THE POLISH
CHRISTIAN PHILOSOPHY
IN THE 20TH CENTURY

Kazimierz Kloskowski

IGNATIANUM UNIVERSITY PRESS

Kazimierz
Kloskowski

Publishing Series

THE POLISH CHRISTIAN PHILOSOPHY IN THE 20TH CENTURY

Mieczysław Gogacz • Stanisław Kamiński • Kazimierz Kloskowski
Kazimierz Kłósak • Feliks Koneczny • Mieczysław Albert Krąpiec
Piotr Lenartowicz • Tadeusz Styczeń • Tadeusz Ślipko • Józef Tischner
Karol Wojtyła • Jacek Woroniecki • Zofia Józefa Zdybicka
The Companion to the Polish Christian Philosophy in the 20th Century

https://pchph.ignatianum.edu.pl

THE POLISH
CHRISTIAN PHILOSOPHY
IN THE 20TH CENTURY

Kazimierz Kloskowski

Grzegorz Bugajak
Anna Latawiec
Anna Lemańska
Adam Świeżyński

Ignatianum University Press

Krakow 2019

This publication was financed within the frame of the Minister of Science and Higher Education programme: "Monuments of Polish philosophical, theological and social thought of the 20th and 21st century," conducted in 2016–2020.
Project no. 0033/FIL/2016/90

Editor of the volume
Anna Latawiec

Reviewers
Włodzimierz Ługowski
Wiesław Dyk

Supervising editor
Roman Małecki

Proofreading
Aeddan Shaw
Dariusz Piskulak

Typesetting
Lesław Sławiński

Cover design
PHOTO DESIGN – Lesław Sławiński

ISBN 978-83-7614-440-5

Ignatianum University Press
ul. Kopernika 26 • 31–501 Krakow, PL
tel. +48 12 39 99 620

wydawnictwo@ignatianum.edu.pl
http://wydawnictwo.ignatianum.edu.pl

Table of contents

I. Kazimierz Kloskowski: Person and Work

I.

Kazimierz Kloskowski: Person and Work

TABLE OF ABBREVIATIONS

ATK – Akademia Teologii Katolickiej w Warszawie [Academy of Catholic Theology in Warsaw]

KUL – Katolicki Uniwersytet Lubelski [Catholic University of Lublin]

PAN – Polska Akademia Nauk [Polish Academy of Sciences]

PAT – Papieska Akademia Teologiczna w Krakowie [Pontifical Academy of Theology in Krakow]

PRL – Polska Rzeczpospolita Ludowa [Polish People's Republic]

RWPG – Rada Wzajemnej Pomocy Gospodarczej [Council for Mutual Economic Assistance]

SFP – Sekcja Filozofii Przyrody [Section of Philosophy of Nature]

TN KUL – Towarzystwo Naukowe Katolickiego Uniwersytetu Lubelskiego [Learned Society of the Catholic University of Lublin]

UKSW – Uniwersytet Kardynała Stefana Wyszyńskiego w Warszawie [Cardinal Stefan Wyszyński University in Warsaw]

WFCh – Wydział Filozofii Chrześcijańskiej [Faculty of Christian Philosophy]

WSD – Wyższe Seminarium Duchowne [Higher Theological Seminary]

WT UKSW – Wydział Teologiczny Uniwersytetu Kardynała Stefana Wyszyńskiego w Warszawie [Faculty of Theology of the Cardinal Stefan Wyszyński University in Warsaw]

1.

Biography of Kazimierz Kloskowski

Academic career

Kazimierz Kloskowski was born on August 20, 1953, in Gdańsk, the youngest of the four children of Leon and Anna, nee Weyer. After graduating from High School no. 6 in Gdańsk in 1972, he attended a philosophical and theological course at the Bishop's Theological Seminary in Gdańsk-Oliwa (current name: Gdańsk Theological Seminary affiliated with the Faculty of Theology at the Cardinal Stefan Wyszyński University in Warsaw). In 1977, he obtained a Master of Theology diploma on the basis of his paper *Nauka o Logosie w dziełach Filona z Aleksandrii i w hymnie Prologu Czwartej Ewangelii* [*Teachings on Logos in the works of Philo of Alexandria and hymn of Prologue of Fourth Gospel*], written under supervision of Dr. Grzegorz Gólski CM. He was ordained on December 18, 1977, by the Bishop of Gdańsk at the time, Lech Kaczmarek.[1] After his ordination, he began his pastoral work at Sacred Heart of Jesus Parish in Sopot. Due to his extraordinary intellectual prowess, in September 1978 he was referred for specialist studies at the Faculty of Christian Philosophy (WFCh) of the Academy of Catholic Theology in Warsaw (ATK; current name: Cardinal Stefan Wyszyński University in Warsaw—UKSW), where he studied the philosophy of nature between 1978 and 1981. He was

[1] On a traditional commemorative devotional picture issued on the occasion of the priestly ordination Rev. Kazimierz Kloskowski placed as a motto sentence from The Gospel according to St. John (4:50): "The man believed Jesus' words."

granted the title of Master of Philosophy with a specialty in the philosophy of nature in 1981, on the basis of his paper *Koncepcja abiogenezy w pracach Reinharda W. Kaplana* [*Concept of Abiogenesis in Works of Reinhard W. Kaplan*]. In 1984, he was awarded the academic title of Doctor of Philosophy on the basis of his paper *Rola przypadku w genezie życia* [*The Role of Chance in the Genesis of Life*] (the reviewers of the thesis were Prof. Bernard Hałaczek and Prof. Leszek Kuźnicki). Both theses were written under the supervision of Prof. Szczepan W. Ślaga. He worked at WFCh from 1985 as an instructor before being made assistant professor in 1987. Between 1987 and 1991 he was secretary of the WFCh Council. On December 6, 1990, on the basis of his academic achievements and the book entitled *Zagadnienie determinizmu ewolucyjnego. Studium biofilozoficzne* [*The Problem of Evolutionary Determinism: A Bio-philosophical Study*] he was awarded a postdoctoral degree in humanities (within philosophy and sociology, philosophy, and philosophy of nature) by the WFCh council (which was confirmed by the Central Commission for Academic Degrees on September 30, 1991). The reviewers were Prof. Leszek Kuźnicki (biology), Prof. Adam Synowiecki (philosophy of natural sciences), and Prof. Szczepan W. Ślaga (philosophy of nature). In the letter of the Rector of ATK dated March 30, 1995, he was named associate professor of ATK. On April 14, 1997, he was awarded the academic title of professor of humanities. On October 7, 1999, the Council of WFCh submitted a motion to grant him the position of full professor.

Between 1992 and 1996, he was Head of the Department of History and Philosophy of Science and supervisor of the Student's Association of Philosophy of Nature. Between 1993 and 1996 he fulfilled the role of Vice-Dean of WFCh. From 1996 (until his death) he was the Head of the Department of Philosophy of Nature. In 1996, he was elected to be the Vice-Rector of Student Affairs at ATK, a role he fulfilled until his death. In recognition of the service of Rev. Prof. Kazimierz Kloskowski for the Gdańsk archdiocese, The Most Rev. Archbishop Tadeusz Gocłowski, the Gdańsk Metropolitan Archbishop, made him an honorary canon of Gdańsk's Archdiocese Chapter in 1996.

Interests, activity, and academic achievements

The academic interests and research activity of Rev. Prof. Kazimierz Kloskowski focused on the questions related to a broadly defined concept of the philosophy of nature, especially the philosophy of biology (biophilosophy). His research focused on the issues of the genesis of life and evolution, creationism, molecular biology, bioethics, genetic engineering, philosophy of God, and sozology (active ecology). He was also interested in the history of science and philosophy. For him, a knowledge of philosophy and science was the basis to draw conclusions which were worldview in nature, which in his own contemplations and attitudes created a harmonious whole with the theses of Christian theology.

In his academic and research output, Rev. Prof. Kazimierz Kloskowski concerned himself with the questions related to the philosophy of nature, as well as those at the intersections of biology, philosophy of biology and biophilosophy, genetics, and bioethics. In his publications and various lectures, he focused primarily on: (1) epistemological and methodological analyses of theory of abiogenesis (verification methods, falsifications, logical and methodological worth assessment); (2) various aspects of determinism of abiogenesis and evolutionary processes (role of chance, problem of purposefulness and stochasticity); (3) the question of the essence of life; (4) methodological analyses of the possibility of combining evolution and creation, evolutionism and creationism; (5) issues of genetics, molecular biology, and bioethics related to the genetic engineering (genetic manipulation).

As an ATK employee, he co-operated with various scientific centers abroad. At invitation of Evolutionary Biology Laboratory of Czech-Slovakian Academy of Science, he completed a one-year scientific internship there in 1992, where his research focused on philosophical anthropology. In 1995, he completed a scientific internship at the Catholic Institute in Paris [Institut Catholique de Paris]. He was invited to and participated in numerous academic conferences and congresses, e.g. in: Zaragoza (1993), Utrecht (1996), Boston (1998). He gave lectures e.g. at: the Polish Philosophy Association in Lublin [Polskie Towarzystwo Filozoficzne w Lublinie], the Academic Association of Catholic University of Lublin [Towarzystwo Naukowe

Katolickiego Uniwersytetu Lubelskiego—TN KUL], the Faculty of Biology, Geography, and Oceanology of Gdańsk University [Uniwersytet Gdański, Wydział Biologii, Geografii i Oceanologii], the Nicolaus Copernicus Naturalists' Association of Zoology Institute of Jagiellonian University in Kraków [Towarzystwo Przyrodników im. M. Kopernika w Instytucie Zoologii Uniwersytetu Jagiellońskiego w Krakowie], and at the 2nd Science Festival of Warsaw University [II Festiwal Nauki w Uniwersytecie Warszawskim]. He co-operated continuously with Gdańsk University [Uniwersytet Gdański] and Gdańsk Academy of Medicine [Gdańska Akademia Medyczna; current name: Gdańsk Medical University], where he was examiner of doctoral candidates of philosophy and the reviewer of five research projects.

From 1992, he was a member of the Polish Philosophy Association [Polskie Towarzystwo Filozoficzne] and the Academic Association of the Catholic University of Lublin [Towarzystwo Naukowe KUL]. From 1996, he was a member of Evolutionary and Theoretical Biology Committee of Polish Academy of Sciences [Komitet Biologii Ewolucyjnej i Teoretycznej Polskiej Akademii Nauk] and a member of Polish Bioethical Committee of UNESCO [Polski Komitet Bioetyczny przy UNESCO]. He also became a member of the Science and Faith Board of the Polish Episcopate [Komisja Nauki i Wiary Episkopatu Polski] (as of 1996) and a member of the International Society of Phenomenology and Sciences of Life (from 1999).

At ATK, he gave cyclical lectures on the philosophy of nature for students of the humanities orientation at the Faculty of Christian Philosophy, and classes on the question of life, the theory and methodology of philosophy of nature, and the ethics of evolutionism for bioethics and human ecology students, as well as classes on the philosophy of nature and seminars on all of the aforementioned subjects. He was co-organizer of four national symposia on the philosophy of nature (1992, 1994, 1995, 1997). In addition, he organized two student academic symposia (Zakopane 1994, Olecko 1995).

Besides working at ATK, from 1983 he gave lectures on logic, methodology of science, philosophy of nature, and the philosophy of God at Gdańsk Theological Seminary [Gdańskie Seminarium Duchowne]. He also gave cyclical lectures at the Mazurian University in Olecko [Mazurska Wszechnica Nauczycielska w Olecku] (from 1992), at the Gdańsk Theological Institute—Gdańsk's branch of the Catholic University in Lublin [Gdański Instytut Teologiczny—filia

Katolickiego Uniwersytetu Lubelskiego w Gdańsku] (from 1987), at the Pomezanian Collegium of Theology [Pomezańskie Kolegium Teologii] and the Higher Theological Seminary in Elbląg [Wyższe Seminarium Duchowne w Elblągu] (from 1993), at the Faculty of Philosophy of the Society of Jesus in Kraków [Wydział Filozoficzny Towarzystwa Jezusowego w Krakowie], and at the Faculty of Educational Studies and Psychology of Białystok University [Wydział Pedagogiki i Psychologii Uniwersytetu w Białymstoku] (from 1994).

Between 1984 and 1991, he fulfilled the roles of editor-in-chief and technical editor of *Miesięcznik Diecezjalny Gdański*, releasing 31 volumes of it. He belonged to the editorial team of academic journal *Studia Gdańskie* from 1983, and the editorial team of the academic journal released by WFCh, *Studia Philosophiae Christianae*, from 1992. In 1996, he was elected deputy editor-in-chief of *Studia Philosophiae Christianae* and co-editor of book series "Z zagadnień filozofii przyrodoznawstwa i filozofii przyrody" ["The Studies from the Philosophy of the Natural Science and the Philosophy of Nature"]. He was a member of the editorial team of journal *Theoria et Historia Scientiarum*, released by Nicolaus Copernicus University in Toruń (as of 1999), and a member of scientific committee of editorial board of journal *Dialogue and Universalism* released by Philosophy and Sociology Institute of Polish Academy of Sciences [Instytut Filozofii i Socjologii Polskiej Akademii Nauk] (from 1997).

His academic achievements include 136 academic papers, including: 5 monographs, 4 academic handbooks, 77 research articles, 27 book reviews, 7 scientific reports, 2 translations, 12 dictionary entries, and the co-editing of 2 monographs. In addition, 2 interviews with him were published as well. He was the promoter of 81 MA theses and 5 doctoral theses. He reviewed 29 MAs, 4 doctoral theses, and 1 postdoctoral thesis. He took an active part in dozens of academic conferences, 18 of which were international. His publications are testament to his ability to approach his subject in a unique and creative way, as well as the fact he possessed a vast knowledge of contemporary scientific and philosophical trends. The papers are also characterized by their high level of methodological rigor, as well as being multi-faceted and offering a comprehensive overview of the subject matter. Thanks to his concept of evolutionary self-determinism, Rev. Prof. Kazimierz Kloskowski expanded the field of knowledge of synthetic theory of evolution and enabled a new approach to the issues of factors and mechanisms of evolution and nature of life. He presented his own option of combining evolutionary and creationist approaches to the origins and development of the world. In analyses of current bioethical dilemmas, he differentiated between "bioethics of facilitating" and "bioethics of border." Because of his premature death, he had not had the opportunity to conduct as many research projects as he was undoubtedly capable of doing.

Illness and death

The academic achievements presented above illustrate that Rev. Prof. Kazimierz Kloskowski was particularly fascinated by the phenomenon of life. As a philosopher of nature, he was fascinated by the mystery of life, its expressions and essence which has not yet been fully explained by advanced natural sciences—biology, chemistry, and physics. In his last book, *Filozofia ewolucji i filozofia stwarzania* [*Philosophy of Evolution and Philosophy of Creation*], he wrote: "contemporary man extremely rarely tries to define life itself. ... However, he has been fascinated by the enormous variety of life forms for a long time."[2] He devoted himself entirely to his scientific and philosophical fascination with life, as demonstrated by the number of his publications on the philosophical problems related to the origins of life, its nature, and the danger to it posed by genetic manipulations. Rev. Prof. Kazimierz Kloskowski was a person with tremendous dynamism and unending reserves of creative strength. Even when he experienced the serious illness which he fought during his final years, he constantly resisted death and remained full of hope for the coming years, making future academic plans and research project and motivating others to be active. Throughout his life, he showed a keen interest in the life of the Gdańsk Theological Seminary, with which he remained deeply connected emotionally. He also retained an interest in the life of the university which he worked for, even when he was no longer able to take an active part in it.

Experiencing the fragility of life due to the tragic death of his brother (1993) and his own illness from 1996, Rev. Prof. Kazimierz

[2] K. Kloskowski, *Filozofia ewolucji i filozofia stwarzania*, vol. 1: *Między ewolucją a stwarzaniem* (Warszawa: Wydawnictwo ATK, 1999), p. 249.

Kloskowski fostered the spiritual aspect of his life even more fully, seeing the source of it in the God-Creator. In his last book, he wrote:

> Natural sciences, due to their nature, are not able to undertake any judgement on questions of soul; it is not their task to "defend" or "deny" its existence. A naturalist can, at most, say that human as a living being evolved from so-called lower creation. ... Undoubtedly, human treated as a "place" of soul's existence is domain of theology.[3]

Despite the limitations placed upon him by the progression of cancer and being stripped of everything that held particular value to him: the strength needed for academic work, the opportunity to be active, participation in everyday duties at the seminary and university, and also despite his ever-increasing physical suffering, he did not give in to discouragement and despair. Even though the question "why did this happen to me?" would sometimes return, he tried to treat it as another natural element of life, written into his fate. Rev. Prof. Kazimierz Kloskowski encountered that question about presence and justification of suffering in the world much earlier than he himself experienced painful illness. Since one of his interests was genetics, he could not has not asked himself about, for instance, the existence of genetic conditions. He gave an answer to this in his last publication:

> When a person states this type of questions, when they accuse God of suffering and illnesses, then they do not actually accuse God Himself, but their own, skewed notion of Him. God Creator is the Absolute Good, and the idea itself, that His Goodness could be tarnished in even the smallest amount, is internally contradictive. ... Facing facts like these, whether the person accuses God-Creator of them or not, usually one out of three attitudes is assumed: either the person accepts, that unfortunately there is a lot of evil in this world, or they pretend not to see it, or they gather their academic, spiritual, physical strength to defeat that evil.[4]

3 Ibidem, p. 280.

4 Ibidem, p. 217.

Rev. Prof. Kazimierz Kloskowski assumed the third attitude—he arranged all his spiritual, mental, and physical strength so not to give in to the destructive strength of suffering. People who witnessed his struggle with the disease reminiscence that, when they visited him, he would frequently repeat: “I am suffering, and you can’t imagine how much. I wish such suffering on no one, even the worst foe, but I always want to accept it and offer it for others: for my loved ones, for clerics, priests, the Church.”[5]

Rev. Prof. Kazimierz Kloskowski died aged 46 after a long and serious illness on 13 October 1999, in the hospital on Łąkowa Street in Gdańsk. The funeral mass at the Archcathedral Basilica in Gdańsk-Oliwa on October 16, which gathered together his numerous family members, friends, co-workers, and students, was said by Rev. Bishop Zygmunt Pawłowicz, the auxiliary bishop of the Gdańsk Archdiocese. Both the mass and the funeral were attended by crowds of Gdańsk’s citizens, as well as representatives of universities and the regional and local authorities. The former President of the Republic of Poland, Lech Wałęsa, was also present. After the Holy Mass, the coffin with the body of Rev. Prof. Kazimierz Kloskowski was laid in family tomb on the Srebrzysko cemetery in Gdańsk-Wrzeszcz. Gdańsk’s metropolitan archbishop Tadeusz Gocłowski, staying at the time in Rome at Bishops’ Synod, wrote in letter of condolence:

> I’ve always been immensely impressed by enormous involvement of Rev. Kazimierz in everything that was relevant to the life and work of Gdańsk’s Church. The Reverend Professor loved academic work. He was an exemplary priest. I will always remain impressed by the most crucial exam which the Reverend Professor took by carrying the heavy cross of suffering.

The farewell to Rev. Prof. Kazimierz Kloskowski bade among others Primate of Poland, cardinal Józef Glemp. On behalf of the Senate and community of Cardinal Stefan Wyszyński University (previously ATK), a reminiscence of Rev. Kazimierz Kloskowski was given by the rector of the university, Rev. Prof. Roman Bartnicki. The Pomeranian voivode, Tomasz Sowiński, a former student of Prof. Kazimierz Kloskowski at the Gdańsk Theological Institute, emphasized in his farewell that the deceased: “Knew how to speak about difficult issues,

[5] Reminiscence of Prof. Maciej Bała, a pupil of Kazimierz Kloskowski.

such as philosophy of nature, in an easy and understandable way. He had an extraordinary talent for getting through to both the young and the old." Sopot's Mayor, Jacek Karnowski, a former member of academic ministry of Our Lady Star of the Sea Parish in Sopot led by Prof. Kazimierz Kloskowski, reminisced: "The citizens of Sopot probably remember Reverend Kazimierz from his harsh, clear in their judgement, sermons. To us, his students, he above all taught us love towards Poland and our parents. In the difficult time of martial law, it was his moral support that stopped many from leaving the motherland forever."

Commemoration

In 2004, the library of Gdańsk Theological Seminary, to which the deceased left his abundant private library in his will, was named after Reverend Professor Kazimierz Kloskowski. Three academic conferences were organized—on the first, fifth, and tenth anniversaries of his death.[6] On the basis of the papers given by their participants, three monographs on issues of evolution and creation, biophilosophy, and the relation between natural sciences and theology were published.[7] A part of the first issue of 36 volume of *Studia Philosophiae Christianae*[8] and a part of 12 volume of *Studia Gdańskie*[9] were dedicated to Prof. Kazimierz Kloskowski, as was the third volume of book series *Episteme*, in which a selection of texts from the academic and didactic papers of K. Kloskowski were published, together with the reminiscences of his co-workers, students, and friends, as well as

[6] "Stwarzanie i ewolucja – pogodzone bliźniaki?" [Cration and Evolution – reconciled twins?], UKSW, Warszawa, 23 October 2000; "Wokół biofilozofii Kazimierza Kloskowskiego" [On biophilosophy by Kazimierz Kloskowski], UKSW – GSD, Warszawa – Gdańsk, 17 October 2004; "Przyrodoznawstwo – Filozofia – Teologia. Obszary i perspektywy dialogu" [Science – Philosophy – Theology: Areas and perspectives of dialogue], UKSW, Warszawa, 13–14 October 2009.

[7] *Stwarzanie i ewolucja*, ed. J. Buczkowska and A. Lemańska (Warszawa: Wydawnictwo UKSW, 2002); *Wokół biofilozofii Kazimierza Kloskowskiego. Wybrane zagadnienia*, ed. M. Bała (Pelplin: Bernardinum, 2004); *Przyrodoznawstwo – Filozofia – Teologia. Obszary i perspektywy dialogu*, ed. J. Meller and A. Świeżyński (Warszawa: Wydawnictwo UKSW, 2010).

[8] *Studia Philosophiae Christianae* 36, no. 1 (2000), pp. 77–137.

[9] *Studia Gdańskie* 12 (1999), pp. 5–78.

the letters of condolence received.[10] Moreover, texts written by Prof. Kazimierz Kloskowski on human evolution, philosophical anthropology, axiology of science, bioethics, and education were published posthumously. The publication also contains excerpts from the theses written under his supervision.[11] The reminiscences of Prof. Kazimierz Kloskowski were included in a publication on the history of ATK.[12] On the 15th anniversary of his death (10/13/2014), co-workers, friends, and students of Rev Kazimierz Kloskowski organized a memorial in Sopot. A commemorative plaque devoted to Rev. Kazimierz Kloskowski was placed at the Our Lady Star of the Sea Church in Sopot, funded by members of the academic ministry and friends of the reverend. Biographical notes on the person and academic activity of Rev. Prof. Kazimierz Kloskowski can be found in *Powszechna encyklopedia filozofii*,[13] *Encyklopedia filozofii polskiej*,[14] and *Encyklopedia katolicka*.[15] Kloskowski's works are frequently quoted and mentioned

---

10 *Episteme* 3 (2000): *Kazimierz Kloskowski* (1953–1999).

11 *Episteme* 11 (2001): *Kazimierz Kloskowski. Zasady – edukacja – testament*.

12 *Ocalić od zapomnienia. Profesorowie ATK w Warszawie we wspomnieniach wychowanków*, ed. J.M. Dołęga and J. Mandziuk (Warszawa: Wydawnictwo UKSW, 2002), pp. 73–80.

13 *Powszechna encyklopedia filozofii*, vol. 5 (Lublin: Polskie Towarzystwo Tomasz z Akwinu, 2004), pp. 660–661

14 *Encyklopedia filozofii polskiej*, vol. 1 (Lublin: Polskie Towarzystwo Tomasz z Akwinu, 2011), pp. 650–651.

15 *Encyklopedia katolicka*, vol. 9 (Lublin: Towarzystwo Naukowe KUL, 2002), p. 157. K. Kloskowski and his works are also cited and mentioned e.g. in: *Polish Philosophers of Science and Nature in the 20th Century*, vol. 3, W. Krajewski (Amsterdam–New York: Brill, 2001), p. 17; M. Wnuk, "Pamięci Księdza Profesora Kazimierza Kloskowskiego (1953–1999)," *Roczniki Filozoficzne* 48–49, no. 3 (2000–2001), pp. 155–157; "Kazimierz Kloskowski," *Ruch Filozoficzny* 55, no. 3 (1998), pp. 501–506; "Kazimierz Kloskowski" [obituary], *Więź* 12 (1999), pp. 214–215; *Sacrum i kultura: chrześcijańskie korzenie przyszłości: materiały Kongresu Kultury Chrześcijańskiej*, Lublin, 15-17 września 2000, ed. R. Rubinkiewicz and S. Zięba (Lublin: Towarzystwo Naukowe Katolickiego Uniwersytetu Lubelskiego, 2000), pp. 141–144; J. Przybyłowski [reviews], *Miscellanea Anthropologica et Sociologica* 2, no. 2 (1993), p. 275: K. Kloskowski, *The Problem of the Evolutionary Determinism: A Biophilosophical Study*, Gdańsk 1990; G.K. Hall, *Bibliographic Guide to Soviet and East European Studies* (New York: New York Public Library, 1997), p. 264; *Сравнительная педагогика в условиях международного сотрудничества и европейской интеграции: материалы IV Междунар. науч. конф, Брест, 12–13 ноября 2009*, vol. 2, part 1, ed. А.Н. Сендер (Брест: Брест. гос. ун-т им. А.С. Пушкина, 2009), p. 90; G. Bugajak, D. Kucharski, A. Latawiec, A. Lemańska, D. Ługowska, A. Świeżyński, J. Tomczyk,

in both Polish and foreign language publications, including those by: Kazimierz Jodkowski,[16] Janina Buczkowska and Anna Lemańska,[17] Grzegorz Bugajak and Jacek Tomczyk,[18] Adam Świeżyński,[19] and Tadeusz Pabjan.[20] Several MA theses have been devoted to the philosophical views and concepts of Kazimierz Kloskowski.[21]

God and Nature: Selected Issues in the Philosophy and Theology of Nature (Warszawa: Wydawnictwo UKSW, 2014); D. Schümann, *Kampf ums Da(bei)sein: Darwin-Diskurse und die polnische Literatur bis 1900* (Köln–Weimar: Böhlau Verlag, 2015), p. 466.

16 K. Jodkowski, "Demistyfikacja sporu kreacjonizm – ewolucjonizm," *Przegląd Filozoficzny*, no. 3–4 (1999), pp. 77–94.

17 J. Buczkowska and A. Lemańska, "Poglądy filozoficzne księdza Profesora Kazimierza Kloskowskiego," *Episteme* 57 (2006), pp. 349–362; A. Lemańska, "Kazimierza Kloskowskiego ewolucyjny model kreacji," in *Wokół biofilozofii Kazimierza Kloskowskiego. Wybrane zagadnienia*, pp. 87–99.

18 G. Bugajak and J. Tomczyk, "On evolution and creation: problem solved? The Polish example," *Zygon* 44, no. 4 (2009), pp. 859–878.

19 A. Świeżyński, *The Philosophy of Human Death: An Evolutionary Approach* (Warszawa: Wydawnictwo UKSW, 2009); A. Świeżyński, "The Philosophy of Nature, Chance, and Miracle," *American Journal of Theology and Philosophy* 32, no. 3 (2011), pp. 221–241.

20 T. Pabjan, "Some Remarks on the Theological Interpretation of the Theory of Evolution," *The Person and the Challenges. The Journal of Theology, Education, Canon Law and Social Studies Inspired by Pope John Paul II* 3, no. 1 (2013), pp. 199–211.

21 There are master's works, e.g.: E. Wolska, *Bioetyka „ułatwiania" i bioetyka „granicy" w ujęciu ks. Kazimierza Kloskowskiego* (Warszawa: UKSW, 2002); A.M. Misiorowska, *Pozorny antagonizm między ewolucją i kreacją w koncepcji ks. prof. Kazimierza Kloskowskiego* (Warszawa: UKSW, 2002); M.T. Misztal, *Krytyka Richarda Dawkinsa koncepcji ewolucjonizmu w pismach ks. Kazimierza Kloskowskiego* (Płock: WSD, 2002).

2.

The character of the period and the academic community

The situation of the academic and philosophical community in Poland during the post-war period

The state of academia in Poland after World War II was the result of changes in scientific policies. These changes reflected the shifts in the ideological and state system which occurred in Poland as the country fell into the orbit of the Soviet Union and the ideology of real socialism.

The history of scientific policy can be divided into the periods which mirrored political or state system changes (with the exception of the first period (1944–1948: the reconstruction of science): (1) state rule over science and the ideologization of science (1949–1955); (2) the attempt to make scientific policy pragmatic, in order to adjust it to the needs of the government (1956–1959); (3) the industrialization of science via the introduction of models taken from economic life, and putting the needs of the economy first (1960–1967); (4) the reideologization of science (1968–1970); (5) further reindustrialization of science (1971–1980); (6) the repression of martial law and subsequent procedures to make scientific policy pragmatic (1981–1989). The period after the social-political changes initiated in 1989 was characterized by the withdrawal from the previous ideological formulas and the search for universal models and the ways to adapt the heritage of scientific policy.[22]

[22] See more: T. Bieńkowski and P. Hübner, "Polska. Nauka. Okres 1944–89 i lata 90." *In Encyklopedia PWN*, https://encyklopedia.pwn.pl/haslo/Polska-Nauka-Okres-1944-89-i-lata-90;4575089.html (Accessed: 5.05.2019).

In 1947, 54 higher education schools functioned in Poland, with 86,500 students and 7,519 academic teachers. After 30 years, these numbers had doubled. In 1977 (when Kazimierz Kloskowski finished his first period of study), there were 1,437 functioning scientific facilities, and PAN (the Polish Academy of Sciences) employed over 10,000 people in 66 facilities. However, quantity was not always accompanied by quality. This fact can be partially explained by the necessity to reduce the number of facilities in the years 1980–1991 by 10%. The sudden increase in the number of higher education schools (along with the concomitant rise in the number of students) occurred after 1990, mainly due to the formation of private universities. The persisting result of the socialist state rule over science which was also present in the scientific community was the community's stagnation. The concept of supervisory control over the scientific movement was strong and it fully depended on central funding which was provided by the country's budget. Despite the losses stemming from the extermination policy of the occupying forces during World War II and the unfavorable processes associated with the introduction of the new state system, Polish scientists continued their work and developed studies which began in the interwar period, making new scientific achievements in the process.[23]

The academic activity of Professor Kazimierz Kloskowski, determined by the years in which his works were published, was vivid during the years 1980–1999. In Polish history, this period of time was characterized by turbulent social-political changes. The most important events included: the formation of the social movement, later the labor union NSZZ "Solidarność" (the Independent Self-governing Labor Union "Solidarity") which was preceded by the mass strikes of laborers in August 1980; the establishment of martial law by the communist authorities (13 December 1981), which was accompanied by repression directed at the activists and members of independent organizations and groups demanding state system, economic and social changes in the country; the discussion of the so-called "round table" between the representatives of the authorities of that time and the leaders of the opposition which resulted in the first partially free elections of the members of Parliament (1989), and then the first fully

[23] See more: P. Hübner, *Nauka polska po II wojnie światowej – idee i instytucje* (Warszawa: Centralny Ośrodek Metodyczny Studiów Nauk Politycznych, 1987).

free parliament elections (1991); the changes in state system and the economy after the power was transferred to the opposition (1990) and the continuation of these changes by subsequent ruling groups in the years that followed; the accession to NATO structures (1999) and the subsequent joining of the European Union (2004).

The dynamically changing social-political-economic situation had a significant influence on the changes happening in the scientific community. In the 1980s, contact between Polish scientists and the scientific community outside the country was very limited. The authorities of that time, due to political reasons, strictly controlled and limited the international trips of scientific representatives, especially those that did not belong to RWPG (the Council for Mutual Economic Assistance). This fact led to the isolation of Polish academia and significantly hindered access to the achievements of international science and the diffusion of Polish research.[24] This situation gradually began to change at the beginning of the 1990s. The abolition of limitations regarding foreign travel and the focus on engaging in international cooperation for the purpose of scientific research lead to more frequent scientific relations with facilities in other countries, as well as the diffusion of Polish research in foreign journals and conferences organized abroad. At the same time, the authorities began the process of reforming the state system, which also included the changes in science and education at higher levels, aiming at their unification with the systems functioning in the countries of Western Europe.

Regaining sovereignty in 1989 entailed many structural and organizational changes in Polish science. The State Committee for Scientific Research [Komitet Badań Naukowych], which was founded in 1991, replaced the formalized system of education planning via the rule of donations based on quality indexes. Education institutions such as the Polish Academy of Learning [Polska Akademia Umiejętności] were reactivated. The transformation of the economic system of Poland in the 1990s created conditions for more effective associations between science and economy than in the case of centrally governed

[24] For example, the number of works which were introduced to the Social Sciences Citation Index for the period of 20 years (1981–2000) and which appeared in foreign journals was 3,136, out of which 1,565 were published in the years 1981–1990 (including only 698 works published together with foreign partners). See: B. Stefaniak, "Polska obecność na liście filadelfijskiej," *Sprawy Nauki* no. 3–4 (2000), pp. 18–19.

economy, in which studies and industrial production were institutionally separated. In the 1990s, the basic infrastructure of innovation was founded in Poland, and efforts to commercialize the results of scientific research began on a larger scale. Gradually, new facilities were constructed: centers of technological transfer, technological parks, business incubators and centers of counselling, information, analyses, trainings and technological audit.

The activity of Kazimierz Kloskowski revolved around philosophical issues. Polish philosophy found itself in a complex situation after 1945: the scope of teaching of philosophy at universities increased greatly (but was almost completely withdrawn from secondary schools); the number of people professionally engaged in philosophy and the number of institutions organizing such research became higher; there was a significant increase in the funding for philosophical research and publishers. However, at the same time, the practicing and teaching of philosophy depended on ideological and political aims, and the organizational, scientific and publishing activity was under the strong influence of the state.[25] In the years 1948–54, a primitive version of Marxism (based on Soviet models) was administratively introduced to all departments of philosophy in Poland. After 1956, a significantly large number of specialists with impressive funding carried out a relatively autonomous (in reference to the authorities' influence) educational, scientific, popularizing and publishing activity, though it was still subjected to strict control. The achievements of the so-called revisionists were very important and many internationally recognized philosophers and historians of ideas who have been working since 1968 outside of Poland originate from this group (Leszek Kołakowski, among others). A significant development and the modernization of research occurred in the area of the history of philosophy, especially in reference to the Middle Ages and modern times. Studies were continued in the field of logic and methodology, referring to the tradition of the Lvov-Warsaw school. A phenomenological facility was founded in Krakow, and independent bodies of Christian philosophy were also in operation (the Catholic University of Lublin, the Academy of Catholic Theology in Warsaw, the Papal Theological

[25] See more: S. Borzym, "Filozofia w Polsce w latach 1945-1990," in *Humanistyka polska w latach 1945–1990*, ed. U. Jakubowska and J. Myśliński (Warszawa: Instytut Badań Literackich PAN, 2006), pp. 67ff.

Academy in Krakow, the Christian Theological Academy in Warsaw). Among the emigration facilities, the Literary Institute in Paris and the journal “Kultura” [Culture] played a significant role. The latter also served as a forum for independent philosophical thought in the country and a publishing entity releasing translations, as well as original works which were not available during the times of the Polish People’s Republic [Polska Rzeczpospolita Ludowa—PRL]. Among the significant national publishers, a few publishing series should be mentioned: “Biblioteka Klasyków Filozofii” [The Library of the Classics of Philosophy] since 1952, “Myśli i Ludzie” [Thoughts and People] since 1960, and the edition of “700 Years of Polish Thought” (a review of source texts for the history of philosophy in Poland). Numerous scientific institutions discussing the problems of philosophy were also created (The Institute of Philosophy and Sociology of the Polish Academy of Sciences, philosophical institutes at many universities). The activity of the Polish Philosophical Society continued, and the next three Philosophical Meetings took place (1977—Lublin, 1987—Krakow, 1995—Toruń).[26]

The philosophical community and the specifics of philosophy at Faculty of Christian Philosophy at the Academy of Catholic Theology in Warsaw

The Faculty of Christian Philosophy at the Academy of Catholic Theology in Warsaw (WFCh ATK) was formed following the resolution of the Council of Ministers on the 2 August 1954. This resolution was one of the actions of the PRL authorities directed against the Catholic Church as it removed the Faculty of Christian Theology from University of Warsaw—the place where it had been present since its foundation in 1816. Similarly, the Council of Ministers incorporated the Faculty of Theology of the Jagiellonian University in the ATK, when the regulation of the 11 August 1954 came into force.

In 1954, WFCh started operating in 6 departments: (1) The Foundations and History of Christian Philosophy; (2) Theoretical and Empirical Psychology; (3) The History of Universal Philosophy;

[26] *Polskie zjazdy filozoficzne*, ed. R. Jadczak (Toruń: Wydawnictwo Uniwersytetu Mikołaja Kopernika, 1995).

(4) Ontology and Logic; (5) The Philosophy of Religion; (6) Ethics. Initially, it employed 3 independent scientific employees, 5 university teachers with assigned hours, 2 assistants and 2 lecturers. 46 students signed up for the first year. The first Dean was Prof. Piotr Chojnacki, and the Associate Dean—Prof. Kazimierz Kłósak.

The structure of WFCh was subjected to a few reorganizations. The first one was carried out in 1956/1957 and concerned the departments in which 12 institutes were formed: the Department of Logic, General Methodology of Sciences and Epistemology (with 3 institutes: Logic, General Methodology of Sciences, and Epistemology and History of Science), the Department of Ontology and Theodicy (with two institutes: Ontology and Theodicy, Philosophy of Religion); the Department of the Philosophy of Nature (with four institutes: Philosophy of Nature, Mathematics and Physics, General Biology, Anthropology), the Department of Theoretical and Experimental Psychology (with two institutes: Theoretical Psychology, Experimental Psychology), the Department of Ethics and the Department of History of Philosophy (with one institute). Such an arrangement of the departments and institutes persisted with small modifications until the academic year 1983/1984. The modifications included the formation of the separate Department of the Philosophy of Religion in 1965/1966 with its institute, so the associated Institute of Theodicy at the Department of Ontology and Theodicy, and (in the academic year 1977/1978) the study of informatics at the Department of the Philosophy of Nature.

Starting with the academic year 1966/1967, while maintaining the arrangement of the departments, 7 specializations were introduced, sometimes also referred to as fields of study. By doing this, the faculty received a dual structure: scientific, based on departments, and didactic, based on specializations. The following specializations were established: (1) Formal Logic; (2) General and Specific Gnoseology and General and Specific Epistemology along with the General Methodology of Sciences; (3) Philosophy of Being, Natural Theology and Philosophy of Religion; (4) Psychological Sciences—Specific, Experimental and Theoretical, as well as Philosophical Psychology; (5) Philosophy of Nature and Philosophy of Natural Science; (6) Axiology, Ethics, Ethology and Philosophy of the Law; (7) History of Philosophy. Another reorganization of the faculty was carried out in the years 1982–1984. On 1 October 1982, the rector of ATK reshaped the 7 departments with their institutes into 17 institutes. The specialization oriented around humanistic philosophy included 7 departments: Department of Ethics, Department of the Philosophy of Religion, Department of the History of Ancient and Medieval Philosophy, Department of the History of Modern and Contemporary Philosophy, Department of the History of Polish Philosophy, Department of Ontology and Theodicy, Department of the Theory of Knowledge. The specialization oriented around natural philosophy included 6 departments: Department of the Philosophy of Man, Department of the Philosophy of Nature, Department of History and Philosophy of Science, Department of Logic, Department of the Methodology of Sciences, Department of Methodology of System-Informatics Sciences. The specializations of psychology included 4 departments: Department of General Psychology and Methodology of Research, Department of Psychology of Personality and Clinical Psychology, Department of Progressive, Pedagogical and Defectological Psychology, Department of Social and Correctional Psychology. It was at that time that four specializations became associated with the humanistic orientation of philosophy: Ethics; Philosophy of Being, God and Religion; History of Philosophy and Gnoseology (i.e. the classical theory of knowledge), eventually reshaped into the specialization of the Theory of Knowledge. Three specializations became associated with the orientation of natural philosophy: Ecology of Man and Bioethics, Philosophy of Nature, and Logic (later: Logic and Methodology of Sciences). These seven specializations determined the areas of philosophical research and education at the faculty until ATK was reshaped in 1999 into the Cardinal Stefan Wyszyński University in Warsaw (UKSW), at which point the two philosophical branches were fused into one. In the meantime, the Department of the Philosophy of Religion was renamed as the Department of Philosophy of God and Religion, and the Department of Ontology and Theodicy was made into the Department of Philosophy of Being (Metaphysics). New departments were also formed: Department of the Philosophy of Ecology and Department of Bioethics, incorporating them into the specialization of the Ecology of Man and Bioethics. The reorganization introduced in 1982 also initiated the formation of specializations in reference to psychology.

From the transformation of ATK into UKSW until the end of the academic year 1998/1999, the faculty carried out scientific-didactic activity in two specializations: philosophy and psychology, in the scope of 7 philosophical specializations and 5 psychological ones at 15 philosophical departments and 11 psychological departments. Students could either choose a 5 year MA program or, at the Higher Professional Study of Ethics, a 3-year BA. Both specializations also boasted full time PhD programs and MA extramural studies. The studies were conducted on the basis of a program which encompassed two main groups of subjects: the general subjects selected for the particular specialization as well as specialized subjects. In 1999, due to the transformation of ATK into UKSW, the following institutes were formed at WFCh: Philosophy and Psychology (currently, there is also the Institute of Ecology and Bioethics which was founded in 2002).[27]

The most prominent professors and academic teachers of philosophy of WFCh ATK include, among others: Rev. Prof. Piotr Chojnacki (1897–1969), Rev. Prof. Kazimierz Kłósak (1911–1982), Rev. Prof. Józef Iwanicki (1902–1995), Prof. Wiktor Wąsik (1883–1963), Prof. Juliusz Domański (b. 1927), Prof. Bolesław Józef Gawecki (1889–1984), Rev. Prof. Tadeusz Ślipko (1918–2015), The Most Rev. Prof. Marian Jaworski (b. 1926)—the cardinal and former metropolitan of the Lvov Latin Church, The Most Rev. Prof. Bronisław Dembowski (b. 1927)—the former bishop of Włocławek, Rev. Prof. Mieczysław Lubański (1924–2015), Rev. Prof. Szczepan Witold Ślaga (1934–1995), Prof. Andrzej Półtawski (b. 1923), Prof. Mieczysław Gogacz (b. 1926), Rev. Prof. Józef Marceli Dołęga (1940–2014), Rev. Prof. Bernard Hałaczek (b. 1936), Rev. Prof. Wojciech Bołoz (b. 1945), Prof. Edward Nieznański (b. 1938), Rev. Prof. Edmund Morawiec (1930–2019) and Rev. Prof. Kazimierz Kloskowski.

Two philosophical schools were formed at the faculty: the school of "consequent Thomism" and the school of the philosophy of nature. Prof. Kazimierz Kloskowski was associated with the latter.

The school of consequent Thomism was formed thanks to Prof. Mieczysław Gogacz, who formulated the concept of practicing the history of philosophy as a science about problems and their solutions presented in the texts of philosophers. The name of the school is derived from the content of the studied texts and from the way it refers to Thomas Aquinas. The school is characterized by a detailed specification

[27] See more: J. Bielecki and J. Krokos, *Wydział Filozofii Chrześcijańskiej na ATK 1954–1999* (Warszawa: Wydawnictwo UKSW, 2001).

of the particular philosophical sciences depending on the realistic aspect of philosophy. This subject is expressed and specified in greater detail in the rules and norms of the particular discipline. Metaphysics is considered as the basic discipline, and its subjects are the first structural elements of every real singular being. In physical anthropology, the subject is enriched by the theory of the body and soul and the existential and being-associated relations. In ethics, the norms of morality are highlighted and derived from the rational nature of man. In terms of pedagogy, the rules of education and upbringing are exposed.

The school of the philosophy of nature was formed mainly thanks to Rev. Prof. Kazimierz Kłósak[28] and, later, by Rev. Prof. Szczepan Witold Ślaga.[29] It is characterized by a significant association with the contemporary achievements of mathematics and nature related sciences in terms of the philosophical subjects, with the full awareness of the separation of the methodology of the sciences of nature from the philosophy of nature. The specifics of the methodology of this school feature reductive reasoning, which enables the acquisition of ontological implications from the phenomenological description of the data of experience. In this case, philosophy is discussed realistically and critically. The pluralism of philosophical disciplines based on their material and formal subjects is highlighted here. It opposes the unitary treatment of philosophy. Hence the care to preserve the separateness and epistemological purity of the particular branches of science. The philosophical studies carried out in this way lead to a dynamic vision of reality. The search for the ontic reasons of its dynamism and changeability is the task of this school. The person continuing the activity of this philosophical school was Rev. Prof. Kazimierz Kloskowski.

The result of the scientific work of the employees of WFCh ATK, aside from their individual achievements, was the creation of *Studia Philosophiae Christianae*—a journal which has been released every half a year (starting from 1965 and continuing today) and a series of publications: *Miscellanea Logica*; *Z zagadnień filozofii przyrodoznawstwa*

---

[28] *Encyklopedia filozofii polskiej*, vol. 1, pp. 654–655; K. Kłósak, *Z teorii i metodologii filozofii przyrody* (Poznań: Wydawnictwo Św. Wojciecha, 1980).

[29] *Encyklopedia filozofii polskiej*, vol. 2 (Lublin: Polskie Towarzystwo Tomasza z Akwinu, 2011), pp. 681–684; S.W. Ślaga, "Życie – ewolucja," in M. Heller, M. Lubański, S.W. Ślaga, *Zagadnienia filozoficzne współczesnej nauki. Wstęp do filozofii przyrody* (Warszawa: Wydawnictwo ATK, 1980), pp. 285–410.

i filozofii przyrody [The Studies from the Philosophy of the Natural Science and the Philosophy of Nature]; *Studia z filozofii Boga, religii i człowieka* [The Studies of the Philosophy of God, Religion and Man]; *Opera Philosophorum Medii Aevii*. The scientific activity of the students is associated with the work of scientific communities: Scientific Community of Students of Philosophy (since 1967), Scientific Community of Students of Philosophy of Nature (since 1978), Scientific Community of Students of Metaphysics (since 2010).

The direct environment of the didactic and scientific work of Prof. Kazimierz Kloskowski was Section of Philosophy of Nature WFCh ATK. Its formation was associated with the specifics of philosophy practiced and lectured at WFCh. The specialized studies in the scope of the philosophy of nature form an area of philosophy which is up-to-date thanks to the advancements in modern mathematics and nature related sciences. These sciences, which progressively lead to higher specialization and the distinction of newly derived areas, require on the one hand the generalization and synthesis from a specific point of view, but on the other—the preparation in the methodological and epistemological aspects in reference to this scientific data, as well as an update and reinterpretation of the issues discussed by the tradition of Thomism and the neo-Thomism philosophy of nature. This is why Faculty of Christian Philosophy of ATK, which has been functioning since 1954, focused on this type of research and studies in its didactic and scientific activity. Initially, the lectures in this matter were of supportive manner in relation to other branches of philosophy practiced at WFCh. In 1957, Department of Ontology and Logic, at which studies and lectures in the field of the philosophy of nature were carried out, gave birth to Department of Philosophy of Nature along with its four institutes: (1) Philosophy of Nature; (2) Mathematics and Physics; (3) General Biology; (4) Anthropology. Since 1965, the department and its institutes as a specialty have used the official names: Philosophy of Nature and Natural Science, General Methodology of Natural Science.

Rev. Prof. Kazimierz Kłósak with his philosophical system and philosophical way of viewing reality has determined the character of scientific studies of the philosophy of nature, original at least in the scope of Europe. The most important properties of the concept of Rev. Prof. Kazimierz Kłósak have to be mentioned. Firstly, philosophy is regarded as simultaneously realistic and critical. It is generally described as the science of the aspect of being something which generally exists in reality and is related to particular types of being. Other formulations of this term highlight the realistic and critical approach: philosophy, in a strict sense, is a science about the aspect of existing realistically as an object—either as an object in general, or as a certain type of object. In a broader sense, philosophy is also understood as a critical reflection on human knowledge, especially in terms of scientific knowledge. The description of philosophy in the strict sense results in the diversity of its types. Secondly, the pluralistically developed concept of philosophy acknowledges the many separate, relatively autonomous philosophical disciplines, both due to the many types of the studied being and the terminology of varying degrees of generalization used for their description, as well as due to the different aspects of being presented in the studies. By studying the realistically existing being, the aspect of being, the contingent or necessary being, being existing in nature or the body-spiritual being, we practice metaphysics, the philosophy of God, the philosophy of nature or anthropological philosophy, respectively. Such a pluralistic approach opposes the unitary conception of philosophy, which assumes that philosophical sciences create one philosophy explaining reality. The unitary approach leads to either the significant reduction in the set of philosophical statements, or to the imposition of the ontological point of view on natural sciences. Furthermore, the constant care for the preservation of separateness and epistemological purity of particular branches of knowledge is associated with this situation. Every type of science with regard to the subject it studies uses an appropriate method and determines its knowledge-related goals. The transferring or imposition of tools and research tasks from one science to the other, studying a different aspect of reality, leads to unjustified extrapolations and pseudo-solutions. The differences between natural sciences and the philosophy of nature are particularly significant. The first, by means of their methods, encompass only the measurable-phenomenal aspects of the studied reality, without implying any ontological solutions. The latter is a science relativized to the aspect of being something which exists in reality within the scope of nature. Following this understanding of these areas of science, it is assumed that natural sciences do not result from the rules of some philosophy, nor do they lead directly to any philosophical conclusions. However, philosophy and the philosophy of nature in particular should—despite the existing epistemological separations—make use of natural sciences in the broadest scope possible. Philosophy uses the data of these sciences not on the basis of any synthesis, as it cannot lead to logical consequences as a result of philosophical statements or by means of the deduction of logical consequences. The only way to practice philosophy in a bottom-up manner is by extracting the ontological implications from the phenomenological description of the data of experience by means of reductive reasoning. This anchoring in natural data ensures the more realistic character of the philosophy of nature (and other branches of philosophy as well). Moreover, the philosophical system presents and strengthens the thoroughly evolutional image of the world and the dynamic vision of reality. By accepting natural approaches, which broke their bonds with the static perception of the world a long time ago, one searches for ontic reasoning of the world's dynamism and changeability. Teilhard de Chardin's vision of the evolutionary world is particularly close to this, although not entirely satisfying. The fact of nature's development, especially of the evolution of the biocosmos, is not fully explained by the existing philosophical theories, which mainly study the aspect of the entity. It is a prominent task to discuss the topic of the method of existence of the type of being existing in nature. The idea that beings embedded within nature exist realistically in a stream of time, i.e. their existence is gradually fulfilled in time, may serve as the basis for an adequate evolutional theory of reality. Finally, by being open to natural sciences and at the same time without ceasing to follow the doctrine of Thomism, one can draw on a philosophical treasury which, after the appropriate clarification and necessary corrections, can still be held valid without rejecting natural studies and which can still respect the requirements of the modern methodology of sciences. In the studies about the beginning of the world, life and man, one can decisively follow creationism. The act of creation, which is inscrutable in itself, is understood via ontological analyses of its results, i.e. the material world. In reference to the genesis of life, indirect creationism is allowed, describing this approach as the emergentism of creational theism. In order to explain the ontic genesis of man, the concept of direct co-participation of the act of creation and natural reasons is developed. This specific Christian naturalism means the bolstering of natural sciences and does not stand in opposition to Catholic orthodoxy.

As it was mentioned, the history of the specialization of the Philosophy of Nature has been closely connected to Rev. Prof. Kazimierz Kłósak since the beginning of ATK, where he was an associate dean in the years 1954–1956 and dean in the years 1956–1976, as well as being the chairman of the department and the institutes of ontology and theodicy, where he conducted classes on the philosophy of nature. In the years 1956–1957, the Department of Philosophy of Nature was managed by Rev. Prof. Józef Szuleta, and after a longer vacancy in the years 1961–1964—Prof. Bolesław Gawecki. In 1964, Rev. Prof. Kazimierz Kłósak returned to work at the department, assuming control over the department as well as the institute of the philosophy of nature (until the year 1981). In the scope of the specialization of Philosophy of Nature, apart from the Institute of Philosophy of Nature, three other institutes were functioning until the 70s. Institute of Mathematics and Physics was managed by Prof. Bolesław Gawecki in the years 1956–1967; Institute of General Biology was managed by Rev. Prof. Józef Szuleta in the years 1956–1969; the management of Institute of Anthropology was assigned to Rev. Prof. Bolesław Rosiński in the years 1954–1964. In subsequent years, significant changes appeared regarding the functioning of the specialization of Philosophy of Nature. From 1982, during the structural reorganization of the Faculty of Christian Philosophy, The specialization of the Philosophy of Nature created two departments: Department of Philosophy of Nature (Rev. Prof. Szczepan W. Ślaga was the head in the years 1981–1995, and Rev. Prof. Kazimierz Kloskowski—since 1996) and Department of Methodology of System-Informatics Sciences (the head: Rev. Prof. Mieczysław Lubański). At the moment of transformation of ATK into UKSW in 1999 and the creation of Institute of Philosophy, Section of Philosophy of Nature was created, which included 3 departments: Department of Philosophy of Nature, Department of Philosophy of Natural Science and Department of System-Informatics Sciences with the following persons as the heads (respectively): Rev. Prof. Kazimierz Kloskowski, Prof. Anna Latawiec, Rev. Prof. Mieczysław Lubański.[30]

[30] Currently (2019), Section of Philosophy of Nature (SFP) still consists of 3 departments: Department of Philosophy of Nature, Department of Philosophy of Science and Department of Methodology of System-Informatics Sciences. The permanent employees of the section include: Prof. Anna Latawiec, Prof. Anna Lemańska, Dr. habil. Adam Świeżyński, Dr. habil. Grzegorz Bugajak.

The section of the Philosophy of Nature owes its specifics and present shape to the scientific achievements of the following persons: Rev. Prof. Kazimierz Kłósak, Rev. Prof. Szczepan W. Ślaga, Rev. Prof. Kazimierz Kloskowski, Rev. Prof. Mieczysław Lubański, Prof. Anna Latawiec, Prof. Anna Lemańska, Dr. habil. Adam Świeżyński, Dr. habil. Grzegorz Bugajak and also Dr. Jarosław Kukowski, Dr. Danuta Ługowska, Dr. Magdalena Weker. The permanent participants in the scientific-research activity of the Section include: the cyclic scientific conference "The Philosophical and Scientific-natural Elements of the Image of the World" (since 1997), and the publishing series "The Studies from the Philosophy of Natural Science and the Philosophy of Nature" (20 volumes appeared until 2011). Among other scientific achievements of the Section, there are a few dozen book publications and several hundred scientific articles.

The most important areas of study and scientific topics currently discussed by the employees of Section of Philosophy of Nature include: philosophy of mathematics, methodology of philosophy of nature, philosophy of simulation and of the virtual reality, genesis and evolution of life, relations between natural sciences and theology, history of natural sciences, philosophy of sciences and philosophy of nature, philosophy of natural sciences and the philosophy of nature.[31]

[31] Among the most important current research publications of SFP published in the English language are the following books and articles: A. Latawiec, "The Notion of Simulation: Some Philosophical Aspects," *Studia Philosophiae Christianae* 32, no. 2 (1996), pp. 165–176; G. Bugajak and J. Tomczyk, "On Evolution and Creation. Problem solved? A Polish example," *Zygon. Journal of Religion and Science* 44, no. 4 (2009), pp. 859–877; G. Bugajak, J. Kukowski, D. Ługowska, A. Latawiec, A. Lemańska, A. Świeżyński, M. Weker, *Philosophy of Nature Today* (Warszawa: Wydawnictwo UKSW, 2009); G. Bugajak, D. Kucharski, D. Ługowska, A. Latawiec, A. Lemańska, A. Świeżyński, M. Weker, *Knowledge and Values* (Warszawa: Wydawnictwo UKSW, 2011); A. Świeżyński, *Epistemology of Miracle: Scientific Inexplicability, Religious Sense and System Approach Towards the Epistemology of Miracle* (Warszawa, Wydawnictwo UKSW, 2012); A. Świeżyński, *Ontology of Miracle: Supernaturality, God's Action and System Approach Towards the Ontology of Miracle* (Warszawa: Wydawnictwo UKSW, 2012); G. Bugajak, D. Kucharski, A. Latawiec, A. Lemańska, D. Ługowska, A. Świeżyński, J. Tomczyk, *God and Nature: Selected Issues in the Philosophy and Theology of Nature* (Warszawa: Wydawnictwo UKSW, 2014); A. Lemańska, "Absolute Truth and Mathematics," in: *God, Truth, and other Enigmas*, ed. M. Szatkowski (Berlin–Münich–Boston: De Gruyter, 2015), pp. 133–140; A. Świeżyński, "Where/When/How Did Life Begin? A Philosophical Key for Systematizing Theories on the Origin of Life," *International Journal of Astrobiology* 15, no. 4 (2016), pp. 291–299; A. Świeżyński,

"Philosophical and Scientific Meanders of the Idea of Spontaneous Generation," in *Philosophy of the Living Nature*, vol. 2, ed. W. Ługowski (Warszawa: IFiS PAN, 2017), pp. 68–97; A. Świeżyński, "A Philosophical Critique of the Concept of Miracle as a 'Supernatural Event'," *Croatian Journal of Philosophy* 17, no. 49 (2017), pp. 57–72. Among the most important current research publications of SFP published in the Polish language are the following books and articles: A. Latawiec, *Pojęcie symulacji i jej użyteczność naukowa* (Warszawa: Wydawnictwo ATK, 1993); A. Lemańska, *Filozofia przyrody a nauki przyrodnicze* (Warszawa: Wydawnictwo ATK, 1998); A. Latawiec, "Uwagi w sprawie wirtualności," *Studia Philosophiae Christianae* 40, no. 2 (2004), pp. 279–291; G. Bugajak, J. Kukowski, A. Latawiec, A. Lemańska, D. Ługowska, A. Świeżyński, *Tajemnice natury. Zarys filozofii przyrody* (Warszawa: Wydawnictwo UKSW, 2009); A. Świeżyński, "Nowożytne przemiany idei samorództwa," *Roczniki Filozoficzne* 57, no. 1 (2009), pp. 195–229; A. Świeżyński, *Filozofia cudu. W poszukiwaniu adekwatnej koncepcji zdarzenia cudownego* (Warszawa: Wydawnictwo UKSW, 2012); A. Lemańska, "Ewolucja jako realizacja projektu?" *Filozofia i Nauka. Studia Filozoficzne i Interdyscyplinarne* no. 3 (2015), pp. 353–358; G. Bugajak, "Pre-aksjologiczny aspekt granic natury: czy istnieją działania (nie)naturalne?" *Roczniki Filozoficzne* 65, no. 1 (2017), pp. 134–139.

3.

Understanding of Philosophy

Kazimierz Kloskowski studied the philosophy of nature at the ATK Faculty of Christian Philosophy. During his studies, philosophy at this Faculty was characterized by certain specific qualities, distinguishing it first and foremost from philosophy taught at other state-run universities, where it was ideologically colored (dialectical materialism) or amounted to analytic philosophy (research in the field of philosophical logic, methodology of science); but also from the philosophy taught at Catholic University of Lublin (KUL), Pontifical Academy of Theology in Krakow (PAT), or in theological seminaries. It was a philosophy that could be described as Christian, but at the same time it was not dominated by Thomism. Leading lecturers were Rev. Prof. Edmund Morawiec, Prof. Mieczysław Gogacz, Rev. Prof. Tadeusz Ślipko, who considered themselves Thomists and developed the philosophy of this trend. Rev. Prof. Kazimierz Kłósak also described himself as a Thomist, however his Thomism did not fit the canon of "classical" Thomism, rather it was open to other philosophical trends. At that time, Prof. Andrzej Półtawski (phenomenologist), Rev. Prof. Bronisław Dembowski (historian of philosophy), Prof. Edward Nieznański, who developed philosophical logic, also taught at ATK. Lecturers, as well as students, had a great deal of freedom within the scope of researching problems and solving them.

The philosophy of nature was also unique at this Faculty. The founder of this specialization was Rev. Prof. Kazimierz Kłósak, who created interesting for many reasons concept of philosophy of nature. His associates and successors were Rev. Prof. Bernard Hałaczek, Rev. Prof. Mieczysław Lubański, Rev. Prof. Szczepan W. Ślaga, Rev. Prof. Józef Dołęga. Ślaga, who was the promoter of the MA and doctoral theses of Kloskowski, had in particular taken up the fundamental ideas of the concept of nature philosophy from Kłósak. Kloskowski accepted the vision of his teachers and their way of practicing philosophy, their personalities influencing him greatly and shaping him as a philosopher.

In his works, Kloskowski does not speak much about philosophy itself or its methods. Comments on this subject can, in a way, be found in the margins of his articles and books. The analysis of his work allows for a reconstruction of the understanding of philosophy and the method he used.

The most important features of Kloskowski's philosophy are as follows: (1) metaphysical and epistemological realism; (2) realistic interpretation of the results of natural sciences; (3) existential pluralism, according to which there is a reality beyond nature; (4) openness to the results of natural sciences. Kloskowski accepts the objective, actual existence of reality which is cognitively accessible to man. Moreover, he believes that certain aspects can be cognitively recognized by methods characteristic of natural sciences and others, in turn, of philosophical methods. Thus, a realistic interpretation of particular sciences is imposed over epistemological realism. It is interesting that Kloskowski seeks justification for realism in—among other things—evolutionary epistemology.

Although Kloskowski believes that philosophy cannot be practiced in isolation from specific sciences, his philosophy is far from naturalism or materialism. Kloskowski has no doubt that, apart from the natural world, there is another reality, a reality transcendent in relation to matter.

Kloskowski also recognizes the limitations of the methods used by natural scientists, and therefore sees the need to include other research methods, including those characteristics of philosophy. With these methods, it is possible to reach the aspects of reality that are not available in the field of natural sciences. This is—on one hand—a justification for the existence of philosophical reflection on the world of nature, i.e. the existence of the philosophical discipline of natural philosophy, and on the other hand, it can be treated as an argument against materialistic monism, which is nowadays often recognized as a consequence of the existence of natural sciences.

Philosophers who accept this view believe that only things in existence are those that are possible to study by means of natural sciences. Kloskowski rejects this position. He believes that the experimental method does not permit the demonstration that the material reality, which the natural sciences take as their subject, is the whole of reality. Materialist positions are not derived from natural sciences; materialism is the assumption adopted at the starting point of a philosophical system.

Kloskowski, after his teachers, postulates that philosophy should use the results of natural sciences. This postulate, contrary to the position of many Thomists (Mieczysław Albert Krąpiec, Stanisław Kamiński, Edmund Morawiec, Mieczysław Gogacz), was defended by Kłósak. Moreover, many problems posed by Kloskowski arise from individual natural theories (models of abiogenesis, theories of evolution). One could, with certain reservations, define his philosophy as the "philosophy in science."[32]

Kloskowski's philosophical research can be divided into three main groups: philosophy of biology, philosophy of living nature (biophilosophy) and bioethics. It is characteristic of his philosophical investigations that the philosophy of biology is interwoven with both biophilosophy and bioethics. Although biophilosophy and bioethics are different research areas of philosophy, Kloskowski sees their connections. Therefore, it should not be surprising that he goes from biophilosophy to bioethics, especially since this area of interest contains ethical problems resulting from genetic manipulation. The ethical problems posed by the possibilities of biotechnology are closely linked to the fundamental issues of philosophy, such as the identity of the organism (being).

Kloskowski's starting point for solving philosophical problems are the results of natural sciences. Thus, as a rule, his works begin with the presentation of those results which, according to him, are significant for a given philosophical problem. Kloskowski then analyzes these results within the framework afforded by the philosophy of science (philosophy of biology), assessing, among other things, their value for philosophy and their credibility. Moreover, he often introduces new "tools" needed for a more complete analysis of data. For example, in his deliberations on the determinants of evolutionary processes,

[32] The term "philosophy in science" is used by Rev. Prof. Michał Heller.

he creates a new category of explanations: explanation by reference to a chance, and, moreover, the chance itself is treated as the cause.[33]

Kloskowski does not stop at the methodological-epistemological analysis of natural theories. He does not practice the philosophy of biology or philosophy of evolution but attempts to reach the essence of reality as it is described by natural theories. Therefore, the pre-developed material becomes an object of strictly philosophical reflection, within the scope of biophilosophy or bioethics.

In Kloskowski's works, one can thus observe the following scheme of proceedings: (a) using the results of natural sciences; (b) methodological-epistemological analysis of these results within the scope of philosophy of biology; (c) transition to the plane of natural or ontological philosophy, where he presents his own solutions to philosophical problems. Thus, Kloskowski passes from the natural sciences through the philosophy of science to the philosophy of nature or bioethics.

In this pattern of operations, one can observe the method of isolating the ontological implications of reduction as proposed by Kłósak. The various stages of the Kłósak method are as follows: (a) developing a general philosophical vision; (b) creation of an image of the natural reality, based on scientific facts, reflecting the knowledge in the field of natural sciences as faithfully as possible (this image is non-philosophical in character and provides a general description of pre-scientific and scientific experience); (c) transforming scientific facts into philosophical facts (at this stage philosophical vision becomes helpful); (d) for philosophical facts, searching for reductive-type ontological implications that explain and justify these facts (the notion of ontological implications is a modification of Carl G. Hempel's concept of the implications of test hypotheses of nature).[34]

There are, however, some differences between Kloskowski and Kłósak. The latter explicitly declared that he was a Thomist and, in his research, he remained faithful to the adopted philosophical position. In particular, the philosophical vision in question was composed of the basic theses of Thomism. This had a significant impact on the problems he proposed. Kloskowski does not accept any particular philosophical

---

[33] See K. Kloskowski, *Zagadnienie determinizmu ewolucyjnego. Studium biofilozoficzne* (Gdańsk: Stella Maris, 1990), pp. 211–223.

[34] See K. Kłósak, *Z teorii i metodologii filozofii przyrody* (Poznań: Wydawnictwo Św. Wojciecha, 1980).

system in advance that would constrain the search for the essence of reality, rather he tries to solve the problems posed by application of various proposals. Contrary to appearances, this does not result in a cluster of unrelated elements, but a coherent conception of nature as a reality both dynamic, creative, but also dependent on the Absolute Being, whom Kloskowski identifies with the Christian God. The second difference between the views of Kloskowski and Kłósak is the understanding of the relationship between the natural and philosophical sciences. According to Kłósak, natural theories are independent of philosophical assumptions, and moreover, no philosophical conclusions arise from them. This has far-reaching consequences.

A philosopher, if he wants to use a result obtained by natural sciences, must first, according to Kłósak, interpret this result philosophically. To illustrate it—transfer it from the plane of the natural sciences to the philosophical, ontological plane. Although Kloskowski recognizes the fundamental differences between the cognition characteristic of natural and philosophical sciences, he distinguishes the cognitive planes of natural and philosophical sciences, and always maintains full awareness during the transition between one plane to another; placing no barriers between these types of sciences. Consequently, he does not attach as much importance as Kłósak does to philosophical interpretation of scientific facts. These differences in their views of the natural sciences are probably due to the fact that for Kłósak, physics were the model of natural sciences, whereas for Kloskowski it was biology. Kloskowski recognizes important methodological-epistemological differences between biological sciences and mathematicised natural sciences.

The nature of biological phenomena causes other types of explanations than the cause-effect ones, that are characteristic of physics, to be allowed in life sciences. As a consequence,

> … in some branches of biology one can notice a degree of demarcation between biological and philosophical knowledge. Biological knowledge in certain aspects has many characteristics in common with the knowledge of philosophy and is dependent in its essential dimension on the accepted philosophical-theoretical vision.[35]

[35] K. Kloskowski and A. Lemańska, "Empiriologiczna teoria nauk szczegółowych," in *Z zagadnień filozofii przyrodoznawstwa i filozofii przyrody*, vol. 15, ed. M. Lubański and S.W. Ślaga (Warszawa: Wydawnictwo ATK, 1996), pp. 183–226.

As already mentioned, Kloskowski left no works in which he would discuss a vision of philosophy and ways of practicing it. His understanding of philosophy and his research method can be reconstructed by analyzing his works. As an example of the practical implementation of the model of philosophy preferred by Kloskowski, we have two articles: *Przypadek jako czynnik abiogenezy*[36] and *Różnorodność i jedność życia*[37] [*Chance as a Factor of Abiogenesis* and *Diversity and Unity of Life*]. Both articles contain rich factual material derived from contemporary natural theories. Thus, in the article *Przypadek jako czynnik abiogenezy*, Kloskowski refers first to models and hypotheses regarding the so-called prebiotic evolution, and then the formation of the first systems, which are the precursors of living organisms. Within these models, he follows the places in which the authors of the concepts refer to the accidental emergence of certain structures. In turn, in the article *Różnorodność i jedność życia*, Kloskowski offers testimonies on the tremendous diversity of the biosphere. At the same time, he claims that processes of evolution are responsible for this state of affairs. On the other hand, he refers to research that demonstrates the specific unity of all living organisms, primarily at the level of their physical and chemical structure. These data are then used by Kloskowski as the starting material for philosophical analyzes.

In the first article, Kloskowski examines "the character of referral to accidental events."[38] His attempt to answer this question remains essentially at the level of the philosophy of biology. Kloskowski introduces a new category of explanations he describes as "explaining by referring to the chance."[39] He comes to the conclusion that "referring ... to the chance has become a specific research procedure."[40] This does not exhaust all the problems that arise when considering the process of abiogenesis. Even on the ontological plane, Kloskowski

[36] K. Kloskowski, "Przypadek jako czynnik abiogenezy," *Studia Philosophiae Christianae* 21, no. 2 (1985), pp. 39–78.

[37] K. Kloskowski, "Różnorodność i jedność życia," *Studia Philosophiae Christianae* 32, no. 1 (1996), pp. 69–90.

[38] K. Kloskowski, "Przypadek jako czynnik abiogenezy," p. 63.

[39] Ibidem, pp. 63–67. A broad analysis of this type of explanation can be found in: K. Kloskowski, *Zagadnienie determinizmu ewolucyjnego. Studium biofilozoficzne*, pp. 211–223.

[40] K. Kloskowski, "Przypadek jako czynnik abiogenezy," p. 67.

is trying to define the nature of random events and their role in the process of abiogenesis. One of the conclusions is that "life might have come in a leaping manner."[41] This opens up the prospect of asking questions about the cause of the appearance of life on Earth in the philosophical sense.

In the article *Różnorodność i jedność życia*, the quoted evidence of the complexity and individualization of the animated world and, at the same time, its homogeneity on the physicochemical level, prompt Kloskowski to acknowledge that both the analytical-summative and the organism-holistic strategies are justified in the study of life.[42] This observation leads him to the conclusion that "both approaches to the phenomenon of life, homogenous and varietal, are legitimate."[43]

Kloskowski then exposes the implications of an ontological nature, giving his own definition of life in the process.[44] He also refers to the controversy between evolutionists and creationists. He comes to the conclusion that "the idea of creation … focuses on research in the philosophical perspective, while evolution seeks solutions in biological sciences."[45] In this context, he advocates the possibility of interpreting the appearance of life on Earth, but also other phenomena, both on the plane of natural and philosophical sciences. More importantly, both these perspectives are complementary, not mutually exclusive.[46] "Diversity and homogeneity," writes Kloskowski, "are two aspects of one reality of life."[47]

Kloskowski thus combines different perspectives, treating them as different aspects of the same reality, which may differ from one point of view to another. This approach is especially helpful when considering evolution and creation, since the inability to combine evolutionism with creationism results from adoption of only one point of view and rejection of others. Taking into account many aspects of the world of nature, it is possible to explain the genesis of the world, living organisms and human beings by reference both to evolution, and

41 Ibidem, p. 77.

42 K. Kloskowski, "Różnorodność i jedność życia," p. 183.

43 Ibidem, p. 183.

44 Ibidem, p. 184.

45 Ibidem, p. 185.

46 Ibidem.

47 Ibidem, p. 187.

to creation, understood as granting of existence and continuity in this existence.

Since the problems of genesis, in particular of life and humanity, have important religious and philosophical significance, theology can use Kloskowski's proposals to explain God's creative action without rejecting what evolutionary theories say about evolution. Thus, in Kloskowski's works, one more role of philosophy, in particular the philosophy of nature, emerges as a link between natural sciences and theology. Kloskowski's approach to worldviews concerning evolution and creation is a natural consequence of his earlier interests, and his proposals for solving these problems lend the theory of natural evolution a wider scope, opening the possibility of interpretation of any dynamic development processes within this paradigm.

In his works, Kloskowski concurrently deals with methodological-epistemological issues and problems of an ontological nature. Consistently distinguishing between research areas, insightful methodological-epistemological analyzes, and proposals for solutions to philosophical problems opening up new research perspectives, are the characteristics of the scientific achievements of Kazimierz Kloskowski.

4.

Detailed theoretical problems

Philosophical reflections by Kazimierz Kloskowski focused on one of the great philosophical questions: the nature of life and living beings, particularly the emergence of life and the origins of biological species.

Since Kloskowski always preceded his philosophical analyses by referencing natural scientific data on the issue (as emphasized in the part on Kloskowski's understanding of philosophy), he became interested in models of abiogenesis (the emergence of life) and theories of evolution (origins of species). Analyzing the models and theories of natural sciences, Kloskowski discovered that their authors often referenced coincidental events. Thus, determining the role of coincidence (chance) in the abiogenesis and life evolution processes became one of the crucial issues for Kloskowski. It became the starting of philosophical reflection, which resulted in two main publications on the subject: *Rola przypadku w genezie życia* [*The Role of the Chance in the Genesis of Life*] (1986)[48] and *Zagadnienie determinizmu ewolucyjnego. Studium biofilozoficzne* [*The Problem of Evolutionary Determinism: A Biophilosophical Study*] (1990).[49]

Interest in the process of biological evolution and simultaneous faithfulness to a worldview rooted in Christianity caused Kloskowski

[48] K. Kloskowski, "Rola przypadku w genezie życia," in *Z zagadnień filozofii przyrodoznawstwa i filozofii przyrody*, vol. 8, ed. M. Lubański and S.W. Ślaga (Warszawa: Wydawnictwo ATK, 1986), pp. 85–237.

[49] K. Kloskowski, *Zagadnienie determinizmu ewolucyjnego. Studium biofilozoficzne* (Gdańsk: Stella Maris, 1990).

to take his own position in arguments and discussions between evolutionists and creationists. The main publication in which he presented his own model of evolutionary creationism is *Między ewolucją a kreacją* [*Between Evolution and Creation*] (1994).[50]

The nature of living organisms is closely connected to biological information. Its crucial carrier in each cell is DNA. Learning about this carrier and its role in the structure and functioning of living organisms enabled far-reaching interference in its structure. The range of genetic manipulations with considerable influence over organism integrity and its species identity compels crucial moral choices to be made. This problem also became a research subject for Kloskowski. An important publication within the area is his book *Bioetyczne aspekty inżynierii genetycznej* [*Bioethical Aspects of Genetic Engineering*] (1995).[51]

Distinguishing between the main research areas became a basis for the division of the achievements of Kazimierz Klosowski in philosophy into three thematic groups: (1) the role of chance in the genesis and evolution of life; (2) model of evolutionary creationism; and (3) place of bioethics in research on human life.

As it has already been emphasized, Kloskowski began all of his philosophical analyses by gathering data from the natural sciences. Thus, all his works contain three interpenetrating layers: scientific data from natural sciences, their meta-theoretical analysis, and philosophical implications resulting from the above and concerning biological reality.

The role of chance in the genesis and evolution of life

Introduction

With the paper *Koncepcja abiogenezy w pracach Reinharda W. Kaplana* [*The Concept of Abiogenesis in the Works of Reinhard W. Kaplan*],[52] Kazimierz Kloskowski began his research on philosophical questions

[50] K. Kloskowski, *Między ewolucją a kreacją* (Warszawa: Wydawnictwo ATK, 1994).

[51] K. Kloskowski, *Bioetyczne aspekty inżynierii genetycznej. Wybrane problemy* (Warszawa: Wydawnictwo ATK, 1995).

[52] K. Kloskowski, "Koncepcja abiogenezy w pracach Reinharda W. Kaplana," in *Z zagadnień filozofii przyrodoznawstwa i filozofii przyrody*, vol. 5, ed. K. Kłósak, M. Lubański and S.W. Ślaga (Warszawa: Wydawnictwo ATK, 1983), pp. 103–150.

regarding the beginning of life on the Earth. In the publication, he analyses the Reinhard Kaplan model of abiogenesis from a methodological and an epistemological point of view. The epistemological, methodological and ontological assessment became the focus of his analyses of other theories of the beginning of life proposed by Hans Kuhn,[53] Manfred Eigen and Peter Schuster,[54] Jacques Monod, and Henry Quastler.[55] Kloskowski considers ways of the verification and falsification of the theories and evaluates their scientific value. The authors of the models analyzed by Kloskowski assign a significant role to the shaping of the first biological system by chance. Therefore, Kloskowski attempts to find on an ontological level a reply to a question: "was the emergence of life on the Earth necessary or did the chance play a significant role in this process?" These reflections prompt his choice of a subject of his doctoral thesis, in which he researched the role of chance events in the emergence of life.[56] In the publication, he focused primarily on analyzing the various models of abiogenesis available to the life sciences. Kloskowski shows what role the authors of the models assign to coincidental events in the process of the emergence of the first living organisms. Chance could have happened at various stages of the prebiotic evolution process, especially during the combination of simple molecules into longer chains, during their competition, during the creation of proteins or nucleic acids, as well as protein-nucleon complexes, and finally during the creation of genes or protocells.

Analyses of the theory of abiogenesis and determining the role of chance events in the emergence of life caused Kloskowski to expand the problem to include the evolution of life, which became the subject of his doctoral thesis: *Zagadnienie determinizmu ewolucyjnego. Studium biofilozoficzne*. The main objective of the work was to determine to what degree biological evolution processes are conditioned deterministically

---

[53] K. Kloskowski, "Teoria abiogenezy w ujęciu Hansa Kuhna," in *Z zagadnień filozofii przyrodoznawstwa i filozofii przyrody*, vol. 6, ed. M. Lubański and S.W. Ślaga (Warszawa: Wydawnictwo ATK, 1984), pp. 269–287.

[54] K. Kloskowski, "Hipercykl jako model abiogenezy," in *Z zagadnień filozofii przyrodoznawstwa i filozofii przyrody*, vol. 7, ed. M. Lubański and S.W. Ślaga (Warszawa: Wydawnictwo ATK, 1985), pp. 257–280.

[55] K. Kloskowski, "Przypadek jako czynnik abiogenezy," *Studia Philosophiae Christianae* 21, no. 2 (1985), pp. 39–78.

[56] Cf. K. Kloskowski, "Rola przypadku w genezie życia," pp. 85–237.

over their historical course, and to what degree—in an indeterministic manner. The issue appears in the context of biologists pointing to various events in the evolution process which they regard as chance. Mutations and recombinations, which are a source of hereditary variability, are such chance events. Environmental changes which influence the adaptation of an organism are also chance sometimes. In the adaptation process, features without adaptive significance may, also coincidentally, be recorded. Meanwhile, in the competition process, an individual who is not the most optimally adapted may coincidentally win. In turn, random fluctuations of gene frequency (genetic drift) eliminate a specific gene or increase its frequency without the influence of the natural selection.

Kloskowski assumes, after biologists-evolutionists, that these events are chance events and points out the consequences of it on the epistemological and ontological level.

Methodological and epistemological analysis of the synthetic theory of evolution

Kloskowski launched his own research on philosophical issues related to the determinism of biogenesis and evolution processes from an analysis of various natural models of abiogenesis and the theory of evolution from the methodological and an epistemological point of view.[57] Particularly interesting are his observations on the subject of the synthetic theory of evolution, which he regards as the most comprehensive reinterpretation of Darwin's conception of evolution.[58] According to Kloskowski, it achieved a high level of theoreticality in proving statements and verifying hypotheses due to utilizing the

[57] "Reflections of this kind—as it seems—are a correct level for extracting the significant character of mechanisms and factors of the evolution. In this context, the specification of terms of determinism and indeterminism and their comparison and referencing to the factors of the evolution obtains particular significance for understanding the issue of evolutionary determinism; the aim is also to include the laws ruling the evolution phenomena, thus necessitating clarification of the terms of cause and causal relationship. Not without meaning are also functional relations, as well as with purposefulness and concidentiality of the processes." K. Kloskowski, "Wokół ewolucji biologicznej. Wybrane problemy biologiczne," in *Z zagadnień filozofii przyrodoznawstwa i filozofii przyrody*, vol. 16, ed. K. Kloskowski and M. Lubański (Warszawa: Wydawnictwo UKSW, 1999), p. 5.

[58] K. Kloskowski, "Ewolucjonizm syntetyczny teorią wielu teorii," *Studia Philosophiae Christianae* 29, no. 1 (1993), p. 89.

results of various disciplines (paleontology, genetics, biogeography, molecular testing, mathematical models) and numerous new research methods.[59]

Kloskowski presents a broad overview of the synthetic theory of evolution, simultaneously showing its development and transformations. In order to do so, he utilizes the works of authors such as Ronald A. Fisher, Sewall Wright, John B.S. Haldane, Theodosius Dobzhansky (population-genetic theory of evolution), Julian Huxley, Ernst Mayr, George G. Simpson, Francisco Ayala (so-called "new synthesis"), Jack L. King, Thomas H. Jukes, Motoo Kimura, Tomoko Ohta, Niles Eldredge and Stephen J. Gould (synthesis of organismal and molecular evolution). The choice of authors is necessarily selective, yet presents the most important stages in the shaping of the synthetic theory of the evolution and the nature of its crucial assumptions.

However, Kloskowski also sees the difficulties with the synthetic theory of evolution. One of them is the fact that it assumes as a general rule that the mechanisms of evolution, which function on the level of microevolution, are sufficient to explain macroevolution and mega evolution.[60] It is not, however, obvious, and as such, is rather an assumption accepted by part of evolutionists than a confirmed fact, which causes discussions among evolutionists on "the processes and mechanisms of evolution and theories of evolution, the source of which, it seems, is several unsolved difficulties of biological and methodological nature,"[61] and in consequence proposing mechanisms of evolution different from natural selection.

Another difficulty of the synthetic theory of evolution lies in the term of natural selection itself. Kloskowski says that:

> … it has not been unequivocally explained yet whether the natural selection should be treated as the basic factor of evolution. Moreover,

[59] Cf. K. Kloskowski, *Zagadnienie determinizmu ewolucyjnego. Studium biofilozoficzne*, pp. 15–101.

[60] "Currently rather commonly accepted synthetic theory of evolution emphasises that mechanisms on the level of microevolution (differentiation of populations within a species) explain sufficiently both macroevolutionary (emergence of genera and families) and megaevolutionary processes (emergence of orders, classes, phyla)." K. Kloskowski, "Kilka uwag na temat syntetycznej teorii ewolucji," *Studia Philosophiae Christianae* 24, no. 1 (1988), p. 194.

[61] Ibidem, p. 195.

> the term of natural selection is frequently used in several different meanings—either of the external natural selection (the environment decides about the selection) or of the internal natural selection (the selection occurs on the level of an organism through corrections of mutation processes).[62]

Kloskowski also considers approaches towards the processes of evolution, that is, the theory of natural mutations and the theory of disturbed balance. They are treated by their creators as alternatives for the synthetic theory. Kloskowski, however, arrives at the conclusion that both theories complete the classic synthetic theory of evolution—they are not its competitors, but complementary approaches: "what classic Neo-Darwinism and the theory of disturbed balance have in common is the directional influence of the natural selection. The genetic drift, meanwhile, is a connection between the synthetic theory of the evolution and the theory of natural mutations."[63]

Kloskowski also noted that in the synthetic theory of evolution,

> detailed reconstructions of evolutionary processes and their modelling (conducted on the basis of paleontological data and experiments) need to be differentiated from the theoretical framework proposing and developing specific explanations and interpretations of facts, e.g. determined by paleontologists. Moreover, the process of evolution within the synthetic theory of evolution is treated as a fact, while determining the evolutionary course and mechanisms itself applies to theoretical level.[64]

Kloskowski arrives at the conclusion that various approaches within the synthetic theory of evolution point to the complexity of its structure. Moreover, it can be considered to be both a theory and a model of the evolutionary processes,[65] as well as "a theory of many theories, assuming that its statements are theoretical constructs, ordered according to specific criteria."[66]

---

[62] K. Kloskowski, "Ewolucjonizm syntetyczny teorią wielu teorii," p. 88.

[63] K. Kloskowski, *Zagadnienie determinizmu ewolucyjnego. Studium biofilozoficzne*, p. 124.

[64] K. Kloskowski, "Ewolucjonizm syntetyczny teorią wielu teorii," p. 88.

[65] Ibidem, p. 95.

[66] Ibidem, p. 98.

These meta-theoretical analyses enabled Kloskowski to attempt the correct placement of chance events, both in genesis and the evolution of life.

Understanding of the term "chance"

Showing the role of chance events in the genesis and evolution of life requires specifying the term "chance," since it is not unequivocal. Referring to the abundant literature on the subject, Kloskowski distinguishes the following definitions of chance: (1) causal, in which the chance is understood either as an event not belonging to a causal series of phenomena or as a nexus of causal chains independent from one another, or as an event without a cause, or finally as disproportionality of the result to the event[67]; (2) teleological, in which the chance is treated as an unpurposeful or unplanned event[68]; (3) probabilistic—chance events are understood here as an unnecessary event, that is, an event that may happen but doesn't have to; in this interpretation, a mathematical term of probability appears, and thus, the chance becomes a research subject of probability calculus[69]; (4) nomological, in which chance events are events that are not subject to any law.[70]

Kloskowski realizes that, in particular situations, stating that a certain event is the chance may be related to the insufficient knowledge of its circumstances. Thus, he considers events to be chancy if they "are subject to strict causality but, due to their occurrence as entireties are impossible to analyze correctly."[71] He also differentiates between a chance in the conditional sense—an event which has no cause in the considered frame of reference, and chance in the unconditional sense—an event which has no ontic cause anywhere. This differentiation enables the chance to "occur in events when their previous context changes."[72]

While explaining and describing abiogenesis processes, Kloskowski narrows the understanding of the chance, treating it as "a phenomenon

[67] K. Kloskowski, "Przypadek jako czynnik abiogenezy," pp. 43–44.

[68] Ibidem, pp. 44–45.

[69] Ibidem, pp. 45–46.

[70] Ibidem, pp. 47–49.

[71] K. Kloskowski, "Rola przypadku w genezie życia," p. 163.

[72] Ibidem.

or group of phenomena occurring as one of many possible events, which is a significant condition of occurring of other phenomenon or phenomena (within specific prebiotic evolution processes on the prehistoric Earth), more or less probable."[73] Kloskowski also utilizes an expression of Tadeusz Wojciechowski, who assumed that "a chance happens when something unexpected, unforeseen (but not unforeseeable!) occurs, something which is not a result of a planned action."[74]

It seems that Kloskowski assumes that, both in the process of abiogenesis and of evolution, a chance may be regarded as either a nexus of independent causal chains or a conditional coincidence at most.[75] Thus, the chance is treated as an event which does not have a cause itself, perhaps only in the considered frame of reference, or the cause of which cannot be unequivocally determined. At the same time, the event becomes a beginning of a new cause-and-effect chain. In this sense, it is a cause of other events.[76] Therefore, it can be said that it "appears to be a factor initiating the evolutionary processes."[77] This approach leads Kloskowski to introduce a new category of explanation in life sciences, one he called "explanation by invoking chance."[78]

Explanation by invoking a chance

Kloskowski notices significant methodological and epistemological differences between biology and physical and chemical sciences. They are for instance caused by using two different research strategies in biology, that is, reductionistic and compositionist strategy.[79]

---

[73] Ibidem, p. 169.

[74] T. Wojciechowski, "Przypadek i celowość w ewolucji biologicznej," in *Z zagadnień przyrodoznawstwa i filozofii przyrody*, vol. 1, ed. K. Kłósak (Warszawa: Wydawnictwo ATK, 1976), p. 328.

[75] K. Kloskowski, *Zagadnienie determinizmu ewolucyjnego. Studium biofilozoficzne*, p. 141.

[76] "The chance presents itself as an event without a cause, but able to be a cause for other events." Ibidem, p. 141.

[77] Ibidem, p. 213.

[78] K. Kloskowski, "Przypadek jako czynnik abiogenezy," p. 63; *Zagadnienie determinizmu ewolucyjnego. Studium biofilozoficzne*, pp. 211–224.

[79] K. Kloskowski and A. Lemańska, "Empiriologiczna teoria nauk szczegółowych," in *Z zagadnień filozofii przyrodoznawstwa i filozofii przyrody*, vol. 15, ed. M. Lubański and S.W. Ślaga (Warszawa: Wydawnictwo ATK, 1995), pp. 208–212.

It causes genetic-historic, functional, and teleonomic explanations to play a significant role in biological sciences along with cause and effect explanations, characteristic for mathematicised natural sciences. According to Kloskowski, the criterion of the division of explanations in the biology, due to the unique nature of biological systems and processes, should include explanans elements and relations between explanans and explanandum.[80] Kloskowski characterizes the explanations in order to use them as a background and therefore emphasizes the necessity of introducing a new type of explanation, that is, explanation by invoking a chance. An example of a genetic-historic explanation is explaining evolutionary processes "in relation to historically occurring new populations with changed genetic structure."[81] The functional explanation is an explanation, in the explanans of which functional laws and necessary conditions occur. Kloskowski emphasizes that "the function can be talked about only in a context of a bigger whole of system or process, and in relation to a purpose. Functional laws, meanwhile, regard in the evolutionary biology for instance the genetic variability, natural selection, and genetic drift."[82] Meanwhile, in teleological explanations, conditions and teleological laws occur in the explanans.[83]

These explanations are not sufficient to understand all biological processes and phenomena, especially the ones in which chance events occur. Therefore, Kloskowski reckons that there is a specific type of explanation in biology, that is, explanation by invoking a chance. In this explanation, the explanans, next to the other laws of evolution and detailed conditions, includes also the "law of chance,"[84] which

---

[80] Ibidem, p. 217.

[81] Ibidem, p. 218.

[82] Ibidem.

[83] At the same time, Kloskowski notes that "we can only speak of a purpose in the evolutionary biology in the context of research on past antecedents of evolution, not its results. And, consequently, teleological laws determine relations occurring between features of antecedents of a specific phenomenon and their achieved purpose, understood as a determinant of previous actions. If the 'purpose' meant achieving intended results, then the purpose would be a result of specific functions. However, due to the creative dimension of the evolution, such relation between the function and the purpose is unacceptable. Only *post factum* can a biologist, by analysing antecedents of a specific biological phenomenon, assess whether the event achieved its purpose." Ibidem, pp. 218–219.

[84] Ibidem, p. 219.

characterizes the evolution in the deepest way.[85] Since chance appears as an event without a cause, but able to be a cause of other events, "the research procedure called explanation by invoking a chance is a typical biological explanation."[86] At the same time, however, according to Kloskowski

> … it is an extraordinarily complex research procedure, since forms of genetic, teleological, and probabilistic explanations may be found in it, depending on the understating of chance events and their role in the evolutionary processes. The issue of chance can't, however, be solved either by citing appropriate structural and statistical laws or by giving their cause and effect, but only by presenting a theory of the reality and correct interpretation of the evolution itself, and therefore determining correctly the range (context) of chance's influence.[87]

While identifying chance events in the genesis of life and in the evolution, Kloskowski arrives at a conclusion that "life could have appeared in a step-like way."[88] At the same time, the double role of the chance in the process of the evolution becomes clear: "The chance is treated on one hand as a mechanism of the evolution, on the other, as a way of explaining the evolutionary mechanism itself."[89]

Chance as a cause of the evolution

Interpretation of chance events in the biogenesis and evolution by Kloskowski causes chance to be possibly regarded as one of the causes of the evolution, on a par with physical and chemical causes, but at the same time subordinate, since it is closely connected to the necessary factors of the evolution, called evolutionary mechanisms.[90] Thus, chance events, while being "creators of novelty," do not bring

[85] K. Kloskowski, *Zagadnienie determinizmu ewolucyjnego. Studium biofilozoficzne*, p. 190.

[86] K. Kloskowski and A. Lemańska, "Empiriologiczna teoria nauk szczegółowych," p. 219.

[87] K. Kloskowski, "Przypadek jako czynnik abiogenezy," p. 77.

[88] Ibidem.

[89] K. Kloskowski, *Zagadnienie determinizmu ewolucyjnego. Studium biofilozoficzne*, p. 214.

[90] Ibidem, pp. 156–159.

chaos in biological processes, but rather complete and cooperate with physical and chemical necessities. Therefore, chance and necessity do not exclude but rather complete each other, while for Kloskowski "the evolution was shaped both by the necessity and the chance events."[91] He notes:

> … during the evolution, the chance mutations, subjected to the natural selection, led to the creation of new populations or species. Therefore, mutations, natural selection, and environmental conditions are all crucial; we call them co-factors of the evolution in the biological sense. Consequently, as soon as during considering the philosophical level we may say that the aforementioned cofactors are determinants of the evolutionary process, while the evolution itself is a transformation of the chance into necessities. The chance and the necessity are thus cofactors of the evolution in the philosophical sense.[92]

Such complementary treatment of chance events and physical and chemical necessities in the processes of abiogenesis and evolution is possible since the influence of the chance is limited by the relative stability of earlier created structures and by interactions between these structures.[93] Correct placement of the chance events is allowed on a philosophical level to avoid extreme interpretations of both these processes—ones accepting the transformation of inanimate matter into animate and the ones treating the abiogenesis as an event so improbable that it's actually impossible. Moreover, it also becomes natural to consider abiogenesis and evolution processes on a philosophical level in the categories of purposefulness, necessity, and causality.

Thus, for Kloskowski,

> … evolution processes appear as an interdependence of determinism and chance; both determinism and chance are to certain degree visible at all stages of the biological evolution (during the competition, adaptation). Moreover, the evolutionary mechanisms themselves are chance in their nature (mutations, genetic drift).[94]

91 Ibidem, p. 268.
92 Ibidem, p. 129.
93 Ibidem, p. 179.
94 Ibidem.

In this context, "the chance can be treated as a necessity of the evolutionary processes"[95] or "the chance and the necessity can be treated as a complementary whole of sorts, the acknowledgement of which ensures understating of the discussed evolutionary processes as well as the influence on their course of the chance events."[96]

Processes of abiogenesis and evolution, depending on natural necessities and chance events, are subject to both deterministic and probabilistic laws.[97] Chance may be considered to be a cause of evolutionary changes if it is related to the natural necessities understood as the presence of correct organic compounds, maintaining proper chemical ratios, volume, temperature, pressure, etc. The emergence and evolution of life occurred due to the concurrence and cooperation of undetermined coincidental events and compliant with natural laws reacting to building elements with each other. Evolutionary mechanisms—internal evolutionary factors such as mutations, recombinations, natural selection, and environmental changes—are chance events, which are simultaneously written into the deterministic evolutionary laws.

The concept of self-determinism

Connecting chance with natural necessities leads Kloskowski to propose a specific solution to the problem of natural determinism. He is perfectly clear that the term determinism is itself not unequivocal and thus attempts to adopt a term which would somehow reflect the assumption of the existence of order in nature, which is a basis of the natural sciences. Therefore, from various propositions, he selects a definition of natural determinism in which conditioning of phenomena comes to the fore.[98] Thus, he assumes that "determinism is a view which states that all natural phenomena are conditioned, that is, unequivocally or probabilistically determined by other

[95] "In evolution there are both unequivocal and probabilistic conditions in the same structure of specific mechanisms and factors of the evolution and between them." Ibidem, p. 268.

[96] Ibidem, p. 265.

[97] Kloskowski emphasises that "evolution depends on both natural necessities and chance events, … and is subject to deterministic and probabilistic laws." Ibidem, p. 150.

[98] Ibidem, p. 149.

(earlier) phenomena, that is, they are subject to the laws of nature."[99] It should be emphasized that Kloskowski allows for (within the view of the determinism) a being to be subject not only to absolute laws of nature but also to probabilistic laws.

Kloskowski does not pick a side in the discussion between the determinists and indeterminists. Instead, he highlights the possibility of finding a compromise by combining, usually counterposed, unequivocal and probabilistic properties. From this perspective, both the emergence of life and its evolution appear as processes conditioned both unequivocally and probabilistically by other, earlier phenomena. It is worth adding that the theories of abiogenesis and evolution are not deterministic in the sense in which classical mechanics is deterministic. However, the chance element plays a different role in them than in quantum mechanics, in certain interpretations of which chance may be understood as an event without any cause. Kloskowski regards chance on the level of biological phenomena as a nexus of circumstances. It becomes a source of novelty and variability and, simultaneously, is subject to evolutionary regularities treated as limits establishing the direction of evolution.

To describe a situation in which determined and chance events co-occur in the evolution process, leading to the creation of a whole variety of living forms, Kloskowski introduces the term of "self-determinism" ("autodeterminizm" in Polish), according to which "processes of the evolution are simultaneously conditioned unequivocally and probabilistically by other (earlier) phenomena. ... Since the nature of the evolutionary processes ... is (simultaneously) determinism and chance."[100] Self-determinism is thus an approach which embraces the cooperation of chance events with factors determining the evolutionary process. For Kloskowski, self-determinism is not only a philosophical view but also a hypothesis explaining evolution and a methodological rule which is a perspective of research on abiogenesis and evolution.[101]

[99] Ibidem, p. 143.

[100] Ibidem, p. 155. Kloskowski emphasizes that "the evolution is decided by determinism and chance" (p. 157), but "the chance can't be treated as a an independent cause in the empirological sense. The chance is a cause as far as it is connected to the natural necessities of the evolution" (p. 159).

[101] K. Kloskowski, *Zagadnienie determinizmu ewolucyjnego. Studium biofilozoficzne*, p. 179.

Evolution observed from the perspective of evolutionary self-determinism is subject to both deterministic and probabilistic laws. It depends significantly on natural necessities and chance events.[102] In this context, according to Kloskowski, it is impossible to determine the character of the evolution process within the discussion between determinism and indeterminism.[103] In the process of evolution, determined events are integrally connected to the chance events: "the evolution in a way appears in the area of connection between directional and chance processes."[104]

Self-determinism may therefore be understood as a particular combination of determinism and indeterminism. Evolutionary mechanisms—evolutionary factors such as mutations, recombinations, natural selection, environmental changes—are chance events, which are simultaneously written into the deterministic evolutionary laws. According to Kloskowski:

> … factors such as environment, isolation, size of population or species, changes rate and their cooperation possess the ability to change the course of the evolution and in this sense, they are unequivocal phenomena. However, their "entrance" into the precisely specified evolutionary process chain may be determined only within higher or lower probability.[105]

The concept of self-determinism enables one to move beyond the presentation of natural phenomena and processes as either only determined or chance. Kloskowski shows that chance and nomological necessity do not have to exclude each other. Moreover, thanks to their coexistence, complex processes can occur, and complicated structures created in nature.

Conclusion

The interpretation of abiogenesis and evolution processes proposed by Kloskowski introduces interesting elements to the discussion on the beginning and evolution of life and his solution to the

102 Ibidem, p. 150.
103 Ibidem, p. 154.
104 Ibidem, p. 175.
105 Ibidem, p. 176.

problem of natural determinism is highly regarded. For example, Leszek Kuźnicki thinks that the analyses of Kloskowski reveal many important, often underestimated aspects of the very complex process of evolution. Particularly interesting from this point of view is the concept of evolutionary self-determinism. Kuźnicki also emphasizes that there are not as deep and insightful analyses of the synthetic theory of evolution as those conducted by Kloskowski.[106] Julisław Łukomski also pointed out the significance of the concept of self-determinism for the better understanding of evolutionary processes.[107]

Other academics, such as Mieczysław Lubański, also make reference to Kloskowski's views.[108] Adam Świeżyński uses his concept of chance in his analyses of miraculous events,[109] while Grzegorz Bugajak refers to Kloskowski's interpretation of chance events when creating his own classification of various conceptions of chance.[110] Also, Anna Lemańska refers to Kloskowski in her analyses of natural determinism.[111]

Despite an appreciation for the solutions proposed by Kloskowski, his views on chance and self-determinism have not been broadly utilized thus far, perhaps stemming from the fact that the issue of chance in abiogenesis and evolution itself does not enjoy a broad appeal. Philosophical discussions on the subject of the emergence and evolution of life rather tend to focus on issues connected to the possibility of occurrence of these processes and the need for alternative

---

106 A. Lemańska, "Sprawozdanie z sesji 'Filozofia ewolucji a filozofia stwarzania. Wkład Ks. Rektora Kazimierza Kloskowskiego do współczesnego ewolucjonizmu', Warszawa, 12.04.2000," *Studia Philosophiae Christianae* 37, no. 1 (2001), pp. 224–227.

107 J. Łukomski, "Ewolucja w ujęciu ks. Kazimierza Kloskowskiego," in *Stwarzanie i ewolucja*, ed. J. Buczkowska and A. Lemańska (Warszawa: Wydawnictwo UKSW, 2002), pp. 19–34.

108 M. Lubański, "Ewolucja a przypadek," in *Stwarzanie i ewolucja*, pp. 96–108.

109 A. Świeżyński, "Is Chance an 'Element' of Miracle? In Search for Common Aspect of Miraculous and Chance Events." *Studia Philosophiae Christianae* 46, no. 2 (2010), pp. 61–86; A. Świeżyński, "The Philosophy of Nature, Chance, and Miracle," *American Journal of Theology and Philosophy* 32, no. 3 (2011), pp. 221–241.

110 G. Bugajak, "Pojęcie przypadku i jego zastosowanie w analizach teorii naukowych," in *Filozofia przyrody współcześnie*, ed. M. Kuszyk-Bytniewska and A. Łukasik (Kraków: Universitas, 2010), pp. 235–245.

111 A. Lemańska, "Determinizm," in: *Encyklopedia filozofii przyrody*, ed. Z. Roskal (Lublin: Wydawnictwo KUL, 2016), pp. 67–86.

solutions. Nonetheless, it seems that the issue of determination in nature is crucial for any understanding of the nature of biological reality, particularly the nature of life. Works of Kloskowski contain numerous interesting solutions, especially the concept of self-determinism which allows us to look at chance and its role in abiogenesis and evolution processes from a different point of view than traditional approaches. Kloskowski does not set chance in opposition to the deterministic regularities of nature. It is due to the "cooperation" of these two factors that such complex systems as living organisms can be created in nature.

The evolutionary model of creation

Introduction

In the 1980s, the ideas of the so-called scientific creationism, those which reject the process of biological evolution, began to surface more widely in Poland, with this type of creationism becoming increasingly popular in the Polish Catholic Church. However, some of the philosophers associated with the Church saw the dangers of the idea of scientific creationism which was propagated in some Catholic circles, especially since it was frequently connected with the rejection of evolutionism.[112] Several prominent philosophers of nature in the Warsaw and Krakow circles, such as Michał Heller, Józef Życiński, Szczepan W. Ślaga and Bernard Hałaczek, became involved in demonstrating that the theses of scientific creationism are false and that there is no need for contradictions between theism and evolutionism. Moreover, concepts began to emerge of evolving nature, dependent to some extent on God, thus connecting creationism and evolutionism.[113]

112 Szczepan W. Ślaga writes: "The activity of creationists, undertaken in the name of the supposed defense of the faith, is extremely detrimental to the study of evolution and, in general, to the natural sciences, being in fact, sectarian and causing great harm to the Catholic religion, completely deviating from thorough theological and biblical studies." S.W. Ślaga, "Myśl katolicka wobec kreacjonizmu 'naukowego'," in *Opinie o filmie video "Ewolucja: rzeczywistość czy domniemanie"*, ed. H. Łomnicki (Kraków: Universitas, 1994), pp. 54–68.

113 In Poland, attempts at reconciling biological evolution and creationism were undertaken by: Kazimierz Kłósak, Szczepan W. Ślaga, Tadeusz Wojciechowski, Michał Heller, Józef Życiński.

Kazimierz Kloskowski also joined in the discussions with the creationists of the fundamentalist movement.

His works on this subject form a logical sequence: from the presentation and critique of the position of the scientific creationists, through the multidimensional analysis of evolutionary processes and the theories of evolution and creation, to the development of his own philosophical position combining creation with the process of evolution. The first works in which Kloskowski demonstrated the lack of grounds for the theories of scientific creationists were of a popular science and were of help for priests, especially catechists, who encountered these issues in their work with young people.[114] Following this, Kloskowski discussed various creationist positions presented in particular by Polish authors in several articles.[115] The extended and systematized philosophical analyses on this subject became the subject of two books: *Między ewolucją a kreacją*[116] and *Filozofia ewolucji i filozofia stwarzania*[117] [*Between Evolution and Creation* and *The Philosophy of Evolution and the Philosophy of Creation*]. In them, apart from presenting the views of evolutionists and authors from different

[114] These publications appeared in the years 1984–1988 in *Miesięcznik Diecezjalny Gdański*, published by the Metropolitan Curia in Gdańsk-Oliwa: K. Kloskowski, "Wokół współczesnej problematyki kreacjonizmu," *Miesięcznik Diecezjalny Gdański* 28, no. 7–9 (1984), pp. 205–214; K. Kloskowski, "Kreacjonizm a granice poznania," *Miesięcznik Diecezjalny Gdański* 30, no. 7–9 (1986), pp. 327–340; K. Kloskowski, "Metodologiczne uwarunkowania kreacjonizmu naukowego," *Miesięcznik Diecezjalny Gdański* 30, no. 10–12 (1986), pp. 423–445; K. Kloskowski, "Wieloaspektowy wymiar 'stwarzania' w Sumie Teologii św. Tomasza z Akwinu," *Miesięcznik Diecezjalny Gdański* 31, no. 10–12 (1987), pp. 435–443; K. Kloskowski, "Ewolucja i kreacja – próba pewnego uogólnienia," *Miesięcznik Diecezjalny Gdański* 32, no. 4–6 (1988), pp. 191–205; K. Kloskowski, "Problem kreacji i kreacjonizmu w ujęciu Kazimierza Kłósaka," *Miesięcznik Diecezjalny Gdański* 32, no. 1–3 (1988), pp. 81–89.

[115] K. Kloskowski, "Profesora Kazimierza Kłósaka koncepcja kreacjonizmu," *Studia Philosophiae Christianae* 28, no. 2 (1992), pp. 61–75; K. Kloskowski, "'Scientific' Creationism – Reception of the Theory in Poland," *Studia Gdańskie* 8 (1992), pp. 150–163; K. Kloskowski, "Myśl kreacjonistyczna w polskich ośrodkach filozoficznych," in *Z Zagadnień filozofii przyrodoznawstwa i filozofii przyrody*, vol. 15, pp. 227–271.

[116] K. Kloskowski, *Między ewolucją a kreacją* (Warszawa: Wydawnictwo ATK, 1994).

[117] K. Kloskowski, *Filozofia ewolucji i filozofia stwarzania*, vol. 1: *Między ewolucją a stwarzaniem*, vol. 2: *Pogodzone bliźniaki. Rzecz o ewolucji i kreacji* (Warszawa: Wydawnictwo ATK, 1999).

creationist schools, Kloskowski presents his own model of evolutionary creationism.

It should be emphasized here that Kloskowski was perfectly positioned to undertake the philosophically and ideologically important problem of reconciling evolution and creation. His works, in which he analyzed various aspects of the evolutionary process and the theory of evolution on various planes (natural, methodological, ontological), provided him with the necessary tools to evaluate creationist positions and, above all, to construct his own model of evolutionary creationism.

Criticism of so-called "scientific creationism"

Kloskowski began building his model of evolutionary creationism with a critique of scientific creationism. He does so from two distinct perspectives: as a methodologist and a naturalist. The former point demonstrates both the internal inconsistencies of this position and those between modern bible studies and the interpretations of the Holy Scriptures by the creationists; as a naturalist, he attacks scientific creationism on the grounds of evolutionary theory.

Kloskowski primarily undermines the way in which creationists interpret the Holy Scripture, especially the Book of Genesis, which contains descriptions of the creation of the world and of the flood. These two biblical events are of central importance to creationists, as they are the basic argument for the direct creation of the world, of particular biological species, and of man. Kloskowski notes that these passages of Holy Scripture, which the creationists refer to, are literary works that convey religious, rather than naturalistic, content.[118] Therefore, they cannot serve as justification for any claims made in the field of natural sciences. Kloskowski's position is in line with the prevailing trend of biblical research, which shows that literal treatment of the content of the Holy Scriptures can lead to significant distortions of the meaning of biblical revelations.

Next, Kloskowski demonstrates at a methodological level that the ways in which creationists justify their theses, especially the critique of evolutionism, are incorrect. The main objection posed against creationists by Kloskowski is the lack of a distinction between the

118 See K. Kloskowski, *Filozofia ewolucji i filozofia stwarzania*, vol. 1, pp. 114–124.

"planes of scientific cognition relevant to particular fields of knowledge."[119] For Kloskowski, the distinction between the research areas of the natural and philosophical sciences is particularly important. Their intermingling is one of the faults of scientific creationists, but also of some evolutionists.[120] In his analyses of evolution and creation, he precisely distinguishes between the following planes: natural, methodological-epistemological and ontological. He states that the act of creation cannot be studied on the phenomenal plane, i.e. by means of natural sciences,[121] since the notion of creation is a philosophical rather than a natural one. Therefore, theories of creation are philosophical theories, and thus have a different methodological-epistemological status than the natural theories of evolution. Because theories of creation and theories of evolution are of a different methodological-epistemological type, the mixing of planes leads to the narrowing or extension of the terms "evolution" and "creation." Consequently, there is a "mixing of strictly philosophical (metaphysical) and natural principles and terms."[122] This is one source of the misunderstandings between creationists and evolutionists. Kloskowski clearly emphasizes that it is impossible to directly compare or confront the statements of creationist theories with theories of evolution, as the creationist scientists tend to.

Kloskowski draws attention to the fact that "evolution" is primarily a natural concept, while "creation" is a philosophical and theological one. Both may therefore be combined with each other only on the level of philosophical considerations. Any attempt to transfer the concept of creation to the field of natural sciences is erroneous. Thus, the creationist argument that biological evolution does not take place in nature, referring to creationism, are methodologically invalid. The debate between creationism and evolutionism must take place on the philosophical plane, not on the plane of natural sciences.

The second line of criticism of scientific creationism refers to the results obtained by naturalists. Kloskowski accepts the process

---

[119] Ibidem, pp. 132.

[120] Kloskowski criticizes, e.g., Richard Dawkins, for the unauthorized extrapolation of the theory of evolution into the field of culture (Ibidem, p. 53).

[121] K. Kloskowski, *Filozofia ewolucji i filozofia stwarzania*, vol. 2, p. 19.

[122] K. Kloskowski, *Między ewolucją a kreacją*, pp. 161–162; K. Kloskowski, *Filozofia ewolucji i filozofia stwarzania*, vol. 2, p. 129.

of evolution, treating it as a fact confirmed by various data.[123] Not being a naturalist, he himself, of course, does not conduct research in this field, accepting the results obtained by naturalists. On the phenomenal (natural) plane, he approves the explanations of the process of evolution adopted in the synthetic theory of evolution. It should be emphasized, however, that Kloskowski also draws attention to other mechanisms of evolution, offered by theories competing against the synthetic theory of evolution, in particular of non-equilibrium and neutral mutations. These theories point to the difficulties and facts which are unexplained by the synthetic theory of evolution, while proposing their own views. Some of them can be used to extend synthetic evolution theory, since it is not a closed system.[124]

Kloskowski treats evolution as a process of

> … interaction of genetic variation and environmental factors. Environmental conditions are important not as much in the process of occurrence of mutations, but in the process of their selection. … Speaking more precisely, evolution is nothing more than the process of influence of natural selection on the hereditary changes occurring accidentally in particular generations. As a consequence, better adapted mutations are maintained, and less adapted are eliminated from the population. This does not mean, however, that a better adapted mutation must be "maintained" under all conditions and the less adapted one must be eliminated. This means that a mutation has a greater or lesser chance of being maintained, fixed in the population—not a certainty.[125]

He concludes: "in the process of evolution, accidental mutations subjected to natural selection result in the emergence of new populations or species."[126]

---

[123] Ibidem, pp. 9–10.

[124] K. Kloskowski demonstrates the stages of development of the synthetic theory of evolution and indicates possible directions for supplementing this theory with results obtained in the theory of non-equilibrium and neutral mutations (K. Kloskowski, *Zagadnienie determinizmu ewolucyjnego. Studium biofilozoficzne*, chapters 1–3), and also that it is "the theory of many theories." Ibidem, pp. 231–248; K. Kloskowski, "Ewolucjonizm syntetyczny teorią wielu teorii," *Studia Philosophiae Christianae* 29, no. 1 (1993), pp. 87–99.

[125] K. Kloskowski, *Zagadnienie determinizmu ewolucyjnego*, pp. 127–128.

[126] Ibidem, p. 129.

It should be emphasized here that the "image" of the process of evolution adapted by Kloskowski is one which functioned in the biological sciences in the 1970s and 1980s. The last thirty years of research have greatly altered the vision of the process of evolution, introducing many new elements that Kloskowski could not have anticipated. However, this does not mean that his analysis is out of date. On the contrary, new natural discoveries and hypotheses put forward by naturalists further support the conviction of the ongoing existence of the process of evolution in nature. Thus, they may be used to reinforce arguments defending evolution.

Theories of evolution vs. theories of creation

Kloskowski's critique of scientific creationism is only one of the elements he introduces into evolutionary creationism. Kloskowski also criticizes the "materialistic" interpretations of the theory of evolution, rejecting the existence of God. He emphasizes that, on the plane of phenomena, the description and explanation of the process of evolution is the domain of natural evolutionary theories, in which there is no place for the notion of creation understood philosophically or theologically. At the same time, non-existence of any reality other than the natural does not arise from it.[127] Natural theories have limitations, primarily based on their research methods, that make the explanations of the world at the mere natural plane insufficient for the philosopher. The experimental method imposes a strict framework on ways of explanation and justification of the theses. Therefore, limitations stem both from the specifics of the subject matter and from the explanations used within them. It should be added that, according to Kloskowski, it is not only the theories of evolution which have limitations: the theories of creation are also not free of them. In the latter, the limitations stem from the assumption that God is the creator of everything, and also from the reductive reasoning characteristic of philosophy and are thus of logical nature.[128] The different nature of the limitations of both types of theory is unsurprising, as they differ both methodologically and epistemologically. At the same time, the existence of these limitations somehow pushes us to overcome

[127] K. Kloskowski, *Filozofia ewolucji i filozofia stwarzania*, vol. 1, pp. 162–168.

[128] K. Kloskowski, *Między ewolucją a kreacją*, p. 145.

them somehow, something which is only possible in the field of philosophy and not the natural sciences.

Kloskowski draws attention to the complexity of the problems examined, which leads in consequence "to the adoption of certain logical, methodological, systematic and ordering assumptions. And that depends in turn on the pre-assumptions."[129] At the same time, evolutionary patterns are more difficult to grasp than regularities at the level of inanimate matter, which makes biological laws statistic in character, allowing exceptions and failing to meet the predictive requirements.[130] In the theory of evolution there are also specific types of explanations, in particular: genetic-historical, functional, teleonomic and by reference to the chance.[131]

Kloskowski also concludes that theories of evolution do not provide complete information about the process of evolution, since human knowledge is always fragmentary,[132] and so he states that "the scope of evolutionary theory may be exceeded."[133] For a philosopher, the world and the individual elements in it become understandable only when he points out the adequate reason for their existence. Thus, Kloskowski seeks the adequate cause of the changes occurring on the existential plane, one that transcends the sphere of phenomena, and finds it in the being transcendent in relation to nature, in the God-Creator. It should be added that some philosophers seek the justification of the existence of matter within itself, recognizing it as an eternal being or as containing its own *raison d'être*. Matter is therefore

---

[129] Ibidem, p. 136.

[130] Ibidem, p. 137.

[131] K. Kloskowski and A. Lemańska, "Empiriologiczna teoria nauk szczegółowych," pp. 217–219.

[132] K. Kloskowski, *Filozofia ewolucji i filozofia stwarzania*, vol. 2, pp. 97–100.

[133] K. Kloskowski, *Między ewolucją a kreacją*, p. 137. "It is easy to see that both evolutionary and creationist theories have their limits. These limits differ in the degree to which each of the explanatory methods is used. Therefore, I believe that both the scope of evolutionary theories can be exceeded by taking into account the propositions of creationist theories, and the scope of creationist theories can be surpassed by using evolutionary theories (as already demonstrated by Pierre Teilhard de Chardin et al.). The point is for the problem of the beginning of the world and of life to be described from a broader perspective; where experience and observation are not the only criteria of credibility, but the correctness of the philosophical argument is also taken into account." Ibidem, pp. 137–138.

considered to be an absolute being but this is unsatisfactory for Kloskowski, as it fails to remove all doubts while actually creating new problems. Matter is unable to justify itself, hence the appeal to a being transcendent in relation to nature.

The methodological and epistemological analysis of the theory of evolution and the theory of creation conducted by Kloskowski was aimed at establishing the status of both these types of theories. They also lead to the conclusion that the natural plane is insufficient for an adequate explanation of the evolutionary process. Although it is necessary to keep in mind the epistemological aspects of the theory of evolution and the theory of creation (the former being natural theories, dealing with the phenomenal plane, the latter—philosophical), it is precisely their limitations that make it necessary, according to Kloskowski, to transcend these limitations and to address the issue of evolution "from a broader perspective, where experience and observation are not the only criteria of credibility, but the correctness of the philosophical argument also plays a role."[134] It is therefore possible to associate the types of natural and philosophical thinking and transcend the epistemological planes.[135]

Thus, Kloskowski reaches the level of philosophical deliberations where the concept of creation lies. He also transfers the concept of biological evolution to that plane. This allows him to search for causes in the ontological sense of the evolution process. Moreover, the natural causes of the evolutionary process indicated in the natural sciences do not negate the possibility of supernatural causes. Thus, evolution does not exclude creation, and the act of creation does not have to mean the direct, temporally and spatially located interference of God in nature, excluding the process of evolution. Thus, at the philosophical level, the theory of evolution requires supplementation with the theory of creation. In turn, the adoption of creationism does not exclude the explanations provided by theories of evolution, it merely lends them a new dimension.

[134] Ibidem, pp. 137–138.

[135] K. Kloskowski, *Filozofia ewolucji i filozofia stwarzania*, vol. 1, pp. 197–199.

An attempt to reconcile evolutionism and creationism

Kloskowski builds the "evolutionary model of creation"[136] starting from: (1) treating the cosmos and the bio-cosmos in a processual way; (2) acknowledging that the fullest cognition of reality seen in a processual way is realized within the framework of evolutionary epistemology.[137]

According to Kloskowski, for most people whose worldview was shaped by the natural sciences, "the cosmos appears as a process,"[138] in which new structures are formed at different levels of matter organization. Kloskowski stresses, however, that the "problem of a rational explanation of the functioning of such a world"[139] remains unresolved on the phenomenal plane. Transcending the natural perspective is possible thanks to the conclusions obtained in the evolutionary theory of cognition. Kloskowski states that "one might speak of a kind of isomorphism occurring between the pattern of nature and the pattern of human perception and thought."[140] It follows that "spiritual cognition has its origin in nature as a result of adapting to it."[141] Thus, man is immersed in a natural reality and, at the same time, transcends it. Evolutionary epistemology allows "the genesis of the world and man to be discussed starting from the natural aspect of the issue up to the point of deriving the philosophical implications within the interdisciplinary perspective of research."[142] From this perspective, it is possible to explain the origin of the world and man by referring to evolution and creation, understood as the granting of existence, and the continuation of this existence. Thus, Kloskowski concludes, "what is defined within the creation as the maintenance of beings in the existence, can be interpreted in the perspective of evolution as a specific field of continuous change in a certain direction."[143] As a consequence,

[136] The "evolutionary model of creation" is the term used by Kloskowski in his *Między ewolucją a kreacją* (p. 175). It may seem ambiguous. It is a such model of creationism in which evolution is taken into account as an inevitable element.

[137] Ibidem, p. 162.

[138] Ibidem, p. 163.

[139] Ibidem.

[140] Ibidem, p. 165.

[141] Ibidem, p. 165–166.

[142] Ibidem, p. 167.

[143] Ibidem, p. 164.

Kloskowski recognizes evolution as a creative process or as a specific moment in the act of creation.[144]

Kloskowski, referring to evolution as a "creative process," mentions the views of Pierre Teilhard de Chardin and Theodosius Dobzhansky.[145] It is worth mentioning that the term "creative evolution" is a term used by Henri Bergson in 1907, who entitled one of his works *L'Évolution créatrice*. Teilhard de Chardin used the ideas of Bergson but he approached the process of evolution quite differently, binding it closely to the creative act: it is not evolution that is creative, it is creation that is evolutionary.[146] Thus, Teilhard de Chardin writes about "evolutionary creation."

Kloskowski's definition of evolution as the moment of creation was adopted from Hoimar von Ditfurth, who points out that

> … "time," inseparable from the space of our Universe, was born along with energy, matter, and natural laws, some thirteen billion years ago, along with the event we call "the big bang." Therefore, for a naturalist, "time" is, next to energy, space filled with matter and the constants of nature (masses of elementary particles, gravitational constant, speed of light, etc.), the feature of this world.[147]

Treating time as an immanent "element of nature" allows Ditfurth to argue that "evolution is identical to the moment of creation."[148] Since man is a temporal-spatial being, every occurrence of something new is "stretched" in time for him. Evolution thus becomes a manifestation of the *creatio continua*, the constant presence of God in processes that take place in nature.[149]

Kloskowski sums up his reflections on creation and evolution thusly:

---

144 Ibidem, p. 167.

145 See K. Kloskowski, *Filozofia ewolucji i filozofia stwarzania*, vol. 1, footnote 29, p. 203.

146 "… evolution assumes its true figure for our mind and our heart. It is certainly not 'creative' as science for a brief moment believed, but it is the expression of creation, for our experience, in time and space." P. Teilhard de Chardin, *The Vision of the Past* (New York: Harper and Row, 1967), p. 231.

147 H. von Ditfurth, *Nie tylko z tego świata jesteśmy. Nauki przyrodnicze, religia i przyszłość człowieka*, trans. A.D. Tauszyńska (Warszawa: PIW, 1985), pp. 136–137.

148 Ibidem, p. 137.

149 Ibidem, p. 138; K. Kloskowski, *Filozofia ewolucji i filozofia stwarzania*, vol. 2, p. 136.

> Why does the world function in this way? It seems that, in response to this question, both evolution, with its associated system of nature laws, as well as creation, providing the idea of sustaining everything in existence, have a voice. … It is the search for the *raison d'être* for the functioning of cosmic and bio-cosmic systems that offers the plane and the opportunity to "reconcile" evolution and creation. Creation is not only the materialization of existence, but also its continuation. Evolution is not only a process of changes, but also a silently accepted moment of their existence.[150]

The necessity of linking evolutionism and creationism stems from the limitations of both evolution theory and creation theory. Theories of evolution attempt to explain the changes taking place in the biosphere at the phenomenal plane. They are not able to reach the causes in the ontological sense. Creationism, in turn, does not have the capacity to describe the processes occurring in nature from the phenomenal side. Therefore, Kloskowski's thesis on

> … creative evolution, evolution as a specific moment of the act of creation, appears to a naturalist as creation, emergence of something new, better; but for a philosopher, it means creative evolution, i.e. the dependence of the world (all that comes as a result of the evolution of the cosmos and of the bio-cosmos) in its existence from God as its cause. In other words, evolution, understood as the process of change, demands the ontic reason for those changes which, in the light of the evolutionary theory of cognition, may be found in creation. Thus, evolution requires creation, and in this sense, evolution confirms creation.[151]

Likewise, Kloskowski justifies the evolutionary creationism in relation to the rise of life. On the basis of the analysis of the vast diversity of the world of living organisms and of their homogeneity on the basic structural level, he comes to the conclusion that

> … the philosophical analysis of inanimate and living matter (one of the possible ones) shows unequivocally that life cannot have arisen only through physicochemical processes. To overcome this mysterious boundary of life, matter needed a supernatural impulse.

[150] Ibidem, pp. 132–133.

[151] K. Kloskowski, *Filozofia ewolucji i filozofia stwarzania*, vol. 1, p. 204.

> This theorem, from the ontological point of view, is a product of the connections between both natural and philosophical options, i.e. the adoption of the principle of self-organization of matter and non-material reason, acting creatively through the forces inherent in matter. The concept of creation does not contain the temporal finality of life, but its dependence on that impulse. Thus, life can exist eternally, and yet be created by the action of the Beginning of Everything. Consequently, evolution appears as a temporal-spatial way of expression of the process of creation.[152]

Kloskowski's concept of evolutionary creation is an expansion and enrichment of the views of his predecessors and teachers, Kazimierz Kłósak and Szczepan W. Ślaga, with some new elements of his own. It is an interesting formulation for many reasons. First and foremost, Kloskowski shows how one can reconcile the image of the world shaped by the results of the natural sciences with the concept of material reality as dependent in its existence from the Creator. This synthesis is not a mechanical combination of two epistemologically and ontologically different concepts, rather it consistently demonstrates, on the philosophical plane, a vision of an evolving nature, the rational existence and transformation of which lies beyond matter. Moreover, in Kloskowski's model of creationism, God is not a hypothesis meant to "patch up" certain gaps in the theory of evolution, nor is he merely the First Mover, who left the world to its own fate. The creator of the universe is still acting in some way through the mechanisms of evolution. This action, however, does not manifest directly on the phenomenal plane, on which causal sequences of events are indicated, although the Creator pervades all the natural reality and is the cause and purpose of its occurrence.

It is also worth mentioning that Kloskowski does not blur the significant differences between the phenomenal (natural) and the philosophical (ontological) planes. He manages to cross and merge them on a new level, or, to use Michał Heller's term, immerses them in a common space.[153] Kloskowski demonstrates that, in this perspective, there is no controversy between evolution and creation. The continuation

152 K. Kloskowski, "Różnorodność i jedność życia," *Studia Philosophiae Christianae* 32, no. 1 (1996), p. 189.

153 M. Heller, "Czy istnieje autentyczna filozofia przyrody?" *Studia Philosophiae Christianae* 23, no. 1 (1987), p. 11.

of beings in existence is not a one-time creative act. It is stretched in time and does not exclude the variability of nature under the influence of natural factors. The creative act thus "allows beings to exist and to remain in time. In this case, the mechanisms of creation are directed by the Creator. It is He who calls upon existence and supports everything."[154] At the same time, processes in nature can occur in accordance with the natural order of things, those which are planned and foreseen by the Creator.

Kloskowski's concept is not free from certain difficulties. They relate, in particular, to the relationship between the Creator and the natural causes and mechanisms of evolution, as evidenced by the natural theories of evolution. Explanations are primarily required regarding the way of God's actions within nature, as a being transcendent to it. Kloskowski stops at fairly vague statements about God acting through natural processes, by evolution. It would be worth it to specify the precise consequences emergent from the fundamental difference between the temporal nature of natural reality and the eternal existence of God. But regardless of these difficulties, the model of evolutionary creationism is a proposition that demonstrates that there is no contradiction between creationism and evolutionism. Moreover, as it is a philosophical concept rather than a scientific theory, it does not position itself in opposition to either the resolutions of particular sciences, leaving them autonomy in their own area; or to the system of religious beliefs. He thus avoids the often-sterile disputes between naturalists and theologians, while at the same time demonstrating the possibility of working out a coherent picture of reality, one in which the vision of evolving nature does not exclude the existence of a reality transcendent in relation to the material world.

Conclusion

Kloskowski's book *Między ewolucją a kreacją* was the first such comprehensive study in Poland to include the problem of the relationship between creationism and evolutionism in both the subject-matter and metatheoretical aspects. This work, or its extended version from 1999 (*Filozofia ewolucji i filozofia stwarzania*, vol. 1), was cited by:

[154] K. Kloskowski, *Filozofia ewolucji i filozofia stwarzania*, vol. 2, p. 69.

Tadeusz Rutowski,[155] Adam Świeżyński,[156] Marek Dziewiecki,[157] Wojciech Cichosz and Krzysztof Gidziński,[158] Dariusz Adamczyk,[159] Józef Chwal,[160] and Tomasz Zalega.[161] The importance of Kloskowski's works is also evidenced by the fact that it was included in the bibliography of the article: "Ewolucjonizm" [Evolutionism] in *Powszechna encyklopedia filozofii* [*Universal Encyclopedia of Philosophy*].[162] The works can be also found in the bibliography of the article: "Ewolucja" [Evolution] in *Encyklopedia filozofii przyrody* [*Encyclopedia of the Philosophy of Nature*].[163] Kloskowski's model of evolutionary creationism is analyzed by Anna Lemańska.[164] Also Józef Dołęga[165] and Kazimierz Jodkowski[166] refer to Kloskowski's work on evolution and creationism.

---

155 T. Rutowski, "Czy istnienie zła da się pogodzić z istnieniem dobrego i wszechmogącego Boga?" *Studia Płockie* 25 (1997), pp. 91–98.

156 A. Świeżyński, "Początek Wszechświata – kreacja czy ewolucja?" *Forum Teologiczne* 9 (2008), pp. 17–27.

157 M. Dziewiecki, "Empatia i asertywność w komunikacji wychowawczej," *Horyzonty Wychowania* 9, no. 18 (2010), pp. 145–176.

158 W. Cichosz and K. Gidziński, "Pedagogiczno-katechetyczne możliwości zastosowania teorii powstania życia Hoimara von Ditfurtha," *Teologia i Człowiek* 18 (2011), pp. 129–151.

159 D. Adamczyk, *Stworzenie – opatrzność – ewolucja. Przyczynek do dialogu nauki i wiary* (Szczecin: Print Group, 2009), pp. 169–212.

160 J. Chwal, "Pogranicze nauk – na przykładzie epistemologii ewolucyjnej i innych zastosowań teorii ewolucji," *Pogranicze. Studia Społeczne* 20 (2012), pp. 297–320.

161 T. Zalega, "Ekonomia ewolucyjna jako jeden z nurtów współczesnej ekonomii – zarys problematyki," *Studia i Materiały. Wydział Zarządzania UW* 19 (2015), pp. 157–177.

162 J. Zon, "Ewolucjonizm," in: *Powszechna encyklopedia filozofii*, vol. 3 (Lublin: Polskie Towarzystwo Tomasza z Akwinu, 2002), pp. 335–351.

163 J. Zon, "Ewolucja," in: *Encyklopedia filozofii przyrody*, pp. 145–159.

164 A. Lemańska, "Kazimierza Kloskowskiego ewolucyjny model kreacji," in *Wokół biofilozofii Kazimierza Kloskowskiego. Wybrane zagadnienia*, ed. M. Bała (Peplin: Bernardinum, 2004), pp. 87–99; A. Lemańska, "Ewolucja a kreacja," *Studia Leopoliensia* 1 (2006), pp. 95–104; A. Lemańska, "Kreacjonizm ewolucyjny jako alternatywa koncepcji inteligentnego projektu," in *Teoria ewolucji a wiara chrześcijan*, ed. E. Wiszowaty and K. Parzych-Blakiewicz (Olsztyn: Wydawnictwo Uniwersytetu Warmińsko-Mazurskiego w Olsztynie, 2010), pp. 119–129.

165 J. Dołęga, "Ewolucyjny model kreacjonizmu," *Archeus. Studia z Bioetyki i Antropologii Filozoficznej* 7 (2006), pp. 5–22.

166 K. Jodkowski, *Spór ewolucjonizmu z kreacjonizmem. Podstawowe pojęcia i poglądy* (Warszawa: Megas, 2007).

On the first anniversary of Kloskowski's death, the Section of Philosophy of Nature of Faculty of Christian Philosophy at UKSW organized the conference "Creation and Evolution: Reconciled Twins?" The title referred to the subtitle of the second volume of Kazimierz Kloskowski's last book *Filozofia ewolucji i filozofia stwarzania*, which reads: *Pogodzone bliźniaki* [*The Reconciled Twins*]. In most of the lectures there were references to Kloskowski's views on the creation and evolution. Articles discussing and expanding some aspects of Kloskowski's model were subsequently published in the collective work: *Stwarzanie i ewolucja* [*Creation and Evolution*].[167] These include articles by: Julisław Łukomski ("Ewolucja w ujęciu ks. Kazimierza Kloskowskiego" [Evolution from the Perspective of Rev. Kazimierz Kloskowski]), Józef M. Dołęga ("Główne problemy ewolucyjnego modelu kreacjonizmu" [The Main Problems of the Evolutionary Model of Creationism]), Wiesław Dyk ("Kreacja i ewolucja w świetle praw przyrody" [Creation and Evolution in the Light of the Laws of Nature]), Bernard Hałaczek ("Pozorne bliźniaki: ewolucjonizm i kreacjonizm" [Seeming Twins: Evolutionism and Creationism]), Jerzy Andrzej Chmurzyński ("'Kreacjonizm' – pojęcie emocjonalne" ["Creationism": An Emotional Concept]).

Kloskowski's views on evolutionism and creationism have also been the subject of MA theses, such as those by: Maciej Szczodrowski, *Interpretacja ewolucji i kreacji w pismach ks. Kazimierza Kloskowskiego* [*Interpretation of Evolution and Creation in the Writings of Rev. Kazimierz Kloskowski*] (Warszawa: WT UKSW), Aleksandra Misiorowska, *Pozorny antagonizm między ewolucją a kreacją w koncepcji ks. prof. Kazimierza Kloskowskiego* [*Seeming Antagonism between Evolution and Creation in the Concept of Rev. Prof. Kazimierz Kloskowski*] (Warszawa: WFCh UKSW), Maria Misztal, *Krytyka Richarda Dawkinsa koncepcji ewolucjonizmu w pismach ks. Kazimierza Kloskowskiego* [*Criticism of Richard Dawkins' Concept of Evolutionism in the Writings of Rev. Kazimierz Kloskowski*] (Warszawa: WT UKSW).

Bernard Hałaczek sums up Kloskowski's reflections on evolution and creation in this way:

> Father Kloskowski lived in the present day. He perceived the fact of the increasing universality of evolutionary explanations, i.e. the fact

[167] *Stwarzanie i ewolucja*, ed. J. Buczkowska and A. Lemańska (Warszawa: Wydawnictwo UKSW, 2002).

of the globalization of evolutionism. Because at the same time he lived religiously, that is why he did not want to, he could not affirm the fact of a collision between faith in God the Creator with the view of the evolutionary development of life and man. Therefore, almost all of his creative effort focused on the harmonious fusion of evolutionism with creationism, on the fact that both these approaches were presented—according to his terminology—as twins.[168]

Important place of bioethics in research on human life

Introduction

In his academic activity, Kazimierz Kloskowski focused primarily on analyses regarding emergence, phenomenon, nature, and the evolution of biological life. It can be easily discerned when one considers his academic achievements chronologically: from the beginning of his academic career, he spent more attention on the aforementioned issues and considered them in the majority of his publications and public presentations. However, in the 1990s, a new area of interest appears in the life of the philosopher: bioethics. It is difficult to unequivocally and definitely determine the cause of Kloskowski's bioethical turn. Perhaps it was determined by the heated arguments and discussions which arose in Polish society about the admissibility of abortion (due to the Protection of Human Fetus Act which was being developed at the time), about euthanasia and medical futility (in the face of the dynamic development of palliative care centers and hospices), and about the future of transplantology (i.a. in the context of a low number of organ donors and challenging the brain death criteria).[169] An additional cause could be the fact that the aforementioned

[168] B. Hałaczek, "Głos w dyskusji na sympozjum w 5. rocznicę śmierci ks. prof. dr hab. Kazimierza Kloskowskiego," *Episteme* 57 (2006): *Rozmaitości ekofilozofii*, pp. 363–364.

[169] Cf. J. Jaroń, "Aktualny stan bioetyki w Polsce," *Mazowieckie Studia Humanistyczne* 2, no. 1 (1996), pp. 91–111; *Bioetyka polska*, ed. T. Biesaga (Kraków: Wydawnictwo Naukowe PAT, 2004); *Przeobrażenia systemowe w państwach Europy Środkowej i Wschodniej: stan aktualny i perspektywy*, ed. Z. Trejnis and B. Jodełka (Siedlce: Wydawnictwo Akademii Podlaskiej, 2004); J. Jaroń, *Aktualny stan bioetyki i ekologii w Polsce i na świecie* (Siedlce: Wydawnictwo Akademii Podlaskiej, 2005) (in the latter on K. Kloskowski see pp. 136, 310–312).

discussions were accompanied by those concerning competing worldview, in which representatives of the Catholic Church and the Polish Church hierarchy took an active part. In the face of the system transformation which began in Poland in 1990, the Polish Church attempted to gain influence on legal resolutions determining the beginning and the end of human life, something which aroused the opposition of atheist groups unwilling to cede social power to the Church. Thus, it may seem that Kloskowski attempted to join the discussion and took a specific stand on the aforementioned issues through his philosophical analyses. He might not have discussed all of the aforementioned subjects, focusing mainly on the issue of genetic engineering, but the way in which he conducted his analyses and resolutions must be considered to be of use in reflections on every bioethical question. Also interesting is the fact that Kloskowski did not strive for publicity or the popularization of bioethical issues, one of the most frequent motivators at the time. Nor did he directly participate in discussions in newspapers and journals, on radio and television. His utterances were strictly academic in character, comprehensive and methodologically ordered, generally free from worldview or religious argumentation, and referencing findings from the area of natural, medical, and social sciences, in particular, biological anthropology, human biology, molecular biology, genetics, medicine, psychology, and pedagogy. Therefore, Kloskowski attempted to shift the bioethical discourse to a strictly factual level, free from emotion and worldview argumentation, and first and foremost, to base it on a foundation of factual scientific findings. Regardless of his own religious and ethical beliefs, which were related to the Christian (Catholic) perspective of seeing the world, he sought and eventually proposed a style of presentation of the issues related to bioethics which could be accepted by everyone sincerely looking for answers and solutions to the dilemmas regarding human life, since he assumed that any idealization of science, education, and social life, conducted even in the name of a greater good, is harmful, leads to false resolutions, does not allow for authentic seeking of truth, and generates growing social conflicts.

Review of the problems related to bioethics

The first paper of Kloskowski on bioethics was published in 1991[170] and explored issues related to transplantation. While analyzing the contemporary status of transplant medicine, the author pointed out both the enormous beneficial potential that the development of the transplantology brings and the dangers related to assigning exaggerated possibilities to it in the area of prolonging human life. He focuses especially on the issues related to the quality of human life, which, as a result of transplants, may not necessarily and always be satisfactory enough to justify complicated, expensive medical procedures which do not guarantee to cure the patient or providing him with long life. Moreover, Kloskowski noted that the dynamic development and popularization of transplantology was accompanied by a shortage of organ donors, which in turn may lead to various misuses in procedures of obtaining organs (e.g. the issue of getting the agreement of the deceased or their family to take organs for a transplant). In the 1990s, there had not been many analyses of the kind in Polish literature and the point of view presented by Kloskowski may be considered as somewhat "against the current" of the common, sometimes uncritical, awe of the possibilities of transplantology and seeing it as the perfect treatment of human physical limits.

His next two publications focused on genetic engineering.[171] In his characteristic way, Kloskowski separated the biological aspect from the ethical aspect of the issue. In his opinion, it should first be determined what genetic engineering is as a form of human scientific activity and what are its contemporary effects related to conducted research. Thus, the author meant to present its methodology, achievements, and perspectives. Only later, in his opinion, could one evaluate the aforementioned aspects and point out the eventual necessity of limiting or otherwise directing human activity in the area. Of great importance for Kloskowski was that the proposed resolutions in the

[170] K. Kloskowski, "Bioetyczne aspekty eksperymentów medycznych. Transplantacje – nadzieje i zagrożenia," *Miesięcznik Diecezjalny Gdański* 35, no. 10–12 (1991), pp. 319–328.

[171] K. Kloskowski, "Wybrane problemy inżynierii genetycznej. Część pierwsza: Przyrodniczy aspekt zagadnienia," *Miesięcznik Diecezjalny Gdański* 36, no. 4–6 (1992), pp. 138–151; K. Kloskowski, "Wybrane problemy inżynierii genetycznej. Część druga: Bioetyczny aspekt zagadnienia," *Miesięcznik Diecezjalny Gdański* 36, no. 7–9 (1992), pp. 243–254.

area of ethics or codified law were not suspended in an academic, factual vacuum, and even more importantly, that they were not a consequence of accepting myths or superstitions, which always accompany scientific area development, as the truth.

In his next publication, Kloskowski developed the latter area of reflection.[172] He focused on comparing the real achievements and findings of genetics with images of its results and further possibilities possessed by an average person (sequencing and mapping of genes, gene therapies, hereditary diseases). He critically approached genetics as a tool used in creating a "perfect human," with no genetic defects or genetically shaped according to the expectations of e.g. parents or society. He considered this understanding of genetics to be degenerative since, according to it, genetics is only a tool used in eugenics. He also pointed out the utopian aspect of actions such as these and their harmfulness from the point of view of social diversity, which is necessary for its proper functioning in the aspect of ethical development and improvement (altruism, ethics of care, noticing human value in perspective other than that of the body and physical fitness, etc.).

> It seems that manipulating genes of specific cells in order to eliminate diseases is, in my opinion, recommended, and even useful. Nonetheless, it is close enough from these kinds of manipulation to experiments on the human genetic material. I fear that the passage from the first kind of manipulation to the second one may happen in a way that is not thought-through, that is, without including ethical aspects of gene therapy. Moreover, at least for now, scientists are not able to predict the reactions of organisms with genetically changed cells.[173]

Another publication which touched upon genetic engineering is a repetition and expansion of certain themes of the publication discussed above.[174] The author focuses on the problems caused by the contemporary intense development of genetic engineering, e.g. the unpredictability of all consequences of the genetic manipulations,

[172] K. Kloskowski, "Genom ludzki. Wyobrażenia a stan faktyczny badań genetycznych," *Studia Philosophiae Christianae* 30, no. 1 (1994), pp. 130–139.

[173] Ibidem, p. 139.

[174] K. Kloskowski, "Bioetyczne problemy inżynierii genetycznej," *Zeszyty Naukowe Politechniki Gdańskiej*, no. 1(511) (1995), pp. 7-17.

stemming from the limits of human perception and the undetermined character of the genetic processes; insufficient involvement and too slow reactions of organizations and teams created in order to determine ethical and legal norms which would regulate activity in the area of genetic engineering; a too one-dimensional treatment of genetic engineering by its current creators as ethically neutral activity; presenting genetic engineering in the popular media as an activity of "redemptive" character for both the individual and the society, which would save them from numerous problems of a medical, economic, pedagogical, and educational nature. The distance that Kloskowski takes towards genetic engineering is not an attempt to discredit it or a sign of an urge to block its further development. However, in the opinion of the Polish philosopher, more caution and distance should be maintained towards the current and expected in the future achievements of the research area since, were it to escape the rational control of scientists, it could result in dramatic consequences for both individuals and whole societies.

Bioethical issues were also considered in an article on the assessment of the admissibility of genetic testing.[175] Kloskowski believed that the admissibility of genetic testing was limited by the priority of the well-being of a human over his freedom, since there is not only freedom but also the moral bond between human and nature as well as between humans.[176] Any ethical assessment of genetic manipulation depends on the internal content of researchers actions, that is, on their honesty and responsibility towards their own consciences.

> Of course, not all scientists conducting genetic manipulations share the view which amounts to shocking the world with some

175 K. Kloskowski, "Inżynieria genetyczna wyzwaniem dla bioetyki," *Studia Teologiczne* 13 (1995), pp. 396–408.

176 "Thus, genetic engineering allows us to intervene in the human genome in a way unimaginable before, while simultaneously being a great danger. It is, nonetheless, an intervention into mysterious areas; that's why it needs to be proceeded by adequate ethical assessment, not only discovery passion or epistemic genetics. In this context, the following question becomes crucial: does genetic engineering ensures human development, does it in its nature allow to maintain respect for a human being as an individual and not only a good model to conduct a specific experiment on? After all, not everything that is possible to do due to genetic engineering can be considered good for a human being and ethically admissible." K. Kloskowski, "Inżynieria genetyczna wyzwaniem dla bioetyki," p. 402.

> amazing result. Nonetheless, when following genetic literature, I get the impression that scientists following these principles somehow purposefully did not awaken the ethical consciousness of contemporary human beings, emphasizing instead a bright vision of its effectiveness, particularly in the area of the human genome.[177]

Moreover, in his opinion, the developing disjunction between the levels of biological and ethical/philosophical knowledge should be eliminated.

> A human being as a person is able to assess himself, his actions, and surrounding him reality, from an ethical and moral point of view. This obvious postulate leads to different interpretations of genetic engineering experiments, depending on whether it's anchored in the bioethics understood as a natural science, or in the bioethics treated as a normative science. And so, the bioethics in the first meaning (as a natural science) bases its norms on uncritical assumptions that scientists are allowed to do anything. Science and progress justify any human activity. Within my concept of bioethics (normative science), a person appears as an entity of objective ethical order. His freedom can, unfortunately, be a destructive factor, justifying and leading to a feeling of unrestricted domination over nature, while due to his physicality, he is a fragment of nature. As a consequence, he should be aware that his life and actions effectiveness depends on the proper usage of nature.[178]

Issues related to ethics are also explored in a publication on the relationship between humans and the environment when considered from the ethical perspective.[179] It includes the findings of Kloskowski in the area of axiological issues related to ecophilosophy, including for instance the value judgement of human life and health. His axiology was developed on the basis of ontology and anthropology. According to the proposition of Kloskowski, biological life, as well as human life and health, are shown as the highest values whilst not being absolute ones. Simultaneously, the author points out that the social and

177 Ibidem, p. 407.

178 Ibidem, p. 405.

179 K. Kloskowski, "O naczelnej zasadzie etycznej relacji: człowiek i środowisko," in *Człowiek i środowisko. Humanistyka i ekologia: prace I Olsztyńskiego Sympozjum Ekologicznego, Olsztyn 5–6 maja 1994 roku*, ed. J. Dębowski (Olsztyn: Wyższa Szkoła Pedagogiczna, 1995), pp. 107–112.

biological environment is most frequently treated as a basic value and common property. Developed within the axiology of ecophilosophy, values can become the basis to work out general ethics and environmental ethics and even ecological legislation. As a consequence, Kloskowski notes that scientific knowledge related to the social and natural environments, as well as developed and accepted environmental ethics, may become the correct basis of ecodevelopment, including the necessity of utilizing bioethics.[180]

The especially intense interest of Kloskowski in bioethical issues (particularly genetic engineering) is confirmed by a series of several articles published in Polish and English in 1996–1997.[181] Common motifs to be found in the works are: an adequate presentation of contemporary state of research in the area of genetic engineering; showing achievements of the genetic engineering as equivocal in terms of options of further usage; treating bioethics as a necessary secondary tool for correct, non-degenerate, and serving humans development of genetic testing; putting forward the demand to make bioethics a mandatory subject for students of medical and biomedical courses, as well as of biological courses focused on conducting research in the area of genetics; popularizing knowledge on bioethics in school, academic, and teachers' education.

---

180 Cf. J.M. Dołęga, "Nauki środowiskowe na początku XXI wieku," *Pedagogia Christiana* 28, no. 2 (2011), p. 21.

181 K. Kloskowski, "Bioethical aspects of genetic engineering," in *Peculiarity of Man as a Biocultural Species*, ed. A. Wiercińska (Warsaw: Wydawnictwo Sorus; Zakład Antropologii Historycznej, Instytut Archeologii, Uniwersytet Warszawski, 1996), pp. 95–102; K. Kloskowski, "Genetic Engineering: A Technique of the Future. Is It a Threat or a Hope?" *Dialogue and Universalism* 6, no. 8–9 (1996), pp. 115–125; K. Kloskowski, "Pierwszeństwo etyki i bioetyki przed genetyką," *Znak* 48, no. 12 (1996), pp. 75–81; K. Kloskowski, "Bioethical Interpretations of Genetic Manipulation," *Dialogue and Universalism* 7, no. 7–8 (1997), pp. 141–147; K. Kloskowski, "Genetyka, bioetyka i edukacja biologiczna," in *Teoria i praktyka ochrony środowiska w Polsce*, vol. 2, ed. J.L. Krakowiak (Warszawa: Centrum Uniwersalizmu UW, 1997), pp. 39–47; K. Kloskowski, "Genetic Engineering: A Technique of the Future. Is it a Fact or a Hope?" in *International Conference Veterinaring Biotechnology Management in Central-Eastern Europe*, ed. K.J. Wojciechowski (Warszawa: SGGW, 1997), pp. 31–40; K. Kloskowski, "Bioethical Interpretations of Genetic Manipulation II," in *IV International Biotechnology Summer School*, ed. E. Łojkowski (Gdańsk: Akademia Medyczna w Gdańsku; Uniwersytet Gdański, 1997), pp. 80–90; K. Kloskowski, "Bioethical Interpretations of Genetic Engineering," in *Veterinary Biotechnology Management in Central-Eastern Europe* (Warsaw: Warsaw Agricultural University; SGGW, 1997), pp. 156–167.

Kloskowski's last works on bioethics also include publications from 1998–1999.[182] They consist of continuations and expansions of issues presented in his earlier works. In these, the author focused on analyzing the following issues: methodological and philosophical aspects of the genetic engineering; various understandings of bioethics and their evaluation; misunderstandings connected to the cognitive status of biological sciences, especially genetics; methodological division between cognitive areas of human biology and ethics; evaluation of methodology of obtaining proposed bioethical solutions and methods of their popularization; raising bioethical awareness in society.

The final publication of Kloskowski, which was published posthumously, was an article published in English.[183] The author used it to evaluate the potential of genetic engineering and dangers connected to this scientific area. He once again considered the issues of injecting new genes into the receiver's body and the nature of genetic engineering. He also analyzed the objective of the *Human Genome Project* in the context of the rule of responsibility in science and maintaining the integrity of human nature.

The works of Kloskowski in the bioethical arena also include two other, less important publications: a review of a well-known and broadly discussed book of Jean Bernard and its translation into Polish.[184] The publications show Kloskowski's intention to introduce Polish readers to the perspectives of foreign authors, whose views became the subject of a multitude of discussions and controversies at the time. The consequent realization of this plan may also be noticed

182 K. Kloskowski, "Does Biotechnology Need Bioethics? II," in *V International Biotechnology Summer School*, ed. E. Piłka (Gdańsk: Akademia Medyczna w Gdańsku; Uniwersytet Gdański, 1998), pp. 250–280; K. Kloskowski, "Concern for Life: Axiological and Ethical Conditioning of the Biotechnology Research," in *VI International Biotechnology Summer School*, ed. J. Bigda (Gdańsk: Akademia Medyczna w Gdańsku; Uniwersytet Gdański, 1999), pp. 171–196; K. Kloskowski, "Does Biotechnology Need Bioethics? I," *Studia Philosophiae Christianae* 35, no. 1 (1999), pp. 5–17; K. Kloskowski, "Klonowanie. Ostatni absurd człowieka XX wieku?" *Medycyna Wieku Rozwojowego* 3 (1999), (Appendix 1), pp. 81–102.

183 K. Kloskowski, "Genetic Engineering: The Promise and Perils," *Dialogue and Universalism* 10, no. 5–6 (2000), pp. 25–30.

184 K. Kloskowski [review]: J. Bernard, *Bioéthique. Un exposé pour comprendre. Un essai pour réfléchir*, Flammarion, Paris 1994, *Studia Philosophiae Christianae* 32, no. 1 (1996), pp. 340–343; Polish edition: J. Bernard, *Bioetyka. Prezentacja stanu badań*, trans. K. Kloskowski (Gdańsk, 1995: Published by the translator's own effort).

in Kloskowski other publications on bioethics. The author repeatedly references the views of Jacques Monod, Jacques Testart, John Maddox, Thomas H. Murray, Theodosius Dobzhansky. Being well-acquainted with the contemporary literature on the subject, Kloskowski attempts to anchor his reflections in its context and does not hesitate to polemize with the authors whose bioethical views he regards as incorrect. Thus, the reader has an opportunity to familiarize himself with a broad overview of views of the researchers who set the tone of discussions on bioethical issues at the time.

It should be noted that the main publication of Kloskowski on bioethics remains a book *Bioetyczne aspekty inżynierii genetycznej. Wybrane problemy* [*Bioethics Problems of Genetic Engineering: Selected Issues*] published in 1995.[185] It contained his main findings on the state of research in the area of genetic engineering and the priority of ethics and bioethics over genetics. It also contained most detailed proposition of his differentiation into bioethics of the "facilitating" and bioethics of the "border." Due to the significance of the solutions presented by Kloskowski in this publication, it deserves its own, more detailed presentation. It will allow the significance of the Polish philosopher to be given its due, thanks to its far-sighted nature.

The main findings regarding bioethical issues in the area of genetic engineering and a proposal of a method to solve them

As mentioned before, the academic and research achievements of Kazimierz Kloskowski in the area of bioethics focus on issues connected to the development of genetic engineering. His analyses appear to be, on one hand, an expression of appreciation of researchers achievements and deep hope for improvement of the situation of people suffering from genetic disorders, cancerous diseases, etc., while, on the other, they are closely connected to the belief that entering the area of these issues is unavoidably connected with the necessity of solving various bioethical dilemmas which should not be ignored. "The progress of natural sciences is undoubted, but it is not the only prospect of researching humans, their actions, and the reality surrounding them. Next to the natural sciences, there are also anthropological and axiological sciences, which are the basis of bioethical

185 K. Kloskowski, *Bioetyczne aspekty inżynierii genetycznej. Wybrane problemy* (Warszawa: Wydawnictwo ATK, 1995).

resolutions of genetic engineering achievements."[186] It is also crucial that the publications of Kloskowski contain intuitions and suggestions regarding the future development of genetic engineering which now, twenty years after the death of their author, turn out to be accurate in a nearly prophetic way.[187]

In the aforementioned book, *Bioetyczne aspekty inżynierii genetycznej. Wybrane problemy*,[188] Kloskowski expressed his view on the issue of development and perspective of genetic engineering and the necessity of supporting and directing its actions by fully utilizing proper bioethical reflection.[189] The publication begins with an interesting historical overview of the development of genetic engineering and a presentation of its contemporary state of research. The author presents the most spectacular achievements of genetic engineering by the

[186] Ibidem, p. 9.

[187] For example: "The Human Genome Project will likely turn out to be particularly helpful in discovering genes responsible for various hereditary diseases, since once sequences of genes are known and information on enzymes disturbances during specific diseases is obtained, it will be simple to determine which gene coding a specific enzyme is placed on a specific chromosome. As a consequence, the knowledge will enable e.g. parents to determine the probability of their children having any hereditary disease, including multifactorial, that is, multigenic diseases, which are the least known diseases in the terms of method of inheriting them. Analogically, the researchers hope to localise all monogenic diseases due to the Human Genome Project. Currently part of them was discovered primarily due to using the aforementioned finger-printing DNA method. Also, of considerable significance are observations of the various biochemical changes of cells. Thus, mapping the whole human genome, and then its sequencing, that is, localising heredity material and understanding the influence of sequenced genes becomes crucial. Only once this is achieved can the exchange or improvement of 'incorrect' genes in the genome be attempted." K. Kloskowski, "Genom ludzki. Wyobrażenia a stan faktyczny badań genetycznych," pp. 137–138. Cf. A. Kochański, "Sekwencjonowanie genomu/eksomu człowieka – aspekt bioetyczny," *Studia Ecologiae et Bioeticae* 12, no. 1 (2014), pp. 29–38.

[188] Descriptions and reviews of this publication may be found in: K. Krajewski [review], *Studia Teologiczne* 14 (1996), pp. 407–408; D. Stańko [review], *Studia Philosophiae Christianae* 33, no. 1 (1997), pp. 200–202.

[189] "The primary goal of the presented reflection was to present some aspects of the attitude towards issues related to the genetic engineering and to point out the necessity of changing this attitude through education of contemporary human beings. I wished to signal dangers which may occur when attitudes regarding the role and place of bioethical reflection in the 'humane' conduct of genetic manipulations are ignored." K. Kloskowski, *Bioetyczne aspekty inżynierii genetycznej. Wybrane problemy*, p. 150.

beginning of the 1990s. Moreover, he points out the practical uses of genetics in agriculture, in the "reconstruction" of extinct species, and in experiments on the human genome. The presented factual state clearly shows that genetic engineering plays a huge role in many areas of life. Against this background, the author analyses the actions conducted by scientists in order to solve problems which apply to people.

The second part of the book is dedicated to the axiological and anthropological conditions necessary to correctly approach genetic experiments in light of bioethical norms. It presents the various conceptions of human beings and different systems of values.

> … classic, that is, unconditional anthropological views, are not always understandable because of their abstractness, and in consequence, remain somehow inadequate in the face of the complexity of issues related to the relation between the geneticist-researcher and the patient. Relative anthropologies, on the other hand, reduce human beings to some (often marginal) properties, which can't be a basis of axiological and ethical resolutions of genetic experiments. However, they make sense and fulfil their role when they are connected to an ethical system due to which axiological and anthropological resolutions gain a global character, that is, over-individualistic. It primarily comes down to understanding human being as a value in itself.[190]

The author points the necessity of maintaining the balance between being a person changing the world with his actions and being a person taking responsibility for these actions; since knowledge of genetics and effectiveness in using its processes themselves, even brought to perfection, are not a sufficient criterion of being a "correct" method of conducting genetic experiments from the ethical and axiological point of view. Biological knowledge must be proceeded by assumptions resulting from a "healthy" system of values, that is, a system in which a human being objectively sees his own value first, both as a geneticist conducting genetic experiments, and as one subjected to these experiments. In relation to this, all experiments consisting of introducing foreign genes into human gametes and human genes into animal gametes should not be conducted. The author is not opposed to gene therapies conducted on cells other than gametes.

190 Ibidem, p. 111.

The last part of the book is dedicated to an attempt to collate the correct criteria for evaluating genetic experiments within the "bioethics of the border," which is an alternative to "bioethics of facilitating."

> The conducted reflection points out first and foremost how extraordinarily important is that scientists (geneticists, molecular biologists) engaging in genetic engineering do not omit and exclude ethical and philosophical questions from their practice. Fascinated with the results of their experiments, they often do not wish to—or are afraid to—seek real answers to the question of whom and what exactly genetic manipulations serve. Moreover, even if it is possible to conduct genetic manipulations from the technical point of view, are they admissible from the point of view of ethics? (bioethics of the 'border'; bioethics of 'facilitating').[191]

The author's further findings and propositions focus on this differentiation. In Kloskowski's opinion, "bioethics of facilitating" has its source in all incorrectness in the understanding of human and his dignity, value system, and finally the science itself. It characterizes with ignoring priority of ethical rules which are applicable in any time and place, practical fulfilment of the rule "the end justifies the means," treating human beings relatively, that is, assuming that the dignity of an individual does not result from his ontic, psychological, and physical structure, but from his relationship with the society and his own self. All kinds of genetic experiments are admissible within it, without any limits. Meanwhile, the "bioethics of the border" has its source in learning good based on rational thinking. It establishes imperative norms and borders of genetic manipulation. The rules of utilizing genetic engineering within it are as follows: (1) the rule of the priority of human well-being over human freedom; (2) the subject of human activity within genetic engineering must be always good, not evil; (3) an awareness of the dignity of a human being, his personal, psychological, and physical structure, as well as his bond with nature; (4) awareness that ethical norms are the borders of genetic engineering (and any science in general); (5) awareness of responsibility for genetic manipulations, which is limited by possibility of invoking the highest value. Finally, the "bioethics of the border" is based on an

191 Ibidem, p. 151.

ethics of personalism and Christian spiritualism which the author advocates.[192] However, in his opinion, not only this kind of ethics conditions “borders” of genetic engineering activity. For he notes that the main problem is the current understanding of science in general, of scientific activity and the level of self-awareness of scientists. In relation to this, he formulates and considers the question of whether genetic engineering experiments on people should be conducted, and if so, which ones. In this matter, he refers to the division of scientists proposed by Paul Chauchard.[193] According to the French philosopher, for certain groups of scientists, medical experiments in the area of genetic engineering are a tool, enabling making changes in the reality of human individual and social life, as well as attaining professional fulfilment. For others, on the other hand, conducting such experiments is a real and serious danger not only for single individuals but also whole societies. The first attitude, in Kloskowski’s opinion, is an expression of human “loftiness” and “self-confidence,” which applies to the possibility of unlimited self-determination about oneself, about the life of other people, and about methods of solving medical problems. This attitude simultaneously shows the belief that eventually a panacea for all human ailments and physical limits can be found, and risks depersonalizing people, especially in the area of genetic engineering treated by many as one of the main measurements of the scientific, technological, and civilizational progress of humans.

> The nature of the error is in making all ethical choices independent of choosing values and concept of humanity. ... All the while it is obvious that if human life is endangered by physiological and anatomical or even genetic errors of his body, then removing these errors is a task of nothing other than genetic engineering. It should

[192] “Obviously, it needs to be strongly emphasised here that bioethical resolutions are based on rational thinking, however, this type of thinking can’t be identified with ethical rationality utilised by genetics using the genetic engineering technology. This statement is a key to my own propositions, that is, analysing genetic experiments either in the light of bioethics of the ‘facilitating,’ or bioethics of the ‘border.’ Choosing the resolutions of bioethics of the ‘border,’ I do believe that it is the only way to adequately answer question of good and evil, and thus, what is admissible or not. This kind of bioethics is based on the ethics of Christian spiritualism and personalism.” Ibidem, p. 148.

[193] Cf. P. Chauchard, *Biologia i moralność*, trans. A. Pilorz (Warszawa: Pax, 1966), pp. 27–29.

> be remembered, however, that a human being is a good in himself, and not an object to fulfil the wishes of his nearest and dearest, not a bringer of happiness for someone else; this fact won't be changed by referencing either the rules of situational ethics or biological knowledge. The goal is not, by any means, to negate this way the general validity of genetic interference. The heart of the matter is that genetic engineering procedures should not be preceded by choosing evil, even if various subjective additional values were presented, such as "this person has a right to be happy," "why not help"—using every mean available to make them healthy. In such calculation, a human being always becomes depersonalized, and that is the nature of evil.[194]

Kazimierz Kloskowski brings attention to conflicts and dangers not only of an ethical but also a scientific nature which are caused by genetic experiments. In light of this, the question of the nature of actual scientific progress appears. In Kloskowski's opinion, actual scientific progress consists not only of successes in the area of natural sciences but also achievements and findings in the area of anthropology and axiology. It means that solving problems and dilemmas connected to scientific progress only on the level of science itself is not enough. It is necessary to introduce the broader perspective of philosophy of human and philosophy of values, proceeded by ethics and bioethics, to the area of experiments. Kloskowski believes that modern science consists not only of researching reality in order to know and understand it through seeking regularities of nature and creating its image but also more and more frequently of egoistic, utilitarian, and commercial uses of its results, which are not necessarily in accordance with the initial assumptions on the conducted experiments. For example, discovering the structure of DNA not only contributed to learning about the structure and functioning of living organisms (including humans) and to the development of genetics, but also resulted in interfering with genetic material, its structure, and even inheritance mechanisms. These possibilities, in turn, made it possible for humans to interfere with the natural reality surrounding them, changing it according to the needs determined by humans, and exploiting its biological resources according to the needs of specific social groups

194 K. Kloskowski, *Bioetyczne aspekty inżynierii genetycznej. Wybrane problemy*, p. 146.

or individuals. This activity determined economic and social results and repeatedly resulted in the deepening of social inequality, discrimination, and conflicts of a legal or even military nature.

Kloskowski considers genetic engineering to be the primary technology of the future. Thus, he acknowledges the pressing need for a far-sighted and deep reflection over this area of scientific research in order to in a way "precede" future research, to prepare ourselves for the dilemmas connected to it, and to determine its scope. The research may bring positive results for humans, such as production growth, limiting hereditary diseases, and even eliminating genetic defects, but they can also have negative results, e.g. dangers related to the artificial selection of individual features (including those of human beings), selective genetic interferences for eugenic purposes, using organism cloning techniques consisting of creating copies of organisms with an expected genetic structure. Therefore, Kloskowski considered issues resulting from genetic engineering research and the possibilities of genetic treatment created by it, as well as the limits of utilizing genetic engineering in genetic experiments from the perspective of the future usage of their results for human good and with an awareness of their significance for human life.

> … It seems justified to recall what was pointed out by J. Bernard … . The author pointed out the necessity of following two rules. Firstly, "what is not scientific, is not ethical." It means that the highest scientific value of all genetic research should be ensured by scientists first before they are evaluated from the ethical point of view. Secondly, "everything that is scientific is not necessarily ethical."[195]

Thus, Kloskowski's postulates and propositions also possess the value of universality, that is, it can be assumed that they are up-to-date and will remain so regardless of the further development of genetic engineering. This is because they were thought out as certain methodological and bioethical frameworks and, simultaneously, should help scientists-geneticists to resolve doubts and make decisions regarding research, as long as they wish to acknowledge the presence of these bioethical dilemmas and the need for their correct and informed solving.

[195] Ibidem, p. 147.

Kazimierz Kloskowski explored the aforementioned issues in the 1990s. This reminder is important since genetic engineering and molecular biology have developed very rapidly and their current achievements clearly surpassed the state of research of the time when they were analyzed and presented by the Polish philosopher. Thus, it is possible to attempt to contest the value of Kloskowski's publications, regarding them as antiquated and mostly outdated. However, their value does not come first and foremost from the adequacy to the real description of genetic testing and its results, but rather, it results from the universal treating of the entirety of genetic engineering development in the perspective of its bioethical non-neutrality and intuitions and prognoses expressed by the author which turned out to be right. A confirmation of this belief is contemporary literature regarding genetic testing and returning over and over discussions on its admissibility.[196] Every achievement in the field which has been lauded by the media, as well as every misuse resulting from the commercialization of research, is broadly commented and discussed by scientists, ethics, lawyers, and representatives of religions. It shows the high susceptibility of society to issues related to genetic engineering and its significance for human individuals and social life. In light of the above, the questions asked by Kloskowski ("Do the actually sometimes amazing results of genetic experiments prove actual human progress?"; "Should— and if so, in which part—achievements of the genetic engineering be interpreted in the light of clearly and precisely determined anthropological, axiological, and ethical norms?") and his diagnosis of the basic problem ("Humans became people who were able to change the reality surrounding them. In a way, man has achieved what had been assigned for ages as the sole province of the gods. ... Everything that is connected to genetic engineering confirms this vision"), as well as the main proposition of its solution ("noticing the possibility

[196] For example: J.H. Evans, *Playing God?: Human Genetic Engineering and the Rationalization of Public Bioethical Debate* (Chicago: University of Chicago Press, 2002); R.M. Berry, *The Ethics of Genetic Engineering* (New York: Routledge, 2010); K.R. Smith and S. Chan, J. Harrins, "Human Germline Genetic Modification: Scientific and Bioethical Perspectives," *Archives of Medical Research* 43 (2012), pp. 491–513; M.-W. Ho, "The New Genetics and Natural versus Artificial Genetic Modification," *Entropy* 15 (2013), pp. 4748–4781; S. Patra and A. Andrew, "Effects of Genetic Engineering – The Ethical and Social Implications," *Annals of Clinical and Laboratory Research* 3, no. 1 (2015), p. 5; S. Mukherjee, *The Gene: An Intimate History* (New York: Scribner, 2016).

of creating 'bioethics of facilitating' and 'bioethics of the border' as a science regulating all genetic actions") did not lose their actuality. This is all the more so since genetic engineering, although still flourishing, remains unable to be its own judge.

Conclusion

The premature death of Kazimierz Kloskowski prevented him from fully developing and systematizing his bioethical views. It may be assumed that this research area would still be being explored by him, especially considering the current dynamic development of genetic testing and bioethical discussions unceasingly accompanying it. Unfortunately, we will never find out what further propositions would he have offered, or how would he interpret and prognose the future of genetic engineering. Nonetheless, it should be assumed that he consistently advocated that ethical norms and legal resolutions be created on the basis of reliable scientific knowledge, not myths and distortions accompanying it, and including the priority of multidimensionally understood human well-being, not only human freedom and striving to obtain complete control over genetic processes occurring within human body. He would surely also advocate the necessity of constantly intensifying educational efforts aimed at making society aware of both the blessings and dangers of genetic engineering development, for freeing the propositions of bioethical resolutions from any ideology, mythology, and manipulation, and for conducting bioethical discourse in a way which is free of environmental and worldview prejudices.

The bioethical research which interested Kazimierz Kloskowski was continued by his co-workers and students. Anna Latawiec, Kloskowski's co-worker at the Faculty of Christian Philosophy, undertook the issues of human death, bioethics status, and genetic engineering in her publications.[197] Research conducted by the philosopher also

[197] A. Latawiec: "Bioetyka, ekofilozofia i filozofia umysłu u progu trzeciego tysiąclecia. Rozważania w świetle najnowszych osiągnięć naukowo-technicznych," *Humanistyka i Przyrodoznawstwo* 5 (1999), pp. 105–116; "Implikacje filozoficzne inspirowane osiągnięciami inżynierii genetycznej," in *Bioetyka i ekofilozofia. Materiały z Konferencji zorganizowanej przez Katedrę Filozofii i Socjologii WSRP w Siedlcach (11 grudnia 1997)*, ed. J. Jaroń (Siedlce: Wydawnictwo WSRP, 1999), pp. 159–170; "Człowiek wobec cierpienia i śmierci?" in *Człowiek i pustka*, ed. Z. Hull and W. Tulibacki (Olsztyn: Olsztyńska Szkoła Wyższa, 2000), pp. 218–225;

became an inspiration for Adam Świeżyński, an employee of the Faculty of Christian Philosophy and his student, who published a series of articles on euthanasia, human death medicalization, palliative care, and suicide.[198] Bioethical issues became a subject of research conducted within the preparation of academic theses written under the direction of Kazimierz Kloskowski.[199]

Kloskowski's publications on bioethical issues are frequently cited in the Polish literature and, albeit less frequently, in foreign literature. His findings are appreciated by well-known and esteemed Polish philosophers and ethics, as well as environmental scientists and

"Filozoficzno-teologiczne implikacje klonowania embrionów ludzkich," in *Bioetyczne problemy inżynierii genetycznej. Materiały na III Krajową Konferencję z cyklu „Nauka na przełomie wieku", 5 czerwca 2000 roku*, ed. W. Dyk (Szczecin: Wydawnictwo Uniwersytetu Szczecińskiego, 2000), pp. 39–51; "Ausgewählte Schutzmechanismen der Natur als Argument für Rationalität in der Gentechnik. Selected Defensive Mechanisms in Nature as an Argument for Rationality in Bioetics," in *Rationalität in der Angewandten Ethik. Racionalita v aplikovaných etikách. Rationality in Applied Ethics*, ed. P. Fobel, G. Banse, A. Kiepas and G. Zecha (Banská Bystrica: Vydavateľstvo Kniháreň – Ján Bernát, 2004), pp. 115–120.

198 A. Świeżyński: "Śmierć, której rzucamy wyzwanie. Wybrane problemy leczenia i opieki nad pacjentami terminalnie chorymi i umierającymi," *Collectanea Theologica* 69, no. 4 (1999), pp. 71–95; "Śmierć, której pragniemy. Zasadnicze motywy działania samobójcy," *Collectanea Theologica* 70, no. 3 (2000), pp. 109–137; "Śmierć innych. Eutanazja w kontekście przemian mentalności współczesnych społeczeństw," *Collectanea Theologica* 70, no. 4 (2000), pp. 67–97; "Wybrane elementy modelu śmierci 'zdziczałej'," *Studia Philosophiae Christianae* 37, no. 1 (2001), pp. 157–174; "Zracjonalizowany model umierania," in *Problemy współczesnej tanatologii*, vol. 5, ed. J. Kolbuszewski (Wrocław: Wrocławskie Towarzystwo Naukowe, 2001), pp. 107–112; "'Śmierć z wyboru' – filozoficzny aspekt samobójstwa," *Studia Philosophiae Christianae* 38, no. 1 (2002), pp. 82–98.

199 Master dissertations: A. Pełka, *Manipulacje na genomie ludzkim. Wybrane zagadnienia bioetyczne* (Warszawa: ATK, 1994); R. Penalver, *Transplantacje. Wybrane zagadnienia bioetyczne* (Warszawa: ATK, 1994); J.P. Winiarski, *Relacje pomiędzy cechami osobowości według teorii „Dawcy i Biorcy" a dobór ról społecznych* (Warszawa: ATK, 1994); A. Rudnicka, *Bioetyczne aspekty diagnostyki prenatalnej* (Warszawa: ATK, 1996); K. Justat, *Problematyka transplantacji w kontekście ustawy o pobieraniu i przeszczepianiu komórek, tkanek i narządów z dn. 26.X.1995 roku* (Warszawa: ATK, 1997); M. Woźniak, *Koncepcja genu w ujęciu Richarda Dawkinsa: próba interpretacji biologicznobioetycznej* (Warszawa: ATK, 1997); D. Ciećwierz, *Aktualne możliwości medycyny reprodukcyjnej na przykładzie metody zapłodnienia „in vitro". Próba oceny etycznej wybranych zagadnień* (Warszawa: ATK, 1997); D. Kozłowska-Nowak, *Aberracje chromosomalne. Implikacje bioetyczne oraz prawne* (Warszawa: ATK, 1997; A. Świeżyński, *Zagadnienie godnej śmierci człowieka. Wybrane problemy bioetyczne* (Warszawa, ATK 1998). Doctoral thesis: I. Grochowska, *Eugenika. Wybrane aspekty bioetyczne* (Warszawa: UKSW, 2000).

representatives of medical sciences, such as: Andrzej Paszewski,[200] Tadeusz Biesaga,[201] Magdalena Fikus and Barbara Chyrowicz,[202] Leszek Kuźnicki,[203] and Roman Tokarczyk.[204] The main publication of Kloskowski's in the area of bioethics (*Bioetyczne aspekty inżynierii genetycznej. Wybrane problemy*) is still recommended as obligatory reading in curricula of various courses at numerous Polish universities. The bioethical views of Kloskowski also became the subject of academic theses.[205] To show the full picture of the reception of bioethical views of Kazimierz Kloskowski it needs to be mentioned that they were

[200] "K. Kloskowski, correctly in my opinion, notes that 'ethical values (good) are reduced to values available to and verifiable by natural and social sciences,' which should be treated in a dynamic way. ... It is worth noting that in the genetic manipulations discussed here, two levels of ethical problems occur: the first is not using a specific procedure since it has not been adequately mastered yet and thus its results can't be sufficiently controlled, and the second—not using the procedure, despite mastering it, since using it in the specific case is regarded as nefarious. Judging by the expressed views, the majority of the researchers are only interested in the first level, and they're the ones whom Kloskowski's observations fit perfectly." A. Paszewski, "Sukcesy naukowe biologów a problem etyczne," *Postępy Mikrobiologii* 39 (2000), pp. 11–12. "Most likely, when new biotechnologies are improved and thus safer, using it on human beings will cause less opposition. It is connected to a rather common nowadays utilitarian attitude, which—as Kazimierz Kloskowski noted—creates a necessity of treating values in a dynamic way; one gets an impression as if values should undergo change. In other words, technological dynamics demands constant verification of values." A. Paszewski and T. Wiścicki, "Majstrowanie przy człowieku. Z prof. Andrzejem Paszewskim, genetykiem z Instytutu Biochemii i Biofizyki PAN, rozmawia Tomasz Wiścicki," *Więź*, no. 6 (2003), p. 34.

[201] T. Biesaga, "Początki bioetyki, jej rozwój i koncepcja," in *Podstawy i zastosowania bioetyki*, ed. T. Biesaga (Kraków: Wydawnictwo Naukowe PAT, 2001), p. 20; T. Biesaga, "Bioetyka," in *Powszechna encyklopedia filozofii*, vol. 1 (Lublin: Polskie Towarzystwo Tomasza z Akwinu, 2000), p. 581.

[202] M. Fikus and B. Chyrowicz, "Inżynieria genetyczna," in *Powszechna encyklopedia filozofii*, vol. 4 (Lublin: Polskie Towarzystwo Tomasza z Akwinu, 2003), p. 912.

[203] L. Kuźnicki, *Autobiografia. W kręgu nauki* (Warszawa: Centrum Upowszechniania Nauki PAN, 2002), p. 282; L. Kuźnicki, "Obecność inspiracji chrześcijańskich w rozwoju ewolucjonizmu," in *Materiały Kongresu Kultury Chrześcijańskiej. Sacrum i Kultura. Chrześcijańskie korzenie przyszłości. Lublin, 15–17 września 2000*, ed. R. Rubinkiewicz and S. Zięba (Lublin: Wydawnictwo KUL, 2000, pp. 141–144.

[204] R. Tokarczyk, *Prawa narodzin, życia i śmierci. Podstawy biojurysprudencji* (Warszawa: Wydawnictwo Zakamycze, 2012), p. 160.

[205] For example: E. Wolska, *Bioetyka „ułatwiania" i bioetyka „granicy" w ujęciu ks. Kazimierza Kloskowskiego* (Warszawa: UKSW, 2002).

sometimes met with criticism of people who either did not share his personal and Christian perspective of genetic engineering evaluation, or believed that his argumentation is impossible to accept among the representatives of materialistic understanding of the world.[206] However, this kind of criticism may also be directed at those who reduce whole reality (including humans) only to the matter, and cognition only to empirical cognition. Moreover Kloskowski himself, while declaring his worldview, noted that it is not the main or only possible standpoint to justify the bioethical solutions proposed by him.

Finally, it is worth noting once again Kloskowski's sagacity in the area of bioethics regarding genetic engineering, which is connected to his attitude of great humility in the face of the limits of human cognition and an awareness of the existence of as yet unexplained mysteries.

> Personally, I believe we possess many genes inherited from our ancestors which became muted. If a species changes, the genes that existed in the previous species do not become extinct—they become muted but continue to exist. The regulatory genes turn them off, frequently for good. But sometimes, an atavism appears, a feature of distant ancestors displayed in a specific individual. And, in my opinion, it proves that genes of our ancestors exist, but are

[206] "The presented (distinguished among many) anthropological and ethical stances treat a human being as a spiritualized biological entity, and that requires situating him in relation to God. Rev. Kazimierz Kloskowski writes about it *expressis verbis*, concluding that assuming a typical human attitude towards cloning '... demands anchoring it in an unequivocal foundation. It is about a foundation not connected to any canon, rule, or norm which may undergo change or negotiation. For me, this foundation is simply the humanity which obliges each reasonable person in an unconditional and total way. Personally, as a religious man, I anchor this humanity in the Absolute.' ... While remaining in full agreement with the aforementioned views, I nonetheless must bring attention to the fact that this kind of reasoning is unacceptable for a materialist. It may be shrugged off and considered strictly a psychological issue, but it just so happens that the resolution of question whether cloning of people should be allowed has a dramatic practical dimension, since human views in democratic societies influence the shape of the codified law. Contrarians of human cloning have a right to demand all possible legal barriers be erected for this kind of actions in scientific laboratories. Thus, I must have at my disposal a line of argumentation which convinces people of various religions and worldviews. In my opinion, neither anthropology, nor ethics, nor metaphysics can offer such argumentation." A.T. Łukowska, "Filozoficzne i światopoglądowe podstawy sporu o klonowanie człowieka," *Medycyna Wieku Rozwojowego* 1 (2001), (Appendix 1), p. 36.

muted. And this is where I see the danger. Playing with human genes may have insane consequences since it can occasionally cause unwanted features of our ancestors, e.g. tails, to reappear because of our lack of knowledge of genes. Therefore, genetic manipulations can turn out to be useful and utile, but they could also become the bane of humanity. However, any reflection on this kind of alternative demands the analysis of the philosophical and ethical assumptions accepted by the scientists leading research on mapping and sequencing of the human genome, as well as genetic therapists and their patients.[207]

[207] K. Kloskowski, "Genom ludzki. Wyobrażenia a stan faktyczny badań genetycznych," p. 139.

5.

DICTIONARY OF BASIC TERMS

BIOETHICS

“L. Kostro, on the other hand, defines bioethics as normative knowledge containing moral issues resulting from structures connected to the development of biomedical sciences. ... Therefore, bioethics appears as ... an interdisciplinary science, treating humans and the world surrounding them in a multidimensional way. Bioethics understood in this manner requires a lot of natural, ethical, and normative knowledge. I admit that bioethics in this approach is the closest to me in both an ethical and perceptional sense. There are at least two reasons for this. One of them refers to the area of biology, in which the aim is to understand the reality itself, while the other is connected to ethics and accepting responsibility.”[208]

“BIOETHICS OF THE BORDER”

“... ‘Ethos of the border’ claims that there are uncrossable borders of human actions. The ethos is applicable even when the crossing would lead to scientific development or civilizational and technological progress. The ‘ethos of the border’ creates norms that are always applicable, regardless of even most humanitarian purposes. ... Bioethics

[208] K. Kloskowski, *Bioetyczne aspekty inżynierii genetycznej. Wybrane problemy*, p. 133.

of this kind does not merely amount to formulating recommendations, indications, incentives. It simply establishes imperative norms and unequivocal moral verdicts of genetic manipulations, taking into consideration knowledge of a factual state of things. … According to the assumptions of the 'bioethics of the border,' understood as science regulating human actions, the moral assessment of each human action depends on assumed qualifying criteria, amounting to the internal content of a specific action."[209]

"Bioethics of facilitating"

"Within 'ethos of facilitating,' everything that eases human life is accepted and becomes admissible always and everywhere. It becomes the highest value of life. … This kind of bioethics has its sources in various 'distortions' of understanding of: human and his dignity, system of values (many of them treated equally, due to which they have no hierarchy), science, primarily genetics and genetic engineering, and ignoring priorities of ethical rules as always applicable, regardless of place and time. Thus, characteristic for this kind of bioethics is treating a person relatively; his dignity depends on the values of his relationship with the society and his own self and thus is not dependent on the individual ontic, psychological, and physical structure of a human being. Scientific 'distortion,' meanwhile, consists of looking for ethical relations in biological sciences, especially in genetics."[210]

Bioethical education

"The heart of the matter … is to, during the process of bringing up human beings, place them in nature, not next to it since they are a significant part of it. Rooted in nature, noticing its harmony and beauty, a human being learns relatively quickly to react to disharmony in the human environment. The next step, it seems, is bringing up young people to empathy. The goal is to teach them the ability to

[209] Ibidem, pp. 134–137.
[210] Ibidem, pp. 134–135.

emotionally identify with another person and empathize with the situation of people near to them. This will allow them to not only understand the behavior of another human being but to love everything that lives. This, consequently, might be a certain form of *katharsis*, an action purifying various human relations."[211]

"This is not about teaching national bioethics. Objective biological data needs to be presented and the nature of presented ethical issues explained without any sense of belonging to a specific spiritual family and the limits resulting from it. Various moral stands must be commented on objectively. ... Two methods of teaching bioethics should be differentiated. The first concerns primarily future doctors. The second concerns doctors, lawyers, and philosophers wishing to gain solid knowledge in the field of bioethics. ... The absolute necessity of such teaching should be emphasized. Ethics should be an element of humanism so crucial for a doctor and it is too frequently ignored. Teaching medicine must combine molecular biology with humanism.

Lectures on bioethics for researchers are necessary. ... All national institutions responsible for research may play a vital role, not by using force, but by offering necessary information at researchers' disposal. Ethical committees of these institutions conduct their pedagogical activity through their notes, critiques, and pieces of advice. ... Therefore, it is possible to provide researchers with the clearest and most up to date information on the evolution of bioethics through time and space, on questions asked in various academic centers around the world and proposed solutions. Constantly teaching bioethics to citizens is both necessary and desired. ... The ethics of biology and medicine not only belongs to biologists and doctors themselves. Nor does it belong only to theologists, philosophers, sociologists, and lawyers, who achieved great competence in the area, either. It is an issue for all citizens. Everyone may at any given moment face the questions of life, death, and conscience, which concern them very deeply. This confirms the significance of the effort to educate and inform youth, students, members of certain professions, and, finally, all citizens."[212]

---

211 Ibidem, pp. 144–145.

212 *Episteme* 11 (2001): *Kazimierz Kloskowski. Zasady – edukacja – testament*, pp. 144–147.

Chance

"… By chance, we will understand an event without a cause, which nonetheless can be a cause of another event."[213]

"I propose to treat chance in a double way[214]: either as conditional or unconditional chance. By the first type of chance, I understand an event which has no cause in the considered frame of reference. Meanwhile, the unconditional chance is an event that has no cause in the whole material world. Let us explain this division by applying it to the evolutionary mechanisms. Mutation is chance (conditional) because it has a cause outside the biological system; it has a cause in the chemical or biochemical system. … More complex is the issue of natural selection. It is known that specific environmental conditions selectively influence … specific phenotypes; this action is causal. … Nonetheless, natural selection also has a chance 'ingredient,' since not always the best-adapted individual is the one that survives. … Of course, cause and effect has a bigger role in natural selection than chance. But here as well it is a matter of conditional chance. …

Thus, it is easily noticeable that within evolutionary processes, we can talk about chance in the conditional sense. There is no unconditional chance here. The chance presents itself as an event without a cause, but able to be a cause for other events."[215]

"… Chance is somehow a beginning, an initiator of 'purposeful action' of the evolution in the direction of functionality, adaptiveness, or directionality (natural level). Thus, invoking a chance does not result from our lack of natural knowledge on evolution, but is a conscious theoretical procedure based on empirical research. In this context, chance becomes, on the one hand, a measurement 'trying out' new, more optimal tasks of the evolving structures, while on the other it modifies the finalist vision of the evolution[216] and traditional

---

213 K. Kloskowski, *Filozofia ewolucji i filozofia stwarzania*, vol. 1, pp. 98–99.

214 Terminology used in explanation is a result of discussion with Dr. habil. Andrzej Bomirski.

215 K. Kloskowski, *Zagadnienie determinizmu ewolucyjnego. Studium biofilozoficzne*, pp. 140–141.

216 Ibidem, pp. 217–220.

understanding of the theological explanation, since the coincidence does not eliminate the existence and action of *causa efficient*."[217]

"In light of this, pointing to chance events in the abiogenesis process becomes a certain research procedure. It comes down to a purposeful emphasis on the 'vague relations' between phenomena in nature. Chance becomes a function determining and explaining the 'spontaneity' of the prebiotic evolution process."[218]

"... On chance as a specific cause of processes occurring in prehistoric period of Earth's history, it may be said that it consisted of a phenomenon or group of phenomena occurring as one of the possible events, without which other phenomena or groups of phenomena, more or less probable processes of prebiotic evolution, would not have occurred. Therefore, the processes of organizing matter, initiated by chance, led to the emergence of life and are the proper background to understanding the significance of chance as a cause."[219]

"... Chance events have a purposeful (constructive) character; a feedback between the chance and the purpose occurs here; the chance decides about the purpose of evolutionary processes but, simultaneously, the purpose is an 'end' of a kind of the chance events, since the chance emergence of a living system assumed the presence of a protein with evaluative and catalyzing properties, as well as of nucleic acids with self-instruction."[220]

Evolution

"Biological evolution ... is a directional, irreversible, progressing in time process, during which the transformation and differentiation of the organization of living organisms occurs."[221]

"... the statement of the continuity of evolution seems indisputable; since each phase of evolution was necessary as a consequence of previous processes. Therefore, it will not be an over-simplification to call evolution a developmental process consisting of constant and

[217] K. Kloskowski, *Filozofia ewolucji i filozofia stwarzania*, vol. 1, p. 99.

[218] K. Kloskowski, "Przypadek jako czynnik abiogenezy," p. 68.

[219] Ibidem, p. 71.

[220] Ibidem, p. 73.

[221] K. Kloskowski, *Filozofia ewolucji i filozofia stwarzania*, vol. 1, p. 80.

gradual transformation into more and more complex and differentiated forms, into more and more perfect systems, both structurally and functionally. Evolution understood in this way does not apply only to processes occurring on our Earth and leading to the emergence of living beings, but also to changes occurring in the cosmos. ... The evolution of the universe is connected to clearly determined laws and seems to be teleological in character ..."[222]

"... (1) Evolution is a gradual process which may be learned about and explained by referring to small genetic changes, including recombinations, which are subject to natural selection; (2) The emergence of new species (a population) from one initial species may be learned about and explained by referencing genetic mechanisms."[223]

"The character of evolutionary changes is primarily decided by mutation processes, natural selection, and genetic drift. The natural selection is a mechanism giving all evolutionary changes character of 'purposeful' environmental adaptations. The nature of this mechanism is—according to Darwin's concept—the various reproductive success rate of specific genotypes within the population."[224]

"... Evolution:

(1) Depends on both natural necessities and coincidental events (both factors are considered on the same level);

(2) Is subject to both deterministic and probabilistic laws. And even though the occurrence of certain regularities between phenomena is not negated within indeterminism, still the nature of these regularities is not clearly specified; on the other hand, referring only to probabilism is not entirely adequate for the determination of the significance of coincidental events during evolution."[225]

Evolutionary creationism

"The beginnings of evolutionary creationism should be sought in the solutions proposed by St. Augustine of Hippo. A continuation of

---

[222] K. Kloskowski, "Przypadek jako czynnik abiogenezy," pp. 51–52.

[223] K. Kloskowski, "Ewolucjonizm syntetyczny teorią wielu teorii," p. 89.

[224] K. Kloskowski, *Zagadnienie determinizmu ewolucyjnego. Studium biofilozoficzne*, p. 135.

[225] Ibidem, p. 150.

his approach to creation are the proposals of P. Teilhard de Chardin, K. Rahner, and A.D. Sertillanges."[226]

"Creation, after all, does not apply to the existence of an entity, but also in maintaining the existence, while evolution is not only a process of changes but also the silently assumed moment of the beginning of their existence. In other words, what within the creation is called maintaining entities in existence may be interpreted in the perspective of evolution as a certain field of constant changes heading in a specific direction."[227]

"... 'Creation' is a philosophical term which consists of the truth about God as the final cause of everything. The term of 'evolution,' meanwhile, is a typical biological term, defining the process of emergence of new species. Attempting to 'reconcile' creation and evolution, ... we realize that biological arguments explaining changes in the universe and biouniverse are not able to answer the following questions: why does the world exist? What is the role of evolution? ... Thus, referring only to the evolution does not solve the issue of the genesis of the world and human, an issue which in its nature requires philosophical, non-empirical reflections; reflections which cannot be verified with data taken from specific natural sciences. In consequence, assumed thesis of creative evolutions, of evolution as a moment of creative act appears to biologist as an emergency, creation of something new and better; while for a philosopher it means creative evolution, that is, the dependence of the world (of everything that emerges as a result of the evolution of the universe and biouniverse) in its existence on God as its cause. In other words, evolution understood as a process of changes demands the ontic rightness of these changes, which may be created in light of the evolutionary theory of perception. Therefore, evolution demands creation and, in that sense, evolution confirms creation."[228]

Explanation by invoking chance

"Various opinions on the significance of the chance in the genesis of life ... depend basically on the degree and range of utilization of this type of explanation, that is, on pointing out various relations occurring

[226] K. Kloskowski, *Filozofia ewolucji i filozofia stwarzania*, vol. 1, p. 63.

[227] Ibidem, p. 199.

[228] Ibidem, p. 204.

between 'prerequisites' and explanans. Thus, invoking chance events in the process of prebiotic evolution not necessarily must have its source in gaps in our knowledge (on the beginning of life); invoking chance may also be a way of explaining the relations occurring between 'prerequisites,' that is, evolving structures."[229]

"Invoking … chance became a certain research procedure, within which a specific evolutionary (biological) process is relativized to physical and chemical solutions. … In light of this, chance events not only 'explain' physical and chemical phenomena in the prehistoric period of Earth's history, but also become a certain kind of paradigm."[230]

"Within … research procedure called explaining by invoking chance, the main goal is to point out specific events which decide about the evolution (transformation) of systems into other, more complex ones in a significant way."[231]

Genetic bioethics

"Bioethics … with all of its scrupulousness related scientific genetic data, shows its enormous significance for both individuals and societies. Its purpose is to show their positive and negative sides. Bioethics becomes to some extent a guarantee of the necessary harmony between genetic factual material and its analysis on the ethical level."[232]

"In bioethics understood this way, two completely different moral interpretations may dominate. One of them applies to the answers to the questions: what are human obligations? What is their range? … Meanwhile, the second interpretation is connected to the ethics of the situation, in which ethical results of utilizing genetic engineering become norms. The aim is not solely to do good due to genetic manipulations, but primarily, to achieve the knowledge level allowing to realize which one of potential goods is the best."[233]

229 K. Kloskowski, *Przypadek jako czynnik abiogenezy*, p. 66.
230 Ibidem, p. 67.
231 Ibidem, p. 71.
232 K. Kloskowski, *Bioetyczne aspekty inżynierii genetycznej. Wybrane problemy*, p. 114.
233 Ibidem, p. 133.

"It seems to me that competent bioethical reflection on genetic engineering experiments demands answers to two basic questions: (1) Whether deep interference in the process of nature as it occurs in current genetic testing is admissible? And, if so, then (2) for what purposes and with what means should such actions be allowed to be undertaken? I believe that an answer to the first question can only be affirmative. Doubts appear when replying to the second question. The main reason is that the character of the answer depends on accepting or rejecting a general bioethical norm, which is as follows: admissibility of genetic testing is limited by the rule of the priority of human well-being over human freedom. ... I wish to ... formulate several thoughts on the subject of relating the genetic experiments to ethical rules. Firstly, a critical reflection over the correlation between basic ethical or moral values and the consequences of genetic manipulations needs to be kept in mind; for example, I reject the rule of saving a life at all costs, by the rule that the end justifies the means. Secondly, I am completely against experiments consisting of introducing foreign genes to human gametes, determining sex artificially, and cloning. A justification of this stand is for me the applicable truth of human dignity and the inviolability of the unique individualism of a person."[234]

"Firstly, the admissibility of genetic testing is limited by the priority of human well-being over human freedom; since there is not only freedom but also the moral bond between human and nature as well as between humans. Secondly, the ethical assessment of genetic manipulation depends on the internal content of researchers' actions, that is, on their honesty and responsibility towards their own consciences. Thirdly, the developing disproportion between biological and ethical/philosophical knowledge should be eliminated."[235]

Self-determinism

"Since the previous attempt to interpret the nature of evolutionary processes did not bring a satisfactory solution, based as it was on the discussion between determinism and indeterminism, let us try

[234] K. Kloskowski, "Inżynieria genetyczna wyzwaniem dla bioetyki," pp. 405–406.

[235] Ibidem, p. 408.

and change our research perspective. I propose referring to the self-determinism. ... According to this, evolutionary processes are conditioned both unequivocally and probabilistically by other (earlier) phenomena. The key to understanding this approach is to accept the conjunctive 'and,' combining two mutually exclusive features regarded within general determinism as unequivocal and probabilistic. This 'conjunctional version' of general determinism appears to accurately express and explain the nature of biological evolution within the synthetic theory of the evolution. The nature of the evolutionary processes is (simultaneously) determinism and coincidence."[236]

"By self-determinism, the following is understood: (1) a view according to which evolution is ordered unequivocally and probabilistically; (2) a hypothesis, within which the nature of the evolution may be explained (its determinism and coincidentally); (3) a methodological rule which demands the necessity of including chance in the evolutionary process and of conjunctional treating evolutionary regularities interpreted as necessity and coincidence."[237]

[236] K. Kloskowski, "Wokół ewolucji biologicznej. Wybrane problemy biologiczne," in *Z zagadnień filozofii przyrodoznawstwa i filozofii przyrody*, vol. 16, ed. K. Kloskowski and M. Lubański (Warszawa: Wydawnictwo ATK, 1999), pp. 5–34.

[237] K. Kloskowski, *Zagadnienie determinizmu ewolucyjnego. Studium biofilozoficzne*, p. 179.

II.

Kazimierz Kloskowski: Selected Writings

Selected and edited by Adam Świeżyński

Translated by Joanna Witkowska

Evolutionary determinism[1]

K. Kloskowski, *Zagadnienie determinizmu ewolucyjnego. Studium biofilozoficzne* (Gdańsk: Stella Maris, 1990), pp. 151–220.

4.3. Self-determinism as a new empiriological perspective

Both the philosophical and natural research of evolution are based on the appropriate definition and recognition of the effects of the various determinants which determine the process of evolution. In order to do this in an appropriate way as far as the methodology is concerned, we have to carry out our quest within a specific research framework. Because the attempt of interpreting the essence of evolutionary processes which was made on the basis of the argument between determinism and indeterminism didn't bring satisfactory solutions [see: K. Kloskowski, *Zagadnienie determinizmu ewolucyjnego. Studium biofilozoficzne*, Gdańsk 1990, pp. 141–155 – eds.], let us try to change our research perspective. I suggest referring to self-determinism. I treat this view as a continuation of the quest carried out in light of the conflict between determinism and indeterminism. Self-determinism claims that the processes of evolution are conditioned both unambiguously and probabilistically by other (earlier) phenomena. The key to understanding this approach is the adoption of the conjunction "and," which combines two features excluding one

[1] Editorial note: The numbering of footnotes was changed from the original publication. In the selected writings, continuous numbering was used within the chapters. Skipped fragments of texts and omitted footnotes are marked. Due to the translation of the original text, minor changes have been made to the original version of texts. Abbreviations in the footnotes have been translated.

another within general determinism and defined as unambiguous and probabilistic. This "conjunction version" of understanding the general determinism seems to express and accurately explain the essence of biological evolution within the framework of the synthetic theory of evolution. The essence of evolution processes … is determinism and chance at the same time. Now, let's have a closer look at evolution from within the new perspective.

4.3.1. The causal dimension of evolutionary self-determinism

Within the conception of evolution placed in the framework of the synthetic theory of evolution, biological phenomena are connected with one another with, for instance causal relations. This connection is a unique one because, apart from the phenomena which are unambiguously determined, we have to take into account the effect of chance events. However, if it is rather easy to determine the causal relation in the unambiguously conditioned phenomena, the real problem is to determine the relation between a cause and chance. This part of the work will attempt to characterize chance events treated as one of the causes of evolution.

4.3.1.1. Capturing chance as the cause of evolution

The cause, within the empiriological framework, is "A phenomenon *A* or the set of phenomena *A*, which (the phenomenon *A* or the set of phenomena *A*) is permanently not only the sufficient, but also the necessary condition of the occurrence of one strictly determined phenomenon *B* or of the strictly determined group of phenomena *B* (as in the case of determinism applying to macroscopic phenomena), or of the occurrence of some of the more or less probable phenomena of some kind, phenomena B_1, B_2, B_3 which are impossible to be predicted exactly (as in the case of indeterminism applying to microscopic elementary phenomena); and the emergence of that which was marked with *B* or with B_1, B_2, B_3 … doesn't bring with itself the emergence of the phenomenon *A* or the set of phenomena *A*."[2]

[2] K. Kłósak, *Z teorii i metodologii filozofii przyrody* (Poznań: Wydawnictwo św. Wojciecha, 1980), p. 17; see also: K. Kłósak, "Teoria kreacjonistycznych początków duszy ludzkiej a współczesny ewolucjonizm," *Analecta Cracoviensia* 1 (1969), p. 40; K. Kłósak, "Metafizyczna i fizyczna zasada przyczynowości wobec relacyj niedokładności W. Heisenberga," *Roczniki Filozoficzne* 1 (1948), pp. 200–211.

Using the above definition for the interpretation of evolutionary processes (in the synthetic theory of evolution version) may raise some doubts. Nevertheless, the discussed researchers [the researchers writing about the synthetic theory of evolution – eds.] do not treat the chance as an intrinsic factor or as entelechy. When talking about the certain phenomenal wholeness of the processes of evolution, they emphasize the appropriate degree of the structural and functional organization of the evolving system on the one hand, but they do not exclude chance events on the other. Moreover, no author claims that chance is the only cause of evolution. The shortest way of expressing this thought is that evolution is determined by both determinism and chance. In other words, determinism and chance are the causes of evolution.

Thus, let us analyze such way of understanding the cause within the context of the definition presented above. The phrase: "a phenomenon *A* or the set of phenomena *A*, which (the phenomenon *A* or the set of phenomena *A*) is permanently not only the sufficient, but also the necessary condition ..." may be reformulated in the language of the researchers being discussed as a claim about the possibility of the occurrence of evolution as the consequence of: (1) natural necessities (population of species, selection, drift, mutations and recombinations), and (2) chance events (the chance mutations, the chance during adaptation and competition). Both necessities of this kind and chance may be interpreted within the operation of the appropriate laws. ... Yet, at this point, it is more important to emphasize that the necessary condition (that, which has to occur) involves, from an empirical viewpoint, a necessary phenomenal antecedent. As far as evolution is concerned, it means defining the necessary condition of the occurrence of evolution. In consequence, necessity appears here as the relative one, i.e. the one, which depends on our knowledge of evolution.[3] The word "permanently," in turn, shows some regularity of the emergence of phenomena. Yet, evolution, from historical viewpoint, is a creative process, because "it brings new things, which didn't exist in the past ... and it is not merely deterministic. ..."[4] So we can't claim that the same genotype or phenotype would always have to emerge under similar conditions. Thus, this definition serves

[3] ...

[4] Th. Dobzhansky, *Determinism and Indeterminism in Biological Evolution*, p. 66.

in our discussion as a means of emphasizing the fact of the occurrence of various "attempts" necessary for the emergence of the most optimal and well-adapted "individual." Generally speaking, what is meant here is the fact that it is not merely natural necessities which are the conditions necessary but simultaneously insufficient for the occurrence of the phenomenon *B* or the group of phenomena B_1, B_2, B_3, ... constitute the phenomenon *A* or the set of phenomena A_1, A_2, A_3. ... We should take into account the broad scope of chance operating in evolution. When paraphrasing B. Gawecki's claim concerning necessity,[5] we may point to an unambiguous relation: when the phenomenon *A* (natural necessities and chance) does not occur, then there is no phenomenon *B* or the group of phenomena B_1, B_2, B_3. ...

The representatives of evolutionism under discussion strongly emphasize the fact that the final moment of a specific phenomenon *A* is identical with the initial moment of the emergence of its consequence as phenomenon *B*.[6] Thus, highlighting a certain connection between evolutionary phenomena, the authors see the causal connection as the sequence of strictly defined phenomena, which, as a result of an "effective" attempt or a series of them, brought something new at a higher organization level. Thus, the causal connection (the relation between the cause, i.e. natural necessities and chance and the effect, i.e. something new, namely a population with a new structure and function) is a unique one. The causal connection is direct in character yet, because of chance, it cannot be the same or common or, more importantly, irreversible.[7] Thus, the sequence of phenomena

---

5 B. Gawecki, *Zagadnienie przyczynowości w fizyce*, Warszawa 1969, p. 111.

6 ...

7 W. Krajewski, *Związek przyczynowy* (Warszawa: PWN, 1971), p. 51; L.D. Roberts in his article "Indeterminism, Chance and Responsibility," published in *Ratio* 13 (1971) on pages 197–198 notes that there exist a few types of chance affecting the sequence of phenomena. The first kind of chance is incorporated into indeterministic events, e.g. the location and speed of a single electron is an unexpected and unordered event. The second type of chance is included into the events, which are unusual, although deterministic, e.g. a shower during a dry season. The third kind of chance may be found in the events, which are neither indeterministic nor unusual. We mean here situations in which a given event was not expected, e.g. strong snowstorms in given territories. In turn, M. Blond and M. Swain in "On the Analysis of Causation," *Synthese* 21 (1970), on pages 222–227, on the basis of the examples of a similar type, try to logically capture the causal connection and sequence of phenomena connected with it; these authors pay special attention to the necessary and sufficient conditions of causal connections ...

which chance events are interrelated with loses its character, at least as it is understood in a traditional way; and it appears not merely as a result of specific causes but rather as a co-effect of evolution factors. The chance can be seen as an "agent" searching for new solutions and providing this co-effect with a dimension which is unique from an empirical point of view.

We may conclude from the above discussion that chance cannot be treated as an autonomous cause in an empiriological sense. Chance is the cause to the extent to which it is connected with natural necessities of evolution.

4.3.1.2. The interpretation of the chance–cause relation

Chance is a phenomenon or a set of phenomena which emerges as one of numerous possible events and which is an essential condition of the emergence of some other more or less probable phenomenon or a set of phenomena (natural selection, mutations, drift, as far as evolution is concerned).[8] But we have to remember that chance understood in such a way may be regarded as the cause of evolutionary phenomena always and only when it is connected with natural necessities. It is the cooperation of natural necessities and chance which leads towards the emergence of evolutionary changes.

This phrase directly shows two basic difficulties in determining the significance of chance events in evolution:

when chance is not connected with the natural necessities of evolution, the above definition of chance is difficult to understand; as treating the chance in an autonomous way leads directly towards the claim that evolution is determined by chaos, because then the most diverse possibilities of the occurrence of evolutionary phenomena cannot be excluded;

in turn, the precision of the operation of the factors determining the processes of evolution doesn't point to the so-called universal order of events (the essential condition of causal connection between phenomena)—if it was fully possible, the chance events as the essential ones for evolution would be excluded or chance would be reduced to the emergence of various mistakes during evolution.[9]

8 …

9 …

The reason for invoking the role of chance in the process of evolution is the impossibility of solving the second difficulty otherwise. The representatives of the synthetic theory of evolution ignore the absolute necessity of a "permanent sequence of phenomena." They also ignore the argument concerning some problems with the reasonable verification of chance events.[10] This critical remark doesn't concern the second difficulty, but in fact it is formulated within the framework of the first difficulty—"autonomous" understanding of chance is excluded by representatives of the theory of evolution who point to empirical data (the biogeographical, paleontological, genetic and biochemical ones), to calculus of probability, to experiments, showing that the process of evolution is far from chaotic. Yet, the essence of the critique is right, as it concerns the absolute impossibility, namely the lack of even the future perspective of verification or falsification of "indiscernible" chance events, unless you shift from the empiriological perspective of the examination of evolution into an ontological one. This conclusion cannot be questioned, even with calculations made within the calculus of probability, as they merely define the frequency of the emergence of given phenomena (within the set of expected events). They concern the statistical laws, the appropriate interpretation of which sheds light on only some aspects of structural and causal laws determining the course of evolutionary processes. Analogically, the attempts made by Th. Dobzhansky,[11] and G.G. Simpson[12] to refer to the possibility of the occurrence of evolutionary processes on other planets will not question the just mentioned conclusion.

The above analyses lead us to the conclusion that solving the problem of chance as a cause depends on understanding the following claims in an appropriate way. Firstly, it is impossible to repeat the course of evolution. Secondly, we may examine our past as it actually is and "verify whether the postulated processes are possible."[13]

If this is so, it is no problem to accept the phrase that chance is an event without any cause, yet capable of being the cause of other events ...

10 ...

11 Th. Dobzhansky, *Determinism and Indeterminism in Biological Evolution*, p. 65.

12 G.G. Simpson, *This View of Life*, chapter 13.

13 W.J.H. Kunicki-Goldfinger, *Podstawy biologii. Od bakterii do człowieka* (Warszawa: PWN, 1978), p. 341.

4.3.2.2. Purpose vs. evolution

When we start examining the problem of purpose, it first of all seems necessary to realize the fact that only man may attribute purposes to people, things and their activities. This anthropological viewpoint is of essential importance for attempts to determine the purpose which a specific phenomenon or process tries to achieve. This is the only perspective from which a man may decide whether somebody or something achieved his/its goal or not. Moreover, he may talk about the events in which the goal is achieved consciously or about those in which it is done unconsciously.[14] M. Beckner claims that purposes may only be attributed to people, because intentions may be attributed only to people; if the intention is possible to determine, then it becomes possible to determine the goal, too.[15] Not all goals are intentions, however. For instance, the aim of a rat's life is to get some food and the rat is not driven with any intention at all; similarly, a self-regulating system, like a self-guiding missile, has its aim, but no intention can be attributed to it. E. Nagel, in turn, distinguishes three interpretations of goal and of goal-directed activities.[16] He calls the first interpretation the intentional interpretation. In accordance with this interpretation, the goal of an activity or a process *G* is intended by a man. What is meant here is the intention which is the "internal mental state" and hence the causal determinant of an activity *A* taking place after the intention. In brief, goal-directed behavior is, therefore, an operation undertaken by some (human) factor in order to achieve goal *G*. In his second interpretation of a goal, Nagel uses the notion of a "coded program" or "program view." An example of a process of this kind is the DNA sequence, a coded program of the development of an organism. The third type of goal-directed behavior is, according to Nagel, the so-called system property. An example of behavior of this type is the maintenance of a stable level of water by an organism in its blood.

A.C. Purton, in turn, mentions use-purposes and the purpose of the intentions, plans and efforts of men and animals, i.e. aim-purposes.[17] The former is the case if a given thing satisfies use-purpose,

---

[14] ...

[15] M. Beckner, *Function and Teleology*, pp. 151–152.

[16] E. Nagel, "Goal-directed Processes in Biology," *Journal of Philosophy* 74, no. 5 (1977), pp. 264–276 ...

[17] A.C. Purton, *Biological Function*, p. 17.

X just when it is used to realize *X*, while the latter is understood as fulfilling the intentions.

Which of the above types of purposes may we talk about when considering evolutionary processes? Selected and at the same time characteristic claims made by representatives of the synthetic theory of evolution will help us answer this question.

F. Ayala[18] says that generally the process of evolution cannot be defined as a purposeful one in the sense of directing it towards the production of a specific DNA sequence with an appropriate information code. What is meant here is rather purpose understood as the necessity of the existence of directional operation of DNA, which facilitates the reproductive fitness of a population in a given environment. R.A. Fisher, in turn, says that the purposeful operation of an organism as a whole is the initial state of evolutionary processes, in which relatively large masses of animate matter guide the cooperation of the parts and particular structures constituting individuals.[19] For E. Mayr, natural selection "rewards" past phenomena, i.e. produces the effective recombinations of genes, yet, it is not a planned action, undertaken because of the future. Natural selection is never directed towards any purpose.[20]

It follows from the above that we may talk about the purpose in evolution: (1) in the sense of the "initial state of evolutionary processes" (R.A. Fisher), namely, as a coded program (E. Nagel) of evolution. Moreover, we may talk (2) about use-purpose (A.C. Purton), but always in connection with the system property (E. Nagel).

[18] F.J. Ayala, *Teleological Explanation in Evolutionary Biology*, p. 11; Ayala distinguishes three types of purposeful phenomena: (1) when the final state or purpose is intended by a given factor; (2) when there is the mechanism, which allows a given system for reaching or maintaining special properties, despite the changes in its environment; (3) when physiological or anatomic structures are built up in the way, which allows them to perform a given function. This distinction allows us to assume, in accordance with (2) and (3) approaches that organisms may be treated as a class of systems, which have merely internal, natural purposefulness. See: F.J. Ayala, *Biology as an Autonomous Science*, p. 321–322; F.J. Ayala, "The Autonomy of Biology as a Natural Science," in *Biology, History and Natural Philosophy*, ed. A.D. Breck and W. Yourgrau (New York: Springer, 1972), p. 1–16 ...

[19] R.A. Fisher, *Indeterminism and Natural Selection*, p. 108.

[20] E. Mayr, "Teleological and Teleonomic: A New Analysis," *Boston Studies in the Philosophy and History of Science* 14 (1974), p. 96.

However, purpose cannot be understood as a realization of one's plans, meeting one's expectations.

Let us now proceed to analyze these generalizations. Why do we reject the claim that evolution is purposeful in the sense of realizing one's intentions? The fundamental argument is that it is impossible to predict the future of evolution. Human intentions make evolution purposeful and they basically involve the assessment of the effectiveness of evolutionary mechanisms. This is the *post-factum* assessment. Then, the purpose lies in the assessment of evolutionary phenomena rather than in the evolutionary mechanisms themselves. Thus, if we may talk about purpose in evolution at all, just one dimension applies here. Namely, the structure and function of organisms and populations is explained with their past, "either the individual past of an organism, or the past of a systematic group. … The organism is built up and operates in accordance with the genetic information it received from its parents. The information constituted the genotypes of a few ancestors and there it had passed the most difficult exam of survival, and leaving the offspring by its and reproduction. The fitness of organisms, as we can see, is the consequence of the past of their strain."[21] Thus, we may talk about purpose in evolution in the sense of the realization of all of the information which was coded in their more or less distant past by an organism, population or species. The second type of purpose in evolution discussed by the representatives of the synthetic theory of evolution is the use-purpose in connection with the system property (the properties of evolution itself). What is meant here is the so-called biological purpose, which is defined by Purton as "a maintained activity."[22] This is the facility which leads any perversions of biological purpose bring about changes, but simultaneously these changes later on affect the elimination of these perversions. This facility is reserved for objects which have use-purposes, and also for those, the activity of which is always regulated within the wholeness, here: for evolution. For this reason, survival cannot be treated as the purpose of an organism, but rather as a consequence of purpose in the second sense, i.e. the use-purpose and maintained activity. Thus, we see that we will talk about the purpose in evolution,

[21] H. Szarski, *Mechanizmy ewolucji*, parts of third edition published in: *Problemy* 772 (1985) 11, p. 45 …

[22] A.C. Purton, *Biological Function*, p. 17 …

paraphrasing M. Beckner's distinction,[23] when there exists purpose (in its first and second sense), evolution shows the "persistence" in achieving these purposes, and it is characterized by a "sensitivity" to the conditions which facilitate the achievement of these purposes. ...

W.J.H. Kunicki-Goldfinger pays attention to yet another aspect of purpose in evolution. He claims that biological evolution has no purpose at all, because it is not discovered in biological research. Organisms are not built purposefully either; they are the results of evolutionary development, during which the program of their functioning, coded organisms function coded in their genomes, has been changing in various ways.[24] The program based on a set of genes was subject to evolution; and organisms do not function due to this set; rather, they just use the information contained in the DNA sequence.[25] In this sense we may assume that "the ultimate result of development process is determined by the program and hence by the purpose coded in this program. So, biology uses the notion of teleonomy, without which it would be impossible to explain most phenomena, not only at the level of organisms but also at the molecular. Yet, teleonomy does not presuppose any superior purpose coming from outside an organism, but merely the purpose-program, being the part of the organism and developed in evolution. Evolution has no program ..."[26]

Generally speaking, the problem of purpose in evolution may only reasonably be solved if we change the perspective of its examination. We mean the examination of the past, of antecedents, key moments (genotypes information), rather than the examination of the very results of evolution. The purpose is to "dwell" in the initial state of objects subject to evolution or in the conservative activity of these objects. And only within this framework is referring to purposeful determinism justified. Moreover, the mechanisms of evolution themselves are neither directed at any purpose nor capable of purposeful activities, "but the increase of probability of passing genes to the nearest generations will be strengthened by the selection, even

[23] M. Beckner, *The Biological Way of Thought* (New York: Columbia University Press, 1959), p. 143–149.

[24] W.J.H. Kunicki-Goldfinger, "Przedmowa," in T. Ścibor-Rylska, *Tajemnice uorganizowania żywej komórki* (Warszawa: Pax, 1986), p. 18.

[25] W.J.H. Kunicki-Goldfinger, *Szukanie możliwości. Ewolucja jako gra przypadków i ograniczeń* (Warszawa: PWN, 1989), p. 137.

[26] W.J.H. Kunicki-Goldfinger, "Przedmowa," p. 19 ...

if there were the causes of the future extinction of a species incorporated into the selection."[27] This conclusion seems to become clearer if we consider purpose through the notion of function.

4.3.2.3. Function vs. purpose

… The most obvious and fundamental interrelation between function and purpose may, as it seems, be formulated as follows: evolutionary processes are capable of affecting the performance of the specific functions of evolving objects and the very course of evolution to the degree to which they operate in accordance with their nature. For this reason, within the empiriological framework, we may discover the functions of organisms, populations and the very course of evolution. This is often identified with the realization of purpose. The purpose of evolution from a biological viewpoint is impossible to define. The essence of evolution is performing the functions of its mechanisms and evolving objects. The result of the performance of these functions is possible to define only with a certain probability; this results from chance events. It sometimes transpires that the features of no adaptive significance strengthen in a population; or it also happens that the dominant individual does not necessarily turn out to be the one which is the best one from the point of view of adaptation. Thus, if we take into account purpose in the first sense (the realization of the past) and in the second sense (maintained activity), the relationship between function and purpose is formulated as follows: the function of an individual organism, species or population and the very course of evolution is the realization of their future state, while purpose involves the realization of the state. As we may easily see, the solution of the problem of whether evolution achieves such a purpose leads to speculation. Within an empiriological framework, we may find out nothing more than that a random *A* performs or not a function *f* within a given system or process.[28] If we adopt another definition of purpose, it is very easy to formulate the claim that the function is the purpose. This applies in particular to purpose understood as the realization of intentions or expectations. Yet, such an identification distorts the picture of evolution and its mechanisms.

[27] H. Szarski, *Mechanizmy ewolucji*, parts of third edition published in: *Problemy* 472 (1985) 11, p. 46.

[28] …

To conclude, we should say that understanding evolution and its mechanisms within an empirical framework involves capturing their functions and not their purpose. Purpose understood as the realization of something in evolution shows the signs of being a philosophical category, because deciding if what has been realized is the achievement of what had been expected, depends on previous theoretical and ontological assumptions.

…

4.4. Final remarks

Evolutionary determinism is based on the empirically correct determination of the sequence of events occurring in the process of evolution. The interpretation of this sequence, from a logical viewpoint, allows for putting together determinism and randomness, although the two notions have so far excluded each other for numerous authors. In consequence, the process of evolution appears as a correlation of determinism and randomness; both determinism and randomness are visible, to a lesser or greater degree, at all stages of biological evolution (during competition and adaptation). Moreover, evolutionary mechanisms (mutations, genetic drift) are, by nature, chance mechanisms.

The attempt to interpret evolutionary phenomena within the framework of determinism and indeterminism turns out to be futile. Various types of determinism presented in this work [see: K. Kloskowski, *Zagadnienie determinizmu ewolucyjnego. Studium biofilozoficzne*, Gdańsk 1990, pp. 141–155 – eds.]: general, unambiguous, ambiguous determinism, causalism, extreme and moderate indeterminism concern only some aspects of evolution. These approaches are, therefore, one-sided, so we rejected them as inadequate. The main reason for such an attitude are the results of our empiriological analyses, which show that both unambiguous and probabilistic conditions in evolution prevail within the very structure of particular evolution mechanisms and factors, as well as between them. Moreover, the argument between determinism and indeterminism itself is the result of an alternative vision of natural phenomena. Evolution, by its very nature, cannot be put within the framework of the argument understood in this way. Evolution points to the existence of an alternative vision of the world of nature and hence there is the necessity to change the research perspective.

I suggested in my work referring to self-determinism as a new empiriological perspective of evolution examination. Self-determinism means: (1) the view, according to which evolution is ordered unambiguously and probabilistically; (2) the hypothesis within which it is possible to explain the essence of evolution (its determinism and randomness); (3) the methodological principle which imposes the necessity of taking chance into account within the process of evolution, as well as the necessity of looking at the regularities of evolution interpreted as necessity and chance from the viewpoint of conjunction.

Within the framework of self-determinism understood in this way, evolution shows its causal, functional and probabilistic character. This interpretation eliminates the purposeful dimension of evolution, since chance may be included into the causal, functional and probabilistic relationships without changing their structure.

…

5.3.1. The paradigm of chance events

Chance (considered in the context of causal, functional, purposeful and probabilistic laws) appears as the factor which initiates the course of evolutionary processes. This unique characteristic of chance events will surely become more understandable if we use L. von Bertalanffy's suggestions (he dealt with the various levels of biological organization of living organisms), and if we transfer them to evolutionary processes. He assumes that, as the organization level increases, the so-called increase of the degree of freedom occurs.[29] The process of the self-organization of structures and systems as a certain wholeness takes place in accordance with specific laws, yet particular events may realize themselves in various ways.[30] The reference to chance may signify that there exists a certain indefiniteness of at least some structural regularities. This is obviously not absolute indefiniteness, as the causal, functional, purposeful and probabilistic laws are known.[31] In this framework, pointing to chance events in the process of evolution becomes a unique research procedure. What is meant here is a kind of intentional highlighting of the "vague relationships"

[29] L. von Bertalanffy, *Problems of Life* (New York–London: John Wiley and Sons, 1952), p. 23 and 173.

[30] Ibidem, p. 175.

[31] …

between the phenomena taking place in evolution. Chance becomes the function defining and explaining the "spontaneity" of the evolution process. The source of such an approach towards the issue of chance and of its significance in evolution lies in using reductionist principles and attempts to justify the essence of evolutionary mechanisms such as mutation and genetic drift. In this way, the proposition that evolution started with chance events (understood as the lack of functional organization) is validated. The special character of a reductionist approach towards chance is connected with the fact that chance is simply impossible to be "observed" as all other physical phenomena are. Thus, we seek to "define" chance as something indefinite, not "shaped" by all that, which is more understandable (the context). Therefore, evolutionary processes are modeled. The most important thing here is capturing the essence of the building and functioning of given structures, their hierarchy, a certain purposefulness of reactions, as well as their variability. Hence, chance is treated as a mechanism of evolution on the one hand, and as a way of explaining the mechanism of evolution on the other. Chance has its justification in induction and statistical analyses. These analyses involve the "inductional adjustment of phenomena to probabilistic laws."[32] Chance has also its justification in hypothetical and deduction analyzes; these analyzes do not involve any generalization of the known facts but rather raising hypothesis (chance events) which could explain them.[33] Thus, what is of increasing significance is defining the relationships between particular theoretical propositions distinguishing and integrating the notion of the randomness of evolutionary processes and their verification within general knowledge of evolution. Empirical and empiriological research of evolution leads us to abandon the question of whether evolutionary processes have a chance-like or deterministic nature; it rather forces us to try to resolve the dilemma of whether to refer to chance as one of causes of evolution or totally reject the attempts to explain evolution.

[32] C.G. Hempel, *Podstawy nauk przyrodniczych*, trans. B. Stanosz (Warszawa: Wydawnictwa Naukowo-Techniczne, 1968), p. 102.

[33] Cf. W. Krajewski, *Prawa nauki. Przegląd zagadnień metodologicznych* (Warszawa: Książka i Wiedza, 1982), p. 123.

5.3.2. Chance events as the basis for a new type of explanation

I have already said that chance events initiate evolutionary processes. And, in this part of my work, I would like to answer the question of which type of chance is involved in the evolutionary processes captured within the synthetic theory of evolution.

5.3.2.1. The principle of chance in the context of a cause

The connection between evolutionary phenomena may be interpreted as a causal relationship: the single and unique sequence of strictly defined phenomena, which, due to one "effective" series of attempts produced this genotype, population, etc. and not another. Chance appears here as an agent "searching" for the evolutionarily optimal solution. The chance becomes the beginning of a new sequence of causes. There can be a few interpretations of the chance captured in this way. (1) If we accept the existence of the so-called causal series of events (a cause of some phenomenon has its cause and this cause, in turn, has its own cause and so on and so forth), then we may talk about the chance, when the emerging event doesn't belong to the sequence of causes in question.[34] But the chance in evolution caused the emergence of systems, which are new as far as their structure and functions are concerned. Thus, we can have here (2) the chance as understood by H. Poincaré: *petites causes, grands effets*—minor causes, major effects. "What is meant here is, most frequently, the antithesis of that, which we regard as unimportant, of that, to which we tend to attribute no value, at least in certain aspects; and the antithesis of that, which seems for us, in these very aspects, important and significant."[35] There is yet another possible interpretation of chance. In A. Cournot's opinion, various sequences of events occur in the world which are causally connected. These series are subject to the phenomenon of interference. Thus, he treats chance as (3) the event, which is the coincidence of the causal sequences, which are independent of one another (the temporal relationship is a chancy one).[36] Thus, what kind of chance are we talking

[34] Cf. W. Krajewski, *Konieczność, przypadek, prawo statystyczne*, pp. 40–41.

[35] N. Sztejnbarg, *Analiza pojęcia przypadku (Przyczynek do słownika filozoficznego)*, p. 168.

[36] ... A. Cournot, *Essai sur les fondements de nos connaissances* (Paris: Librairie Hachette, 1912), p. 38.

about within the synthetic theory of evolution? The answer to this question depends on the definition of evolution itself and on its necessary conditions; actually, the knowledge of these conditions determines the interpretation of chance events. Yet, we know very well that we are unable to retrace evolutionary processes in a given period of time. Hence, on the basis of some theoretical generalizations, we conclude that we may see a causal series or causal relationship in the process of evolution. Hence, we accept chance as a phenomenon or a set of phenomena which emerge as one of possible events such that, without it, no other phenomena or groups of phenomena would not take place within specific evolutionary processes. The important phrase here is "one of possible events, such that without it the process of evolution could not occur." This phrase allows us to capture the very process of evolution and not merely on a linear (spatial and temporal) basis. Chance in the sense presented above allows us to see evolution as a network, in which a particular series of events, e.g. the emergence of new genotypes, do not have to occur after the "self-destruction" of their ancestors. Even the clearly and strictly defined factors determining evolutionary processes do not exclude chance operating in this way because of the peculiar, i.e. random law of evolutionary phenomena and because of their complexity. The explanation through referring to the chance is, therefore, based on the impossible to prove thesis, but at the same time this thesis does not exclude various possibilities of the occurrence of phenomena, apart from chaos; chaos is not identified here with the chance. Thus, the research procedure known as explaining by reference to chance involves, first of all, pointing to chance as a specific cause of evolution. The chance events are the necessary condition and the rule included in the procedure of explaining.

5.3.2.2. The paradigm of chance in the context of purpose and function

In the claim that chance is the cause (initiator) of evolution, there is an inherent postulate of chance's "purposeful" activity. As I pointed out earlier, purposeful activity is understood simply as the set of functions which occur among various phenomena. Then, the following question almost automatically arises: do we impose purposefulness on chance events?

It seems that the above problem should be solved by means of the correct understanding of the preposition concerning the role of the chance as a factor initiating evolution and the processes of self-organization. As R.T. O'Grady correctly remarks, order within a living system may be explained in the context of the processes of inheritance and it depends on both external and internal factors.[37] Evolutionary changes were always associated with functional change as the adaptation of a living system to the environment, i.e. with the spontaneous changes of the factors, which are the internal factors of the emerging organization. The explanations of these changes are the domains of functionalist and structuralist theories. Similarly, we should distinguish the so-called end-directed activity, which is called the teleomatic or teleonomic property of emerging structures, from teleology as the means of explaining phenomena. The above claim allows us to treat chance analogically (on two levels). Firstly, chance is a peculiar property of evolution which is reducible to nothing else but chance. Secondly, the reference to chance constitutes a unique model of explaining evolutionary processes. Such a distinction, in consequence, obliges us to emphasize that reducing chance (which is one of the essential elements of evolution) to some other factors, would be a too one-sided method of explaining. Moreover, the question arises as to the adequacy of the evolution mechanisms which have been known and accepted so far[38]; doubts also appear as to whether referring to chance questions both teleological and functional explanations, or if it is a new kind of explanation.

On the basis of [the above – eds.] considerations ... it is rather obvious that chance events are purposeful (constructive) in character; there is feedback between chance and purpose here; chance determines the purpose of evolutionary processes but simultaneously the purpose is a kind of "end" of chance events. Thus, chance mutations presupposed the existence of genotypes of a certain type yet the very process of mutation was not a fully random one. Rules and laws, e.g. those concerning selection, existed which limited the number of possible combinations. Arguments of this type are, within an empirical framework, justified by empirical data coming from various biological sciences. However, from the methodological perspective, referring to both purposefulness and

---

37 R.T. O'Grady, "Evolutionary Theory and Teleology," *Journal of Theoretical Biology* 107 (1984) 4, pp. 563–564.

38 ...

chance merely highlights certain functions of the emerging structures. In this sense, the teleological explanation and the one "through chance" are analogical. The teleological explanation, however, has unique characteristics, i.e. it clearly determines, from the structural and functional viewpoint, the results of specific processes (the essential features).[39] Yet, cannot the explanation "through chance" be contained within the teleological one? The teleological explanation pays attention to the products of "certain specific processes, and especially to the role of particular parts of the system in maintaining its general properties and behaviors"[40] as a whole; in turn, "non-teleological explanations direct our attention first of all to the conditions, on which the emergence and maintenance of specific processes depends, as well as to the factors, on which the permanent presence of certain fundamental properties of the system depends."[41] It seems that with such claims, the explanation through chance should be classified as a non-teleological explanation, because of the impossibility of predicting the emergence and reaction of specific systems in an unambiguous way. Obviously, prediction is possible and it is determined by statistical laws. Prediction is not the key element for understanding the explanation in question, however. Nevertheless, if we highlight the functional aspect of evolution, then we may treat the explanation "through chance" as a special form of teleological explanation. Referring to chance does not stem from the gaps in our knowledge of evolution; rather it is a conscious theoretical assumption. Hence, the explanation "through chance" may constitute a new perspective for the classification of biological explanations; therefore, what is meant here would not be making a distinction between teleological and non-teleological explanations, but rather pointing to the essential premises of the sequences of phenomena which occur within a given space and time. In this context, the claim that chance is a factor which does not perform "its own" functions will become more understandable. What is meant here is an evolutionary change, which does not lead to some expected purpose (progress), and/or a property of an organism, which does not perform its functions on a given level of evolution. Chance is, above all, a factor which "attempts at" new, optimal tasks of evolving structures.

39 …

40 E. Nagel, *Struktura nauki*, p. 363.

41 Ibidem.

The philosophy of evolution and the philosophy of creation

K. Kloskowski, *Filozofia ewolucji i filozofia stwarzania*, vol. 1: *Między ewolucją a stwarzaniem* (Warszawa: Wydawnictwo ATK, 1999), pp. 190–294.

6. Evolution and creation – an attempt at synthesis

From the viewpoint of the reliability of the Christian outlook, we cannot ignore attempts to answer the following question: is it possible, at least to some extent, to "reconcile" creation with evolution? If so, won't this "reconciliation" become the reason for questioning, on the one hand, the truth that the whole world (including man) was created by God, namely, everything which exists owes its existence to God; and, on the other hand, the theory concerning the evolutionary emergence of the world and living organisms?

From St. Augustine, who referred to germinal principles [*rationes seminales* – eds.], through Thomas Aquinas with his conception of vital potentialities, to the present, periodically there have occurred attempts to "reconcile" creation and evolution. Of these, we should mention: Teilhard de Chardin,[1] K. Rahner,[2] P. Sertillanges,[3] as well as

[1] "Comment se pose aujourd'hui la Question du Transformisme," in *Œuvres de Pierre Teilhard de Chardin*, vol. 3: *La vision du passé* (Paris: Éditions du Seuil, 1957), p. 39.

[2] "Die Hominisation als theologische Frage," in P. Overhage, K. Rahner, *Das Problem der Hominisation* (Freiburg: Herder, 1961), pp. 58–63.

[3] *L'idée de création et ses retentissements en philosophie* (Paris: Aubier, 1945), pp. 127–150.

K. Kłósak[4] and T. Wojciechowski.[5] Nevertheless, recently one can observe the emergence of numerous conceptions, often pseudo-scientific ones, which both question evolutionary processes and negate the possibility of reconciling creation and evolution in any respect. One example of this approach are the proposals of the "scientific" creationists.[6]

I would like to present a solution in this chapter which allows us to "reconcile" creation and evolution. My proposal is based on the acceptance of the natural vision of the world, and the evolutionary theory of knowledge is of fundamental significance—a theory which has greatly influenced the development of the modern, Western European philosophy of science. ...

6.1. Evolution or creation?

E. Mayr[7] notes that the emergence, character and the very development of science (biology) depends on the so-called silent assumptions. What is more, these assumptions very frequently determine the reception or rejection of scientific discoveries. In consequence, "various researchers draw contrary conclusions from the same facts."[8] So, if a scientist starts the reflection upon a chosen problem and if he doesn't want to arrive at ambivalent outcomes in his work, he first of all has to analyze the history of the problem at hand. The above cited author writes straightforwardly that, in order to understand the foundations of the new emerging ideas, "the scientist should examine the ways of modifying the old ideas and the reasons for their rejection,"[9] and the essential role is played here, as J. Losee[10] pointed

4 "Teoria kreacjonistycznych początków duszy ludzkiej a współczesny ewolucjonizm," *Analecta Cracoviensia* 1 (1969), pp. 32–56; cf. K. Kloskowski, "Problem kreacji i kreacjonizmu w ujęciu Kazimierza Kłósaka," *Miesięcznik Diecezjalny Gdański* 32, no. 1–3 (1988), pp. 81–89.

5 "Teoria ewolucji i wiara," *Śląskie Studia Historyczno-Teologiczne* 12 (1979), pp. 99–117.

6 R.L. Numbers, "Creationism in 20th-Century America," *Science* 218, no. 4572 (1982), pp. 538–544 ...

7 *The Growth of Biological Thought: Diversity, Heredity and Evolution* (Cambridge, MA: Harvard University Press, 1982), pp. 17–18.

8 Ibidem, p. 834.

9 Ibidem, p. 631.

10 *Philosophy of Science and Historical Enquiry* (Oxford: Oxford University Press, 1987). ...

out, by the way the history of science, or even of a particular problem, is treated with respect to the philosophy of science which a given scholar accepts.

…

Up to the second half of the 19th century, it was quite commonly accepted that both the world and the man emerged as results of God's creation acts. Yet Charles Darwin, in his 1859 work *On the Origin of Species*, presented a solution to the problem of the emergence of the world and man which was completely different to the one which had been commonly accepted. The new element in this solution was the presentation of natural rather than philosophical arguments for evolutionary processes. Unfortunately, this new vision of the beginning of the world and man was misunderstood. In consequence, Darwin's natural theory of evolution was treated as irrefutable evidence for the validity of the philosophical view known as material monism. Therefore, it was an attempt to justify philosophical views by a scientific thesis. This interpretation resulted in connecting evolutionism, as logic would put it, in a symmetric relationship with material monism. The main promoter of this approach was E. Haeckel.[11] He claimed that the theory of evolution not only provides the full picture of the phenomenon of life, but also that it thoroughly answers all of the "whys" of this phenomenon, a role previously reserved for philosophy. These answers are mechanistic and causalistic in character, meaning that they see the causes of phenomena merely in natural, physiochemical processes, contrary to discerning the operation of supernatural creative forces, as was the case in the past.

The fact that F. Engels used Darwin's conception (or, perhaps a better term would be proposal) for his obsessive fight against theology,[12] caused evolutionism to be seen in another way. There emerged the myth of the impossibility of reconciling religious truths with the results of natural sciences. … Haeckel reduced the natural thesis that man had developed from the world of animals to the claim that man is no different to an animal, or that man is a kind of animal.

---

[11] *Natürliche Schöpfungsgeschichte* (Berlin: Verlag von Georg Reimer, 1898), p. 95.

[12] See: F. Engels, *Dialektyka przyrody*, trans. W. Krajewski (Warszawa: PWN, 1979), pp. 9–12, 256.

Yet, it is obvious that the developmental continuity (evolution) doesn't have to exclude the peculiarity of a new [evolutionarily emergent – eds.] being.[13] F. Engels, in turn, was wrong when he said that if we wanted to treat religious truths as true ones, then the theorems had to be argued for within the natural sciences; while theology—as any other academic discipline—has its own characteristic research methods. Hence the interpretation of evolution within Darwin's theory was unable to "ruin" theology, as Engels claimed; rather it showed very clearly the necessity of distinguishing the research framework (the scientific, philosophical or theological one), within which reflections upon evolution are carried out. All attempts to repudiate theological theses within natural research should be treated as mistakes of cognitive competence.

We can raise similar objections against the theologians who questioned the validity of the theses of evolution theory (a scientific framework) by referring to the dogmas of faith about the world and man being created by God (a theological framework). In this way, they wanted to defend the exceptional role of man among other creatures which, in their opinion, was questioned by the biological theory of evolution with its variability of species. And, quoting the authority of Aristotle and St. Thomas Aquinas[14] was of great significance, as they interpreted the causal connections of events in a unique way: the effect cannot be more perfect than its cause (*omnis agens agit simile sibi*). The above rule was realized in the following way with respect to evolution processes: if a cause cannot bring about an effect which would surpass the scope of its cause, then no species of plants or animals can bring about the emergence of a species which is more perfect than it was. The premise of the equal scope of cause and effect is correct, but the conclusion is wrong since it implicitly assumes the absence of an internal capability for progress and development in particular beings (species).[15] The attempts to answer the question of the

[13] B. Hałaczek, "Człowiek w statycznym i dynamicznym poglądzie na świat," *Śląskie Studia Historyczno-Teologiczne* 7 (1974), p. 205.

[14] Cf. A.G.M. van Melsen, *Natur und Moral*, in *Das Naturrecht im Disput*, ed. F. Böckle (Düsseldorf: Patmos Verlag, 1966), p. 70; A. Hollerbach, *Das christliche Naturrecht im Zusammenfang des allgemeinen Naturrechtsdenkens, in Naturrecht in Kritik*, red. F. Böckle, E. W. Böckenfoerde (Mainz: Matthias Grünewald Verlag, 1973), p. 28–29.

[15] …

priority of creation or evolution, as it is easy to notice, are similar in character to previous controversies concerning the theorems of G. Bruno, Copernicus and Galileo.[16] ...

Therefore, it would not be any exaggeration to say that the essence of the controversy between creation and evolution presented in this chapter is the dichotomous and antagonistic approach towards the contents and scope of the two notions; thus, it is hardly surprising that one group of scholars refers to the theory of evolution as an argument against the thesis of the world and man being created by God, while others refer to the content of dogma as an argument against evolution.[17] The reasons for such a state of affairs are the frequently unconscious, silent assumptions mentioned above. These are:

(1) mixing up strictly philosophical principles and terms (usually metaphysical) with natural ones;
(2) a narrowing understanding of science, excluding theology and even philosophy.

One further source of misunderstanding is the fact that the content of the notions of creation and evolution was either narrowed down or unnecessarily broadened. And defining creation within the framework of faith not only means that God created the world and man a very long time ago (the moment which began the existence of everything); the term "creation" contains one more important meaning, namely that created beings are permanently maintained in their existence, i.e. they are always directed at their Creator, from whom they receive their existence. St. Thomas (*Summa Theologiae* I, q. 46, a. 1–3) insisted that it is not important whether beings have their beginnings in time or they exist eternally in creation; what is important is rather the presence of a permanent relationship between the created beings and their Creator; and this relationship could last eternally (the moment of maintaining in existence). For Darwin, in turn, evolution was the process of the emergence of a species, dependent on natural selection, which Darwin, in his time, was unable to justify

[16] Cf. L.E. Goodman, M.J. Goodman, "Creation and Evolution: Another Round in an Ancient Struggle," *Zygon* 18, no. 1 (1983), pp. 10–11.

[17] Cf. F. Elliott, "The Creative Aspect of Evolution," *International Philosophical Quarterly* 6, no. 2 (1966), pp. 230–247.

adequately.[18] Therefore, Darwin's solutions[19] should be treated merely as natural proposals of searching for the laws governing evolution rather than as the only ultimate explanation of the emergence of the world and man (as Haeckel wanted it to be).

The circumstances presented above may be treated as the reasons justifying the wrong way of understanding the problems of creation and evolution, as well as the relationships between them and the claim concerning the impossibility of "reconciling" creation and evolution with one another. This is of crucial importance since the above mentioned reasons were present not only among biologists and theologians at the turn of the 20th century, but they also appear from time to time in the present.[20]

…

6.2. A proposal for solving the problem

The essence of the proposed approach is an attempt to combine the philosophical and natural type of thinking with each other (within which the terms evolution and creation function respectively), i.e. two different images of the world. This proposal is based on the following assumptions: firstly, the cosmos and biocosmos are regarded as processes; secondly, the knowledge of the reality seen in this way is most fully realized within the evolutionary theory of knowledge.

The image of the world as seen by contemporary man is shaped mainly by the results of the natural sciences. Starting from M. Planck's quantum theory (1900) up to the latest theories of Ch.J. Pedersen, D.J. Kram, J.M. Lehn (supermolecular chemistry), K.A. Muller, J.G. Bednorz (high temperature superconductivity), S. Tonegawa (the sources of antibody diversity) the world presents itself as a continuous process, i.e. happening in time. What is meant here is not

---

[18] S.W. Fox, T. Nakashima, "Endogenously Determined Variants as Precursors of Substrates for Natural Selection," in *Individuality and Determinism*, ed. S.W. Fox (New York: Plenum Press, 1984), p. 195.

[19] …

[20] W.L. Craig, "Creation and Mr Davis," *The British Journal for the Philosophy of Science* 37 (1986), pp. 163–175; B.J. Loewenberg, "Darwin and Darwin Studies 1959–63," *History of Science* 4 (1965), pp. 15–54; W. Broad, "Creationists Limit Scope of Evolution Case," *Science* 211, no. 4488 (1981), pp. 1331–1332; R.W. Bruhoe, "Natural Selection and God," *Zygon* 7, no. 1 (1972), pp. 30–63.

merely the fact that there are phenomena occurring in the world, as in a kind of their "base": the world itself happens; the appropriate processes happen and take place in it. ... Thus, it seems that the processual (dynamic) approach towards reality (in both the micro- and macro-dimension), is commonly accepted. Nevertheless, the problem of reasonably explaining the function of the world understood in this manner has not yet been solved.

Both creation and evolution seem to be able to be such reasons for the functioning of the world—the idea of creation understood as maintaining things in their existence and the evolution with its dependence on specific laws of nature. In searching for the reason for functioning of the cosmos and biocosmos, I see a possibility of "reconciling" creation and evolution. Creation concerns not only the emergence of a given being, but also maintaining it in its existence; and evolution is not only the process of changes, but also the silently assumed moment of their emergence. In other words, that, which is called 'maintaining a being in existence'—within the creation framework, within the evolution framework—may be interpreted as a kind of 'field of continual changes' taking place in a specific direction.

The second assumption ... is based on the interesting theorems of evolutionary theory of knowledge. R. Riedl, an advocate of this theory, understands evolution as the process of gaining information. Knowledge, in turn, is the phenomenon by which living systems obtain information concerning the regularities occurring in the world by continual adjustment to them.[21] The evolutionary theory of knowledge undertakes the examination of old philosophical problems, and the outcomes of these examinations are subject to empirical verification. Evolutionary epistemology attempts to answer the questions of "why?" and "how?"; it analyzes the applied reasonings (in terms of cause, time, purpose, space), regardless of the experience. What is meant here is the system of hypotheses which emerged and developed as a result of the progressive adaptation of man to reality. Another problem tackled by evolutionary epistemology is an attempt to determine the character of inductive generalizations and their relation to reality. Reality is ordered in a hierarchical way. Such an order

[21] R. Riedl, *Biologie der Erkenntnis* (Berlin–Hamburg: Verlag Paul Parey, 1981), p. 7; R. Riedl, *Die Strategie der Genesis* (München–Zürich: Piper Verlag, 1984), p. 51.

exists, because our perception and thinking developed as adaptations to this hierarchically ordered reality. Our perception and thinking reflect reality, thus we generalize through induction, in accordance with the laws of nature. Another Riedl's reflection concerns the search for certainty, similarities, causes, purposefulness in relation to human way of thinking. Thinking in terms of similarity, linear causality and purposefulness is human innate faculty, and it reflects reality to which it adapted itself.

…

One of the fundamental assumptions of evolutionary epistemology is the theorem concerning the preservation of the relationship between the type of perception and thinking and the hierarchically ordered nature. Thus, we may talk about a kind of isomorphism between the paradigm of nature and the one of human perception and thinking. Nevertheless, all the cognitive mechanisms are appropriate only within such reality, for which they got formulated as a result of selection.[22]

Let us ignore the discussion of the validity of evolutionary epistemology theorems; instead, let us try to answer the question: What evolutionary epistemology may contribute to the research of understanding the act of creation and the process of evolution?

Our cognitive apparatus and faculties are the results of the operation of biological evolution and they constitute a certain history of genealogical development. Phylogenetic experience determines the character of this development. Thus, the actuality of human cognition depends on the relationship between our cognitive apparatus and reality. If such a relationship (adaptation) did not exist, there would not be life on Earth. Moreover, at the level of humans this relationship allowed for surpassing natural sensory cognition, characteristic of animals, and for developing spiritual cognition.[23] If, in accordance with

[22] R. Riedl, *Biologie der Erkenntnis*, p. 8.

[23] F.M. Wuketits distinguishes human psychic and spiritual cognitive faculties. The former is characteristic of all living organisms, which have their nerve system, allowing them for receiving the stimuli from the world around, while the latter are exclusively characteristic of the man. See: F.M. Wuketits, *Grundriß der Evolutionstheorie* (Darmstadt: Wissenschaftliche Buchgesellschaft, 1982), pp. 11–12. Cf. F.M. Wuketits, "Evolution as a Cognition Process: Towards and Evolutionary Epistemology," *Biology and Philosophy* 1, no. 2 (1986), pp. 191–206.

evolutionary epistemology theses, spiritual cognition has its source in nature as an effect of its adaptation to nature, then man is constituted not only by the physical dimension of nature, but also by "something more," something spiritual. Asking about the origin of man within such framework, we can find the answer through searching for the source of humanity in both physical and spiritual reality reflected in human cognitive faculties.

The new interpretation applied in evolutionary epistemology allows us to discuss the origin of man starting from biological aspects of this issue, up to philosophical implications of it, within a unified approach. This approach also avoids the charge of not distinguishing between the respective research fields of scientific and philosophical anthropology. In consequence, the problem of the origin of man, discussed within evolutionary epistemology, appears as a paradigm of interdisciplinarity and complementary character of biology and philosophy. What is more, evolutionary theory of cognition shows that human cognitive faculties are not limited to the senses, but they also include the spiritual sphere. Man transcended the borderlines of biological cognition gaining the property of abstract thinking and notional speech. Due to this property man surpasses nature itself and the faculties of sensory cognition. So, in such perspective, a man can ask about the source of him "being different" from all other organic creatures.

K. Lorenz,[24] in turn, maintains that living creatures are historical beings, understanding of whom is based on the knowledge of evolutionary processes. Therefore, both man and every other living creature owe their properties to evolution. As far as the understanding of human uniqueness is concerned (the properties characteristic only of man not of other creatures), we should reconstruct the phylogenetic path, on which, towards the end of Tertiary, there appeared a peculiar system wholeness, capable of notional thinking and speech. These reconstructions of the peculiar properties are called by K. Lorenz the evolutionary theory of knowledge. Its fundamental thesis that man totally comes from the world of nature and that his fate is connected

[24] K. Lorenz, *Odwrotna strona zwierciadła*, trans. K. Wolicki (Warszawa: PIW 1977), pp. 33–34; cf. Z. Łepko, "Antropologia Konrada Lorenza," in *Z zagadnień filozofii przyrodoznawstwa i filozofii przyrody*, vol. 13, ed. M. Lubański and S.W. Ślaga (Warszawa 1991: Wydawnictwo ATK), pp. 183–249.

with this world, is connected with the theorem of human exceptionality and of our irreducibility to nature.

The new way of interpreting and carrying out analyses of scientific research, presented above and undertaken within evolutionary epistemology, allows for discussing the genesis of the world and man starting from the natural aspect of the problem up to drawing philosophical implications within interdisciplinary research perspective. Such a way of capturing reality simultaneously eliminates the charge of not distinguishing the respective research fields of natural sciences and philosophy.[25]

If we agree with the assumptions adopted in this chapter, according to which: (1) the surrounding reality is processual in character, and (2) it is most fully acknowledged and understood in light of evolutionary epistemology, I see a possibility of solving the problem "creation or evolution" within the thesis: evolution is a creative process[26] or evolution is a peculiar moment of the act of creation.[27]

... The process of the emergence of new species and of dying out the old ones ... is realized by trial and error method. The exceptional achievement of this process, from the biological point of view, is the emergence of human species. Biological evolution, when giving raise to the man, surpassed itself. That is why evolution may be regarded as a peculiar "way, through which the process of creation is being realized."[28]

---

[25] Great difficulties appear in the very reception of evolutionary theory of knowledge, mainly because of: (1) the terminology not having been worked out for this field yet (and each field of knowledge does have its own terminology); (2) questioning the way of confirming the assumptions of evolutionary theory of knowledge. Cf. N. Tennant, "In Defence of Evolutionary Epistemology," *Theoria* 49, no. 1 (1983), pp. 32–48; M. Bradie, "Assessing Evolutionary Epistemology," *Biology and Philosophy* 1, no. 2 (1986), pp. 401–459.

[26] Cf. P. Teilhard de Chardin, *Que faut-il penser du transformisme? Dossiers de la Commission synodale*, vol. 2, June–July 1929, after: K. Kłósak, "Zagadnienie stworzenia wszechświata w ujęciu P. Teilharda de Chardin," *Studia Philosophiae Christianae* 1, no. 2 (1965), p. 283; cf. Th. Dobzhansky, *Różnorodność i równość*, trans. A. Makarewicz (Warszawa: PIW, 1979), p. 128; F. Elliot, "The Creative Aspect of Evolution," pp. 246–247.

[27] Cf. H. von Ditfurth, *Nie tylko z tego świata jesteśmy. Nauki przyrodnicze, religia i przyszłość człowieka*, trans. A.D. Tauszyńska (Warszawa: PIW, 1985), p. 136.

[28] Th. Dobzhansky, *The Biological Basis of Human Freedom* (New York: Columbia University Press, 1956), p. 124.

H. von Ditfurth is much more radical in his claims, because, for him, evolution is identical with the moment of the act of creation. He claims that "biological and cosmic evolution are, in our brains, the projections of creation," that "the history of both inanimate and animate nature is a form through which we experience creation (from the inside), which (from the outside) from the transcendental perspective, i.e. actually, is the matter of one single moment."[29]

Nevertheless, when adopting the above explanations concerning the reconciliation of evolution and creation, we have to emphasize strongly that, ... "creation" is a philosophical term, the meaning of which is the truth of God as the ultimate cause of everything; while the term "evolution" is a typical notion from natural sciences, which describes the emergence of new species. When attempting to reconcile creation and evolution within the framework of evolutionary theory of knowledge, we actually realize that the natural reasons explaining evolutionary changes of cosmos and biocosmos are unable to answer the questions: Why does the world exist?, What is the role of evolution?, Is the world just an ordinary spectator or maybe the main actor and a potential director?[30] Thus, referring merely to evolution doesn't solve the problem of the genesis of the world and man; the problem, which, in its essence, requires philosophical, non-empirical reflection; reflection, the outcome of which is impossible to be verified by data taken from particular natural sciences. In consequence, the thesis of the creative evolution, of evolution as a moment of the act of creation, appears to a natural scientist as the process of the emergence of something new, something better; while, for a philosopher, it means creative evolution, namely, the dependence of the world (all that, which emerges as a result of the evolution of cosmos and biocosmos) in its existence on God as on its cause. In other words, evolution understood as the process of changes, requires some ontic reason for these changes, which, in the light of evolutionary epistemology, may be creation. Evolution, therefore, requires creation and, in this sense, evolution confirms creation.

...

[29] H. von Ditfurth, *Nie tylko z tego świata jesteśmy*, pp. 137–138.

[30] Th. Dobzhansky, *Różnorodność i równość*, p. 132.

6.4. Searching for new approaches

In light of the discussion presented above, we may say that "reconciling" evolution with creation primarily requires a common field, i.e. a single approach, which would enclose both scientific and philosophical reflection. Obviously, within this new research perspective, evolution and creation do not lose their commonly accepted meanings, … rather, some of these meanings are highlighted, i.e. those which are actually their essence. Hence, in creation, it is emphasized that it is not a sudden, immediate emergence of a being, but rather the process of the transformation of a being into another (the ontic reason is God, while the natural ones are the physiochemical phenomena). Evolution, in turn, pays attention to the fact that the emergence of a new species, as asserted in the natural sciences, is not a sufficient reason for justifying the reasonability of this process. As a consequence of reconciling evolution and creation, there appears an evolutionary model of creation constituting the basis for the evolutionary version of Christian creationism, the main ideas of which … may be accepted by both an open natural scientist and a philosopher. This is the case because the logical and methodological analyses of the fundamental thesis of this version of creationism, i.e. that evolution is a specific moment in the act of creation, indicates the possibility of the consistency between evolution and creation expressed in the logical process of confirmation. This process does not merely consist of proving the adopted thesis to be true or false; rather it is connected with the presentation of the particular conception of the philosophy of science adopted by the given researcher.

As I share the above views, I would like this discussion to be treated just as: (1) a kind of attempt to integrate ideas which seem to be in conflict with one another as far as their outlook and philosophy is concerned, i.e., the ideas of evolution and creation; (2) an attempt to change the approach towards evolution and creation, leading to the development of a new research strategy without methodological contradictions in the process of "reconciling" the theorems justified in physics and chemistry with philosophical ones. Moreover, within the research convention which I have adopted, I presented an evolutionary version of Christian evolutionism. Certainly, I treat the above considerations only as a suggestion for further analyses.

…

8. The diversity and unity of life

Our contemporary civilization—like no other before—is fascinated with the problems of life to an extent which no past civilization was; it attempts to explore various aspects of these problems. What is meant here is, first of all, a shift in the manner in which the problem of life is captured, rather than a simple expansion of the scope of research from systematics and paleontology to the protection of natural environment and ecology. This concerns the theoretical, experimental, subject-matter and meta-theoretical research. Nevertheless, the passing of time makes man pay more attention to solving practical problems than to any reflection upon the very phenomenon of life. Typically, man concentrates rather on the particular phenomena of life, perceiving and exploring it in plants, animals, in himself; man focuses on that which is directly available to him, and which is possible to verify in an empirical way. For the ordinary man, deeper reflection is more difficult as it requires him to use a complex, often abstract (philosophical) notional apparatus. As a result, it is not surprising that man very rarely attempts to define life itself but this was always the case. Even so, he has always been fascinated with the great diversity and abundance of forms of life. This fascination is recorded, for example, in the beautiful description of the creation of the world in The Book of Genesis: "And God created great sea creatures, and every living thing that moves, which the waters brought forth abundantly, after their kind, and every winged fowl after its kind. ... And God made the beasts of the earth after their kinds, and cattle after their kinds, and everything that creeps upon the earth after its kind."[31]

8.1. Biodiversity

The diversity of life we observe is the fundamental feature of the animate world.[32] Due to this feature, the animate world maintains its existence. Five breakdowns of evolutionary processes have occurred so far; they required as many as 25 million years in Ordovician, 30 million years in Devonian, 100 million years in Permian and Triassic and 20 million years in Cretaceous to reach the original level of biodiversity. Nature, therefore, reproduces itself for a very long time

[31] Gen. 1:21, 25. King James 2000 Bible.

[32] E.O. Wilson, *The Diversity of Life* (New York–London: W.W. Norton Company, 1993), pp. 15, 31 and 35.

in order to prevent its biodiversity from being destroyed. Moreover, we should note that the biosphere, i.e. the sphere of the globe inhabited by all organisms, makes up as little as 1/10 billion part of the Earth mass. It encloses the lower part of atmosphere, hydrosphere and the outer part of the lithosphere, and it is a kilometer-thick sphere in the area of half a million square kilometers ... Despite of that life is abundant in its millions of creatures, in its biodiversity.

...

8.3. The quest for the mystery of life

Reflections upon the mystery of life are rooted in the analytical way of thinking which is characteristic of man. Thus, it is not surprising that as early as Aristotle[33] every living thing was seen as having to move due to some internal causes, while the source of motion for inanimate objects was some external cause. Aristotle's simple analysis of the movement of plants made him exclude them from the group of living creatures. On the other hand, he assumed that plants had their souls, which he treated as a principle of life, performing the functions of animation and reproduction. This dilemma was solved as late as by St. Albert of Lauingen. No—he said—plants do not move the way animals do. Plants are attached to the ground, but they are capable of taking food; they grow, reproduce and die, so they have to have the matter organized to the similar degree to that in animals.[34] St. Thomas Aquinas, in turn, following Aristotle's suggestions, treated life either as a kind of existence of beings capable of performing internal life functions (plants, animals, men), or as the functions of living beings themselves (reproduction, growth and so on). Living beings differ from non-living ones in that the former move as a result of functions which are not given from the outside (= self-perfection, spontaneity).[35] ...

---

[33] Aristotle, *Metaphysics* 1045a.

[34] A. Paszewski, "Les problèmes physiologiques dans *De vegetabilibus et plantis libri VII D'Albert von Lauingen*," *Actes du XIe Congrès International d'Histoire de Sciences* 5 (1968), p. 325; cf. A. Paszewski, "Albert z Lauingen o roślinach i zwierzętach," *W Drodze*, no. 11–12 (1981), p. 25.

[35] I, q. 54 a. 2; cf. S.W. Ślaga, "Próba uściślenia Tomaszowego określenia istoty życia," *Studia Philosophiae Christianae* 10, no. 2 (1974), pp. 67–100.

8.4. Biounity

Nowadays, the total number of species of living creatures on Earth is estimated as being between 10 to 100 million. In this great abundance, however, a characteristic unity may be observed both in common and in scientific cognition. The unity concerns, first of all, the physical structure—the cellular and chemical structure—the presence of a significant amount of water and macromolecules (proteins, nucleic acids, lipids and sugars). In consequence, living objects are treated as ordered systems which consist of a set of elements and fragments cooperating with one another and constituting a unique, individual unity. What is more, species which are subject to evolution constitute a phylogenetic unity in this respect. These two properties, considered as complementary, determine biounity, the unity of life or organized wholeness. Biounity is expressed through the following functions: metabolism, excitability, autonomy of movements, growth, development, reproductiveness. In this context, it is not surprising the need to undertake the research for the sources of biounity.

…

To sum up, the above presented analyses… point to one single beginning of life on Earth. Yet, it doesn't mean that life emerged immediately; rather it emerged over the course of billions of years. Within an unstable environment, primitive forms of life could have been destroyed many times on the basis of the method of trial and error, namely they emerged and developed to some critical point and then they perished. Finally, a system appeared which, through spontaneous mutation, acquired the features which enabled its adaptation to the new circumstances, e.g. by developing the mechanism of stress response; this was the beginning of all organisms. The evidence is their common genetic code and the similarity of the structure and functions of some proteins. This is why no one can be surprised at my suggestion that it is necessary to try to examine the phenomenon of life thoroughly and to expand the definition of life by means of the revision of traditional views, e.g. with respect to the creation of life and to evolutionary processes.

…

8.7. Biodiversity and biounity: an attempt at assessment

The data concerning nature presented above may be sufficient to determine the source and foundations of the simultaneous diversity and unity of life for some scholars. These reasons are most often reduced to treating life as either the better-informed matter,[36] or as matter organized in such a way that it is equally valid to explore it from both the perspective of unity and diversity. Thus, what is meant here is the highlighting of two aspects to the one, overarching reality of life.

In turn, other philosophers—particularly those, who seek an ontic reason for the observed diversity or unity of life on the Earth—have the right to ask: what is the source of information regarding animate matter or the "mysterious" tendency to self-organization of life?

8.7.1. Epistemological and methodological reflections

Results from the natural sciences show that the animate world is much more complex and individualized than the world of inanimate matter. That is why it is much more difficult to construct theorems in biology than for example in physics. Even the very act of establishing the criteria for distinguishing the animate matter from inanimate is a troublesome process. We can find examples even in our daily lives. Lower animals or plants can be in a so-called state of anabiosis, i.e. the state of the suspension of animation in response to unfavorable environmental conditions. The commonly adopted criteria do not allow the determination of whether an animal is still alive or not in this case. It is still more difficult to point to its unity with the animate world. Biological sciences talk about such life properties, … but they are used as criteria rather too freely.

It is also very difficult to precisely determine the essence of life as far as philosophy is concerned. We don't know whether life is a thing, a part of thing, a property of a material object or the property of the reactions occurring within material objects. Life may also be a primitive indefinable property. Moreover, the interpretation of natural sciences data requires the adoption of either an analysis-sum approach (life is then analyzed through the decomposition of living organisms and phenomena into elementary elements, and then they are explained with physical and chemical laws) or the organismal-wholeness approach

[36] Cf. J. Guitton, G. Bogdanov, I. Bogdanov, *Gott und die Wissenschaft* (München: Artemis Verlag, 1992), pp. 50 and 57.

(it considers an organism as a whole, in its complexity and always as an internally integrated system).

It seems that the two implicit assumptions of the examination of life lead to focusing either on its homogeneity or heterogeneity. In consequence, it is easy to notice that two attitudes towards the phenomenon of life are valid: both from the perspective of unity and diversity. The lack of a full acceptance to this conclusion results from the impossibility of working out a definition of life which would be commonly accepted. In this respect, the scholarly world is strongly divided here. Some academics argue that the formulation of any definitions of life is nonsense, because life cannot be treated universally since, when we talk about life, we talk about it in relation to a specific living organism. Other scholars, in turn, argue that life cannot be defined at all, because it is a primitive, indefinable term, which functions in biology in a manner akin to how "set" does in mathematics. Still others claim that the state of scientific research doesn't allow us to define the essence of life in a precise way. I personally think that we can, and should, try to define life. Obviously, we should take into account the results of biological research, and, with the organismal-wholeness approach, mentioned above, we may expect some positive solutions. Thus, I consistently adopt the view that life is:

(1) the way organisms exist and function;
(2) the most specific property of organisms;
(3) the continual and complex process of self-organizing of the system, which is characterized with metabolism, the ability to store and transfer genetic information, the ability to adapt itself to its environment, the ability to evolve; the process in question started about 3.5 billion years ago.

8.7.2. Biophilosophical and ontological considerations

As I indicated above, genetic code is almost identical in the whole of the living world, with the exception of some mitochondrial DNA where a few codons perform different functions. Thus, genetic code is extremely stable and "preserved" despite the evolutionary processes which have been in operation for a very long time. The situation is similar with certain proteins, e.g. with histones and cytochrome C, which perform the same functions in different organisms. For me personally, these discoveries confirmed the possibility of validly questioning the “traditional” paradigm, which sees evolution and creation as mutually exclusive; a paradigm, which has been established by intellectuals, who treat evolution as a new religion rooted in Heraclitus’ philosophy, which maintained that all reality is changing all the time—*panta rei*. Yet, it turns out that not all of reality is changing. In consequence, it is no longer plausible to raise the objection that if life on Earth appeared as a result of evolution, then referring to the doctrine of creation is nonsense. In essence, objections of this type are based not on scientific reason, but rather on an outdated, old paradigm of science. So, I propose to look at the problems in question within the context of a different paradigm. ...

Within this newly proposed paradigm, the idea of creation—generally speaking—focuses on research within philosophical framework, while evolution seeks solutions in the biological sciences (I assert and highlight this fact once again here for emphasis). As far as methodological correctness is concerned, interpreting the emergence of life on Earth in the two frameworks is acceptable, as they are not mutually contradictory; what is more, they can even complement one another. Hence, if we take into account that reality is processual in character and that it is thoroughly acknowledged and understood in light of evolutionary epistemology (the relevance of human knowledge depends on the relationship between human cognitive apparatus and reality),[37] the thesis that evolution is a particular moment of the act of creation becomes valid.[38] Th. Dobzhansky[39] highlights the fact that evolution is creative, as new species appear because of it. And each new species tries a new way of existence. Most of them perish, but some survive and discover new, better ways of existence; they are subject to the so-called adaptive radiation.

Moreover, the truth of the creation of life by God is not in opposition to the view that life is eternal. The notion of creation does not contain the temporal finiteness of life, but rather its total dependence (in its existence) on the Creator. Thus, life could exist eternally and at the same time it could be created by God.

---

37 F.M. Wuketits, *Grundriß der Evolutionstheorie* (Darmstadt: Wissenschaftliche Buchgesellschaft, 1982), pp. 11–12.

38 H. von Ditfurth, *Nie tylko z tego świata jesteśmy. Nauki przyrodnicze, religia i przyszłość człowieka*, trans. A.D. Tauszyńska (Warszawa: PIW, 1985), p. 136.

39 Th. Dobzhansky, “Creative Evolution,” *Diogenes* 58 (1967), pp. 62–74.

In other words, the doctrine of creation focuses primarily on the dependence of living creatures, and everything else, in their existence on God. This very truth is not in contradiction with the thesis that man and the world "emerged" through the process of evolution.[40] Simultaneously, the structural and functional conservatism of genetic code, histone or cytochrome C draws attention to the fact that life, in all its abundance and temporal limitedness, did not appear exclusively through evolutionary processes. Thus, referring to self-organization of matter, to the tendency to transform into increasingly ordered and well-organized states of matter, is not so obvious and persuasive. Consequently, in the deepest philosophical sense, pointing to the activity of the Beginning of Everything here is not nonsensical.

Moreover, the property of the self-organization of matter mentioned above, as well as the functional and structural conservatism of various life structures, may serve as a kind of verification of the fact that a Divine plan of the development of matter in encoded in the foundations of the unity and diversity of life, or that there is a supernatural intelligence which directs the evolution of life; or there is a guiding idea which orders the complex sets of structures and functions constituting a living creature from the inside.

As we may easily notice, such an interpretation of the phenomenon of life draws our attention to the problem of the purpose and purposefulness of the biocosmos: everything which acts, acts on purpose. I am obviously aware that the acceptance of the above mentioned theorems will be far from easy.[41] There are many reasons for this and the fundamental one is that "the scientistic mentality has not been completely forgotten yet. We still live with it. We have the conviction that culture as a whole should be a vassal of the empirical sciences."[42] I hope this attitude will soon disappear otherwise no one will be able to present the problem of the unity and diversity of life deeply and thoroughly.

---

[40] St. Thomas Aquinas emphasized that the world certainly has its temporal beginning, yet, as a matter of fact, the created world could equally exist eternally; the essence of the fact that the world was created is not the fact that it started existing at some point, but that its relationship could last eternally – *Summa Theologiae* I, q. 46.

[41] …

[42] A. Synowiecki, "Wiedza w 'przestrzeni' przedmiotu," *Zeszyty Naukowe Politechniki Gdańskiej. Filozofia* 2 (1995), p. 70.

8.8. Summary

…

Two elements constitute the essence of natural reflection upon the mystery of life and they lead us towards the following conclusions:

(1) Diversity and unity are two aspects of the same reality of life, analogical to the wave and particle structure of matter in physics;
(2) The tension between the diversity and unity of life is the essential "spring" for the development of the knowledge of life. That is why the very interpretation of the unity and diversity of life requires a two-sided approach or an analytical and summative one. In consequence, it may be easily asserted that life developed its diversity due to evolutionary mechanisms, while the unity of life is due to the mechanisms "preserving" some life functions and structures.

Examining these problems within a philosophical and ontological framework leads us to the following questions: Could the diversity and unity of life appear exclusively due to the processes of nature? What lies at their beginning? And, what is more, how did life appear on Earth?

The philosophical analysis of inanimate and animate matter clearly proves that life could not has emerged merely as a result of physiochemical processes. Matter needed some supernatural impulse to cross this mysterious border of life. This proposition, from the ontological point of view, is the combination of both natural and philosophical options, namely, the acceptance of the self-organization of matter principle and the non-material reason, acting creatively through the forces present inside the matter. And, the notion of creation doesn't contain the temporal finiteness of life, but rather its dependence on a supernatural impulse. Thus, we may say that life exists eternally, while being created through the activity of the Beginning of Everything. In consequence, evolution appears as the spatial and temporal way of realizing the process of creation.

…

9. Instead of a conclusion

9.1. The philosophy of evolution

The natural explanation of the emergence of the world and man is based on adopting the postulate of the occurrence of evolutionary sequences. This postulate is logical in character, which means that the adequate examination of reality becomes impossible without adopting it. With respect to biological evolution, this sequence permits us to define evolutionary processes as the natural ones which proceed in accordance with the laws of nature. The attempts to capture this sequence within a theoretical framework are nothing other than theoretical constructs ordered according to specific criteria. So, if we take into account the development of evolutionary biology, we can talk about genetic and population theory, molecular theory, etc. If the criterion is, in turn, the definition of evolution, then we should point to the theory of evolution formulated by, e.g.: Ch. Darwin, Th. Dobzhansky, J.B.S. Haldane, E. Mayr, M. Kimura, etc. In turn, when the criterion would be pointing to the most important mechanism of evolution, then we need to distinguish between e.g. the theory of natural selection and the mutation theory. The multiplicity of theories of evolution shows that not all the things are explained with respect to the variability in nature. ... In consequence, theories of evolution present a causal sequence of transforming lower forms into higher ones, together with a description of the manner in which this process occurs. Nevertheless, at this very moment, a question arises which the biologist is unable to answer because of the research methods which he uses. The question is the following: why does anything new emerge, anything which was not present earlier, in the process of the variability of nature? Biologists present various and diverse paths of evolution (theories of evolution) and they highlight various factors and mechanisms. Hence, the question about the scope of these factors and their adequacy in the context of the causality principle has to arise.

Moreover, we should note that the term "evolution" is at present understood commonly as the evolution of species, which is not fully precise or adequate. The literal meaning of the term "evolution" is "development." Yet, with respect to biological phenomena, the term "evolution" highlights the fact that species undergo gradual changes. This definition is accepted without question because it is confirmed by both observations in laboratories and the functioning of organisms in their natural environment. Moreover, the nature of organisms and of their populations is such that the evolution mechanisms: natural selection, genetic drift and others, simply have to operate—they are the inevitable necessity of animate nature. Nevertheless, understanding biological evolution as the gradual transformation of species is just one approach towards it. Biological evolution may also be understood as the process by which new species emerge through "appropriate" development. And sometimes at this point scholars start the discussion with other vision of the emergence of new objects, i.e. with creationism. It should be emphasized here (as it is the fundamental thing in understanding biological evolution) that evolution is a straightforward progressive process, which leads to the increase of ordering, the increase of the information content in the developing systems. Unfortunately, even such a sophisticated phrase doesn't lead us towards the positive answer to the fundamental question of biological evolution, namely the following question: are we able to predict what future evolution will be like? In my opinion, we are unable to predict the future changes in organisms which might occur as a result of evolution. We are able to predict, at least with some probability, the results of human biotechnological activities. In consequence, we should agree with at least two suggestions. Firstly, the theory of evolution as the one describing the course of species transformation cannot adequately be constructed, ... as we are unable to predict future evolutionary events (see the problem of the falsification of a theory). Secondly, we have to realize that even Darwin himself left many things "unexplained," and, for example, on the basis of his texts, we can only point to competition as the initiator of evolutionary changes. However, for many people the question still remains open: "Which level does the competition mechanism operate on"? This is why it seems necessary, at least from the methodological point of view, to distinguish between evolution as a characteristic natural fact, from the theory of evolution, i.e. the peculiar thought construct made by the man and being the vision of the development of nature as well as all kinds of existential, political, and worldview implications stemming from it. Evolution is a historical phenomenon. In turn, the theory of evolution, taking into account for example paleontological methods and the laws which govern physical and chemical phenomena, helps us to understand the very process of development, i.e. evolution. We may also try to answer the question: where does man come from? We may do so by means of explaining the mechanisms of this process. Perhaps, because we tend to forget the necessary distinction between evolution as a process and evolutionism as a historical science, all possible implications are vague. And, it is obvious that both paleontology and evolutionism as historical sciences concern a small scale, namely, that, which we are able to observe and perform experiments on; these small scale observations and experiments serve, in turn, as partial confirmations of evolutionary theories. We can't forget, either, that evolution is not merely a theory, it is a fact. Evolution in this sense is a description of what happened in the animate world. So, it is important to distinguish the fact from its interpretation; and theories of evolution are interpretations of the fact of evolution; theory of evolution simply describes the facts of evolution. It is like with past events, which are historical facts, but the book which describes these facts is a kind of a theory of that history. What is more, the theory of evolution is not just an interpretation of evolutionary facts, it is more: for instance, it relates observed fossils to each other (it relates one fossil to another, taking into account their emergence and structure); it presents a specific sequence of events. And it was Darwin, who first presented such a possible sequence of events, the mechanism of evolution, which makes those individuals survive, whose features are best adaptations to the environment. Nowadays, I will stress it once again, we are able to examine the process of evolution in laboratories. An example may be evolution of microorganisms, which—in experiment—become immune to antibiotics; in the past these bacteria had no such feature, no resistance to given antibiotics. Also, this is true that, due to the methods used in molecular biology (manipulations with DNA), we can select the systems which will have expected properties. The coding organisms are simply able to select the appropriate genotypes. Simultaneously, as a natural scientist, I realize that there exist events in the process of evolution which we are unable to explain. This is for instance the reason for gaps in the theories of evolution. They are simply incomplete. Nevertheless, the facts which may be interpreted in their global form confirm these theories of evolution.

The fundamental element in characterizing the evolutionary sequence turns out to be determining the level on which the mechanism of natural selection operates: is it a gene, genome, organism, species or population level? The differences of the opinions in this respect require, according to D. Hull,[43] not merely increasingly precise biological research, but rather philosophical, metaobjective reflection. And within this very reflection we should, firstly, determine the features of the objects which are subject to selection and, at the same time, answer the question of whether they are subject to evolution. Secondly, we should precisely define the term "unit of selection." Some scholars understand such a "unit" as creatures which replicate themselves in a diverse way, namely some do so to a greater extent while others do to a lesser; while other scholars emphasize the cooperation of creatures with their environment, as a result of which their diverse replication occurs. Obviously, both processes are absolutely necessary for the process of evolution through natural selection to take place. Thus, consequently we should say that the "unit of selection" is connected with the process of reproduction, cooperation and evolution. Moreover, in D. Hull's opinion, solving the problem of selection in evolutionary processes is impossible within traditional approaches,[44] namely by referring to species selectionism. It turns out that in some groups of organisms just a single gene can function as a replicator; in other groups whole genomes can function as replicators; and in still other groups – the whole organism or species. Hence, it is not surprising that understanding the essence of the process of evolution requires a new approach, which D. Hull calls the ontology of replicators, interactors and heredity.[45] Replicators are creatures which are subject to the complex process of reproduction; interactors, in turn, are the units which produce the diverse replication based on the direct cooperation with the environment. The solution of the problem of the relationships between replicator, interactor and heredity involves the question of whether units bigger than single genes (or even the whole genomes) are able to function as replicators.

Causes in the natural sciences are understood as an always occurring antecedent of a given phenomenon or of group of phenomena. Within the ontic framework, in turn, a cause is the source which a thing comes from, which the thing depends on for its existence.

[43] D. Hull, "Units of Evolution: A Metaphysical Essay," in *The Philosophy of Evolution*, ed. U.J. Jensen, R. Harré (Brighton: The Harvester Press, 1981), pp. 23–25.

[44] Ibidem, pp. 26–30.

[45] Ibidem, pp. 30–34.

Consequently, the appearance of a being is something new, because it started existing, because it is. Moreover, the new thing exists beyond its cause and it possesses the property of "being in itself," and simultaneously it is connected with its cause, due to which it exists.[46] As it seems, the complementary treatment of the two approaches towards the cause allows for an understanding of the essence of evolution process, which involves the emergence of something new, of something which did not exist before. What is more, it indirectly explains the philosophical proverb that the effect may be more perfect than its cause.

It seems that from Lamarck's proposal onwards, all theories of biological evolution should, to a lesser or greater extent, be treated as a kind of set of hypotheses, the verifiability of which is based on empirical data. In other words, theories of biological evolution constitute one strong inductive argument for the variability of nature, taking into account the particular facts confirmed through observation. In this context, a theory of evolution may be defined as a theory of possibilities. Such a dynamic approach towards evolving reality is, of course, contradictory to static interpretations of reality. I personally see here a seeming controversy, which is a continuation of classic controversies between nominalism and Neoplatonism. One of the sources of these seeming controversies are different ways in which evolutionists and creationists understand science. Biological reality, dependent for instance on the chance process of mutation, genetic drift, isolation, natural selection, in a sense "exceeded" the possibility of interpreting it in traditional philosophical terms. And this weakness of old philosophy inspired numerous philosophers to suggest a new, dynamic philosophical system, i.e. evolutionary creationism. But there arise fundamental questions: Is the status of the "subject" of evolution, in philosophical sense, as ambiguous as it is in biological sense (gene, genome, species, population), and does it actually exist and is subject to evolution? Answering these questions seems to require not only purely biological knowledge, but also a knowledge of the metaphysics of evolution as the theoretical context for research on the variability of animate nature.

---

[46] P. Schoonenberg, *Boży świat w stwarzaniu*, trans. H. Bednarek (Warszawa: Pax, 1972), pp. 29–30.

9.2. The philosophy of creation

If we want to understand the fact of creation, we first have to emphasize the lack of contradiction in creating from nothingness. The key here is capturing the relationship between the input material (nothingness) and the emerging effect of this creating fact. ... Calling anything into being from nothingness requires the appropriate efficient cause, i.e., one which is proportional to the effect. So, there has to appear the question: what or who is this very efficient cause. No one questions the truth of the existence of the material world, based on direct observation, but the existence of the efficient cause, which is defined in Christian philosophy as God, is not so obvious. Man arrives at it through a long and difficult quest. Nevertheless, he is sometimes unable to reach this truth because of: (1) the apparent antagonism between science and religion; (2) the inability to distinguish the scope of the natural sciences, philosophy and theology; (3) incorrect logical attempts to prove the existence of God through reasoning characteristic of the natural and deductive sciences.[47] As it seems, these are the causes of difficulties in arriving at the acceptance of God's existence, which bring fundamental difficulties in adequate understanding the idea of creation. Overcoming this impossibility requires a change in terms of perspective. And this change is most clearly visible in Christian philosophy. ... God ... exists, because the real world exists, but the existence of God is not obvious for man. Yet it may become obvious, if he switches from the natural perspective of reflection to the philosophical one. Then, it will become obvious that the reality exists, because God exists. ... Thus, creating is the total dependence of everything on God in their existence.

As it seems, there are many sources of a potential lack of understanding of the ideas presented here. The key element, in my opinion, is the strong tendency to treat the emergence of subsequent evolutionary events in an absolute way, while it is relative. We should talk about time with respect to a specific evolutionary system of reference. But God the Creator—which many people do not realize—should be treated as the one who is absolute in time. I mean here that God exists beyond time. For Him, everything happens "now." Thus, evolutionary processes take place in time, ... while God as the non-temporal being

[47] K. Kloskowski, *Filozofia Boga* (Gdańsk: Gdańskie Seminarium Duchowne, 1991), p. 8.

always "acts." For God, neither the past nor the future exists. It is only man for whom such categories either facilitate or make an understanding of the world and himself difficult (emergence, evolution, etc.). In consequence, forgetting that God—the first cause, the Absolute—is a being existing beyond time and space, usually leads to the following problems, which may be formulated as questions: Is God the law maker, who "infused" matter with specific physical and chemical laws "at the beginning" (from human viewpoint)? Simply speaking, is God the law maker, or maybe a "craftsman," who constructed something which He has to "fix" from time to time in order for it to function properly? The answer is by necessity trivial. But because the contemporary man has the biggest problems with simple issues, let us make it explicit. Firstly, God exists in His nature and in all of its laws, not only in the physical and chemical ones. Secondly, God, as I pointed out above, is a being which exists eternally (with no beginning), and because of that, He is entitled to create the world, organic life, man, at any time. From the viewpoint of natural sciences, we know that the Cosmos appeared about 15–12 billion years ago and life about 5–4 billion years ago, while man appeared either 3 or 1–0.5 million years ago (these are the time frames of the currently adopted conceptions of anthropogenesis: the Pliocene one or the higher and lower Pleistocene one). Yet, what is most important here is that the notion of creation doesn't enclose the temporal finiteness of the world, organic life, man, but rather their secondary character, their dependence in existence on God the Creator. The Creation is not God's magic play, as a result of which something emerges. So, God is not an irresponsible law maker who intervenes at moments of crisis in the existence of the beings, things or creatures which He created.

Still other doubts concern the problem of the emergence of the human soul. If the process of evolution takes place and is a continuous process, and man emerged out of the animal world, then where is the "place" for the emergence of the human soul; in other words: "When was the soul incorporated into the human being?" In order to answer this question, we first should make things more precise. From the viewpoint of the natural sciences, it is difficult to talk about the soul, because of a simple reason. The soul is not "preserved" anywhere in fossil form. Nevertheless, there exist the products of human spirit: we create culture, we are conscious of our own existence, of our own death; we are able to share our feelings with other people, etc. So, I would like to pay attention to the fact that the "beginning" of everything is not really very well-known to us, particularly with respect to the "beginning" of the characteristic laws of the man, who exists. Yet, if we assume that there exists only one Cosmos (the one we know and function in), then the result of evolution, e.g. the man with his unique psycho-physiological structure, is difficult to explain or the chance of his emergence is small. Hence, another question may arise: if everything which happened from the very beginning were repeated, would the reality have looked like the one surrounding man and being in himself? I admit that this is an open question for me, one which I am unable to answer in an unambiguous way. However, the most important thing as far as the human soul is concerned may be formulated as follows: the natural sciences are, by their nature, unable to consider the problem of the soul at all. They are neither able to defend nor negate its existence. A natural scientist may only say that man as a living creature evolved from the so-called lower creatures (we mean here, first of all, the presentation of the evolution of the animal psyche and its transformation into the human one—human self-consciousness). And man treated as the "place" of the existence of soul is the domain of theology.

At the end of our considerations, we should also pay attention to yet another problem if we want to avoid falseness in the problems of philosophy of creation. I think we should realize that it is something different to take into account the Creator and creation in the process of justifying the existence of all beings, or, more precisely, taking into account the Creator as the proto-cause, the first cause, etc. beyond the evolutionary mechanisms described by natural sciences; this is simply a philosophical approach, a certain proposal of the emergence and function of the reality, which is known by man in an asymptotic way. But, commonly and pragmatically, the notions of creation and creationism exclude coexistence with evolution and evolutionism. In this case, creationists are anti-evolutionists. This attitude is very old from the temporal viewpoint. We may even say that this is the first attitude concerning the natural world which was widespread in modern science. For me personally, this attitude is unacceptable and I express it in this work. Nevertheless, we should remember that such an attitude has its source in ancient times. The first philosophers of nature were, with almost no exceptions, creationists, namely, the reality was created by God, gods, etc. Moreover, the fact that the reality is "wonderful" is evidence for the Creator's existence. Currently, creationism is certainly in the minority, albeit a noisy one. I mean here, in particular, the so-called scientific creationism … —the American and Australian tradition. Simultaneously, … in the Polish, European philosophical tradition, there exists a well-motivated and justified evolutionary creationism. …

9.3. Permanent questions: searching for the certainty of justifications

…

The end of controversy? Do the dogma of creation and the science of evolution exclude each other?

Scholars have tried to formulate answers to this question as early as in Darwin's times. Nevertheless, both in the 19th century and today, similar sources of misunderstandings concerning the evolution-creation relationship are discernible. Some scholars seek to reject the idea of evolution on the basis of religious attitudes, while others, in particular natural scientists, question the deepest meaning of the religious doctrine of creationism as one which is inconsistent with evolutionary theories. But both approaches are mistaken. The idea of creationism emphasizes the fact that everything was created by God, i.e. anything, which exists, permanently receives its existence from God. Thus, the permanent dependence on God in existence is the most important component of the act of creation, contrary to the temporal finiteness or infiniteness or the initial moment of the existence of everything. Thus, the world could simultaneously be eternal and created by God.

Consequently, within the framework of natural sciences, the thesis of the stability and invariability of species is opposed to evolution. Unfortunately, this very important thesis was interpreted in terms of one's outlook and historically related to faith in God, to creation. Such an interpretation is recurrent. That is why, for many people, creationism stands in opposition to the theory of evolution; this is a fundamental misunderstanding, because what should really stand in opposition to the theory of evolution is not creationism but the theory of the stability and invariability of species. I would also like to refer at this point to sociobiology, which has the world of animals as its object of research. This field of science explicitly shows that the actual evolutionism-creationism argument takes place among natural scientists (biologists) and not between theologians and natural scientists. After 1975, i.e., after the publication of the work by E.O. Wilson entitled: *Sociobiology: The New Synthesis* (Cambridge, MA, Harvard University Press), a discussion about the usefulness of Darwinism started. Sociobiology is an attempt to bridge the gap in evolutionism which appeared after the publication of Darwin's work. This is a kind of evolution in Darwin's theory of evolution. Namely, the conception of the unit of natural selection was changed. Hamilton (1964) started to argue that the gene was such a natural selection unit. This thesis was later on used by E.O. Wilson and R. Dawkins. There appeared the radical views explaining the whole sphere of human behavior, even such features as being homosexual, etc. by reference to genetic determinism. We should note here that for people adopting creationism, no natural (biological) theory is a problem, misfortune or threat for their views. Yet, we cannot agree to any attempt of extrapolation of the results of natural sciences, often obtained in a very narrow field, to both the reality surrounding man and man himself. And we are faced by precisely such an extrapolation in sociobiology. The dramatic argument concerning sociobiology ... among biologists shows that evolutionism and synthetic theory of evolution are problematic from the viewpoint of worldview, philosophy and even politics (as it was the case with Copernicus-Galileo argument in the past). That is why it is extremely important to make the language utilized more and more precise as far as evolutionism and creationism are concerned. It is worth noting here that in 1982, i.e., on the centenary of Darwin's death, there were numerous seminars and conferences concerning the implication of the problem in question. There was only one but fundamental conclusion drawn from these meetings, namely, the faith (religion), generally speaking, and science are two components of the same culture. They have to coexist and function as complementary to one another otherwise the vision of reality is impoverished. We mean here that we have to realize that both in evolutionism and creationism we have to do with the same reality and the same man, but captured from two different perspectives. Each of the two perspectives has its own characteristic and even antagonistic elements (evolution is the process of development from "something" less perfect to something more perfect and better adapted to the environment; creationism, in turn, emphasizes the dependence of everything on the proto-cause). but these elements are not the evidence for the contradiction or the impossibility of co-existence. This is still better confirmed, because the context of the evolutionism–creationism argument is nowadays in a much better methodological situation than it was in the 19th century. What I have in mind is mainly the fact that 20th century scientific research requires taking into account the effects of work of K. Popper, T.S. Kuhn, I. Lakatos, P.K. Feyerabend, etc., whose language and precision permits the drawing of methodological demarcation lines between the fields of knowledge, so as not to mix them up. So, I personally admit that in my life between faith and science, between religion and science, I have never experienced any theoretical conflict.

If we relate the above thoughts to the idea of evolution, it is difficult to understand where the contradiction between evolutionism and creationism arises for many people. The variability of everything described in various evolutionary theories is the realization of the act of existence of the matter—the gift of God the Creator. The act of existence is the foundation which permits everything to develop. The reason why the idea of evolution is seen as contradictory to the doctrine of creation is that what gets emphasized is a secondary aspect: the temporal moment of the act of creation, while, the fundamental aspect of the act of creation, namely the dependence of everything in its existence on the Creator, is ignored. Actually, the evolution-creation problem is connected with answering the following questions: does God exist and what is His nature? These are just the answers to these questions which explain that the Cosmos, life and man exist, although they could not exist.

Thus, the task of the rational man involves concentrating on the interpretation of events in our world, improved in accordance with scientific standards, rather than questioning evolution or creation. The best confirmation of this are the continuous attempts to explain anthropogenesis. The problem of anthropogenesis, as with any other problem, still brings controversies and evokes various emotions. The unambiguous reconstruction of the course of evolutionary processes, namely the gradual change of the genetic structure of some species, leading to *Homo sapiens sapiens* is extremely difficult to predict. Archaeological data, as well as examining the anatomical, biochemical and psychical similarities between a chimpanzee, gorilla, orangutan and man, raise numerous doubts. Recently, scientists have connected great expectations with DNA examination, i.e., with finding genes encoding various phenotype features. What is meant here is "finding" the genetic links, i.e., the distances between markers (the known and placed gene) in a given chromosome. If we examine genetic links, namely, the presence of two genes at a relatively small distance from each other in a single chromosome, as well as what a given linked gene is, we mean determining with which marker this gene occurs in a given chromosome. The distance between one and the other markers is assumed to be about 100,000 nucleobases. These are the very points of reference, which are supposed to allow anthropologists to trace a gene down through generations. In other words, these points of reference show the character of the relationship between various biological organisms. What is more, scientists, by analyzing these genetic maps and changes in genes, try to answer the following questions: where and when did the first representatives of contemporary man appear?

…

9.3.6. Epistemological, methodological and ontological reflections. Conclusions

While analyzing the presented conceptions [of Mitochondrial Eve and Y-chromosomal Adam – eds.], I almost automatically ask the question: is the evolution of man governed by the same laws as the evolution of other species? I think it is worth trying to analyze our knowledge of the evolution of man in light of the laws governing the biological evolution as a whole. Then there arise great difficulties, because, according to the laws governing evolution, the so-called *Homo erectus*, *Homo neanderthalensis*, *Homo habilis*, *Homo sapiens* as species should be isolated from other species as far as their reproduction is concerned. And this is really the case. A new species first emerges as a result of geographical isolation. Reproductive barriers emerge and then, even if the species mix with one another in the same territory, they cannot cross with one another. Yet, the conceptions of the origin of man under discussion lead us to ask the question of whether crossing occurred or not. If so, then it would be very difficult to justify the great variability of the human race. As there exist numerous human races, when did they have time to emerge? As far as the procedure of evolution is concerned, it is really surprising. What is more, this may lead us to the conclusion that perhaps these species were not the true species, but merely the variations, i.e. races. And maybe they gave rise to various races—let us call it race genesis—as a result of crossing. The emergence of these races was, in consequence, earlier than the emergence of the species of Homo sapiens as such. Genes had already been contributed by different species which were to be subspecies in this case. Thus, it turns out that races emerged and these races changed in some way, i.e. they crossed with one another. Yet, it follows from mitochondrial examination of DNA and ZFY gene that the species emerged, spread out and replaced all others. Unfortunately, this claim is not consistent with the paleontological data. If man had wandered one million years ago, and if it had been the single large species and if this species had adapted to various environmental circumstances, then the races would have developed. But if man was wandering for 200–300 thousand years, he killed off other species or races and, in consequence, the contemporary races had too little time to emerge. The conceptions presented here point to the existence of one single pre-man at the roots of all contemporary men.

Yet, if we accept the genetic data confirming this proposition, it is doubtful whether these data are sufficient to solve the problem of anthropogenesis through the mechanisms of evolution themselves. Or more precisely, the question is whether in its anthropogenesis, there occurred exclusively mechanical transfer of genetic provision from a common ancestor to *Homo sapiens sapiens* (from one woman the pre-mother or from one man the pre-father). It seems that the solution of this question within anthropological framework may be found in theistic interpretation of evolution theory, which assumes that at the roots of the emergence of every single being there lies God's plan of the development of life through all the stages of evolution. What is meant here is the so-called the direct creating action of God realized through the forces which are present in the matter.

Man is not exclusively his genetic provision, but also his spiritual psychism. ... it just justified to refer to the creation act of the First Cause necessary for the emergence of psychism as well as for the natural efficiency of beings, namely the pre-ancestors of man, their genetic provision in the process of anthropogenesis. Man appears as a new organic quality in relation to his ancestors, hence, in other words, as a new ontological form of the existence of being, requiring an adequate cause. Moreover, the above shows that one who accepts such an evolutionary origin of man has to accept (as far as the human body is concerned) as the parents the form of pre-mother (maybe the pre-mother is the Mitochondrial Eve) or the pre-father with the ZFY gene situated in the homological chromosome Y.

* * *

It may be hoped, that the careful reflection upon the process of evolution and the phenomenon of creation, upon the theory of evolution and the theory of creation, presented in this work, shows some possibilities and ways of reconciling the scientific and philosophical (theological) truths. Nevertheless, it doesn't follow that our vision of the natural world, an element of which is man, has become a uniform one. On the contrary, it is more complex than it was in the past, because it is conditioned by more and more new inventions and discoveries. Yet, it is also characterized by heuristic abundance, as it is permanently open to various proposals; it offers new paradigms which are justified by the models of explaining accepted by particular researchers.

BIOETHICAL ASPECTS OF GENETIC ENGINEERING

K. Kloskowski, *Bioetyczne aspekty inżynierii genetycznej. Wybrane problemy* (Warszawa: Wydawnictwo ATK, 1995), pp. 57–63.

3.5. Ambivalence of the results of using the technology of genetic engineering

The above examples of the effective use of the genetic engineering technology clearly illustrate the various positive biological, medical and even economic effects on the one hand but, on the other, they illustrate the difficulties in using genetic engineering technology in a consistent way and raise doubts concerning their future prospects.

3.5.1. Biological implications

The project of identifying the human genome (the Human Genome Project) raises great hope. That's why scientists expect the systematic development of biological science on the basis of knowledge of the total amount of genes in human DNA, their placement in relation to one another and their activity.[1]

In consequence, we will obtain genetic information related to what it means to be healthy or ill, young or old, man or woman. Certainly, the relationship between phenotype (external qualities) and genotype will be known to us. Anthropological genetics, in turn, will finally allow us to present the actual history of the human species

[1] K. Matsubara, "On the Analysis of the Human Genome and the Human Genome Project," in *Human Genome Research and Society*, ed. N. Fujiki, D.R.J. Macer (Christchurch: Eubios Ethics Institute, 1992), pp. 16–17.

and its relationship to other living creatures.[2] For instance, we already know on the basis of similarities and differences between the enzymes of the so-called stabilized human populations, that Basques directly come from post-Neanderthal tribes, while contemporary Europeans came either from the Middle East or from Caucasus region.[3] Yet, numerous scholars feel anxious about these positive outcomes.[4] They mean mainly the danger of creating accidentally a bacterium or virus with carcinogenic or toxic properties which are difficult to predict.[5] Yet, the danger of this kind is rather improbable, because biological protective barriers are built up, i.e., the genetic engineering uses, first of all, the strains or vectors of bacteria, which are unable to develop outside the laboratory.[6]

3.5.2. Medical implications

From the early 1980s, the methods of genetic engineering allow various biotechnological associations (Genentech, Genex, Biogen) to produce hormones, to increase the production of antibiotics, vaccinations and vitamins.[7] Insulin, which is synthesized by bacteria and which is similar in its structure to the human variant, is of great importance for people suffering from diabetes. Previously, insulin was acquired from the pancreases of cattle and pigs yet some people were unable to tolerate such animal insulin (animal insulin differs from human in the structure of its peptide chain and a few aminoacids), which leads to the production of antibodies. Moreover, killing animals is limited in amount, so the reserves of this hormone are insufficient. The process of synthesizing somatostatin hormone by bacteria was discovered in 1977, ... and Gentech started its industrial production

[2] M. Fikus, "Człowiek bez granic," *Wiedza i Życie* 6 (1993), p. 21; J. Roberts, "Global Project Under Way to Sample Genetic Diversity," *Nature* 361 (1993), p. 675.

[3] M. Fikus, "Człowiek bez granic," p. 21.

[4] E. Matsunaga, "Panel Discussion on Social, Legal and Ethical Problems Associated with the Human Genome Project," in *Human Genome Research and Society*, pp. 18–28.

[5] W. Gajewski, *Genetyka ogólna i molekularna* (Warszawa: PWN, 1987), p. 407; J. Maddox, "New Genetics Means No New Ethics," *Nature* 364 (1993), p. 97.

[6] W. Gajewski, *Genetyka ogólna i molekularna*, p. 408.

[7] M. Fikus, *Inżynierowie żywych komórek* (Warszawa: Wiedza Powszechna, 1982), pp. 163–179.

2 years later. The production of interferon is also important for countering viral and cancerous diseases. Unfortunately, practice shows that the interferon therapy is not effective for all patients. What is more, even with positive effects, the recurrence of disease was observed when coming off the interferon and some people happened to experience side-effects. For instance, the interferon taken by HIV carriers led to symptoms similar to those which appear after infecting an organism with the flu virus: granulocytopenia in 55% and the increased activity of enzymes in the liver in 45% of patients. Despite the objections just presented, the advantages of using various interferon substances are unquestionable.[8]

Yet, if the medicine called "gene therapy" is meant, the degree of its use depends on the level of our knowledge of human genome, its structure and functioning. Thus, consequently, the outcomes of the Human Genome Project may bring enormous progress in gene therapies. Moreover, the methods of introducing genes are still thought to be imperfect and thus new vectors, namely the conveyors of genes, are constantly being sought.[9]

Another noteworthy method of gene therapy was the one which was effectively used by W.F. Anderson to eliminate the deficiency of adenosine deaminase in children. … Their lives were prolonged, but the problem is that lymphocyte cells lived no longer than a few months. Thus, the treatment has to be repeated quite often, increasing the cost of the therapy.[10] But we should note that manipulating genes may, on the one hand, eliminate some genetic anomalies (bringing particular disease), but, on the other hand, make the human organism more susceptible to infections and new diseases.[11] A good example here is the illustration of the relationship between sickle-cell anemia and malaria. Sickle-cell anemia is a disease caused by the activity of the mutated gene which is responsible for the emergence of hemoglobin. Such "sick" hemoglobin, in the lowered pressure of oxygen, crystallizes and causes the lysis of red blood cells. Sickle-cell

---

8 Article signed by initials: M.F., "Skuteczność kliniczna L-interferonu," Biotechnologia – PI 12, no. 2 (1991), pp. 67–68.

9 W.A. Silverman, *Human Experimentation: A Guided Step into the Unknown* (Oxford: Oxford University Press, 1986.

10 Cf. D. Dickson, "Britain Plans Broad Strategy on Genome Approves Therapy," *Nature* 361 (1993), p. 387.

11 Cf. J. Habgood, "Manipulating Mankind," *Nature* 365 (1993), p. 304.

anemia occurs in homozygotes which have two mutated genes, while homozygote carriers of this gene have one part of their hemoglobin which is healthy and the other mutated yet they are still healthy. What is more, they are immune to malignant malaria. This follows from the fact that the parasite causing malaria cannot develop in blood cells containing this abnormal hemoglobin. This phenomenon of being immune is also the case with those who suffer from thalassemia.

The facts mentioned above show the great possibilities of using gene therapy as a kind of medicine. Yet, as it seems, the knowledge of human genome will, first of all, permit the better diagnosis of conditions rather than curing them since correct diagnosis will allow for either starting or stopping gene therapy at the appropriate moment of a patient's life.[12]

3.5.3. Economic implications

Medical treatments which use genetic engineering are very expensive but, at the same time, provide enormous benefits. Examples of very cost-effective production are that of somatostatin, insulin, interferon or growth hormones. For instance, the traditional method of obtaining somatostatin from animal brains requires killing 500,000 animals in order to get 0.005g of it, while the biotechnological method allows for a similar amount of somatostatin to be obtained from 9 liters of bacteria strain,[13] while the American company Eli Lilly produces human insulin relatively cheaply on the basis of *Escherichia coli*. It is possible to get 100 grams of insulin from 2,000 liter fermentation containers.[14] The production of interferon in an organism is very low. An infected cell produces just 10^{-11} grams of it, while the Biogen company produces about 1 milligram of the interferon of human leucocytes from 1 liter of *Escherichia coli* strain.[15]

As far as financing of genetic research itself is concerned, the German Ministry of Scientific Research and Technology allocated 60 million Deutsche Marks for the 6-year development of new technologies

[12] Cf. B. Müller-Hill, "The Shadow of Genetic Injustice," *Nature* 362 (1993), p. 491.

[13] S. Russel, *Biotechnologia* (Warszawa: PWN, 1990), p. 264.

[14] Ibidem, p. 267.

[15] Ibidem, p. 270.

of gene therapies. Deutsche Forhungsgemeinschaft, in turn, gave 6.6 million Deutsche Marks for the realization of a 3-year program of the research of molecular basis of the mechanism of defense against cancerous diseases at Freiburg University.[16] In the USA, the Human Genome Project is to cost 3 billion dollars until the end of 1995. Now, this research will be accelerated and cheaper because of the use of computers and robots.[17] Yet the costs of the program just mentioned which will be realized in American, French, British, Japan and German laboratories, are estimated to be about 12 billion dollars.

To sum up, the results of using genetic engineering presented in this work raise both optimism and a kind of anxiety. Genetic engineering becomes extremely important for farming, for retracing the history of human origins, examining extinct species, as well as for producing hormones, vaccinations and vitamins. Gene therapies, in turn, boost human health and often even human life. Nevertheless, the examples just discussed present the weakness of genetic engineering as well. We mean here various types of technical difficulties and biological threats during gene therapies. Thus, the great expectations associated with genetic engineering should be verified in the light of its known and predictable side-effects. Moreover, Paul Berg thinks that the tendency towards producing medicines bringing enormous financial profits may limit or even eliminate scientists' inquisitiveness and passion for discoveries. In consequence, the biotechnological companies financing the research will reserve their property rights in relation to the information concerning new medicines; this, in turn, will lead towards limiting the exchange of scientific thought.[18]

Conclusion

The development of genetic engineering, particularly over the last few years, enabled the deep understanding of the structure of DNA, the inherited material of all organisms. In consequence, there appeared the myth of the technical possibilities of the "reformulat-

---

[16] R. Unterhuber, "Gene Therapy Gathers Speed in Germany," *Nature* 365 (1993), p. 197.

[17] Cf. Ch. Anderson, "US Genome Project Does It the French Way, Conceding that Size Matters After All," *Nature* 360 (1992), p. 401; C. Macilwail, "Genome Project 'To Be Done by 1994'," *Nature* 362 (1993), p. 488.

[18] T. Beardsley, "Złoty wiek biologii," *Świat Nauki* 1 (1995), pp. 76–77.

ing" of DNA structure for utilitarian needs and correcting all the genetic mistakes of a given organism or even species. Nevertheless, the analyses just presented not only break this stereotype, pointing to the necessity of using genetic engineering in a reasonable way (numerous achievements important for farming, reconstruction of extinct species, etc.), but also determine the knowledge of the human genome. There are the whole fragments of DNA which are totally unknown to us, to the extent that we don't even know whether there are genes there. Perhaps, these unknown fragments do not serve genetic expression at all, namely, they do not serve the expression of genes in the phenotype, the emergence of a given feature under the influence of a gene.

What is more, genes themselves are built up in such a way that some sequences contain genetic information—the so-called exons—but there are the sequences between them, which do not contain genetic information—the so-called introns. As an aside, introns are removed from RNA during gene expression and they are thought to serve nothing at all. Thus, it is unknown what introns exist for—perhaps they accelerate the process of evolution.

Moreover, there are very long sequences between genes which we know nothing about either. We only know that these sequences contain the so-called regulatory genes, which control the so-called expression of genes, i.e., which switch the functioning of genes on and off. Perhaps there are also other types of genes in these sequences. I personally think that we do have a lot of genes inherited from our ancestors which were switched off. As it is not the case that if the species changes, the genes present in the previous species disappear; rather they are switched off. The regulatory genes switch them off, often forever. But sometimes there emerges some atavism in contemporary man, some feature coming from their distant ancestors. This demonstrates that the genes of our pre-ancestors do exist, but they are switched off. And this is the point, which I see the danger at. Manipulating human genes may bring unpredictable and terrible consequences, as it may occasionally bring out the unwanted features of our extinct ancestors, e.g. having a tail, which will result from our lack of knowledge of genes. Genetic manipulations may turn out to be very important and useful but also threatening for mankind at the same time. Yet, the reflection upon the alternative of this type requires the analyses of the philosophical and ethical assumptions made by gene therapists, their patients and scientists, who carry out the research on mapping and sequencing human genes. And the following pages of this work are devoted to this.

…

2. Bioethical interpretations of genetic manipulations: Consequences and norms

The problems of genetic engineering presented so far, including its anthropological and axiological context and bioethical doubts, lead us to the conclusion that the first element of fundamental bioethical decisions is the necessity of making the choice at the very beginning.[19] What is meant here is simply the choice between the "ethos of facilitation" and "ethos of limitation." Within "ethos of facilitation" all things are accepted which make human life easier and more comfortable; all these things are acceptable in all situations. And this is most important here. The "ethos of limitation" claims that there are limitations in human activities which cannot be exceeded. This ethos is in force, even if exceeding the limitations in question could bring the development of science or the progress in science or technology. The "ethos of limitation" imposes norms, which are always in force, regardless of even the most humanitarian goals.

The essence of genetic engineering strategies is worth considering in this context. Three fundamental strategies may be mentioned. These are: (a) negative eugenics; (b) positive eugenics; (c) negative euthenia and positive euthenia.

Negative eugenics includes genetic manipulations following from the care of human health, namely curing various diseases or reducing their negative effects or even eliminating some diseases. Positive eugenics, in turn, uses genetic manipulations for improving the genetic provision of population, for "producing" the genetically "improved" man, e.g., with respect to his intelligence, to the verification of the insufficiently known laws of nature (combining human and animal cells) for utilitarian or scientific reasons. Negative euthenia,[20] in turn, is a kind of modification of the environment in order for an individual

---

[19] M. Iłowiecki, "Przedmowa do wydania polskiego," in J. Testart, *Przejrzysta komórka*, trans. J.A. Żelechowska (Warszawa: PIW, 1990), pp. 5–20.

[20] T.A. Shannon, *An Introduction to Bioethics*, second edtion (New York: Paulist Press, 1987), p. 134.

with a genetic defect to be able to develop in a more or less appropriate way (the example here may be the production of insulin). Positive euthenia involves experiment manipulations which are aimed at satisfying human cognitive and existential desires (e.g. cloning of organisms).

Yet, idealizing the possibilities given by genetic engineering is not correlated with the statements of some genetic centers, which point to the dangers brought by some genetic experiments. Perhaps they mean protection against the persistent public opinion which could totally ban genetic research.[21]

2.1. Bioethics of "facilitating"

The bioethics of this type is rooted in various "deviations" of understanding[22]: the man and his dignity; the system of values (many of them are treated as the equal ones, so they aren't put in hierarchical order); science (including, first of all, genetics and the technology of genetic engineering); ignoring the priori character of ethical principles as being always in force, regardless of time and space. Thus, the characteristic thing is treating the man in a relative way; thus his dignity is based on the advantages of his relationship to himself and to the community; thus, it doesn't depend on the personal ontic and psycho-physiological structure of each man. The scientific "deviation" involves simply looking for ethical reasons in the results of biological sciences, particularly in genetics.

In consequence, using genetic engineering is reduced merely to the realization of technical possibilities, and it is not a genetic issue at all. What is more, these technical possibilities depend on the purpose of their use. So, the morality of human activity depends on its purpose, namely, the end justifies the means. Ignoring fundamental values permits relating human activity in genetic engineering to the situation, which it is realized in. And, it is obvious that we cannot draw the unambiguous norm of behavior from any situation. Thus, the ethical norms are relative, so the ethics is relativistic, too. Yet, the situations

[21] Cf. B. Rok, "Etyka czy biologia. Uwagi na marginesie inżynierii genetycznej," *Człowiek i Światopogląd*, no. 8 (1984), pp. 74–86.

[22] Cf. J. Bernard, *Od biologii do etyki. Nowe horyzonty wiedzy, nowe obowiązki człowieka*, trans. J.A. Żelechowska (Warszawa: Wydawnictwo Naukowe PWN, 1994), pp. 90–92; W.F. Anderson, "Human Gene Therapy: Scientific and Ethical Considerations," in *Ethics, Reproduction and Genetic Control*, ed. R.F. Chadwick (London: Routledge, 1987), pp. 157–162.

of using genetic engineering just mentioned … are ethical in character, as a scientist faces the choice of values. Yet, he often chooses not the value adopted a priori, rooted in ontological framework, but rather the one adopted a posteriori. Thus, he acknowledges and accepts the good, but this good is the relative one. Hence, all human activities are kind of facilitations and not the rationally and ethically justified limitations concerning human life. I think that the supporters of ethical thinking of this type have the following priorities.

(1) The principle of the superiority of science development and civilization and technological prosperity over ethical behavior of man is the goal, which justifies all the activities of genetic engineering (the end justifies the means).
(2) The achievements and outcomes of genetic engineering, of science as a whole, become the norm of ethical behavior (mixing up the scientific and ethical frameworks in analyses).
(3) The man and the nature are treated like instruments, like objects, because of their relational character.
(4) The assessments of genetic engineering activities depends on the situation, in which they are carried out.
(5) Ethical norms are acceptable to the extent, to which they "get adapted" to science, and not within the whole system of values, but rather some of them are sufficient and highlighted only for short-term purposes.
(6) All the things are permitted, which may be justified in a rational way (a choice of the lesser evil); thus, there are no constraints on genetic engineering research, and even if some constraints are accepted, they are not the absolute ones and they can be ignored in some situations.

The norms just mentioned undoubtedly provide the chance of making great progress in genetic manipulations, up to the "absurdity," namely, to creating people with the right genetic features; they make lives of parents easier, as their sick children may be cured (these often are just dreams); and finally, they facilitate all the types of examining human population, their biological and productive value. Nevertheless, diagnosing various diseases on the basis of genetic research may become the curse for those, who got the information about this. This may make the sick man lose the meaning of his life, and his relatives may get the sense of threat. Genetic examination, although theoretically carried out for the sake of patient's health, may, within bioethics of facilitation, serve someone else. They may, but doesn't have to, serve various organizations, e.g. insurance companies and other firms, and hence, not necessarily good and honest purposes.

As early as in 1938, J.B.S. Haldane[23] observed in his research that not all the workers, who worked in polluted and destroyed natural environment respond to it in the same way. In his opinion, the difference in their responses was rooted, at least to some extent, in inheritance system. So, we should find out which workers are genetically prone to which diseases and, in accordance with this knowledge, make them do different jobs.

The knowledge of that may be obtained through the method called screening. Yet, screening may only in theory serve good purposes, i.e. the improvement of the health of community. The outcomes of screening may be used by bosses (because they accept the ethics of "facilitating") either to employ or dismiss workers. The good purpose of obtaining by a worker the knowledge of his genetic burden becomes the subject of trade between his boss, and himself so it is a great threat for the latter. And we should distinguish the so-called optional screening from the obligatory one. The former is aimed at making particular people conscious of the health hazards, they may experience while working in a given company. The obligatory screening, in turn, may lead directly towards being dismissed from one's work.

The example here may be the screening of sickle-cell anemia. If we used it as a criterion of employment, one of eight black workers (treating this one actually asymptomatic carrier as the sick) wouldn't be able to be employed.[24] Also, the company employing such people loses a lot. Why should it make an investment in the sick and in their therapy? Why should it slow down its production and become less cost-effective? These are the pragmatic results of thinking according to the norms of ethics of "facilitating." And the moral consequences are still more serious. Simply employing or not employing someone because of his susceptibility to occupational or non-occupational diseases, is limiting his freedom. These will be other people, who, for "scientifically," i.e., genetically justified reasons, will decide what

[23] J.B.S. Haldane, *Heredity and Politics* (London: Allen and Unwin, 1938).

[24] T.H. Murray, "Ethical Issues in Human Genome Research," *The FASEB Journal* 5 (1991), pp. 55–57.

a given person should do in his life. The decision-makers themselves justify their decisions with very good arguments, i.e. the good of the community, not exposing people's health to various diseases, etc. Human freedom becomes the ambivalent value.

Another, more dangerous consequence is treating the man not as a person but rather as a machine, which should perform particular tasks in its society. "Probably, the claim that the person with good achievements in some fields of human activity usually has a better genotype than the one, whose achievements are not so good, may be at least partially right."[25] Another example is the military plan Alpha, carried out in the USA.[26] It involved the screening of immigrant recruits from the viewpoint of their intellectual skills. The outcomes were unfavorable. They were assumed to be the factor determining the inborn skills; rather they should be assumed to be the culture information. The survey totally ignored the fact of not knowing English at all or of barely knowing it. The tests and questionnaires were prepared in English. Such or similar approach towards the man in the light of genetic research totally depreciates him. The biological dimension of the research cannot determine ethic decisions. Obviously, it is impossible to justify genetically human personal structure, freedom of choice, respect, etc.

2.2. Bioethics of the "border"

Bioethics of this kind is not reduced to formulating recommendations, suggestions and encouragements. Instead, it simply establishes imperative moral norms and delivers clear moral verdicts[27] for genetic manipulations, taking into account the knowledge of current state of affairs. Thus, it is worth answering the question: what are the most important rules of using genetic engineering, which conform to the objective moral order (bioethics of the "border")?

[25] E. Mayr, *Populacje, gatunki i ewolucja*, trans. W. Byczkowska-Szmyk et al. (Warszawa: Wiedza Powszechna, 1974), p. 537.

[26] T.H. Murray, "Ethical Issues in Human Genome Research," p. 60.

[27] T. Ślipko, *Granice życia. Dylematy współczesnej bioetyki*, second edition (Kraków: Wydawnictwo WAM, 1994), pp. 105–106 and 16; cf. J. Reiter, "Gentechnologie oder die Manipulation des Lebens," *Arzt und Christ* 30, no. 3 (1984), p. 109–118.

(1) The possibility of carrying out the genetic research is limited by the principle of superiority of the good of the man over his freedom.
(2) Psycho-physiological and personal (ontic) structure of the man, his dignity (autonomous rather than the relative one) and the non-instrumental treatment of the nature are the fundaments of conscious human activity within genetic engineering.
(3) The ethic norms are the limitations of the possibilities of genetic engineering (of science as a whole).
(4) The responsibility (in its deepest sense) for genetic manipulations is limited by the possibility of referring to the supreme value (for me, this is God).
(5) The object of human activity within genetic engineering is good and not evil. Moral evil is never justified. Physical evil, in turn, is justified, when doing such evil is the side-effect of acting object or is the means of achieving moral good.

According to the assumptions of the bioethics of the "border," understood as a science regulating human behavior, the moral assessment of each human activity depends on the adopted criteria of qualification, reduced to the internal content of given activities. "The genetic manipulations considered from this viewpoint present themselves as the activities, which are not morally determined as good or bad; in other words, they are morally neutral. Within their purposeful structure, the direct reference to the moral good of human person is invisible; in this respect, they are open to moral determinations coming from the external sources."[28] This theorem doesn't raise any doubts or objections in relation to the use of genetic engineering in farming or in "reconstructing" extinct species. The objections concern particularly the experiments with human genome.

As far as the use of genetic engineering for improvements and corrections of an individual human being is concerned, we have to highlight merely the possibility of its wrong use. Analogically, the alcohol may serve as a medicine, but it may also serve as the means of performing morally bad deeds. Yet, this doesn't exclude the use of genetic engineering technologies to relieve human suffering and to cure

[28] T. Ślipko, *Granice życia. Dylematy współczesnej bioetyki*, p. 128; cf. J. Seifert, "Genetischer Code und Teleologie," *Arzt und Christ* 34, no. 4 (1988), pp. 185–200.

his diseases. Thus, the moral judgment of genetic manipulations involves, as a matter of fact, the qualification of moral circumstances and conditions. In this case this qualification involves determining clearly the purposes, which genetic scientists want to achieve. What is more, firstly, the very patient's agreement implies that he knows the potential dangers of genetic manipulations and the ethics of "limitation" doesn't allow him to transmit these dangers to his off-spring. Secondly, any potential mistake of these manipulations may be multiplied in the future, namely, in the future populations. In such a context, the individual (gene) manipulations of somatic cells seem to be possible to accept morally, if they are done for morally acceptable purposes, i.e. economic, medical, pharmacological and commercial ones. In turn, the lineage manipulations (gene manipulations of sexual cells) of an organism, particularly the man (the example with SRY gene and calves with human gene) should, in principle, be regarded as morally unacceptable. I use the term "in principle," because the outcomes of these experiments oblige me as a philosopher just to make the declarations, which may be either accepted or rejected by the scientists dealing with genetic engineering.

These declarations are to draw scientists' attention to their moral responsibility and the honesty of their conscience. The most important thing for them is, first of all, that they should try, on the basis of achievable outcomes, to judge their conscience honestly through taking into account the components of scientific procedures known to them; they should do so using possible to establish, general rules of morally qualifying their research activity.[29] Making such attempt is extremely difficult. Numerous world famous geneticists (the best possible genetic knowledge) barely know ethics and philosophy. This is the very disproportion between the level of natural and ethical and philosophical knowledge, which often becomes the source of many conflicts and misunderstandings, often the seeming ones.

We should, at this point, reflect, at least briefly, upon the *in vitro* fertilization technique,[30] which is wrongly identified with genetic engineering.

---

[29] T. Ślipko, *Zarys etyki szczegółowej*, vol. 1 (Kraków: Wydawnictwo Apostolstwa Modlitwy, 1981), p. 171.

[30] Cf. E. Schockenhoff, "Der gläserne Mensch. Ethische Überlegungen zur Analyse des menschlichen Genoms," *Arzt und Christ* 38, no. 4 (1992), pp. 87–102.

It has been used so far in two ways. The first (historically speaking, the newer one) involves the situation, in which a single egg cell was fertilized *in vitro* with a sperm. The scientists waited until the zygote got divided into 8 blastomeres, i.e. the offspring cells. Then, they were separated and placed within the so-called "transparent cover," made of the substance taken from weeds. Each of them started developing as a separate organism. The research was stopped and the embryos were destroyed. We should note that all of them had the same genotype (genetic constitution of an individual), which means that they were human clones. ...

The second situation is as follows[31]: a woman is hormonally induced to produce a few egg cells. Then, these cells are surgically taken from the ovary and each of them is *in vitro* fertilized with a separate sperm, which increases the chances of implementation of an embryo in the womb. The embryos, which were "unused," are either frozen or destroyed.

It is extremely important to realize that "A child (when in vitro fertilization technique is used – K.K. note) may potentially have five parents: two biological parents (actually genetic parents, i.e., the providers of the egg cell and sperm), a surrogate mother, who carried the *in vitro* embryo to the full term and, finally, two so-called social parents, who adopted the child, after his birth (because the surrogate mother left the child, after her pregnancy had finished, ... and, finally, his biological parents didn't want him for any reasons)."[32] Yes, the *in vitro* fertilization technique facilitates having one's own offspring and it is the solution of childlessness, but this technique doesn't cure infertility. Who was unable to have his or her own off-springs for some reasons, is still infertile even after such "manipulation." Hence, it is relatively easy to notice that the realization of the need of parenthood at all costs may be rooted in treating the man as a being, who has no spiritual component in himself.

Thinking in terms of biological possibilities is the sufficient argument for ignoring any ethical doubts. What is more, this approach loses the fundamental purpose of conception of the child, i.e., the absolute value of human life in itself; it is motivated with egoistic and utilitarian

[31] J. Bernard, *La bioéthique. Un exposé pour comprendre. Un essai pour réfléchir* (Paris: Flammarion, 1994), pp. 40–41.

[32] M. Iłowiecki, "Przedmowa do wydania polskiego," p. 13.

reasons: I have the right to be happy having a child. The parents' happiness is treated as the ultimate, supreme good of human being, while forgetting that the child has also the right to happiness. Whose happiness is more important then? What is more, financing the so-called surrogate mother leads towards a kind of selling of the carried child. Or maybe should women be treated as super-incubators?!

The lack of any limitations makes the above problems extremely controversial.[33] And if we pay attention to the "unused" *in vitro* fertilized cells, which are either frozen or destroyed, we see that the whole problem is not neutral as far as ethics is concerned. What we have here are human embryos. Even if we don't think they are people, they are the potentially human (not animal) beings. Thus, it cannot be surprising that bioethicists look for the norms which would limit the realization of all the technical possibilities provided by such genetic manipulations.

2.3. The need for bioethical education

Because of the obvious difference in understanding bioethics itself, it is necessary to work out the common ground on which contemporary man (fascinated with the effectiveness of genetic experiments and scientific and technical achievements as such) would be able to value his activities in the right way. The contemporary man may treat the arbitrarily established normative definition of bioethical decisions as depriving him of his freedom. But the acceptance of the "easing" version of the approach towards bioethical problems brings with it the threats which I discussed above.

The key to resolving this dilemma seems to be the presentation of the possibility of turning away from descriptive, natural interpretations and statistical genetic experiments to favor a normative approach. The possibility of this turn is, for me, the defense against the alienation of the contemporary man from his human dimension. I think that only after putting these problems in order, we may understand and accept the bioethical obligatory norms of human conduct (the "bioethics of the border"). Thus, I will now attempt to put things in order. Following the thinkers of ancient Greece, I will try to present the value of love and wisdom with respect to making ethical choices of the genetic manipulations carried out.

---

[33] T.A. Shanon, *An Introduction to Bioethics*, pp. 137–138.

2.3.1. Scientific-natural education

Seneca argued that the need to find a long-lasting means against the permanent and multiplying vile acts existed not just to stop them, but rather to make them not win.[34] I have already presented some of the vile acts connected with genetic engineering. Now, I'm going to concentrate on the means which should be used in order for the vile acts to be treated by the contemporary man as vile acts and as nothing more.

The fundamental problem is to correlate two obvious facts with one another. The first one concerns the definition of man presented by Aristotle: man is an intellectual animal (*zoon logikon*). He highlights this animal character of man here. The second fact is connected with reasoning, the ability to know the causal relationships of human inhibitions (*gnothi seauton*). These two facts are either permanently ignored or only highlighted one-sidedly. As a result, contemporary man has lost the ability to distinguish between sense and nonsense, beauty and ugliness, truth and falseness, good and evil. K. Lorenz claims that "the best school, in which the young man may learn that the world is reasonable, is his direct contact with the nature. I can't imagine that human child with normal inclinations, who has the ability to establish close and friendly contact with living beings,, i.e., with great and harmonious beings of nature, could experience the world as nonsense."[35] Thus, man, within the process of being brought up, should be placed within nature and not beside it, because he is an essential part of it. If man is placed within t nature and is able to see its harmony and beauty, he will learn relatively quickly to react appropriately to disharmony in human environment.

The next step is to raise young people who are capable of empathy. We mean teaching them to identify with someone else in his feelings, to sympathize with a given person in the situation he is in. Empathy will not only allow us to understand someone's behavior but also to love every living being.[36] And this, in turn, may be a kind of catharsis, the activity which purifies various human reactions.[37]

---

[34] L.A. Seneka, *Myśli*, trans. S. Stabryła (Kraków: Wydawnictwo Literackie, 1989), p. 83.

[35] K. Lorenz, *Regres człowieczeństwa*, trans. A.D. Tauszyńska (Warszawa: PIW, 1986), p. 174.

[36] Ibidem, p. 181.

[37] K. Lorenz, *Tak zwane zło*, trans. A.D. Tauszyńska (Warszawa: PIW, 1976), p. 349.

If I regard the principles presented above as the fundamental ones in raising a normal man, I do so as not to make his normal, i.e. natural (included in his nature) vision of himself, the world and of other men repugnant. ... If man rejects reasonability, he may easily become an animal; yet, he also will become an animal if he uses his reason in a wrong way; if he treats other people as the means for himself and for his own purposes. So, humanity must be a sacred thing for man.[38] This follows from the very fact of being a person. And the person is the foundation of moral imperative, according to which every man should be treated as the purpose and not just as a means of one's activity. In this context, the claim made by W.J.H. Kunicki-Goldfinger seems to be shocking but intellectually precise. The famous biologist argues that "From the viewpoint of physics and chemistry, nucleic acids of man and swine are not different at all, as far as thermodynamics is concerned. Nevertheless the man is different from swine, and even there are people, who are not 'swines'."[39] And the proposed way of educating is to deserve to reduce the number of "swines" among people as much as possible.

2.3.2. Intellectual education

The situations connected with genetic intervention discussed above ... clearly indicate that we are confronted by perversions of some kind. The first and most obvious degeneration involves the justification of ethical choices in terms of natural sciences rather than ignoring ethics as a whole. In consequence, some scientists think that the appropriate amount of successful experiments, based on intellectual justifications, may verify values such as: parental love, responsibility, freedom, dignity and so on. More precisely, the situations just discussed have their ethical dimension, because man is forced to choose them. But, are these the choices of values? Moreover, if the system of values is being destroyed, no reasons (even those most effective from the viewpoint of natural sciences) taken from outside of this system, are sufficient to justify all genetic manipulations.

---

[38] I. Kant, *Krytyka praktycznego rozumu*, trans. J. Gałecki (Warszawa: PWN, 1972), p. 211.

[39] W.J.H. Kunicki-Goldfinger, "Redukcjonizm w biologii, czyli o drogach poznania życia," *Delta* 117, no. 9 (1983), p. 12.

The essence of the mistake lies in making ethical choices independent of the choices of values and the conception of man. Hence there appears the new thinking that the very subjective choices of values, as well as subjectivism in understanding man, should determine human ethics (the ethics of individualism). And this is obvious that if human life is threatened with physiological, anatomic or even genetic mistakes in his organism, correcting these mistakes belongs to the very discipline of genetic engineering. Yet, we have to remember that man is the good in himself and not the object of pleasures of his friends or relatives or the provider of someone else's happiness; and this won't be changed by either referring to the principles of situational ethics or to scientific knowledge. Yet, we do not mean to negate the validity of genetic interventions as such. The essence is that the genetic engineering activities cannot be preceded by the choice of evil, even if it is completed with various subjective reasons such as: she/he has the right to be happy; Why shouldn't we help—by all means—in making her/him healthy? Man always becomes the object in such a calculation and this is the essence of evil. Evil always remains evil, even if we try to use the natural knowledge to get rid of the remorse.

A very clear conclusion follows from the above: everyone who wants to preserve their humanity makes choices in terms of values and, in this way, becomes more of a human being. If they do not do so, they are simply animals, as animals don't make choices of values.[40] If the, in turn, they make the wrong choices, their humanity and being a subject rather than an object is threatened. Obviously, I would like to repeat it once again. This cannot be changed either by the more and more new and sophisticated achievements of genetic engineering, or by fascinating outcomes of numerous natural sciences. The choices of values belong to the sphere of ethics and they cannot be removed from the sphere of human conscience.

Moreover, "If the increase in scientific and technical knowledge is not accompanied (and it is quite well-known) by the corresponding increase in the knowledge of the man, the consequence is (which is not very often and not very clearly noticed) not just the stagnation

[40] R. Ingarden, *Książeczka o człowieku* (Kraków: Wydawnictwo Literackie, 1972), p. 25.

but also the regression of the knowledge of the man."[41] I hope this will not be confirmed at the end of 20th century within the context of the genetic engineering research. That is why it is reasonable to repeat the things which J. Bernard paid attention to.[42] He mentions the necessity of observing two rules. Firstly, "What is not scientific, is not ethical either." This means that scientists should guarantee that genetic research is of the best possible value, before the research is subject to ethical judgment. Secondly, "Everything, which is scientific, is not necessarily ethical."

...

Obviously, we should emphasize the fact that bioethical decisions are based on rational thinking. Yet, because of this, this type of thinking cannot be identified with the ethical rationality applied by genetic engineers. This very proposition is the key to my own proposals of analyzing genetic engineering experiments in the light of either the bioethics of "facilitating" or bioethics of the "border." I strongly opt for the decisions of bioethics of the "border," because I think that only this kind of bioethics is able to answer the question of good and evil adequately; and hence it is able to decide which human rights are right or wrong, to determine which things are banned and which are not. The bioethics of this type is based on the ethics of Christian personalism and spiritualism.

[41] B. Hałaczek, "Człowiek w kontekście sukcesów nauki. Eksplozja wiedzy, regresja samowiedzy," in *W kierunku chrześcijańskiej kultury*, ed. B. Bejze (Warszawa: Wydawnictwo ATK, 1978), p. 422.

[42] J. Bernard, *La bioéthique. Un exposé pour comprendre. Un essai pour réfléchir*, pp. 85–86.

Bibliography

Publications of Kazimierz Kloskowski

Books

Kloskowski, K. *Zagadnienie determinizmu ewolucyjnego. Studium biofilozoficzne*. Gdańsk: Stella Maris, 1990.

———. *Między ewolucją a kreacją*. Warszawa: Wydawnictwo ATK, 1994.

———. *Bioetyczne aspekty inżynierii genetycznej. Wybrane problemy*. Warszawa: Wydawnictwo ATK, 1995.

———. *Filozofia ewolucji i filozofia stwarzania*, vol. 1: *Między ewolucją a stwarzaniem*. Warszawa: Wydawnictwo ATK, 1999.

———. *Filozofia ewolucji i filozofia stwarzania*, vol 2: *Pogodzone bliźniaki. Rzecz o ewolucji i kreacji*. Warszawa: Wydawnictwo ATK, 1999.

Academic handbooks

Kloskowski, K. *Filozofia przyrody*. Gdańsk: Gdańskie Seminarium Duchowne, 1990.

———. *Filozofia Boga*. Gdańsk: Gdańskie Seminarium Duchowne, 1991 (Next editions: 1993, 1995, 1998).

———. *Wokół ewolucji biologicznej. Refleksje z zakresu filozofii przyrody*. Olecko: Mazurska Wszechnica, 1998.

———. *Powołanie nauczyciela do pedagogizacji siebie i swoich działań*. Olecko: Mazurska Wszechnica, 1998.

Edited books

Kloskowski, K., Bugajak, G., and Latawiec, A. *Filozoficzne i naukowo-przyrodnicze elementy obrazu świata*, vol. 2. Warszawa: Wydawnictwo ATK, 1999.

Kloskowski, K., and Lubański, M. *Z zagadnień filozofii przyrodoznawstwa i filozofii przyrody*, vol. 16. Warszawa: Wydawnictwo ATK, 1999.

Articles

Kloskowski, K. "Koncepcja abiogenezy w pracach Reinharda W. Kaplana," in *Z zagadnień filozofii przyrodoznawstwa i filozofii przyrody*, vol. 5, ed. K. Kłósak, M. Lubański and S.W. Ślaga, pp. 103–150. Warszawa: Wydawnictwo ATK, 1983.

———. "Teoria abiogenezy w ujęciu Hansa Kuhna," in *Z zagadnień filozofii przyrodoznawstwa i filozofii przyrody*, vol. 6, ed. M. Lubański and S.W. Ślaga, pp. 269–287. Warszawa: Wydawnictwo ATK, 1984.

———. "Wokół współczesnej problematyki kreacjonizmu," *Miesięcznik Diecezjalny Gdański* 28, no. 7–9 (1984), pp. 205–214.

———. "Hipercykl jako model abiogenezy," in *Z zagadnień historii przyrodoznawstwa i filozofii przyrody*, vol. 7, ed. M. Lubański and S.W. Ślaga, pp. 257–280. Warszawa: Wydawnictwo ATK, 1985.

———. "Przypadek jako czynnik abiogenezy," *Studia Philosophiae Christianae* 21, no. 2 (1985), pp. 39–78.

———. "Kreacjonizm a granice poznania," *Miesięcznik Diecezjalny Gdański* 30, no. 7–9 (1986), pp. 327–340.

———. "Metodologiczne uwarunkowania kreacjonizmu naukowego," *Miesięcznik Diecezjalny Gdański* 30, no. 10–12 (1986), pp. 423–445.

———. "Nauka o Logosie w dziełach Filona z Aleksandrii i w hymnie Prologu Czwartej Ewangelii," *Studia Gdańskie* 6 (1986), pp. 313–352.

———. "Rola przypadku w genezie życia," in *Z zagadnień filozofii przyrodoznawstwa i filozofii przyrody*, vol. 8, ed. M. Lubański and S.W. Ślaga, pp. 85–237. Warszawa: Wydawnictwo ATK, 1986.

Kloskowski, K., and Kucharczyk, K. "Refleksje na temat 'nowych pojęć struktury chemicznej i biologicznej' sformułowanych przez E.B. Cohena," *Kosmos* 36, no. 4 (1986), pp. 591–598.

Kloskowski, K. "Koncepcja biogenezy Manfreda Eigena i Hansa Kuhna," *Zeszyty Naukowe Wydziału Biologii i Nauk o Ziemi. Biologia* 7 (1987), pp. 113–131.

———. "Wieloaspektowy wymiar 'stwarzania' w *Sumie Teologii* św. Tomasza z Akwinu," *Miesięcznik Diecezjalny Gdański* 31, no. 10–12 (1987), pp. 435–443.

———. "Wokół struktury nauk biologicznych," *Studia Philosophiae Christianae* 23, no. 2 (1987), pp. 187–198.

———. "Ewolucja i kreacja – próba pewnego uogólnienia," *Miesięcznik Diecezjalny Gdański* 32, no. 4–6 (1988), pp. 191–205.

———. "Kilka uwag na temat syntetycznej teorii ewolucji," *Studia Philosophiae Christianae* 24, no. 1 (1988), pp. 193–201.

———. "Problem kreacji i kreacjonizmu w ujęciu Kazimierza Kłósaka," *Miesięcznik Diecezjalny Gdański* 32, no. 1–3 (1988), pp. 81–89.

———. "Próba klasyfikacji i charakterystyki teorii we współczesnych naukach o przyrodzie i człowieku," *Miesięcznik Diecezjalny Gdański* 32, no. 10–12 (1988), pp. 370–387.

Kloskowski, K., and Kucharczyk, K. "Reflections on the subject of 'New Concepts of Chemical and Biological Structure', formulated by E.B. Cohen," in *Z zagadnień filozofii przyrodoznawstwa i filozofii przyrody*, vol. 10, ed. M. Lubański and S.W. Ślaga, pp. 241–249. Warszawa: Wydawnictwo ATK, 1988).

Kloskowski, K. "Chance as a Factor of Abiogenesis," in *The Origin of Life – Abstracts the Sixth ISSOL Meeting and the Ninth International Conference*, ed. Z. Masinovki, pp. 323–324. Prague: International Society for the Study of the Origin of Life; Czechoslovak Academy of Sciences, 1989.

———. "Stochastyczność procesu ewolucyjnego," *Miesięcznik Diecezjalny Gdański* 33, no. 10–12 (1989), pp. 230–235.

———. "Przypadek w genezie życia," *Studia Philosophiae Christianae* 24, no. 2 (1990), pp. 163–168.

———. "Bioetyczne aspekty eksperymentów medycznych. Transplantacje – nadzieje i zagrożenia," *Miesięcznik Diecezjalny Gdański* 35, no. 10–12 (1991), pp. 319–328.

Kloskowski, K., and Ślaga S.W. "Neopanspermia alternatywą abiogenezy?" in *Z zagadnień filozofii przyrodoznawstwa i filozofii przyrody*, vol. 13, ed. M. Lubański and S.W. Ślaga, pp. 109–156. Warszawa: Wydawnictwo ATK, 1991.

Kloskowski, K. "Autoreferat habilitacyjny: 'Zagadnienie determinizmu ewolucyjnego. Studium biofilozoficzne'," *Edukacja Filozoficzna*, no. 13 (1992), pp. 173–175.

———. "Syntetyczna teoria ewolucji a neutralizm i punktualizm," *Studia Philosophiae Christianae* 28, no. 1 (1992), pp. 31–51.

———. "Profesora Kazimierza Kłósaka koncepcja kreacjonizmu," *Studia Philosophiae Christianae* 28, no. 2 (1992), pp. 61–75.

———. "'Scientific' Creationism – Reception of the Theory in Poland," *Studia Gdańskie* 8 (1992), pp. 150–163.

———. "Wybrane problemy inżynierii genetycznej. Część pierwsza: Przyrodniczy aspekt zagadnienia," *Miesięcznik Diecezjalny Gdański* 36, no. 4–6 (1992), pp. 138–151.

———. "Wybrane problemy inżynierii genetycznej. Część druga: Bioetyczny aspekt zagadnienia," *Miesięcznik Diecezjalny Gdański* 36, no. 7–9 (1992), pp. 243–254.

———. "'Scientific' Creationism in Poland," in *Baer and Modern Biology*, ed. K. Hull, pp. 67–68. Tartu: University of Tartu, 1992.

———. "Cel i wyjaśnianie celowościowe ewolucji," *Studia Gdańskie* 9 (1993), pp. 257–265.

———. "Święty Albert Wielki z Lauingen jako przyrodnik i myśliciel," *Universitas Gedanensis* 9 (1993), pp. 25–39.

———. "Ewolucjonizm syntetyczny teorią wielu teorii," *Studia Philosophiae Christianae* 29, no. 1 (1993), pp. 87–99.

———. "Genom ludzki. Wyobrażenia a stan faktyczny badań genetycznych," *Studia Philosophiae Christianae* 30, no. 1 (1994), pp. 130–139.

———. "The Chance and the Prebiotic Evolution," *Studia Philosophiae Christianae* 30, no. 2 (1994), pp. 163–169.

———. "Teoria nauki w ujęciu profesora Bolesława Józefa Gaweckiego," *Universitas Gedanensis* 11 (1994), pp. 10–21.

———. "On the Problems of the Purposefulness of Biological Evolution," *Theoria et Historia Scientiarum* 4 (1994), pp. 51–66.

———. "Bioetyczne problemy inżynierii genetycznej," *Zeszyty Naukowe Politechniki Gdańskiej*, no. 1(511) (1995), pp. 7–17.

———. "O naczelnej zasadzie etycznej relacji: człowiek i środowisko," in *Człowiek i środowisko. Humanistyka i ekologia. Prace I Olsztyńskiego Sympozjum Ekologicznego, Olsztyn 5–6 maja 1994 roku*, ed. J. Dębowski, pp. 107–112. Olsztyn: Wyższa Szkoła Pedagogiczna, 1995.

———. "Myśl kreacjonistyczna w polskich ośrodkach filozoficznych," in *Z Zagadnień filozofii przyrodoznawstwa i filozofii przyrody*, vol. 15, ed. M. Lubański and S.W. Ślaga, pp. 227–271. Warszawa: Wydawnictwo ATK, 1995.

Kloskowski, K., and Lemańska, A. "Empiriologiczna teoria nauk szczegółowych," in *Z zagadnień filozofii przyrodoznawstwa i filozofii przyrody*, vol. 15, ed. M. Lubański and S.W. Ślaga, pp. 183–226. Warszawa: Wydawnictwo ATK, 1995.

Kloskowski, K. "Antropological Conditions of the Sozology," in *I diritti fondamentali dell'uomo e dell'ambiente*, ed. R. Sobański and S. Tafaro, pp. 123–130. Warszawa: Wydawnictwo ATK, 1995.

———. "Antropologiczne uwarunkowania sozologii," *Studia Philosophiae Christianae* 31, no. 2 (1995), pp. 91–104.

———. "Inżynieria genetyczna wyzwaniem dla bioetyki," *Studia Teologiczne* 13 (1995), pp. 396–408.

———. "Poglądy filozoficzne profesora Szczepana Witolda Ślagi," *Studia Philosophiae Christianae* 32, no. 1 (1996), pp. 11–36.

———. "Różnorodność i jedność życia," *Studia Philosophiae Christianae* 32, no. 1 (1996), pp. 69–190.

———. "Bioethical Aspects of Genetic Engineering," in *Peculiarity of Man as a Biocultural Species*, ed. A. Wiercińska, pp. 95–102. Warszawa: Wydawnictwo Sorus; Zakład Antropologii Historycznej, Instytut Archeologii, Uniwersytet Warszawski, 1996.

———. "Determinism, Indeterminism and Autodeterminism of Evolutionary Processes," *Theoria et Historia Scientiarum* 5 (1996), pp. 111–136.

———. "Zagadnienia ewolucji człowieka. Współczesne koncepcje antropogenezy," *Śląskie Studia Teologiczne* 29 (1996), pp. 235–239.

———. "Genetic Engineering: A Technique of the Future. Is It a Threat or a Hope?" *Dialogue and Universalism* 6, no. 8–9 (1996), pp. 115–125.

———. "Pierwszeństwo etyki i bioetyki przed genetyką," *Znak* 48, no. 12 (1996), pp. 75–81.

———. "Bioethical Interpretations of Genetic Manipulation," *Dialogue and Universalism* 7, no. 7–8 (1997), pp. 141–147.

———. "Genetyka, bioetyka i edukacja biologiczna," in *Teoria i praktyka ochrony środowiska w Polsce*, vol. 2, ed. J.L. Krakowiak, pp. 39–47. Warszawa: Centrum Uniwersalizmu Uniwersytetu Warszawskiego, 1997.

———. "Genetic Engineering: A Technique of the Future. Is It a Fact or a Hope?" in *International Conference Veterinaring Biotechnology Management in Central – Eastern Europe*, ed. K.J. Wojciechowski, pp. 31–40. Warszawa: SGGW, 1997.

———. "School and Teachers Tendency of Education in Poland: A Humanists Reflections," in *Mission and Strategy of University*, ed. K. Koralewski, pp. 31–40. Gdańsk: Technical University of Gdańsk, 1997.

———. "Szkoła i nauczyciel a tendencje edukacyjne w Polsce. Refleksje humanisty," in *Misja i Strategia uczelni*, ed. K. Koralewski, pp. 31–39. Gdańsk: Politechnika Gdańska, 1997.

———. "Bioethical Interpretations of Genetic Manipulation II," in *IV International Biotechnology Summer School*, ed. E. Łojkowski, pp. 80–90. Gdańsk: Akademia Medyczna w Gdańsku; Uniwersytet Gdański, 1997.

———. "Zagadnienie początków życia – problem wciąż otwarty," *Łódzkie Studia Teologiczne* 6 (1997), pp. 27–33.

———. "Bioethical Interpretations of Genetic Engineering," in *Veterinary Biotechnology Management in Central-Eastern Europe*, pp. 156–167. Warsaw: Warsaw Agricultural University; SGGW, 1997.

———. "Science and the Scientific Reality: An Attempt to Find an Adequate Strategy of the Biological Research," in *Memory, History and Critique: European Identity at the Millennium. Proceedings of the Fifth Conference of the International Society for the Study of European Ideas (ISSEI), 19–24 August 1996*, ed. F. Brinkhuis and S. Talmor, pp. 145–155. Utrecht: ISSEI; University for Humanist Studies, 1998.

———. "Bioethical Interpretations of Genetic Manipulation: A Context of the Question of an Ethical Nature," in *XX World Congress of Philosophy*, pp. 109–110. Boston, 1998.

———. "Does Biotechnology Need Bioethics? II," in *V International Biotechnology Summer School*, ed. E. Piłka, pp. 250–280. Gdańsk: Akademia Medyczna w Gdańsku; Uniwersytet Gdański, 1998.

———. "Uwarunkowania metodologiczno-historycznego naukowego obrazu świata," in *Filozoficzne i naukowo-przyrodnicze elementy obrazu świata*, vol. 1, ed. A. Latawiec and A. Lemańska, pp. 23–37. Warszawa: Wydawnictwo ATK, 1998.

Kloskowski, K., Czalej, S. "Analogiczne poznanie Boga w ujęciu biskupa profesora Bohdana Bejze," *Łódzkie Studia Teologiczne* 7 (1998), pp. 51–102.

Kloskowski, K. "Concern for Life: Axiological and Ethical Conditioning of the Biotechnology Research," in *VI International Biotechnology Summer School*, ed. J. Bigda, pp. 171–196. Gdańsk: Akademia Medyczna w Gdańsku; Uniwersytet Gdański, 1999.

———. "Does Biotechnology Need Bioethics? I," *Studia Philosophiae Christianae* 35, no. 1 (1999), pp. 5–17.

———. "Is the Essence of Life a Natural or Philosophical Problem?" *Analecta Husserliana* 59 (1999), pp. 265–275.

———. "Science and the Scientific Reality: An Attempt to Find an Adequate Strategy of the Biological Research," *Theoria et Historia Scientiarum* 6 (1999), pp. 71–93.

———. "Wiek XX stuleciem biologii. Refleksje filozofa przyrody," in *Filozoficzne i naukowo-przyrodnicze elementy obrazu świata*, vol. 2, ed. G. Bugajak, K. Kloskowski and A. Latawiec, pp. 15–55. Warszawa: Wydawnictwo ATK, 1999.

———. "Is Biology Characterised by Peculiarites?" in *11th International Congress of Logic, Methodology and the Philosophy of Science, Cracow, August 1999*, *Volume of Abstracts*, p. 347. Krakow, 1999.

———. "Wokół ewolucji biologicznej. Wybrane problemy biologiczne," in *Z zagadnień filozofii przyrodoznawstwa i filozofii przyrody*, vol. 16, ed. K. Kloskowski and M. Lubański, pp. 5–34. Warszawa: Wydawnictwo ATK, 1999.

———. "Wokół filozofii ewolucji i filozofii stwarzania," *Universitas Gedanensis* 11, no. 1–2 (1999), pp. 111–128.

———. "Klonowanie. Ostatni absurd człowieka XX wieku?" *Medycyna Wieku Rozwojowego* 3 (1999), (Appendix 1), pp. 81–102.

———. "Dwa porządki: ewolucji i kreacji," in *Episteme* 1 (1999): *Solidarni z nauczaniem Jana Pawła II*, pp. 195–206.

Kloskowski, K., and Czalej, S. "Analogiczne poznanie Boga w ujęciu biskupa profesora Bohdana Bejze," *Studia Gdańskie* 12 (1999), pp. 21–77 [reprinted from: *Łódzkie Studia Teologiczne* 7 (1998), pp. 51–102].

Kloskowski, K. "Genetic Engineering – The Promise and Perils," *Dialogue and Universalism* 10, no. 5–6 (2000), pp. 25–30.

———. "Dokąd ewolucjo – dokąd kreacjo?" *Studia Philosophiae Christianae* 36, no. 1 (2000), pp. 90–104.

Book reviews

Klosklowski, K. "Kenneth G. Denbigh: *Świat i czas*, trans. J. Mitelski, Warszawa 1979," *Studia Philosophiae Christianae* 16, no. 2 (1980), pp. 216–217.

———. “Albert Nałczadżjan: *Intuicja a odkrycie naukowe*, trans. I. Bukowski, Warszawa 1979,” *Studia Philosophiae Christianae* 7, no. 1 (1981), pp. 218–220.

———. “Jan Strzałko, Maciej Henneberg, Janusz Piontek: *Populacje ludzkie jako systemy biologiczne*, Warszawa 1980,” *Studia Philosophiae Christianae* 18, no. 1 (1982), pp. 236–238.

———. “Rupert Sheldrake: *A New Science of Life: The Hypothesis of Formative Causation*, London 1981,” *Studia Philosophiae Christianae* 19, no. 1 (1983), pp. 195–198.

———. “Werner Holzmuller: *Makromolekule als Trager von Lebensprozessen*, Berlin 1981,” *Studia Philosophiae Christianae* 19, no. 2 (1983), pp. 236–237.

———. “Albrecht Unsold: *Evolution kosmischer, biologischer und geistiger Strukturen*, Stuttgart 1981,” *Studia Philosophiae Christianae* 19, no. 2 (1983), pp. 237–241.

———. “*Evolution Now: A Century After Darwin*, ed. J.M. Smith, London 1982,” *Studia Philosophiae Christianae* 21, no. 1 (1985), pp. 215–218.

———. “*Francis Crick: Life Itself: Its Origin and Nature*, London–Sydney 1982,” *Studia Philosophiae Christianae* 21, no. 1 (1985), pp. 218–223.

———. “Franz M. Wuketits: *Biologische Erkenntnis. Grundlagen und Probleme*, Stuttgart 1983,” *Studia Philosophiae Christianae* 21, no. 2 (1985), pp. 215–218.

———. “Peter Medawar: *The Limits of Science*, Oxford 1985,” *Studia Philosophiae Christianae* 23, no. 1 (1987), pp. 227–231.

———. “John Losee: *Philosophy of Science and Historical Enquiry*, Oxford 1987,” *Studia Philosophiae Christianae* 24, no. 2 (1988), pp. 161–164.

———. “*Evolutionary Process and Theory*, ed. S. Karlin and E. Nevo, San Diego–Toronto 1986,” *Studia Philosophiae Christianae* 26, no. 1 (1990), pp. 209–210.

———. “Agnessa Babloyantz: *Molecules, Dynamics and Life*, New York–Singapore 1986,” *Studia Philosophiae Christianae* 26, no. 1 (1990), pp. 210–213.

———. “*Theories of Explanation*, ed. J.C. Pitt, New York–Oxford 1988,” *Studia Philosophiae Christianae* 26, no. 2 (1990), pp. 154–156.

———. “*Evolutionary Biology at the Crossroads: A Symposium at Queens College*, ed. M.K. Hecht, New York 1989,” *Studia Philosophiae Christianae* 28, no. 1 (1992), pp. 177–180.

———. “E.I. Kołczynskij, S.A. Orlow: *Fiłosofskije problemy biologi w CCCP (1920–1960)*, Leningrad 1990,” *Studia Philosophiae Christianae* 29, no. 1 (1993), pp. 200–204.

———. “Paul H. Harvey, Mark D. Pagel: *The Comparative Method in Evolutionary Biology*, Oxford–New York–Tokyo 1991,” *Studia Philosophiae Christianae* 29, no. 1 (1993), pp. 204–207.

———. “Tim M. Berra: *Evolution and the Myth of Creationism*, Stanford 1990,” *Studia Philosophiae Christianae* 29, no. 2 (1993), pp. 196–200.

———. "*Explanation and Its Limits*, ed. D. Knowles, Cambridge–New York–Sydney 1990," *Universitas Gedanensis* 9 (1993), pp. 122–126.

———. "Ian Stewart: *Czy Bóg gra w kości? Nowa matematyka chaosu*, trans. M. Tempczyk, W. Komar, Warszawa 1994," *Universitas Gedanensis* 11 (1994), pp. 106–110.

———. "Edward O. Wilson: *The Diversity of Life*, New York–London 1993," *Universitas Gedanensis* 14 (1996), pp. 122–125.

———. "Jean Bernard: *Bioéthique. Un exposé pour comprendre. Un essai pour réfléchir*, Paris 1994," *Studia Philosophiae Christianae* 32, no. 1 (1996), pp. 340–343.

———. "Adam Synowiecki: *Przyrodoznawstwo – dzieło ludzi i cząstka kultury*, Gdańsk 1998," *Studia Philosophiae Christianae* 35, no. 1 (1999), pp. 181–187.

———. "Adam Synowiecki: *Przyrodoznawstwo – dzieło ludzi i cząstka kultury*, Gdańsk 1998," *Universitas Gedanensis* 11, no. 1–2 (1999), pp. 263–266.

———. "Wolfgang Balzer, Chris M. Dawe: *Models for Genetics*, Frankfurt am Main–Berlin–New York–Paris–Wien 1997," *Studia Philosophiae Christianae* 35, no. 2 (1999), pp. 215–222.

———. "Wiesław Dyk: *Rola praw biologicznych w wyjaśnieniu ewolucyjnym*, Szczecin 1998," *Studia Philosophiae Christianae* 35, no. 2 (1999), pp. 230–241.

———. "Steven Rose: *Lifelines: Biology beyond Determinism*, Oxford–New York 1998," *Studia Philosophiae Christianae* 35, no. 2 (1999), pp. 222–230.

Scientific reports

Kloskowski, K., Sobkowicz, D. "Sprawozdanie z działalności Koła Naukowego studentów filozofii przyrody w r. akad. 1978/79," *Studia Philosophiae Christianae* 16, no. 2 (1980), pp. 247–249.

———. "Sprawozdanie z działalności Koła Naukowego studentów filozofii przyrody w r. akad. 1979/80," *Studia Philosophiae Christianae* 17, no. 1 (1981), pp. 252–254.

Kloskowski, K. "Sprawozdanie z działalności Koła Naukowego studentów filozofii przyrody w r. akad. 1981/82," *Studia Philosophiae Christianae* 19, no. 1 (1983), pp. 252–256.

———. "Międzynarodowa Konferencja na temat: Baera współczesna biologia, Tartu 28 II – 02 III 1992," *Studia Philosophiae Christianae* 27, no. 2 (1992), pp. 265–266.

———. "Sprawozdanie z pobytu w Czecho-Słowackiej Akademii Nauk w maju 1992," *Studia Philosophiae Christianae* 29, no. 1 (1993), pp. 215–216.

———. "XIX Międzynarodowy Kongres Historii Nauki, Saragossa (Hiszpania) 22–29 sierpnia 1993," *Studia Philosophiae Christianae* 30, no.1 (1994), pp. 179–180.

———. "Filozofia życia i filozofia biologii na VI Polskim Zjeździe Filozoficznym. Sprawozdanie z posiedzenia Sekcji Filozofii Życia i Biologii – VI Polski Zjazd Filozoficzny (Toruń 05.09.1995 r.)," *Studia Teologiczne* 14 (1996), pp. 368–371.

Translations

"*Wyjaśnianie w nauce*, translation of the excerpts of the book: *Theories by explanations*, ed. J. Pitta, New York–Oxford 1988," *Miesięcznik Diecezjalny Gdański* 33, no. 7–9 (1989), pp. 179–184.

Jean Bernard, *Bioetyka. Prezentacja stanu badań.* Gdańsk 1995, translation of the book: Jean Bernard: *Bioéthique. Un exposé pour comprendre. Un essai pour réfléchir*, Paris 1994 (published by the translator's own effort).

Interviews

"Kleryków należy traktować poważnie, czyli partnersko," *Novellae Olivarum* 30, no. 59 (1990), pp. 36–39.

"Nieuchwytne życie," *Przegląd Katolicki* 81, no. 9 (1993), pp. 1, 10–11.

Encyclopedic articles

"Epigeneza"; "Fizykalizm"; "Opis naukowy"; "Pangeneza"; "Pankosmizm"; "Pansomatyzm"; "Preformizm"; "Relacjonizm"; "Struktura"; "Systematyka"; "Typ"; "Typologia," in *Słownik pojęć filozoficznych*, ed. W. Krajewski and R. Banajski. Warszawa: Wydawnictwo Naukowe Scholar, 1996.

Selected bibliography on Kazimierz Kloskowski

Adamczyk, D. *Stworzenie – Opatrzność – Ewolucja. Przyczynek do dialogu nauki i wiary*. Szczecin: Print Group, 2009.

Bała, M. "Rys biograficzny i bibliografia prac śp. ks. prof. dr hab. Kazimierza Kloskowskiego," *Studia Gdańskie* 12 (1999), pp. 3–20.

Biesaga, T. "Bioetyka," in *Powszechna encyklopedia filozofii*, vol. 1, p. 581. Lublin: Polskie Towarzystwo Tomasza z Akwinu, 2000.

Buczkowska, J., and Lemańska, A. "Poglądy filozoficzne księdza Profesora Kazimierza Kloskowskiego," *Episteme* 57 (2006): *Rozmaitości ekofilozofii*, pp. 349–362.

Bugajak, G. "Pojęcie przypadku i jego zastosowanie w analizach teorii naukowych, in *Filozofia przyrody współcześnie*," ed. M. Kuszyk-Bytniewska and A. Łukasik, pp. 235–245, Kraków: Universitas, 2010.

Bugajak, G., and Tomczyk, J. “On Evolution and Creation: Problem Solved? The Polish Example,” *Zygon* 44, no. 4 (2009), pp. 859–878.

Chwal, J. “Pogranicze nauk – na przykładzie epistemologii ewolucyjnej i innych zastosowań teorii ewolucji,” *Pogranicze. Studia Społeczne* 20 (2012), pp. 297–320.

Cichosz, W., and Gidziński, K. “Pedagogiczno-katechetyczne możliwości zastosowania teorii powstania życia Hoimara von Ditfurtha,” *Teologia i Człowiek* 18 (2011), pp. 129–151.

Dołęga, J.M. “Ewolucyjny model kreacjonizmu,” *Archeus. Studia z Bioetyki i Antropologii Filozoficznej* 7 (2006), pp. 5–22.

Episteme 3 (2000): *Kazimierz Kloskowski (1953–1999)*, ed. J.M. Dołęga and J. Meller.

Episteme 11 (2001): *Kazimierz Kloskowski. Zasady – edukacja – testament*, ed. J. Krajewski and J. Sokołowski.

Fikus, M., and Chyrowicz, B. “Inżynieria genetyczna,” in *Powszechna encyklopedia filozofii*, vol. 4, p. 912. Lublin: Polskie Towarzystwo Tomasza z Akwinu, 2003.

Hall, G.K. *Bibliographic Guide to Soviet and East European Studies*. New York: G.K. Hall & Co., 1997, p. 264.

Hałaczek, B. “Głos w dyskusji na sympozjum w 5. rocznicę śmierci ks. prof. dr hab. Kazimierza Kloskowskiego,” *Episteme* 57 (2006): *Rozmaitości ekofilozofii*, pp. 363–364.

Jaroń, J. *Aktualny stan bioetyki i ekologii w Polsce i na świecie*. Siedlce: Wydawnictwo Akademii Podlaskiej, 2005, pp. 136, 310–312.

Jodkowski, K. “Demistyfikacja sporu kreacjonizm – ewolucjonizm,” *Przegląd Filozoficzny* 3–4 (1999), pp. 77–94.

———. *Spór ewolucjonizmu z kreacjonizmem. Podstawowe pojęcia i poglądy*. Warszawa: Megas, 2007.

“Kazimierz Kloskowski” [obituary], *Więź* 12 (1999), pp. 214–215.

“Kazimierz Kloskowski,” *Ruch Filozoficzny* 55, no. 3 (1998), pp. 501–506.

Krajewski, K. [review of: Kazimierz Kloskowski, *Bioetyczne aspekty inżynierii genetycznej*, Warszawa 1995], *Studia Teologiczne* 14 (1996), pp. 407–408.

Kuźnicki, L. *Autobiografia. W kręgu nauki*, Warszawa: Centrum Upowszechniania Nauki; Polska Akademia Nauk, 2002, p. 282.

———. “Obecność inspiracji chrześcijańskich w rozwoju ewolucjonizmu,” in *Sacrum i kultura. Chrześcijańskie korzenie przyszłości. Materiały Kongresu Kultury Chrześcijańskiej, Lublin, 15–17 września 2000*, ed. R. Rubinkiewicz and S. Zięba, pp. 141–144, Lublin: Towarzystwo Naukowe KUL, 2000.

———. “Wkład ks. prof. dr hab. Kazimierza Kloskowskiego do poznania struktury współczesnego ewolucjonizmu i hipotezy powstania życia,” *Studia Philosophiae Christianae* 36, no. 1 (2000), pp. 104–111.

Lemańska, A. “Determinizm,” in *Encyklopedia filozofii przyrody*, ed. Z. Roskal, pp. 67–86. Lublin: Wydawnictwo KUL, 2016.

———. "Ewolucja a kreacja," *Studia Leopoliensia* 1 (2006), pp. 95–104.

———. "Kazimierza Kloskowskiego ewolucyjny model kreacji," in *Wokół biofilozofii Kazimierza Kloskowskiego. Wybrane zagadnienia*, ed. M. Bała, pp. 87–99. Pelplin: Bernardinum, 2004.

———. "Kreacjonizm ewolucyjny jako alternatywa koncepcji inteligentnego projektu," in *Teoria ewolucji a wiara chrześcijan*, ed. E. Wiszowaty and K. Parzych-Blakiewicz, pp. 119–129. Olsztyn: Wydawnictwo Uniwersytetu Warmińsko-Mazurskiego w Olsztynie, 2010.

———. "Sprawozdanie z sesji 'Filozofia ewolucji a filozofia stwarzania. Wkład Ks. Rektora Kazimierza Kloskowskiego do współczesnego ewolucjonizmu', Warszawa, 12.04.2000," *Studia Philosophiae Christianae* 37, no. 1 (2001), pp. 224–227.

Lubański, M. "Ewolucja a przypadek," in *Stwarzanie i ewolucja*, ed. J. Buczkowska and A. Lemańska, pp. 96–108. Warszawa: Wydawnictwo UKSW, 2002.

———. "Kazimierz Kloskowski (1953–1999). Sylwetka naukowa," *Studia Philosophiae Christianae* 36, no. 1 (2000), pp. 77–81.

Łukomski, J. "Ewolucja w ujęciu ks. Kazimierza Kloskowskiego," in *Stwarzanie i ewolucja*, ed. J. Buczkowska and A. Lemańska, pp. 19–34. Warszawa: Wydawnictwo UKSW, 2002.

Łukowska, A.T. "Filozoficzne i światopoglądowe podstawy sporu o klonowanie człowieka," *Medycyna Wieku Rozwojowego* 1 (2001), (Appendix 1), pp. 27–37.

Misiorowska, A.M. *Pozorny antagonizm między ewolucją i kreacją w koncepcji ks. prof. Kazimierza Kloskowskiego* (Warszawa 2002) (typescript).

Misztal, M.T. *Krytyka Richarda Dawkinsa koncepcji ewolucjonizmu w pismach ks. Kazimierza Kloskowskiego* (Płock 2002) (typescript).

Ocalić od zapomnienia. Profesorowie ATK w Warszawie we wspomnieniach wychowanków, ed. J.M. Dołęga and J. Mandziuk, pp. 73–80. Warszawa: Wydawnictwo UKSW, 2002.

Pabjan, T. "Some Remarks on the Theological Interpretation of the Theory of Evolution," *The Person and the Challenges. The Journal of Theology, Education, Canon Law and Social Studies Inspired by Pope John Paul II* 3, no. 1 (2013), pp. 199–211.

Paszewski, A. "Sukcesy naukowe biologów a problem etyczne," *Postępy Mikrobiologii* 39 (2000), pp. 11–12.

Paszewski, A., and Wiścicki, T. "Majstrowanie przy człowieku. Z prof. Andrzejem Paszewskim, genetykiem z Instytutu Biochemii i Biofizyki PAN, rozmawia Tomasz Wiścicki," *Więź*, no. 6 (2003), pp. 26–37.

Polish Philosophers of Science and Nature in the 20th Century, vol. 3, ed. W. Krajewski, p. 17. Amsterdam–New York: Brill, 2001.

Przybyłowski, J. [reviews of: K. Kloskowski, *The Problem of the Evolutionary Determinism: A Biophilosophical Study*, Gdańsk 1990], *Miscellanea Anthropologica et Sociologica* 2, no. 2 (1993), pp. 275–275.

Schümann, D. *Kampf ums Da(bei)sein Darwin-Diskurse und die Polnische Literatur bis 1900*. Köln–Weimar: Böhlau Köln, 2015, p. 466.

Stańko, D. [review of: K. Kloskowski, *Bioetyczne aspekty inżynierii genetycznej*, Warszawa 1995], *Studia Philosophiae Christianae* 33, no. 1 (1997), pp. 200–202.

Świeżyński, A. "Is Chance an 'Element' of Miracle? In Search for Common Aspect of Miraculous and Chance Events," *Studia Philosophiae Christianae* 46, no. 2 (2010), pp. 61–86.

———. *The Philosophy of Human Death. An Evolutionary Approach*. Warszawa: Wydawnictwo UKSW, 2009, pp. 85–92.

———. "The Philosophy of Nature, Chance, and Miracle," *American Journal of Theology and Philosophy* 3 (2011), pp. 221–241.

Tokarczyk, R. *Prawa narodzin, życia i śmierci. Podstawy biojurysprudencji*, eleventh extended edition. Warszawa: Lex a Wolters Kluwer business, 2012.

Wnuk, M. "Kazimierz Kloskowski," in *Encyklopedia filozofii polskiej*, vol. 1, pp. 650–651. Lublin: Polskie Towarzystwo Tomasza z Akwinu, 2011.

———. "Kazimierz Kloskowski," in *Encyklopedia katolicka*, vol. 9, p. 157. Lublin: Towarzystwo Naukowe KUL, 2002.

———. "Kazimierz Kloskowski," in *Powszechna encyklopedia filozofii*, vol. 5, pp. 660–661. Lublin: Polskie Towarzystwo Tomasza z Akwinu, 2004.

———. "Pamięci Księdza Profesora Kazimierza Kloskowskiego (1953–1999)," *Roczniki Filozoficzne* 48–49, no. 3 (2000–2001), pp. 155–157.

Wolska, E. *Bioetyka 'ułatwiania' i bioetyka 'granicy' w ujęciu ks. Kazimierza Kloskowskiego*. Warszawa 2002 (typescript).

"Wspomnienia," *Studia Philosophiae Christianae* 36, no. 1 (2000), pp. 112–138.

Zalega, T. "Ekonomia ewolucyjna jako jeden z nurtów współczesnej ekonomii – zarys problematyki," *Studia i Materiały. Wydział Zarządzania UW* 19 (2015), pp. 157–177.

Zon, J. "Ewolucja," in *Encyklopedia filozofii przyrody*, ed. Zenon Roskal, pp. 145–159. Lublin: Wydawnictwo KUL, 2016.

———. "Ewolucjonizm," in *Powszechna encyklopedia filozofii*, vol. 3, pp. 335–351. Lublin: Polskie Towarzystwo Tomasza z Akwinu, 2002.

Studies

Anderson, Ch. "US Genome Project Does It the French Way, Conceding That Size Matters After All," *Nature* 360 (1992), p. 401.

Anderson, W.F. "Human Gene Therapy: Scientific and Ethical Considerations," in *Ethics, Reproduction and Genetic Control*, ed. R.F. Chadwick, pp. 157–162. London: Routledge, 1987.

Ayala, F.J. "Biology as an Autonomous Science," in *Topics in the Philosophy of Biology* (*Boston Studies in the Philosophy and History of Science*, vol. 27), ed. M. Grene and E. Mendelson, pp. 312–329. Dordrecht: Springer, 1976.

———. "Teleological Explanation in Evolutionary Biology," *Philosophy of Science* 1 (1970), pp.1–15.

———. "The Autonomy of Biology as a Natural Science," in *Biology, History and Natural Philosophy*, ed. A.D. Breck and W. Yourgrau, pp. 1–16. New York: Springer, 1972.

Beardsley, T. "Złoty wiek biologii," *Świat Nauki* 1 (1995), pp. 76–77.

Beckner, M. "Function and Teleology," *Journal of the History of Biology* 2, no. 1 (1969), pp. 151–164.

———. *The Biological Way of Thought*. New York: Columbia University Press, 1959.

Bernard, J. *Bioéthique. Un exposé pour comprendre. Un essai pour réfléchir*. Paris: Flammarion, 1994.

———. *Od biologii do etyki. Nowe horyzonty wiedzy, nowe obowiązki człowieka*, trans. J.A. Żelechowska. Warszawa: Wydawnictwo Naukowe PWN, 1994.

Berry, R.M. *The Ethics of Genetic Engineering*. New York: Routledge, 2010.

Bertalanffy, L. von. *Problems of Life*. New York–London: John Wiley and Sons, 1952.

Bielecki, J., and Krokos, J. *Wydział Filozofii Chrześcijańskiej na ATK 1954–1999*. Warszawa: Wydawnictwo UKSW, 2001.

Bieńkowski, T., Hübner P. "Polska. Nauka. Okres 1944–89 i lata 90.," in *Internetowa Encyklopedia PWN*, https://encyklopedia.pwn.pl/haslo/Polska-Nauka-Okres-1944-89-i-lata-90;4575089.html (access: 18.05.2019).

Biesaga, T. "Początki bioetyki, jej rozwój i koncepcja," in *Podstawy i zastosowania bioetyki*, ed. T. Biesaga, pp. 11–26. Kraków: Wydawnictwo Naukowe PAT, 2001.

Bioetyka polska, ed. T. Biesaga. Kraków: Wydawnictwo Naukowe PAT, 2004.

Borzym, S. "Filozofia w Polsce w latach 1945–1990," in *Humanistyka polska w latach 1945–1990*, ed. U. Jakubowska and J. Myśliński, pp. 96–126. Warszawa: Instytut Badań Literackich PAN; Fundacja Akademia Humanistyczna, 2006.

Bradie, M. "Assessing Evolutionary Epistemology," *Biology and Philosophy* 1, no. 2 (1986), pp. 401–459.

Brand, M., and Swain, M. "On the Analysis of Causation," *Synthese* 21 (1970), pp. 222–227.

Broad, W. "Creationists Limit Scope of Evolution Case," *Science* 211, no. 4488 (1981), pp. 1331–1332.

Bugajak, G. "Pre-aksjologiczny aspekt granic natury: czy istnieją działania (nie)naturalne?" *Roczniki Filozoficzne* 65, no. 1 (2017), pp. 134–139.

Bugajak, G., Kucharski D., Latawiec A., Lemańska A., Ługowska D., Świeżyński A., and Tomczyk J. *God and Nature: Selected Issues in the Philosophy and Theology of Nature*. Warszawa: Wydawnictwo UKSW, 2014.

Bugajak G., Kucharski D., Ługowska D., Latawiec A., Lemańska A., Świeżyński A., and Weker M. *Knowledge and Values*. Warszawa: Wydawnictwo UKSW, 2011.

Bugajak G., Kukowski J., Latawiec A., Lemańska A., Ługowska D., and Świeżyński A. *Tajemnice natury. Zarys filozofii przyrody*. Warszawa, Wydawnictwo UKSW, 2009.

Bugajak G., Kukowski J., Ługowska D., Latawiec A., Lemańska A., Świeżyński A., and Weker M. *Philosophy of Nature Today*. Warszawa: Wydawnictwo UKSW, 2009.

Burhoe, R.W. "Natural Selection and God," *Zygon* 7, no. 1 (1972), pp. 30–63.

Chauchard, P. *Biologia i moralność*, trans. A. Pilorz. Warszawa: Pax, 1966.

Cournot, A. *Essai sur les fondements de nos connaissances*. Paris: Librairie Hachette, 1912.

Craig, W.L. "Creation and Mr Davis," *The British Journal for the Philosophy of Science* 37 (1986), pp. 163–175.

Dickson, D. "Britain Plans Broad Strategy on Genome Approves Therapy," *Nature* 361 (1993), pp. 387.

Ditfurth, H. von. *Nie tylko z tego świata jesteśmy. Nauki przyrodnicze, religia i przyszłość człowieka*, trans. A.D. Tauszyńska. Warszawa: PIW, 1985.

Dobzhansky, T. "Creative Evolution," *Diogenes* 58 (1967), pp. 62–74.

———. "Determinism and Indeterminism in Biological Evolution," in *Philosophical problems of biology*, ed. V.E. Smith. pp. 55–66. New York: St. John's University Press, 1966.

———. *Różnorodność i równość*, trans. A. Makarewicz. Warszawa: PIW, 1979.

———. *The Biological Basis of Human Freedom*. New York: Columbia University Press, 1956.

Dołęga, J.M. "Nauki środowiskowe na początku XXI wieku," *Pedagogia Christiana* 28, no. 2 (2011), pp. 21.

Dziewiecki, M. "Empatia i asertywność w komunikacji wychowawczej," *Horyzonty Wychowania* 9, no. 18 (2010), pp. 145–176.

Elliott, F. "The Creative Aspect of Evolution," *International Philosophical Quarterly* 6, no. 2 (1966), pp. 230–247.

Engels, F. *Dialektyka przyrody*, trans. W. Krajewski. Warszawa: PWN, 1979.

Evans, J.H. *Playing God? Human Genetic Engineering and the Rationalization of Public Bioethical Debate*. Chicago: University of Chicago Press, 2002.

Fikus, M. "Człowiek bez granic," *Wiedza i Życie* 6 (1993), p. 21.

———. *Inżynierowie żywych komórek*. Warszawa: Wiedza Powszechna, 1982.

Fisher, R.A. "Indeterminism and Natural Selection," *Philosophy of Science* 1 (1934), pp. 99–117.

Fox, S.W., and Nakashima, T. "Endogenously Determined Variants as Precursors of Substrates for Natural Selection," in *Individuality and Determinism*, ed. S.W. Fox, pp. 185–201. New York: Plenum Press, 1984.

Gajewski, W. *Genetyka ogólna i molekularna*. Warszawa: PWN, 1987.

Gawecki, B. *Zagadnienie przyczynowości w fizyce*. Warszawa: Pax, 1969.

Goodman, L.E., and Goodman, M.J. "Creation and Evolution: Another Round in an Ancient Struggle," *Zygon* 18, no. 1 (1983), pp. 3–43.

Guitton, J., Bogdanov, G., and Bogdanov, I. *Gott und die Wissenschaft*. München: Artemis Verlag, 1992.

Habgood, J. "Manipulating Mankind," *Nature* 365 (1993), pp. 304.

Haeckel, E. *Natürliche Schöpfungsgeschichte*. Berlin: Verlag von Georg Reimer, 1898.

Hałaczek, B. "Człowiek w kontekście sukcesów nauki. Eksplozja wiedzy, regresja samowiedzy," in *W kierunku chrześcijańskiej kultury*, ed. B. Bejze, p. 422. Warszawa: Wydawnictwo ATK, 1978.

———. "Człowiek w statycznym i dynamicznym poglądzie na świat," *Śląskie Studia Historyczno-Teologiczne* 7 (1974), pp. 197–206.

Haldane, J.B.S. *Heredity and Politics*. London: Allen and Unwin, 1938.

Heller, M. "Czy istnieje autentyczna filozofia przyrody?" *Studia Philosophiae Christianae* 23, no. 1 (1987), pp. 5–20.

Hempel, C.G. *Podstawy nauk przyrodniczych*, trans. B. Stanosz. Warszawa: Wydawnictwa Naukowo-Techniczne, 1968.

Ho, M.W. "The New Genetics and Natural versus Artificial Genetic Modification," *Entropy* 15 (2013), pp. 4748–4781.

Hollerbach, A. "Das christliche Naturrecht im Zusammenhang des allgemeinen Naturrechts-denkens," in *Naturrecht in Kritik*, ed. F. Boeckle and E.W. Boeckenfoerde, pp. 9–38. Mainz: Grünewald, 1973.

Hübner, P. *Nauka polska po II wojnie światowej – idee i instytucje*. Warszawa: Centralny Ośrodek Metodyczny Studiów Nauk Politycznych, 1987.

Hull, D. "Units of Evolution: A Metaphysical Essay," in *The Philosophy of Evolution*, ed. U.J. Jensen and R. Harré, pp. 23–67. Brighton: The Harvester Press, 1981.

Iłowiecki, M. "Przedmowa do wydania polskiego," in J. Testart, *Przejrzysta komórka*, trans. J.A. Żelechowska, pp. 5–20. Warszawa: PIW, 1990.

Ingarden, R. *Książeczka o człowieku*. Kraków: Wydawnictwo Literackie, 1972.

Jaroń, J. "Aktualny stan bioetyki w Polsce," *Mazowieckie Studia Humanistyczne* 2, no. 1 (1996), pp. 91–111.

Kant, I. *Krytyka praktycznego rozumu*, trans. J. Gałecki. Warszawa: PWN, 1972.

Kłósak, K. "Metafizyczna i fizyczna zasada przyczynowości wobec relacyj niedokładności W. Heisenberga," *Roczniki Filozoficzne* 1 (1948), pp. 200–211.

———. "Teoria kreacjonistycznych początków duszy ludzkiej a współczesny ewolucjonizm," *Analecta Cracoviensia* 1 (1969), pp. 32–56.

———. "Zagadnienie stworzenia wszechświata w ujęciu P. Teilharda de Chardin," *Studia Philosophiae Christianae* 1, no. 2 (1965), pp. 276–293.

———. *Z teorii i metodologii filozofii przyrody*. Poznań: Księgarnia Św. Wojciecha, 1980.

Kochański A., "Sekwencjonowanie genomu/eksomu człowieka – aspekt bioetyczny," *Studia Ecologiae et Bioeticae* 12, no. 1 (2014), pp. 29–38.

Krajewski, W. *Konieczność, przypadek, prawo statystyczne*. Warszawa: PWN, 1977.

———. *Prawa nauki. Przegląd zagadnień metodologicznych*. Warszawa: Książka i Wiedza, 1982.

———. *Związek przyczynowy*. Warszawa: PWN, 1971.

Kunicki-Goldfinger, W.J.H. *Podstawy biologii. Od bakterii do człowieka*. Warszawa: PWN, 1978.

———. "Przedmowa," in T. Ścibor-Rylska, *Tajemnice uorganizowania żywej komórki*, pp. 13–24. Warszawa: Pax, 1986.

———. "Redukcjonizm w biologii, czyli o drogach poznania życia," *Delta* 117, no. 9 (1983), p. 12.

———. *Szukanie możliwości. Ewolucja jako gra przypadków i ograniczeń*. Warszawa: PWN, 1989.

Latawiec, A. "Ausgewählte Schutzmechanismen der Natur als Argument für Rationalität in der Gentechnik. Selected Defensive Mechanisms in Nature as an Argument for Rationality in Bioetics," in *Rationalität in der Angewandten Ethik. Racionalita v Aplikovaných Etikách. Rationality in Applied Ethics*, ed. P. Fobel and G. Banse, A. Kiepas, G. Zecha, pp. 115–120. Banská Bystrica: Vydavateľstvo Kniháreň – Ján Bernát, 2004.

———. "Bioetyka, ekofilozofia i filozofia umysłu u progu trzeciego tysiąclecia. Rozważania w świetle najnowszych osiągnięć naukowo-technicznych," *Humanistyka i Przyrodoznawstwo* 5 (1999), pp. 105–116.

———. "Człowiek wobec cierpienia i śmierci?" in *Człowiek i pustka*, ed. Z. Hull and W. Tulibacki, pp. 218–225. Olsztyn: Olsztyńska Szkoła Wyższa, 2000.

———. "Filozoficzno-teologiczne implikacje klonowania embrionów ludzkich," in *Bioetyczne problemy inżynierii genetycznej. Materiały na III Krajową Konferencję z cyklu "Nauka na przełomie wieku", 5 czerwca 2000 roku*, ed. W. Dyk, pp. 39–51. Szczecin: Wydawnictwo Uniwersytetu Szczecińskiego, 2000.

———. "Implikacje filozoficzne inspirowane osiągnięciami inżynierii genetycznej," in *Bioetyka i ekofilozofia. Materiały z Konferencji zorganizowanej przez Katedrę Filozofii i Socjologii WSRP w Siedlcach (11 grudnia 1997)*, ed. J. Jaroń, pp. 159–170. Siedlce: Wydawnictwo WSRP, 1999.

———. "The Notion of Simulation – Some Philosophical Aspects," *Studia Philosophiae Christianae* 32, no. 2 (1996), pp. 165–176.

———. "Uwagi w sprawie wirtualności," *Studia Philosophiae Christianae* 40, no. 2 (2004), pp. 279–291.

———. *Pojęcie symulacji i jej użyteczność naukowa*. Warszawa: Wydawnictwo ATK, 1993.

Lemańska, A. "Absolute Truth and Mathematics," in *God, Truth, and Other Enigmas*, ed. M. Szatkowski, pp. 133–140. Berlin–Münich–Boston: Walter de Gruyter Verlag, 2015.

———. "Ewolucja jako realizacja projektu?" *Filozofia i Nauka. Studia filozoficzne i interdyscyplinarne* 3 (2015), pp. 353–358.

———. *Filozofia przyrody a nauki przyrodnicze*. Warszawa: Wydawnictwo ATK, 1998.

Łepko, Z. "Antropologia Konrada Lorenza," in *Z zagadnień filozofii przyrodoznawstwa i filozofii przyrody*, vol. 13, ed. M. Lubański and S.W. Ślaga, pp. 183–249. Warszawa: Wydawnictwo ATK, 1991.

Loewenberg, B. J. "Darwin and Darwin Studies 1959–63," *History of Science* 4 (1965), pp. 15–54.

Lorenz, K. *Odwrotna strona zwierciadła*, trans. K. Wolicki. Warszawa: PIW, 1977.

———. *Regres człowieczeństwa*, trans. A.D. Tauszyńska. Warszawa: PIW, 1986.

———. *Tak zwane zło*, trans. A.D. Tauszyńska. Warszawa: PIW, 1976.

Losee, J. *Philosophy of Science and Historical Enquiry*. Oxford: Oxford University Press, 1987.

M.F. "Skuteczność kliniczna L-interferonu," *Biotechnologia – PI* 12, no. 2 (1991), pp. 67–68.

Macilwail, C. "Genome Project 'to Be Done by 1994'," *Nature* 362 (1993), p. 488.

Maddox, J. "New Genetics Means No New Ethics," *Nature* 364 (1993), p. 97.

Matsubara, K. "On the Analysis of the Human Genome and the Human Genome Project," in *Human Genome Research and Society*, ed. N. Fujiki and D.R.J. Macer, pp. 16–17. Christchurch: Eubios Ethic Institute, 1992.

Matsunaga, E. "Panel Discussion on Social, Legal and Ethical Problems Associated with the Human Genome Project," in *Human Genome Research and Society*, ed. N. Fujiki and D.R.J. Macer, pp. 18–28. Christchurch: Eubios Ethics Institute, 1992.

Mayr, E. "Teleological and Teleonomic. A New Analysis," *Boston Studies in the Philosophy and History of Science* 14 (1974), pp. 91–117.

———. *Populacje, gatunki i ewolucja*, trans. W. Byczkowska-Szmyk. Warszawa: Wiedza Powszechna, 1974.

———. *The Growth of Biological Thought. Diversity, Heredity and Evolution* (Cambridge, MA: Harvard University Press, 1982).

Melsen, A.G.M. von. "Natur und Moral," in *Das Naturrecht im Disput*, ed. F. Boeckle, pp. 61–85. Düsseldorf: Patmos Verlag, 1966.

Mukherjee, S. *The Gene: An Intimate History*. New York: Scribner, 2016.

Müller-Hill, B. "The Shadow of Genetic Injustice," *Nature* 362 (1993), p. 491.

Murray, T.H. "Ethical Issues in Human Genome Research," *The FASEB Journal* 5 (1991), pp. 55–57.

Nagel, E. "Goal-directed Processes in Biology," *Journal of Philosophy* 5 (1977), pp. 261–279.

———. *Struktura nauki*, trans. H. Eilstein. Warszawa, PWN, 1961.

Numbers, R.L. "Creationism in 20th-Century America," *Science* 218, no. 4572 (1982), pp. 538–544.

O'Grady, R.T. "Evolutionary Theory and Teleology," *Journal of Theoretical Biology* 107, no. 4 (1984), pp. 563–578.

Patra, S., and Andrew, A. "Effects of Genetic Engineering – The Ethical and Social Implications," *Annals of Clinical and Laboratory Research* 3, no. 1 (2015), p. 5.

Polskie zjazdy filozoficzne, ed. R. Jadczak. Toruń: Wydawnictwo UMK, 1995.

Przeobrażenia systemowe w państwach Europy Środkowej i Wschodniej: stan aktualny i perspektywy, ed. Z. Trejnis and B. Jodełka. Siedlce: Wydawnictwo Akademii Podlaskiej, 2004.

Purton, A.C. "Biological Function," *The Philosophical Quarterly* 29, no. 114 (1979), pp. 10–24.

Rahner, K. "Die Hominisation als theologische Frage," in P. Overhage and K. Rahner, *Das Problem der Hominisation*, pp. 13–90. Freiburg: Herder Verlag, 1961.

Reiter, J. "Gentechnologie oder die Manipulation des Lebens," *Arzt und Christ* 30, no. 3 (1984), pp. 109–118.

Riedl, R. *Biologie der Erkenntnis*. Berlin–Hamburg: Verlag Paul Parey, 1981.

———. *Die Strategie der Genesis*. München–Zürich: Piper Verlag, 1984.

Roberts, J. "Global Project Under Way to Sample Genetic Diversity," *Nature* 361 (1993), p. 675.

Roberts, L.D. "Indeterminism, Chance and Responsibility," *Ratio* 13 (1971), pp. 195–199.

Rok, B. "Etyka czy biologia. Uwagi na marginesie inżynierii genetycznej," *Człowiek i Światopogląd*, no. 8 (1984), pp. 74–86.

Russel, S. *Biotechnologia*. Warszawa: PWN, 1990.

Rutowski, T. "Czy istnienie zła da się pogodzić z istnieniem dobrego i wszechmogącego Boga?" *Studia Płockie* 25 (1997), pp. 91–98.

Schockenhoff, E. "Der gläserne Mensch. Ethische Überlegungen zur Analyse des menschlichen Genoms," *Arzt und Christ* 38, no. 4 (1992), pp. 87–102.

Schoonenberg, P. *Boży świat w stwarzaniu*, trans. H. Bednarek. Warszawa: Pax, 1972.

Seifert, J. "Genetischer Code und Teleologie," *Arzt und Christ* 34, no. 4 (1988), pp. 185–200.

Seneka, L.A. *Myśli*, trans. S. Stabryła. Kraków: Wydawnictwo Literackie, 1989.

Sertillanges, P. *L'idée de création et ses retentissements en philosophie*. Paris: Aubier, 1945.

Shannon, T.A. *An Introduction to Bioethics*, second edition. New York: Paulist Press, 1987.

Silverman, W.A. *Human Experimentation: A Guided Step into the Unknown*. Oxford: Oxford University Press, 1986.

Simpson, G.G. *The Meaning of Evolution*. New York: Mentor Books, 1958.

———. *This View of Life: The World of an Evolutionist*. New York: Brace and Company, 1964.

Smith, K.R., Chan, S., and Harrins J. "Human Germline Genetic Modification: Scientific and Bioethical Perspectives," *Archives of Medical Research* 43, no. 7 (2012), pp. 491–513.

Stefaniak, B. "Polska obecność na liście filadelfijskiej," *Sprawy Nauki*, no. 3–4 (2000), pp. 18–19.

Synowiecki, A. "Wiedza w 'przestrzeni' przedmiotu," *Zeszyty Naukowe Politechniki Gdańskiej. Filozofia* 2 (1996), pp. 11–57.

Szarski, H. *Mechanizmy ewolucji*, third extended edition. Warszawa: PWN, 1986.

Sztejnbarg, N. "Analiza pojęcia przypadku (Przyczynek do słownika filozoficznego)," in *Księga pamiątkowa ku uczczeniu 15-lecia pracy nauczycielskiej w Uniwersytecie Warszawskim prof. Tadeusza Kotarbińskiego*, pp. 161–179. Warszawa: Nakładem Uczniów, 1934.

Ślaga, S.W. "Myśl katolicka wobec kreacjonizmu 'naukowego'," in *Opinia o filmie video 'Ewolucja: rzeczywistość czy domniemanie'*, ed. H. Łomnicki, pp. 54–68. Kraków: Universitas, 1994.

———. "Życie – ewolucja," in M. Heller, M. Lubański, and S.W. Ślaga, *Zagadnienia filozoficzne współczesnej nauki. Wstęp do filozofii przyrody*, pp. 285–410. Warszawa: Wydawnictwo ATK, 1980.

Ślipko, T. *Granice życia. Dylematy współczesnej bioetyki*, second edition. Kraków: Wydawnictwo WAM, 1994.

———. *Zarys etyki szczegółowej*, vol. 1. Kraków: Wydawnictwo Apostolstwa Modlitwy, 1981.

Świeżyński, A. "A Philosophical Critique of the Concept of Miracle as a 'Supernatural Event'," *Croatian Journal of Philosophy* 17, no. 49 (2017), pp. 57–72.

———. *Epistemology of Miracle. Scientific Inexplicability, Religious Sense and System Approach Towards the Epistemology of Miracle*. Warszawa: Wydawnictwo UKSW, 2012.

———. *Filozofia cudu. W poszukiwaniu adekwatnej koncepcji zdarzenia cudownego*. Warszawa: Wydawnictwo UKSW, 2012.

———. "Nowożytne przemiany idei samorództwa, " *Roczniki Filozoficzne* 57, no. 1 (2009), pp. 195–229.

———. *Ontology of Miracle. Supernaturality, God's Action and System Approach Towards the Ontology of Miracle*. Warszawa: Wydawnictwo UKSW, 2012.

———. "Philosophical and Scientific Meanders of the Idea of Spontaneous Generation," in *Philosophy of the Living Nature*, vol. 2, ed. W. Ługowski, pp. 68–97. Warszawa: IFiS PAN, 2017.

———. "Początek Wszechświata – kreacja czy ewolucja?" *Forum Teologiczne* 9 (2008), pp. 17–27.

———. “Śmierć innych. Eutanazja w kontekście przemian mentalności współczesnych społeczeństw,” *Collectanea Theologica* 70, no. 4 (2000), pp. 67–97.

———. “Śmierć, której pragniemy. Zasadnicze motywy działania samobójcy,” *Collectanea Theologica* 70, no. 3 (2000), pp. 109–137.

———. “Śmierć, której rzucamy wyzwanie. Wybrane problemy leczenia i opieki nad pacjentami terminalnie chorymi i umierającymi,” *Collectanea Theologica* 69, no. 4 (1999), pp. 71–95.

———. “‘Śmierć z wyboru’ – filozoficzny aspekt samobójstwa,” *Studia Philosophiae Christianae* 38, no. 1 (2002), pp. 82–98.

———. “Where/when/how Did Life Begin? A Philosophical Key for Systematizing Theories on the Origin of Life,” *International Journal of Astrobiology* 15, no. 4 (2016), pp. 291–299.

———. “Wybrane elementy modelu śmierci ‘zdziczałej’,” *Studia Philosophiae Christianae* 37, no. 1 (2001), pp. 157–174.

———. “Zracjonalizowany model umierania,” in *Problemy współczesnej tanatologii*, vol. 5, ed. J. Kolbuszewski, pp. 107–112. Wrocław: Wrocławskie Towarzystwo Naukowe, 2001.

Teilhard de Chardin, P. “Comment se pose aujourd’hui la Question du Transformisme,” in *Œuvres de Pierre Teilhard de Chardin*, vol. 3: *La vision du passé*. Paris: Éditions du Seuil, 1957.

———. “Que faut-il penser du transformisme?” *Dossiers de la Commission synodale* 2 (1929) 6–7, s. 462–469.

———. *The Vision of the Past*. New York: Harper and Row, 1967.

Tennant, N. “In Defence of Evolutionary Epistemology,” *Theoria* 49, no. 1 (1983), pp. 32–48.

Thomae Aquinatis, *Summa Theologica*. Taurini: P. Marietti, 1922.

Unterhuber, R. “Gene Therapy Gathers Speed in Germany,” *Nature* 365 (1993), p. 197.

Wilson, E.O. *The Diversity of Life*. New York–London: W.W. Norton Company, 1993.

Wojciechowski, T. “Przypadek i ce1owość w ewolucji biologicznej,” in *Z zagadnień przyrodoznawstwa i filozofii przyrody*, vol. 1, ed. K. Kłósak, pp. 321–351. Warszawa: Wydawnictwo ATK, 1976.

———. “Teoria ewolucji i wiara,” *Śląskie Studia Historyczno-Teologiczne* 12 (1979), pp. 99–117.

Wuketits, F.M. “Evolution as a Cognition Process: Towards and Evolutionary Epistemology,” *Biology and Philosophy* 1, no. 2 (1986), pp. 191–206.

———. *Grundriß der Evolutionstheorie*. Darmstadt: Wissenschaftliche Buchgesellschaft, 1982.