata – landowners, peasants, bourgeoisie and the proletariat – all this affected the ideational life of their nations, determining the

course of their cultural development and of social and political thought.¹⁷ National freedom fighters fought against the strong remnants of feudalism and foreign domination, against monarchist oppression, political conservatism, idealism and religious obscurantism, against the feudal ecclesiastical reaction. In opposition to the latter, two antagonistic conceptions crystallized in Eastern Europe in the first half of the 19th century: bourgeois-liberal (represented by the pathetic epigones of German idealism) and revolutionary-democratic.

Revolutionary-democratic ideology and its corresponding materialist philosophy, associated with the liberation movement of the peasantry and other working strata against feudalism, evolved in East European countries until about the 1870s. Over the following years, it was replaced by Marxism.¹⁸ Both revolutionary democracy and Marxism stood in opposition to bourgeois idealism.¹⁹ In East European thought, theoretical problems developed in the most unique way in the realm of aesthetics, not by coincidence especially in literature. The realistic aesthetics of the revolutionary democrats was associated with the literary depiction of the world, only secondarily with the fine arts (particularly with painting) and national music (especially opera). Revolutionary Democrats and later Marxists reworked materialist aesthetics to justify realistic trends in literature and fine arts, fighting against the idealistic theory of „pure art“, theoretically explicating the principles of conceptuality or ideism, and popularity or the ability to reach masses in art. Progressive, materialistic aesthetics

¹⁷ In *Dějiny filosofie. 4. (The History of Philosophy Vol. 4)*, (Prague: Státní nakladatelství politické literatury, 1962), 311.

¹⁸ While Marxism as an ideology of the international revolutionary proletariat existed and developed in West European countries from the mid-1840s, in many East European countries, where the transition from feudalism to capitalism was only beginning to take shape, revolutionary anti-feudal social forces (peasantry, petty-bourgeois urban strata, intelligentsia) and their representatives were still refining their revolutionary-democratic ideology. With the growth of industry and of the working class, Marxism began to develop in East European countries in the 1880s.

¹⁹ In the latter half of the 19th century, the ideology of liberal bourgeoisie was based on positivism, which accused the emerging socialist movement of surviving Romanticism. Not surprisingly, Comte, the founder of positivism, defined what he called the metaphysical stage as a transitional period, which was already over and which was identical to the revolutionary theories and processes that tear down the old systems. With the growth of the revolutionary workers' movement, positivism became more and more reactionary. It embarked on the path of bourgeois apologetics and resistance against Marxism. The bourgeoisie, which ceased to be a revolutionary class, feared (and continues to fear) the revolutionary consequences of Marxism. Its fear of revolution was (and still is) greater than that of a reaction.

as a platform for critical realism (life of the common people – that is the content and reality of art!) stood in opposition to the idealist and formalist bourgeois aesthetics, which often defended the thesis of „art for art’s sake“. This situation was most salient in Russia.

Engels wrote that the era of Germany’s political and social humiliation in the late 18th and early 19th centuries at the same time marked the golden age of German literature and philosophy.²⁰ Correspondingly, the period of Tsarist despotism in 19th century Russia was the golden age of Russian literature. Philosophical, social and moral reform efforts of Russian society found an outlet mostly in fiction. This determined its basic feature for the entire 19th century: high sensitivity to social needs and strong social impact. Russian literature of the time of severe social oppression was the main arena of the struggle for social and political progress. Russian progressive authors wove into their works their people’s most cherished dreams of universal happiness.²¹

Russian Romanticism was one of the checkpoints on the road to Realism. In literature, its foundations were laid by Pushkin, while Gogol started the tradition of critical realism, thus determining the main course of Russian literature until the end of the 19th century. Its creative principles found theoretical underpinnings in the revolutionary-democratic critique and materialistic aesthetics of Belinsky, followed by the efforts of Chernyshevsky, Dobrolyubov and other Russian revolutionary democrats, which inspired the works of Stasov, a prominent art critic and theorist of Russian realistic painters and musicians. The naturalist school of thought, which originated in the 1840s, gave rise to an artistic system called Russian Critical Realism able to express the reality of the growing capitalism in Russia. The Russian novel became the pinnacle of East European literature, which, in turn, profoundly influenced the development of world literature.

The French (1789) and the German (1848) bourgeois revolutions were preceded by a revolution in philosophy, which provided their conceptual framework. The same phenomenon could be observed in Russia. In the time of Tsarist autocracy and gloom, revolutionary-democratic philosophy, materialist aesthetics and the literature of critical realism emerged and developed from the 1840s onwards, paving the way for the victorious Marxism-Leninism in 1917. The struggle with outdated social relations first began in the realm of ideas, to spread into politics and finally into

²⁰ Karl Marx and Friedrich Engels, *Spisy. Svazek 2 (Writings. Vol. 2)*, (Prague: Státní nakladatelství politické literatury, 1961), 556.

²¹ Milan Pišút and Pavel Výraštek, *Dejiny svetovej literatúry 2. (The history of the world literature. Vol. 2)*, (Bratislava: Vydavateľstvo Osveta, 1963), 185 – 186.

economy. In Russia, this path led from the emergence of revolutionary democracy, through the dissemination of Marxism and the founding of the Bolshevik Party, up to the political victory of the proletariat and the introduction of socialist relations of production.

Modernism, which began in Western Europe early in the 20th century, was just another form of Romanticism, the result of the desire derived from it to unchain artistic imagination. Just like Romanticism, it defended the right to the freedom of artistic creation. Literary modernism turned away from the prose cultivated by Realism to manifest itself most prominently especially in poetry, just as was the case with Romanticism. Yet, modernist manifestos no longer called for the praise of nature, of the common people or of the past, but sang praises for the growing victory of the machine and the big city. The ambition of modernism was to create art for the technologically and socially revolutionary 20th century. The trends, currents and schools of the 20th-century bourgeois art based on formalism expressed the contradictory nature of capitalist society; the artists' works responded to the advancement of technology and civilization.²² The real, material world ceased to be their object of expression (loss of imagery, of communicativeness, of cognitive value). They detached the artist's work from true reality and their aesthetic conception was mostly subjectivist. They abandoned the means of expression of 19th-century art even at the cost of losing contact with a large part of their audience.

Literature was stripped of the means of depicting reality truthfully and objectively. Social motivation of an individual's actions was not accepted. Social analysis was replaced by experimentation with form. The overall tone of the works of art, which only the initiates could understand fully, was hopeless and pessimistic. Formalism and individual protest were also typical of the fine arts. Futurism valued modern machines more than the classic works of ancient art. In an anarchic rebellion against the inhumanity of the First World War, Dadaism expressed the social helplessness of petty-bourgeois intelligentsia.²³ The underlying social motive behind expressionism was the anarchic protest of bourgeois and petty-bourgeois intelligence against the shortcomings of capitalism, with extreme

²² Many representatives of modernity subscribed to the revolutionary lines of thought; they formed an avant-garde, in which they combined their artistic pursuits with social revolution - socialism. They arrived at Marxism and took active part in socialist movements or transformations in socialist countries (Aragon, Picasso, Brecht, Nezval, Mayakovsky and others).

²³ By the late 1950s, Anglo-American pop art (the use of trivial phenomena of everyday life) followed Dadaism in its artistic work, revealing some negative aspects of civilization, however, it was not of long duration.

subjectivism as its aesthetic conception. Cubism sought to express the highly subjectivist „knowledge“ of objects or of the human body. Under the influence of Freudism, the Surrealists focused on depicting strange dreams and nightmares, hallucinations, pathological states; their works were full of horrors and heartless pessimism while Tachism transformed art into absurdity, turning into a means of expression of all kinds of subjectivist ideas. By the same token, Abstractionism separated art from life and real events, from human environment. Its lifelessness, dehumanization and aversion to reality fully suited and captured bourgeois ideology and aesthetics. The above trends and currents in the fine arts, with their formalist experimentation, were unable to surpass the visual art, which reflected reality and which did not ignore the life or interests of society.

The artistic achievements of the latter half of the 20th century pale in comparison with the previous period. Literature, theatre, fine arts, classical music, all these experienced a marked decline - and this despite the fact that in the Western „welfare state“, public and private funds invested in art far exceeded those in the past. The existentialist literature expressed the states typical of a social subject of bourgeois society, regardless of the social relations in which he or she lived. Equally indifferent to real social relations were adherents of the French „new novel“, the origin of which was influenced by the philosophy of Neo-Positivism. Its authors aimed to capture objective reality on the grounds of „pure knowledge“, without attempting to analyse its nature or the prospects of development. They preferred a description of things and the environment, mental and psychological states of their characters with an emphasis on the formal aspects of their work. Thus, the new novel essentially meant an escape from reality. The social critical features of the so-called absurd theatre, i.e., the opposite of socially engaged theatre, remained ineffective as well. This subjectively expressed dramatic form, which absolutized the sense of alienation of man in the conditions of capitalism, negated the class-conditioned nature of the system.²⁴

The visual arts ceased to be what they used to be, even compared to those between the world wars. The works of post-war painting and sculpture were usually much inferior to those of the interwar period. As Hobsbawm points out, just contrast the list of names of painters and

²⁴ The alienation of man, reflected in the post-war literature and drama, his existential questions and problems, are not typical of a man living in a socialist society. Nevertheless, in the turbulent 1960s, some authors mechanically applied the principles of absurd theatre in the artistic depiction of human life outside of capitalism. During the Cold War, their works sounded like an advertisement for anti-communism.

sculptors who created their work before and after the mid-20th century. Some progress was only made in architecture, and that was only because of its relation to technology, industry and urbanism. In classical music, the decline in traditional genres was veiled by the rise of pre-recorded music. With regard to the former, one can mostly hear the works of dead classicists. Only few operas composed after 1950 have become a lasting part of the international or local repertoires, which endlessly replay the works of composers born in the 19th century or earlier, while the US prefers musicals. Only a handful of composers write symphonies.²⁵ One of the expressions of the demise of classical music is featuring the works of composers of popular music (most often for cinema, musical and television) as if equivalent to those of the past composers of opera, symphonic or chamber music.

The world of „high art“, with its traditional forms, was coming to an end in the West. Yet this decline in the classical genres was not due to the lack of talent but rather stemmed from the change in the motives, opportunities and support for the specific forms of art creation. Bourgeois culture brought new forms, which generated profit: music for cinematography, fashion design, television series (soap opera, sitcom), video.²⁶ The other decisive factor in the development trends of Western art of the latter half of the 20th century was the defeat and death of modernism. The avant-garde ghettos were few and still declining. Related artistic genres, while initially successful in Europe, died out gradually to be resurrected in the United States after World War II. The emerging Postmodernism, with its eclecticism, irrationalism and mythology, was not an equal substitute. The cure was worse than the disease.

In the post-1950 period, culture was largely influenced by technology. Popular art and entertainment assumed new creative forms (cinema, television, video and ultimately the Internet as a powerful means of artistic expression), which also affected the modes of perception – a triumph of sound and image, which limited the influence of the printed word.²⁷ The ultimate driving force behind disseminating works of art to a wider public by means of technology in bourgeois society is profitable business. Art has merged with the economic interests of consumer society. Mass entertainment industry (film, radio, television, pop music), which has formed the basis of popular culture, has adapted to the demands of the capitalist

²⁵ Eric Hobsbawm, *The Age of Extremes* (New York: Vintage, 1996), 523-524.

²⁶ These forms include cheap Hollywood-produced films for fooling masses about wizards, spells, ghosts, demons, satans, zombies, vampires, werewolves, monsters, serial killers, psychopaths, cannibals, assassins, aliens and the like.

²⁷ Hobsbawm, *The Age of Extremes*, 513-514.

market.²⁸ The bulk of the profit comes from short-term fashion cycles and from the mass sale of non-durable products. The only quality standard in art is its marketability. Commercialization of culture, which has corrupted many artistic genres, has replaced renowned authors and time-tested works of art with the names of saleable articles printed on T-shirts or pinned onto clothes. Objects of mass consumption and entertainment, funded by advertising agencies and their campaigns, have turned into idols of the brainwashed society. Old-style artists have been gradually sidelined until being drowned by the flood of non-art. Bourgeois art has faded into nothingness. Technology, commercialization and consumerism have had a lion's share in this slump.

Science

In the feudal economy, there was no way to use science rationally or practically. This was made possible only with the emergence of capitalist social relations, born in the bosom of the most advanced form of feudalism that existed in Western Europe. At the time of its disintegration and the onset of capitalist relations of production, as a result of the development of new productive forces, the bourgeoisie gave rise to modern experimental science based on mathematics. Its emphasis on science followed on from the medieval version of Aristotelianism taught at universities as a system of knowledge. For centuries, Aristotle became the central figure of the Western European intellectual (philosophical, scientific) world. Indeed, intellectual development in Western Europe took the course of dealing with the legacy of Aristotle and other authorities of antiquity with reverberations that lasted into the latter half of the 20th century.²⁹ In the grip of Catholic theology, clergy at art faculties particularly began to focus on the laws of motion formulated in Aristotle's writings. While in Byzantium, Platonism contributed to the ultimate victory of religious mysticism, in Western Europe, Aristotelianism stimulated interest in mechanics, which later served as the basis for the evolution of modern physics and the mechanistic-materialist conception of nature, the world, and the universe. Whereas the evolution of non-European science was brought to a close during the 17th century, in East Europe, following the advances in astronomy during the Renaissance, the local culture with literature at its

²⁸ Dominika Dinušová, *Za hlasom revolúcie (Following the Voice of the Revolution)*, (Bratislava: Veda, 2018), 123.

²⁹ Notable milestones on this journey were the Renaissance renewal of the heliocentric system (Copernicus) and the presentation of a new treatise on human anatomy, which was more than a mere transcript of ancient originals (Vesalius).

core became a source of later patriotic (revivalist) science and philosophy in the region. However, the evolution of thought and of social and natural philosophy (science) in the East languished compared to the pace of development in Western Europe. The stagnation was caused by the surviving feudal relations of production, while in 17th century Western Europe, their gradual replacement by capitalist relations served as an impetus for the advancement of modern bourgeois philosophy and the associated experimental science.

Hence, the development of science was limited to Western Europe. Its theorists were the founders of modern bourgeois philosophy: the English materialist Bacon and the French idealist Descartes. They rejected medieval scholasticism as a cognitive method (uncritical submission to authority, dogmatism, speculation, lack of experimentation, prevalence of deduction) in order to develop a new method based on the materialist concept of nature. Science was no longer seen as a means of reconciling man with the world but as an opportunity to dominate nature by mastering its eternal laws. This new attitude largely resulted from the new bourgeoisie's interest in material wealth.

Owing to Bacon and Descartes, the philosophy of the bourgeois era was primarily a philosophy of science. Science gained the same reputation as that enjoyed by the philosophy during Antiquity. Science and philosophy merged into one. Philosophers sought to provide the means, tools, methods, and systems for scientific understanding and knowledge of the world. They presented their philosophy as science, while scientists, in their turn, formulated their conclusions within the framework of natural philosophy, renamed science only during the first half of the 19th century. At universities, science was part of the curriculum of artistic (philosophical) faculties up until the 20th century. Only during the Renaissance period, it was briefly associated with fine art, not philosophy.

Modern experimental science originated in the country with the most advanced capitalist relations – England. Against Aristotle's *Organon* (a collection of works on logic), Bacon put his *New Organon of Science* as a novel and more effective epistemological tool. His philosophy gave rise to the development of English materialism. Bacon criticized speculative science while remaining a geocentrist. This did not prevent him from becoming the founder of modern science based on observation and experiment. Descartes' French idealistic rationalism, inspired by mathematics, appealed to reason and self-reflection; it did not favour observation or experience. Rather than mechanics (physics), Descartes gave preference to mathematics as an exemplary science, the basic premises of which followed from themselves. Thus, instead of (experimental) induction, he

preferred (mathematical) deduction, which connected his philosophy with the late Middle Ages. Descartes' philosophy, considered a kind of Catholic heresy by influential Jesuit patrons, expressed a spirit of compromise with feudalism. Its dualism (material and spiritual substance, the existence of which was determined by God), defined the dual path of development of Cartesianism. Gassendi, Spinoza, Bayle, Fontenelle and others followed the course of materialism. However, the idealistic aspects of Cartesianism, refined by occasionalism and influenced by Descartes' teaching on the innate idea of God as well as by Jansenism, which, in turn, was affected by Descartes' logical deduction and his teaching on the method, prevailed.

Idealistic rationalism was rather pronounced only in continental European countries (apart from France, especially in Germany). In England, materialistic empiricism and natural religion (deism) spread in the 17th-century intellectual circles, while France was dominated by a positive religion – Jansenism. The greatest French scientist of the 17th century, Pascal, whose views combined major discoveries with religious fanaticism and scepticism aimed against science and rationalist knowledge, lived and worked in the Jansenist monastery of *Port-Royal*. Up until the 18th century, this monastery was the stronghold of French Cartesian Enlightenment. With the defeat of Jansenism, Cartesianism gradually disappeared from its homeland, giving way to English materialism, empiricism, sensualism and deism. It was these trends and theories that mostly shaped the 18th-century French Enlightenment. Descartes' rationalist idealism mostly found its way into art. Under its influence, the artistic style of Classicism was formed with its criteria of reason, regularity, order and duty (the role of reason in art). In the realm of Enlightenment philosophy, Descartes' influence was most reflected in the formal sovereignty of the French encyclopaedists, who made it clear to the world that certitude of their knowledge stemmed from the unquestionable thesis of *cogito, ergo sum* (I think, therefore, I am). Yet, they put main emphasis on induction and experience, rather than on deduction. However, their conceptual source – English empiricism and sensualism – eventually reached a dead end in the British Isles, resulting in noetic scepticism (Hume). The underlying reason for such a development was the inconsistency of Locke's philosophy, which influenced both Bishop Berkeley's subjective idealism and English and French materialism. The theoretical basis was provided by German Kantian rationalism and French empirical positivism.

In the 17th century, which marked the beginning of the battle between Antiquity and modern times, the entire edifice of assumptions inherited from the Greeks and canonized by both Islamic and Christian theologians

collapsed, giving rise to a wholly new system.³⁰ Ancient problems were resolved by new experimental and mathematical methods. Aristotelian physics was refuted by mechanics while the hierarchical universe of the Middle Ages gave way to the idea of the mechanical world as a machine (dynamic universe as opposed to static universe). Newton's gravitational theory brought about the logical unity of the laws of celestial mechanics (developed by Kepler) and terrestrial mechanics (developed by Galileo). It ultimately dispelled the old notions of the Earth, the solar system (in a way, of the perpetual motion) and the universe, resulting from Aristotle's theories.³¹

New experimental science provided a novel basis for British bourgeois philosophy. The validity of a simple natural law, as formulated by Newton, also seemed to justify a turn to deism in religion, to *laissez faire* in economics, to liberalism in politics and to utilitarianism in ethics. The materialistic laws of mechanics ruled in religion, economy, politics and ethics. God and the King were both constitutional monarchs, who merely supervised the movement of celestial bodies and political parties governed by the laws of mechanics. In economy, the movement of goods on the market was governed by the same laws. In ethics, morality presented a mechanistic balance between satisfaction and suffering. This proved that science was a social and economic phenomenon rather than an expression of absolutely pure thinking. At the London Conference on the History of Science in 1931, Soviet physicist Gessen stated that, far from the fruit of his scientific genius or the result of the internal logic of science, Newton's work rather stemmed from the social and economic forces of 17th-century Britain, thus serving the needs of the British bourgeoisie.³²

Science became an integral part of the new capitalist civilization, acquiring continuity and status it never lost again.³³ In the 17th century, it succeeded in mechanics – physics, mathematics and astronomy, but not in chemistry, biology, medicine, not to speak of the science of society. After 1700, it experienced a temporary decline. The most significant result was

³⁰ John Desmond Bernal, *Science in History* (London: Watts & Co., 1954), 258.

³¹ While Newton's system of the universe meant a serious concession from religious orthodoxy, it also greatly restored the credibility of the divine purpose. Newton represents a compromise between religion and science, similar to that between the bourgeoisie and the nobility of 1688 (the „glorious revolution“). The stability of the system is maintained by God through his intervention. Thus, he himself becomes a constitutional monarch.

³² Ziauddin Sardar, *Thomas Kuhn and the Science Wars* (Icon Books Ltd., 2000), 16.

³³ Bernal, *Science in history*, 344.

the victory of Newtonian classical physics – materialist mechanics.³⁴ It was not until the industrial revolution when science was firmly embedded into the mechanism of production. Once the industrial revolution was under way, science was introduced into practice, carrying the signature of materialism. The other major impetus for its new development was the Great French Bourgeois Revolution. The growth of modern science, from the very beginning linked with capitalism, became pervasive and its momentum was irreversible.³⁵ Physics remained the queen of science – its greatest achievement in the 19th century was the electromagnetic theory, which proved the interrelatedness of some natural phenomena (electricity, magnetism, optics). Together with the laws of thermodynamics (mutual transformations of different types of energy), it appeared to signify some finality in the development of physics. Evolutionary theory became the pinnacle of slowly and moderately progressing biology. As an innovator rather fittingly compared to Copernicus, Darwin reversed the compromise between science and religion, which had existed from Newton's time, permanently in favour of science. The fundamental significance of Darwin's theory of evolution was that it brought to the natural sciences a historical element, ultimately breaking with the traditional Greek school, the eternal truths and the perennial categories of Plato and Aristotle, and reverting to the earlier heresies of ancient Ionian philosophers and Democritus, who emphasized rational development and change.³⁶ The idea of natural selection, based on the then common conception of the natural justice of free competition, was used by the bourgeoisie to justify reckless capitalist exploitation.

Scholarly science of the 19th century depended on the success of science in industry. It enjoyed considerable freedom as long as it respected conventional boundaries in politics and religion. For political and religious reasons, it continued to pretend respect for idealism. One notable exception, the Russian naturalists, combined expertise with materialism and with progressive, often truly revolutionary, social ideas. While in the West, in as early as the latter half of the 19th century, the worldview of natural sciences was largely agnostic and phenomenological, in Tsarist Russia, natural scientists drove scientific knowledge to its materialistic consequences, i.e., from theory towards revolutionary practice. Darwin, who found enthusiastic supporters in Russia, was rejected wherever he gave in to Malthusianism and fatalism.

³⁴ Euler's *Mechanics* (1736) represents a summary and extension of knowledge about mechanics.

³⁵ Bernal, *Science in history*, 370.

³⁶ *Ibid*, 472-473.

Towards the end of the 19th century, the general long-term scientific outlook was largely pessimistic. The development of science seemed to be coming to an end. The new positivism created by Mach and Avenarius argued that matter and physical hypotheses are no longer necessary and that all science can be derived from direct observation. Early in the 20th century, the first positivists raged against materialistic ideas such as the idea of atoms, an attitude that was not very reasonable as exactly at the time, physical research filled these concepts with real meanings, which, in the following years, became increasingly obvious.³⁷ Atomic physics came into being; towards the end of World War II, its power severely affected masses of people when the atomic bombs were used against the Japanese civilian population by the US financial oligarchy (not by Hitler's Nazi rule).

Science evolved unevenly across time and space. Periods of rapid progress were followed by long intervals of infertility or decline until a new boom took place, often in a different country. In terms of the geographical distribution of science, towards the end of the 19th century, virtually all scientific world was concentrated in Germany, Great Britain and France; elsewhere in Europe or America as well as in Asia and Africa, science was not given proper attention. After 1945, although it made rapid progress in the old centres, this growth was completely overshadowed by the tremendous pace of development of science in the United States and, to a large extent, in the Soviet Union. The prospects of the earlier centres of the capitalist world were rather reduced, with scientists having fewer opportunities as they could not compete with the United States in terms of scientific equipment or funding.³⁸

After 1945, when the USA gained dominance in the capitalist world, with the growing concentration of science in the country, the rather vast financial and human resources as well as scientific efforts proportionally reduced the development of the former centres of science in the „free

³⁷ The tendency towards positivist, idealistic and formal philosophies has become one of the obstacles to the development of science, which divert scientists from an effective experimental approach to problems and lead them to passive meditative approaches, where they enter a stream of meaningless and unrealistic experiences, or ponder over eternal and abstract truths. These pathways only lead to sterility. The great progress achieved in the first half of the 20th century is the result of attempts explicitly or implicitly materialistic and closely connected with materialistic technology. Positivism and other similar philosophies (e.g. Bergson, pragmatism) sought to rid science of the revolutionary edge, only to ridicule any idea that could be used to significantly improve man's destiny and to make science acceptable to the organized religion and the bourgeois state (See: Bernal, *Science in History*, 324, 401).

³⁸ Bernal, *Science in History*, 16, 29.

world." Major research in almost all industries, especially physics, was now only possible in well-equipped laboratories, mostly in the USA, while in other countries, the latter dropped in numbers and the new ones were not built so generously. Of the capitalist countries, only the United Kingdom and, to some extent, Sweden could claim to be completely independent in basic research, but even there, their independence was quite dubious in some sectors. The governments of most other countries suffered from such serious financial issues, mostly caused by military spending and trade restrictions, that science was practically vanishing there. With all the merits of the work of individual scientists in these countries, organized scientific work could no longer be kept at a state-of-the-art level, and these countries were increasingly drawn into the sphere of influence of the United States.³⁹

Bernal recognizes three stages in the evolution of science in terms of its position in society. The first stage, the 1890s, marked the era of private science, with experiments performed in a professor's small laboratory or in an inventor's workshop. The next stage, the 1920s and 1930s, was the era of industrial science, the age of research laboratories. The third stage, first observed in the USSR and in the rest of the world during World War II, was the era of public science, when research and development spending amounted to hundreds of millions and when really huge institutes were needed, often as large as cities, with the appropriate number of staff and equipment. The machinery became so expensive and the groups of operators became so large that their respective governments could not afford them, so only the most powerful countries could play a significant role in the physical sciences. A capitalist country can call on the help of monopoly companies, which are states in their own right, to spend resources on development agreements in their own interest. The first stage involved small improvements and small-scale equipment. The second stage gave rise to whole new scientific industries. In the third stage, the largest enterprises appeared, mostly resulting in war production as the main focus of state-capitalist entrepreneurs.⁴⁰ The growing need for scientific applications and the urgency of the tasks imposed on science by war and war preparations themselves have linked science with bourgeois governments even more tightly.

The project of developing and manufacturing the atomic bomb during World War II gave fresh impetus to the development of state science in the USA. What followed was an enormous increase in the concentration

³⁹ Ibid, 387.

⁴⁰ Ibid, 20.

of science, people and resources, promising greater efficiency. The experience of war research served as a proof that with huge accumulation of resources, it was possible to solve even the most challenging technological problems within a relatively short period of time. While in the past, science was lagging behind industry, in the USA, it made every effort to catch up with the latter in the new conditions, and even to stand at its head. Thus, technology has been increasingly led by science. Since the mid-20th century, the USA has been dominated by technology based on advanced scientific theory and research. So what then are the main characteristics of research and development in their American headquarters? Orientation towards war goals, direct connection of scientific progress with industrial and armament progress, large-scale concentration of mainly physical sciences, science-driven technology. This clearly demonstrates the focus on applied research to the detriment of basic research.

The rapid evolution of science, which, in Western Europe, began in the 17th century, came to an end in the 1950s. Towards the early 1960s, the development of natural sciences was gradually limited to random discoveries of little import (most often related to biology, elementary particle physics and new chemical elements) and the revision of the already formulated theories. At that time, technological means began to appear that allowed to confirm or rebut previous conclusions, ideas and hypotheses. One exception - the discovery of the quantum Hall effect (K. Klitzing, 1980) - only confirmed the rule. The stalled development in natural sciences and their limited advances since the 1960s coincided with the shift of the focus of scientific research to the United States. In addition to the USA, other major countries such as the United Kingdom, the Soviet Union, Sweden and Germany joined in the development of post-war science; however, over time, the bulk of the research began to be conducted in the USA. Since the late 1980s, prominent individuals, who came up with major discoveries, became a thing of the past to be replaced by countless scientific teams. Today, achievements in science largely depend on the amount of capital invested in research, now morphed into industry.

The predominance of technology over science has become apparent. It was first demonstrated by the development of space research and spaceflight. Between 1957 and the mid-1970s alone, 8,530 satellites and other man-made space objects were launched, of which 929 new types of equipment, including 151 spacecraft and satellites, in 1975.⁴¹ Space flights have not only affected space research (the discovery of quasars

⁴¹ Jaroslav Folta and Luboš Nový, *Dejiny prírodných vied v dátach (Important dates in the history of natural sciences)*, (Bratislava: Smena, 1981), 236.

and pulsars), the emergence of various hypotheses associated with the Big Bang theory (including the existence of cosmic strings), but have also sparked philosophical debate about the expanding or shrinking universe. The development of astronautics/cosmonautics engendered cosmic physics and stellar physics, planetary geophysics and extra-terrestrial biology (exobiology). Perhaps the most significant achievement in the field of physics was the construction of immensely powerful particle accelerators. Similar projects have given rise to new advances in technology. Since the early 1980s, the prevalence of technology has been demonstrated by the development of electronics (large-scale powerful mainframe computers, personal computers and mobile technology) and computer science. Along with biology and cybernetics, the latter has become the „queen of science“, replacing physics.⁴²

The heyday of science coincides with economic activity and technological progress. The path of science – from Egypt and Mesopotamia to Greece, from Islamic Spain to Renaissance Italy, from there to the Netherlands, France, England, Germany and finally to the USSR and especially to the USA, is identical to the course taken by trade and industry. Among the individual outbursts of activity, there were periods of stagnation, sometimes even of degeneration, such as in the early 18th century. These periods coincided with those when a society languished or declined, and the production continued along the beaten track.⁴³ The question then arises, whether the current break in the development of the natural sciences is only a temporary phenomenon of the capitalist world, merely a stage of short-term decline, which will later be followed by new development, or whether this is one of the manifestations of the twilight of bourgeois society. If the latter is the case, then the new development of science must be accompanied by the outbreak of a social revolution that will bring to life new creative forces, similar to those awakened by the Great Bourgeois Revolution in France and later by the Great October Socialist Revolution in Russia. The revolution will provoke an unprecedented activity that will

⁴² Since 1900-1927, there has been no new revolution in physics, only a huge evolutionary development within the same conceptual framework, which has only brought complications. The theoretical foundations of science have become more problematic than ever before. No „big“ or „final“ theory that would unify the phenomena of nature studied by physics (gravity, electromagnetism, relativity, quantum mechanics, elementary particles) has so far been formulated, despite the great efforts of Einstein, Heisenberg and other prominent figures of 20th-century physics to emulate Maxwell's success in framing his electromagnetic theory in the 19th century.

⁴³ Bernal, *Science in History*, 41-42.

create new great works of human thought, a new science that cannot develop under the old economic or political systems.

Conclusion

The transfer of the capital of the world imperialism to the United States has deprived Western Europe of its previous significance and position in the world. The art and science of the bourgeois world have been gradually waning. From the imitation of antiquity through romantic individualism, realism and the application of the principle of „art for art's sake“, bourgeois art ended its development by turning away from true reality and moving towards formalism, subjectivism, isolation, helplessness, anarchic protest and pessimism. The loss of social significance, dehumanization in artistic expressions, the inability and impossibility to establish better life prospects have become symptoms of the twilight of bourgeois art. Science is limited by the class-antagonistic capitalist society, more precisely, by its very nature: the exploitation of man by man. In order to preserve this exploitation, the greatest material and intellectual effort of imperialism is devoted to keeping the world in poverty, ignorance and fear. Only a small portion of new knowledge, skill or ingenuity is used to improve human condition; most of it is utilised for enslavement and destruction.

In the bosom of capitalist relations of production, technology continues to develop and reinforce the technocratic nature of Western civilization. However, in contrast to experimental science, which came into being in the 17th century, the visible onset of Western technology is of a later date. The technology, by which Western Europe overtook the rest of the world, was of recent origin, its major inventions and patents being delayed. The associated Industrial Revolution did not begin in Great Britain until after 1780. The steam engine (first introduced in the factory in 1774) became the universal prime mover of its peak phase. However, its designer Watt launched his brainchild only in 1784. The late advent of technology may signal the potential for its further development and future prospects.

Since the mid-20th century, monopolistic capitalism has become one-dimensional, with its hegemon – the armed American empire providing bread and games. It controls science-based technology, propaganda and show business, which has substituted art. These, among other factors, still present powerful means of securing class domination of the bourgeoisie without contributing to the transition of the imperialist stage of development of capitalism to a new, higher stage. On the contrary, they accentuate its parasitic, rotting nature, thus paving the way for the transition to socialism.

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The study has been released as a partial result of the joint scientific VEGA project of the Ministry of Education, Science, Research and Sports of the Slovak Republic and the Slovak Academy of Sciences, No: 2/0152/20, *Developmental Trends of Current Capitalism: Contradictions and Conflicts*.

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