

Chapter 2

The Life and Education of Jakob von Uexküll

Abstract The chapter presents the main events of Jakob von Uexküll's life (1864–1944): the childhood in the estate of Keblaste, the school years in Coburg, the university years in Tartu, the study and research trips to Italy and France, the economic and professional difficulties due to World War II and the Russian Revolution, the creation of the *Institut für Umweltforschung* in Heidelberg, the frictions with the Nazi Regime, the decision to move (for health reasons) to Italy, where Uexküll died in 1944. Along with the biographical events, the chapter introduces some reference points that will be important to understand the Uexküllian concept of Umwelt: the Kantian transcendental approach, the influence of vitalism, the relations with the emerging discipline of ethology.

Keywords Uexküll's biography • Estonia • Germany • *Institut für Umweltforschung* • Frictions with Nazi Regime • Biology • Vitalism • Ethology

2.1 The First Studies in Philosophy and Science

The biologist Jakob von Uexküll belonged to a family of the ancient German Baltic nobility.¹ The origins of his family go back to the first arrivals of German knights in the Baltic lands. His name derives from the Estonian term “uex”, one, and “külla”,

¹The main sources of information on the life of Jakob von Uexküll are the biography published in 1964 by his wife, Gudrun von Schwerin-Uexküll (von Uexküll 1964), and the work by Florian (Mildenberger 2007). While Gudrun von Uexküll's biography is very precise both about his institutional scientific career, and about Uexküll's personal and social life, Mildenberger's work, more accurate and scientific, is a detailed reconstruction of the theoretical and historical institutional context in which Uexküll worked. For a good summary in English on the other hand, see Rütting 2004; the article refers to both the sources mentioned. As regards an overall assessment of the theoretical aspects of Uexküll's work, introductory monographs are not available so far, except for special issues dedicated to Uexküll of the magazines “Semiotica” and “Sign Systems Studies” (whose interpretation is, however, specifically semiotic, with the risk of neglecting other aspects of the Uexküllian work), cf. “Semiotica” 134 (2001), “Sign Systems Studies” XXXII, 1/2 (2004).

village, and therefore means “a village”. Uexküll’s ancestors were granted the title of baron as a reward for their loyalty as vassals, and from then on the history of the family – which the oldest records describe as violent, quarrelsome and always ready to rise above the law – is inseparably linked with that of Estonia.

One of Jakob’s ancestors, Berend Johann von Uexküll, is remembered for having issued, the year of the French Revolution, a private “law” which granted freedom to the peasants who tended his lands and for being in favour of the liberation of all Estonian farmers (who were subjected to serfdom like throughout the Tsarist empire). In 1811, on the initiative of the Baltic nobility, the Russian government passed a law which freed Estonian farmer. Fifty years later, the “Liberating Tsar” Alexander II extended this measure to the whole kingdom. Few years after these reforms, Jakob’s grandfather, Bernhard Otto, was critical of the nobility’s policy towards peasants and tried to accelerate the ongoing modernization process (Mildenberger 2007: 16). Bearing this in mind, Jakob always felt inwardly bound to continue this liberal tradition. Far from thinking himself in some way superior to others because he belonged to a noble family with a century-old history, he was always convinced that the value of an individual derives solely from his actions. Along with other reasons, it was this conviction that brought him, as we will see, to oppose Nazism’s ideological use of the concepts of “blood” and “race”.

Jakob von Uexküll was born on September 8th 1864 on the family’s small estate at Keblaste, now Mikhli. He was the third of four children, two older brothers and a younger sister. His father, Alexander, was a territorial administrator for the Russian government and nourished a strong passion for natural sciences, especially geology. His mother, Sophie von Hahn, has been described as an intelligent and sociable woman with a great sense of humour. The estate of Keblaste, situated in a still intact rural environment, offered Jakob a wide variety of experiences in nature. From a very early age he spent many hours intent on observing beetles, caterpillars and frogs. As the children grew older, the family began to spend most of the year in the baronial house of Reval (now Tallinn), where the boys were able to attend the Episcopal school.

In spring 1875, his older brother Alexander fell seriously ill, so the family moved to Coburg in Germany, where Alexander could receive better medical care. The time in Coburg, during which Jakob attended the local *Gymnasium*, lasted about 3 years. After returning to Estonia, Jakob completed high school and in 1884 he enrolled at the Faculty of Natural Sciences at the University of Dorpat, now Tartu, and chose zoology as his main discipline. His years at university were decisive for his intellectual development. During *Gymnasium* Jakob had already read Kant’s *Critique of Pure Reason*, from which he drew strong intellectual stimulation. Under the influence of Kant, at this stage nature appeared to him in the first place as a set of phenomena rigidly determined by antecedent causes, and from which is therefore absent any teleology. According to Mildenberger, this mechanistic interpretation of Kant – which ignores the *Critique of the Power of Judgment* and the ideas that it will offer to the Romantics’ philosophies of nature – is due to the influence of

biologists such as Mayer² and Helmholtz,³ who from 1842 turned to Kant to oppose the prevailing vitalistic theories. But a similar interpretation of Kantianism is also found in a scientist like Gustav Magnus.⁴

Thus, in his early university years, Uexküll's worldview is that of a "convinced determinist and materialist" (von Uexküll 1964: 24), but even before that, at a lecture in preparation for his confirmation, he is said to have expressed the opinion that "every action takes place according to a law of nature" and that "the statement 'I am the author of my actions' is a self-complacent nonsense" (von Uexküll 1964: 24).

The study of Kant also led Jakob to define, extremely early, what his main interest as a biologist would be: understanding the cognitive modalities that shape animal species' perceived environment. In other words, Jakob's interest for species-specific "subjective worlds" may be born as an in-depth study of the Kantian thesis according to which the experience of living beings is determined by *a priori* categories. He realized that the transcendental analysis that Kant directed to the minds of human beings could be extended to other animal species too. This way, the study of the transcendental structures of the mind left the field of pure logic to enter that of natural sciences (i.e. what we would call cognitive sciences today). In Uexküll, the exploration of pure reason becomes the pursuit of ways to access the cognitive worlds of nonhuman animals. Transcendental philosophy thus emerged as a new scientific discipline, both empirical and theoretical, which Uexküll called *Umweltlehre* (theory of the environment).

If it is expected for his theoretical interests to become dominant in Uexküll's work, they coexist with a very strong inclination towards direct observation as well as anatomical and physiological study of animals. Already during his first year of university he set off for the Dalmatian island of Lesina (now Hvar) with Alexander Braun – his zoology teacher, who held a vitalist position. There he had the occasion to study marine fauna directly, which remained the main destination of his empirical research.

²Robert Mayer (1814–1878) was a German physician and physicist who studied the phenomena of the body's metabolism focusing on the assumption of conservation of energy within physiological processes. From the point of view of theoretical biology, he pursued the aim of replacing the vitalist notions of the time (in particular the so-called "vital force" of plants) with empirically demonstrable and quantitatively measurable forces.

³Hermann von Helmholtz (1821–1894) was a German doctor, physicist and physiologist, he was the pupil of Johannes Müller (cf. *below*, 24, n. 6) and Gustav Magnus (cf. *below*, n. 4). He played a role in the turning point of the 1840s, when physiology was separated from metaphysics and put into the category of natural science aimed at achieving empirically demonstrable and mathematically quantifiable results. After some work of a purely physiological, he volunteered an application of the physics of forces to the body metabolism, in particular to the muscle system.

⁴Gustav Magnus (1802–1870). German physicist and chemist, he was among the founders of the *Berliner Physikalische Gesellschaft*. Characterized by a purely empirical position, he rejected any form of idealist philosophy of nature. His studies include the physics of gas and heat transmission.

In the 4 years he attended the University of Dorpat, Uexküll came into contact with the second of the theories – this time in opposition – which would determine his vision of the world: the Darwinian theory of evolution by natural selection. As far as the reception of Darwinism is concerned, the cultural environment of Dorpat was mainly affected by the influence of the vitalist biologist von Baer,⁵ who was very well known in Germany and in the rest of Europe. In addition to his studies on the reproductive systems of mammals and marine animals, von Baer was known for his fierce anti-Darwinism. According to von Baer, the weakness of the Darwinian theory of evolution consists in its being focused solely on antecedent mechanical causes and on random variations, and that it actually ignores the teleological character of every organic process (ultimately due to a superordinate and external factor to nature itself). Against Darwin von Baer raises Johannes Müller's theses,⁶ perhaps the last vitalist to have left his mark on German medicine. Müller's work is also very important for Uexküll to shape his biological and environmental conception. On the one hand it represents a connection with Schelling and Hegel's romantic philosophies of nature (Cimino 1997: 14; Lohff 1997: 141); on the other hand, however, it underlines the importance of experiment even for the vitalist scientist.⁷

The prestige and influence of von Baer, which was not only considerable within the academic world but also among the Baltic Germans in general, meant that (at least until his death) the University of Dorpat remained a stronghold of anti-Darwinism and vitalist biology. This outcome was also due to the great power of the Evangelical Theological Faculty of Dorpat, which systematically opposed teaching evolutionist theses. A significant example is the case of Schleiden⁸: in 1864, he

⁵Karl Ernst von Baer (1792–1876) was an Estonian biologist and anthropologist, professionally active in Germany and Russia. He studied medicine at Dorpat, Berlin and Vienna. In the early years of his career as a researcher (Königsberg 1819–1834), Baer focused mainly on embryology, succeeding in isolating the egg in the ovaries of female mammals in 1826. From the point of view of biological theory, the importance of Baer lies on the one hand in the fact that he proposed a unified theory of animal procreation (the egg as original cell in all animal species), and on the other hand that he peremptorily underlined the epigenetic character of embryonic formation: it proceeds from the homogeneous to the heterogeneous, and it is not sustainable that the parts of the animal are already preformed in the egg (von Baer 1827).

⁶Johannes Müller (1801–1858) was a German physiologist and zoologist, from 1830 he taught anatomy and physiology at the University of Berlin. In addition to scientific knowledge and a great inclination for empirical research, Müller has a solid philosophical background (he was a student of the theologian Christian Brandes, who introduced him to Aristotelian philosophy). In the course of his work he devised a philosophy of nature that combines elements of Goethe's colour theory with romantic idealistic notions. Besides Helmholtz (*cf. above*, 23, n. 3), Ernst Haeckel (*cf. below*, 51, n. 6) also appeared among his pupils.

⁷In the family library, Uexküll also had access to the transcript of the lecture on nature held by Hegel in Berlin in 1821–1822, which was written by his grandfather, Berend-Johann von Uexküll (1793–1870), known as Boris von Uexküll (Mildenberger 2007: 38; Hegel 2002).

⁸Matthias Schleiden (1804–1882) was a biologist, botanist and anthropologist. Along with Theodor Schwann (1810–1882), he was the founder of the modern cell theory, which he developed from the

had to leave the Chair of Plant Physiology and Anthropology because of pressures from the members of the Evangelical Theological Faculty. A strong supporter of an inductive and materialistic biology, Schleiden made it no secret that he considered the vitalist concepts (such as life force) as an obstacle to the progress of biology based on an empirical approach (Mildenberger 2007: 30).

During Uexküll's years there, the situation within the Faculty of Natural Sciences of Dorpat improved slightly for the supporters of Darwinism and materialism, as the appointment of a scholar like Kraepelin⁹ demonstrated. Among the courses in Uexküll's syllabus was also included the one on the theory of evolution held by Professor Julius von Kennel (1854–1939), a staunch Darwinist. Uexküll described the encounter with Kennel as follows:

While until that moment I had been dealing with the analysis of solid facts, Kennel's influence made me consider theory for the first time. Kennel was a professed Darwinist and a supporter of the theory of descent. Initially I was very impressed by the network of relationships that Darwin had established between animal configurations. The simple concepts of modification and survival of the adapted seemed to provide a plausible explanation of the origin of species. [...] But Kennel himself completely ruined that impression when he assured he was able to prove the relationship between two given species taken randomly out of all the existing ones. I thought to myself quite rightly: "These are only games, not science" (von Uexküll 1964: 35–36, 38).

The initial enthusiasm with which Uexküll accepted Darwin's theory, consistent with the materialism and determinism he professed, quickly changed into a definitive and radical rejection of the very idea of natural selection.¹⁰ This rejection – which brought Uexküll to formulate alternative theories in the following years, which could explain the differences and similarities between biological species without the use of Darwinian theoretical tools – in the short term directed his choice to engage in empirical research rather than in the formulation of general theories.

work of the English botanist Robert Brown (1773–1858). Schleiden devoted the last part of his activity to anthropological and historical-cultural research.

⁹Emil Kraepelin (1856–1926) was a German physician and psychiatrist. In 1882 he was working in Wilhelm Wundt's (1832–1920) laboratory of experimental psychology. His studies mainly focus on *dementia praecox* and manic-depressive psychoses, and his approach is empirical with somatic-materialist tendencies (which often results in a lot of attention to the pharmacological aspects of the studied diseases).

¹⁰The research conducted by Mildenberger on the copy of *The Descent of Man* owned and read by Uexküll also highlighted that the latter tended to reduce the well-structured Darwinian theses to the sole struggle for existence, and that he was not interested in other parts of the theory of evolution (such as sexual selection). Greater interest can be found regarding topics such as perception and social behaviour of animals though (Mildenberger 2007: 37–38). In the following years, in particular in the article *Darwin und die englische Moral*, to the criticism regarding the biological field Uexküll added the heavy accusation that British imperialism could find in Darwinism, and particularly in the supremacy of the strong, a sort of ethical and political justification (von Uexküll 1917: 229).

2.2 Research Trips and Contributions to Physiology

The new direction his research took is also due to Uexküll's decision to abandon his zoology studies in order to devote himself to physiology, in which he graduated in 1890 with a thesis on the parietal organ in the frog. Incubated in Dorpat, this decision was reached in the following years: first in 1888, then in the years 1901–1902 Uexküll worked in Heidelberg as an assistant to the physiologist Wilhelm Kühne¹¹ at the *Physiologischer Institut* of the local university. His field of investigation concerned neuro-muscular physiology. In this period Uexküll's research practice attempted to reconcile mechanistic hypotheses with vitalist theoretical thesis, following that synthetic approach that would characterize all his later works (Mildenberger 2007: 53–54).

During his long collaboration with the University of Heidelberg, Uexküll regularly went to the Zoological Station in Naples, a scientific institution founded in 1873 by Anton Dohrn¹² and financially supported by the German government and the city of Naples. The Zoological Station, which welcomed marine biologists from all theoretical backgrounds, was one of the most important meeting points for the different lines of research that Europe could boast in those years. Its openness also made it possible for scholars who found themselves in strong theoretical opposition to meet. Amongst the most significant of these meetings, we should mention the one which took place between 1880 and 1890 and involved the famous biologist Driesch¹³ (who explicitly defined himself as “neovitalist” from 1898) and the mechanist Loeb,¹⁴ founder of the theory of tropisms.

¹¹Wilhelm Kühne (1837–1900) was a German chemist and physiologist; he was a pupil of Helmholtz and mainly dealt with muscle physiology. But his studies in cytology also led him to take a stand in the debate on cell structure and on the function of cell protoplasm, two topics that were of great interest to Uexküll (see *below*, 65).

¹²Anton Dohrn (1840–1909) was a German zoologist who adhered to Darwinism through the influence of Haeckel (they were very close friends in their youth) and devoted himself to the reconstruction of the evolutionary history of animals, particularly marine life. For this purpose, he founded a research station on marine biology in Naples in 1870, the Zoological Station, which soon became a meeting point for physiologists and biologists of international importance. Over the years, Dohrn became increasingly involved in the organization and financing of the Zoological Station, and dedicated himself to empirical research to a lesser extent.

¹³Hans Driesch (1867–1941) was a German biologist and philosopher. In his youth he studied with Haeckel and adhered to his mechanistic and Darwinian view of phylogeny and of evolution. The works of Wilhelm Roux (*cf. below*, 30, n. 23) on frog eggs led him to seek an answer to one of the empirical questions that, at the time, divided biologists into two opposing sides (mechanists and vitalists) that of the nature of the process of embryonic formation. Between 1891 and 1900, at the Zoological Stations of Trieste and Naples, Driesch repeated Roux's experiments on a sea urchin egg (for details *cf. below*, 53). Unlike Roux, the results of his experiments led him to stand firmly in favour of a vitalist theory which would focus on the effective action of an extramaterial organizing principle (the *entelechy*) on the embryo and in general on the organic matter.

¹⁴Jacques Loeb (1859–1924) was a Jewish German biologist and physiologist, considered one of the leading exponents of mechanism in the late nineteenth century. Strongly influenced by

Uexküll arrived in Naples in April 1891 to pursue his studies on marine fauna; his intent was to extend to marine fauna (especially octopus and sea urchins) the methods of investigation developed by Kühne for frogs. At the Zoological Station Uexküll had the occasion to become acquainted with Driesch and to gain a thorough understanding of the experiments the latter used to demonstrate the inadequacy of the mechanistic theses mainly in embryology. It was at that time that Uexküll began to form the idea of total finality that characterizes living organisms. This “correspondence with a plan” (as the German word *Planmäßigkeit* could be literally translated) is particularly visible in the motor system of the sea urchin.

As Uexküll’s friend and pupil Otto Cohnheim¹⁵ recalled,

his experiments [on sea urchins] impressed us very much, but above all we were struck by the first appearance of what Uexküll called “construction plan” [*Bauplan*] and explained as follows: “When a dog runs, it moves its legs – when a sea urchin runs, it is moved by its legs. The sea urchin is a republic of reflexes [*eine Reflex-Republik*], where the central nervous system is replaced by the construction plan” (von Uexküll 1964: 41)

At the same time, however, as Mildenerberger commented, in his work as a physiologist, Uexküll was still “completely taken by the possibilities of mechanistic thinking” (Mildenerberger 2007: 57), so much so that he saw the nerve connections of the animals he examined as “automatic machines” (von Uexküll 1894: 593) connected by a comprehensive system of reflexes. This coexistence of a mechanistically oriented research practice and a teleological-vitalist philosophy of life was a characteristic of the Uexküllian approach.

In 1899, the biologist went to Paris to study in the laboratory of the physiologist Etienne Marey,¹⁶ famous for being among the first scientists to apply cinematographic techniques to the study of animals’ body movements (the *chronophotographic* method, as it was then called). Uexküll learned the new technique, successfully used it on the movements of fish and butterflies and then introduced it to the Naples Zoological Station (Rüting 2004: 39). At the same time, together

Schopenhauer’s philosophy, Loeb tried to investigate the existence of will in living organisms from an empirical point of view. His field of study looked into tropisms, i.e. fixed motor reactions in response to certain stimuli. Extending the research of Julius von Sachs, who had demonstrated the existence of tropisms in the vegetal world, Loeb wanted to show that physiology and animal behaviour can also be interpreted in terms of fixed reactions to given stimuli. Loeb was at the Naples Zoological Station between 1889 and 1890.

¹⁵Otto Cohnheim (1873–1953) was a German chemist and physiologist who was famous for his research on enzymes, respiration and the effects of ultraviolet rays. In 1913 he became the director of the Physiology Institute of the Eppendorf Hospital in Hamburg. In 1917 he changed his name to Kestner to conceal his Jewish origins. Cohnheim met Uexküll in Naples in 1893, and then he did not hesitate to appeal to his academic contacts to help Uexküll. Their friendship continued until the death of Uexküll.

¹⁶Etienne Jules Marey (1830–1904) was a French physiologist who became famous for the invention of graphic and cinematographic recording techniques of physiological or motor processes. From a theoretical point of view, Marey supported a form of reductionist mechanism, based on the assumption that the processes taking place in living beings should be reduced to physical and chemical laws (Marey 1873).

with his colleagues Behte¹⁷ and Beer,¹⁸ Uexküll wrote an article in which they criticized the anthropomorphic terminology used in physiology at the time and they suggested replacing it with an “objectifying terminology” (Uexküll et al. 1899: 517). The article, which became quite well-known and was positively received by the behaviourists in the U.S. and by Pavlov¹⁹ in Russia, suggested for example to replace the term “sight” and “smell” respectively with “photoreception” and “stiboreception” (Harrington 1996: 42; Rüting 2004: 40).

In 1900, following Kühne’s death, Uexküll’s situation at the *Physiologischer Institut* in Heidelberg became uncertain. Indeed, Kühne’s successor at the head of the institute, Albrecht Kossel,²⁰ was not interested in his research. In 1902, Uexküll was denied the access to the laboratory in Heidelberg, and in 1903 (because Dohrn turned down his request for research funds at the Zoological Station) also to the one in Naples. In the following years Uexküll was able to carry out field research only by financing his stays at various seaside resorts himself (e.g. Beaulieu, Roscoff, Berck-sur-Mer and Biarritz). The difficulty of such studies, their unsystematic nature and possibly a change in his own approach to research pushed Uexküll more and more towards theoretical reflection. The first result of this change was his essay dated 1902 *Im Kampfe um die Tierseele [In Battle over Animal Psyche]*, where Uexküll attempted a first application of Kant’s philosophy to biology (von Uexküll 1902: 24).

In 1902, in Naples, Uexküll met the 24 year-old German aristocrat, Gudrun von Schwerin, who became his wife. Ever since the beginning the couple shared the same interests, as for the rest of their lives. Gudrun, open-minded and full of scientific interests, took part in her husband’s research and writing work; and when Uexküll lost his entire estate, and with it the opportunity to conduct independent scientific research, his wife helped him not only financially, but also by encouraging him to write.

At the beginning of the twentieth century, Uexküll saw his chances of getting a stable job at a research station were thin: neither the *Physiologischer Institut* or the Zoological Station of Naples, nor even the one in Rovinj (near Trieste) accepted to

¹⁷Albrecht Bethe (1872–1954) was a German physiologist who operated in Cologne and Frankfurt; he met Uexküll in 1897 at the Naples Zoological Station.

¹⁸Theodor Beer (1866–1919) was a German Jew (he converted to Christianity in his youth) and a physiologist. From 1895 Beer was one of the most regular visitors of the Zoological Station in Naples. In addition to having written the mentioned article with him, Beer evoked Uexküll’s research in sensory physiology in Beer 1896: 870.

¹⁹Ivan Petrovich Pavlov (1849–1936) was a Russian physiologist and psychologist. Initially dedicated to the study of circulatory and digestive systems, he then moved on to neurology and behavioural science from the early years of the twentieth century. In this field, his name is inseparably linked to the reflex theory he elaborated, which is based on the distinction between conditioned and unconditioned reflexes and aspires to be globally recognised as the explanation of physiology and human and animal behaviour.

²⁰Albert Kossel (1853–1927) was a German physiologist and chemist who was awarded the Nobel Prize in 1910 for his studies on the cell nucleus.

collaborate with him. This mainly depended on the fact that Uexküll was known as a theorist of biology with a vitalist and anti-Darwinian credo, as well as a staunch supporter of the applicability of the Kantian transcendental philosophy in biology; his approach to empirical research seemed to be compromised by an excess of philosophical theses. However, reality is probably more complex. Towards 1903, Uexküll began to realize that the climate of intolerance that characterized the biological debate in Germany made it impossible to follow what Mildenerger calls a “middle way” (Mildenerger 2007: 71) between vitalism (or rather – neovitalism) and mechanism, which is Uexküll’s typical research pathway as we have already seen. He was so openly on the side of the neovitalists, attracting the enmity of many scientists – including Goldschmidt²¹ – that he was described as somewhat of an “eccentric mystic figure” (Goldschmidt 1956: 66; Mildenerger 2007: 70, 141–142).

Although the possibility of doing research was slim, the Uexküll couple settled all the same in Heidelberg in 1905, the city where Jakob had many friends and admirers. In 1907, the University of Heidelberg awarded him an honorary doctorate of medicine. The conferment of the title, which may seem contradictory in the face of the refusals mentioned above, occurred in a very significant context, especially for understanding the peculiar esteem Uexküll was held in. As a matter of fact, the scientific motivations awarding the doctorate were the following: “For his accurate and brilliant experiments on nerve and muscle stimulation” (von Uexküll 1964: 90).²² As Uexküll himself would discover later, this wording was purposefully chosen in order to avoid every suspicion that it was the biologist’s theoretical and philosophical conceptions that were evaluated positively by the academic world.

The honorific recognition from the University of Heidelberg was followed by many others: the universities of Kiel and Utrecht awarded him an honorary doctorate and he was made a member of the Academy of Sciences in Halle. Despite these successes, Uexküll’s dream of creating his own research institute seemed to be unattainable. In the years immediately before the First World War, the biologist also appealed to the *Kaiser-Wilhelm-Gesellschaft*, which did not support his project, but still granted funds for him to carry out his research in a private capacity (10,000 marks for three consecutive years). In his letter of thanks for the funds assigned to him, Uexküll expressed his regret caused by the society’s rejection of his bigger project (for which the biologist estimated he needed at least 200,000 marks) and reminded them of his theoretical positions:

If we do not want to extend the concept of biology boundlessly, but to intend it as the study of the characteristics of animals, in order to draw a clear dividing line with the science of inanimate matter, it is necessary to start from the characteristic of correspondence to a plan,

²¹Richard Goldschmidt (1878–1958) was a Jewish German Zoologist and geneticist who was active until 1936 at the Kaiser Wilhelm *Institut für Biologie* in Berlin-Dahlem, then at Berkeley University in California (due to his expatriation for racial reasons). He was best known for his studies on the emergence and transmission of mutations in the genetic makeup of organisms.

²²In particular, Uexküll’s fame in the neuromotor field was due to the discovery of the so-called *Uexküll’s law*, according to which neural excitation goes through a relaxed muscle more easily than through a contracted one. The law proved useful in orthopedics (Rüting 2004: 40; Kull 2001: 5).

which alone distinguishes the living from the inanimate. Biology thus coincides with the doctrine of the forms of conformity to a plan [*Planmäßigkeiten*] in nature [and] is divided into two main parts: in the theory of the formation of the correspondence to the plan, which its founder, Prof. Roux,²³ called “mechanics of development”, and in the special biology that deals with experimentally investigating the correspondence to a plan of adult animals. I can give myself some credit in special experimental biology. [...] Whether it wants it or not, zoology must admit the existence of the living nature of the correspondence to a plan – it rejects it though in principle as a scientific problem, and under the influence of Darwinism, it tries to put in its place the obedience to mechanical laws. [...] As things stand today, biology in Germany is sentenced to death and will always be an American science (reported in von Uexküll 1964: 96).

The letter only got a formal reply. With the funds raised, between 1911 and 1914, Uexküll embarked on study trips in Beaulieu, Rapallo and Biarritz. The biologist was accompanied by an assistant (Dr. Felix Gross, a young Viennese scholar) and sometimes by his family, which greatly expanded in the meantime. Between 1904 and 1909 the Uexküls had three children: Damajanty, the eldest daughter, the second son Thure²⁴ and Gustav-Adolf, their third son.

2.3 Arising of Political and Philosophical Interests and the Transition to Theoretical Biology

The outbreak of war surprised the family in Schwerinburg in Mecklenburg, on his wife’s property. As a Baltic German, German culture and loyalty to the Russian monarchy were inseparably intertwined in Uexküll’s family history; not to mention the fact that he had a Russian passport. Therefore, he risked being confused with the enemy. The German authorities, however, took into account his ethnic origin and his wife’s status, and allowed the family to stay on. Besides, from a political point of view, the Baron was openly sided with Germany and condemned as unnatural and

²³Wilhelm Roux (1850–1924) was an embryologist, anatomist and physiologist who was best known for having applied to intraorganic phenomena (intracellular in particular) the Darwinian concept of struggle for existence. As a theorist, Roux refused an exclusively mechanical interpretation of organic processes and gave significant weight to the holistic concept of autoregulation of the organism taken as a whole. But this did not lead him to accept neovitalist positions. In embryology he supported the thesis of the so-called mosaic embryo, i.e. of the contemporaneous presence of a number of locally situated factors (“determinants”) (Roux 1881; Cheung 2004: 143–149).

²⁴Carl Kuno Thure von Uexküll (1908–2004) was a doctor and psychotherapist and one of the leading figures in psychosomatic and integrated medicine in Germany in the twentieth century. Thure von Uexküll succeeded in introducing many elements from his father’s *Umweltlehre* into the theory and practice of medicine, such as the holistic approach and the importance of the subject (against the objectivism of medicine). Thure studied medicine with Gustav von Bergmann (1878–1955), who had already grasped the potential of the Uexküllian theses in their understanding of the psychosomatic interactions and diseases. Of great importance are his efforts to spread the thought of his father, wherein he accentuates the semiotic aspects (*cf. below*, 225). For an introduction to the life and work of Thure von Uexküll *cf.* Otte 2001.

immoral the American alliance with Russia (of which he condemned the medieval institutions and ways, in particular as far as the Jews were concerned²⁵).

Not having the chance to perform his experiments, Uexküll dedicated himself during the war years to expanding his theoretical concepts in new directions, launching a line of study that led him to publish a large number of writings on politics, morality and spirituality. This does not mean, however, that Uexküll lost touch with his main interests. For instance, when he began to deal with “vital functions” of the state, he did so by applying concepts and categories taken from his own theoretical biology to the dynamics of collective institutions. This was what happened in 1915 with the essay *Volk und Staat* [*People and state*], in which the state is seen as a natural creation of the vital power of the people, and therefore as an entity which is subjected to the latter (von Uexküll 1915: 53–66). The national character which appeared to him as the most compatible with a harmonic and organic state was the German one, which the biologist (at least in the pre-modern phase) described in idealistic tones as the bearer of a deep sense of unity and responsibility.²⁶

Consistent with this vision, the original element, the “cell” of the state, is not the individual but the family. When family falls apart, the people and the state collapse too; and from this process emerges the typically modern phenomenon of mass. In mass society, both socially and politically, the organic value and the purposefulness that family and people had in common with the rest of nature are missing; and this is reflected firstly on the efficiency and resilience of democracy. “[To rule the state] it seemed to him” – his wife reminisced about that time – “that the methods of men lacked structure and planning” (von Uexküll 1964: 104).

In 1917, the Russian revolution, whose effects also affected the Baltic regions, took the baron’s estates in Estonia from him (they were expropriated because of their being noble properties). Moreover, the economic crisis that accompanied the first months of the revolution made Russian State bonds, of which most of his financial assets consisted, worthless. By every possible means at his disposal Uexküll did his best to persuade the German government of the *Reich* to see to the fate of the Baltic Germans, but by the end of 1917, he had to face the facts: the separate peace of the

²⁵“In Russia, thousands of Jews were tortured and burned. This is very well-known in America, and yet they carry on with their dealings by providing weapons to Russia” (reported in von Uexküll 1964: 101).

²⁶The friendship and correspondence with Houston Stewart Chamberlain (1855–1927) dates back to that time. Houston Stewart Chamberlain was an English philosopher and writer who became famous for his researches on races; his works, especially *Arische Weltanschauung* and *The Foundations of the Nineteen Century*, were to be used by the Nazis to support their ideology and their racial policies (Chamberlain 1905, 1911). From the point of view of their theoretical connections, Chamberlain and Uexküll were both convinced of the superiority of German culture. Chamberlain was also inspired by Uexküll for his thesis of the centrality of the subject in natural processes (Rütting 2004: 41–42; Mildenerger 2007: 95; Chamberlain 1919: 137). The fact that Uexküll wrote the foreword to the book of Chamberlain *Natur und Leben* has often been taken as evidence of Uexküll’s assumed involvement with the Nazi regime (Chamberlain 1928). On this subject cf. below, 38.

Central Powers with Soviet Russia not only pronounced the irremediable loss of his assets, but also implied the disappearance of the country Uexküll had known in his youth, in which Russians, Estonians and Germans cohabitated relatively peacefully.

From this moment onwards the Uexküll family, which had moved back to Heidelberg in the summer of 1917, lived merely off the wife's wealth, much less than the income from their lost property. This severely restricted Uexküll's possibility to conduct independent experimental research, and was perhaps one of the reasons that led him to devote himself more and more to theoretical works. At that time, the poet Rainer Maria Rilke, a friend of the Uexkülls since 1904, asked the biologist for biology lessons. As Rüting pointed out, "Rilke wanted to find relief from his depression in the science of organic life and its harmony" (Rüting 2004: 43).

Also in 1917, the biologist wrote *Biologische Briefe an eine Dame* [Biological letters to a lady], a work dedicated to his wife (von Uexküll 1919). *Biologische Briefe an eine Dame* is the outcome of a series of general-public lectures Uexküll held in the same year. During this event, in a gradual and unplanned way, his wife played a particular part: at the end of the conference, she would ask Jakob very naïve questions, to which she knew the answer perfectly well, with the sole purpose of inducing him to use a terminology that would be less specialized and more accessible to the public. The book covers key topics and concepts in the biologist's reflection, such as *Bauplan*, instinct and experience.

Due to economic difficulties and supply problems caused by the war, the family moved to Londorf an der Lumda (near Gießen) in January 1918, to the wife's younger brother. There Uexküll began to understand the full extent of the historical upheavals triggered by the end of the war and by the Russian Revolution. He as well as his wife's family were attacked by the Londorf community for false reasons and accused of being, as they were aristocrats, "parasites [and] thieves of the people's land" (von Uexküll 1964: 118). Thanks to his ability to mediate and his accommodating nature, however, the Baron prevented these disagreements from having serious consequences and from fatally compromising the relationship between the Uexküll family and the community.

On a political level, however, his opinion on the ongoing historical changes was clear: Uexküll reiterated the idea, already expressed in *Volk und Staat*, that democracy is contrary to the natural structure of the state, and even represents its degeneration. Using the metaphorical power potentially present in biological concepts, in a letter to Chamberlain dated November 20th 1917, he compared the fall of the Tsarist Empire to the dissolution of a giant amoeba in a protoplasmic decomposing mass (Rüting 2004: 44). Besides, at that time, Uexküll often quoted some verses from *Demetrius* by Schiller – "Majority is madness [...]. Sooner or later must the state be wrecked/when numbers sway and ignorance decides" (Schiller 1902: 380), and made them his own in the following motto: "The people have only one right – to be governed well" (von Uexküll 1964: 119). This markedly conservative attitude is reflected in *Staatsbiologie. Anatomie-Physiologie-Pathologie des Staates* [Biology of the state. Anatomy, physiology, pathology of the state] (von Uexküll 1920a).

Despite their difficulties, the time the family spent in Londorf was fairly peaceful, but ended dramatically in summer 1923: after a short trip to Schweringsburg, where Uexküll's wife's older brother lived (and whose health was permanently deteriorated after his return from war), the family were suddenly unable to pay for their journey back. The high inflation rate in Germany shortly after the war made the little they still owned worthless. So they were obliged to move once more and the family remained in Schweringsburg.

From the point of view of his work as a scholar, 1924 proved extraordinarily rich in positive events for Uexküll. Before we report them, we find it appropriate to volunteer the words his wife used to summarize the Estonian biologist's path until then:

If Uexküll, shortly before his sixtieth birthday, had taken stock of his life, among the losses he would have placed his loss of faith in Germany, his abandonment of hope for a new Baltic state, and, closely linked to the loss of his Baltic properties, the end of every opportunity to be a private researcher like before. Naples, Dar es Salam, Biarritz: those scientific expeditions have been rendered impossible by his new "refugee" status. But exactly that loss could become an advantage, in that it forced him to sort, summarize and interpret the material collected up to that point. [...] The theorist had to reap what the empirical researcher [*der Praktiker*] had sown. So did this mean turning to speculation, to philosophy? Aware of the dangers this enterprise presented, but armed with the sobriety of the researcher and with a generous treasure of original empirical results, Uexküll wrote *Theoretische Biologie* [*Theoretical Biology*] (von Uexküll 1920b). With this he set himself two goals: the first was to draw a sort of summary of his observations, the second was to force his colleagues to challenge his interpretation of such observations (von Uexküll 1964: 133).

Though it was not immediately widely spread, *Theoretische Biologie* marked a turning point in the production of Uexküll. An English edition was published a few years later, which was responsible for the entry of the term *Umwelt* in the international biology lexicon (von Uexküll 1926). In Germany the work had a second revised edition (von Uexküll 1928) and many reprints,²⁷ although its main contents were never accepted by the academic world. As reported by his wife, "though they had recognized the importance of Uexküll's experiments on muscles and nerves, specialists would not hear about an "immaterial construction plan" – i.e. the key topic in *Theoretische Biologie*. It must have reeked too much of metaphysics!" (von Uexküll 1964: 133).

However, there are a few significant exceptions to this general attitude: Driesch stated that with *Theoretische Biologie* Uexküll left physiology behind and reached true biology (Driesch 1921: 202; Mildemberger 2007: 124), while Cohnheim not only reviewed the work positively, but also succeeded in his attempt to provide Uexküll with an invitation to the International Congress of Physiology (held in Edinburgh in 1923). The meeting was of extreme importance to German researchers, who had not taken part in international conferences since before the war (there had not been any German participant at the International Congress held in Paris in 1920). In Edinburgh, Uexküll had the opportunity to come face to face with the greatest physiology experts of the time, including Pavlov.

²⁷ Cf. below, 125, n. 30.

2.4 The *Institut für Umweltforschung* in Hamburg

Upon returning from the conference, Cohnheim contacted the academic authorities of the University of Hamburg as well as the people in charge of the Hamburg Zoological garden, with the goal to have Uexküll hired as a paid researcher. In 1924, Uexküll was appointed “assistant scientific collaborator” by the University of Hamburg. He was also presented with a possible promotion to extraordinary professor for the future. The position meant managing a laboratory and an aquarium supplied by the Hamburg Zoological Garden.

As Cohnheim wrote in his diary,

the new title of “assistant scientific collaborator” can only put a smile on Uexküll’s face, who has always regarded titles and solemnity as a little useless and who, now in his sixties, has already been awarded an honorary doctorate twice. But to be given the chance to be able to return to work, that certainly filled him with joy (von Uexküll 1964: 139)²⁸

At the beginning of 1925, the biologist moved to Hamburg with his family. The aquarium at the Zoological Garden, Uexküll’s new workplace, was a small facility with about a dozen of fresh and salt water tanks. It was practically derelict, because from the beginning of the war onwards management could no longer afford to pay the costs for Mediterranean and exotic fish. Under the direction of Uexküll the tanks were once again filled with marine life coming from the North Sea: mullets, wolffish, starfish, molluscs, sea urchins and sea anemones. Apart from the increase in the few visitors to the aquarium, the presence of marine animals allowed Uexküll to resume his experiments. As the aquarium did not have a real laboratory, the biologist improvised one in a kiosk originally used for selling cigarettes and peanuts. While he joked about this peculiar settlement, Uexküll never complained about it; to him, what mattered most was being able to work and to pass on his ideas to his assistant and to the students he conducted his research with.

Uexküll’s tenacity and the presence of a good number of private sponsors succeeded in gradually turning that makeshift lab into a real research institute, which, in 1927, the biologist named *Institut für Umweltforschung* [Institute of Environmental Research]. The main difficulty resided in the mistrust of the official academic circles, for which the concept of Umwelt should be confined to its original area of applicability, i.e. sociology, and should not be extended to the study of the animal world. Even those who looked favourably on Uexküll and his research advised him to adopt a different name, such as *Institut für Vergleichende Physiologie* [Institute of comparative physiology]; on this point, however, the biologist held his ground.

The Institute was soon moved to more adequate premises. Administratively it was part of the Zoology Department of the University of Hamburg, and not –

²⁸Also in 1924, Uexküll’s sixtieth birthday was celebrated by friends and pupils with the publication of a paper in his honour: a special edition of “Pflügers Archiv für die gesamte Physiologie” (205, 1924), which contains 19 scientific contributions by authors from all over the world.

as Uexküll had hoped – of the Medicine one, whose members “were less biased against the [the biologist’s] vitalistic views and did not require any profession of faith in Darwin” (von Uexküll 1964: 152). Uexküll was at the head of the *Institut für Umweltforschung* until 1936, during which time the institute became well-known on international scale, and it also made the most diverse personalities and approaches meet. Between 1926 and 1934 the Institute also published more than 70 scientific works under the direct supervision of Uexküll (Kühl 1965: 4–15; Hünemörder 1979: 105–125). From 1930, Uexküll occasionally held seminars on the philosophy of nature and the theory of knowledge together with Adolf Meyer-Abich.²⁹

In 1940 Uexküll’s assistant Friedrich Brock³⁰ took over managing the Institute. During Brock’s military service and imprisonment, the Institute was managed by Emilie Kiep-Altenloh,³¹ who was able to ensure its survival by training guide dogs for the blind for the German army. The dog training used an innovative method, developed by Uexküll and Emanuel Sarris³² and based on the Uexküllian principles of *Umweltlehre*.³³ In 1959, the Institute lost its autonomy – the director of the Department of Zoology considered it outdated – and it was merged with the *Zoologisches Institut und Museum*. The teaching of *Umweltforschung* was removed from the Zoology degree programme in 1964.

²⁹Adolf Meyer-Abich (1893–1971) was one of the first German philosophers to see the critical value of the concept of holism in relation to natural sciences (Meyer-Abich 1926, 1963).

³⁰Friedrich Brock (1898–1958) was a German philosopher and zoologist. Originally the pupil of Driesch, he met Uexküll at the Naples Zoological Station and became his assistant at the University of Hamburg in 1925. After qualifying for university teaching in 1939, he became the director of the *Institut für Umweltforschung* in 1940, and remained so until 1945. Back in Hamburg after the war, Brock contributed to the reconstruction of the institute (Mildenberger 2007: 134–135; Brock 1939: 16–68).

³¹Emilie Kiep-Altenloh (1888–1985). In addition to her legal background, Altenloh was politically active from a young age in the ranks of the *Deutsche Demokratische Partei* and was responsible for promoting equality between men and women. When power fell in the hands of the Nazis, she was forbidden to devote herself to politics, which is the reason why she turned to biology and zoology in 1934, without meeting any political hostility at Uexküll’s *Institut für Umweltforschung*. After the war she became a member of the German parliament from 1961 to 1965 (Mildenberger 2007: 170; Kiep-Altenloh 1944: 69–82, 1948: 57–59).

³²Emanuel Georg Sarris was the pupil of the vitalist psychologist William Stern (1871–1938). Sarris worked with Uexküll at the *Institut für Umweltforschung* from 1931 to 1937 and then became a lecturer in Greek at the University of Hamburg (Mildenberger 2007: 171; Sarris 1933a, b; von Uexküll and Sarris 1931a, b, c, 1932).

³³This method is still employed today. It is based on the principle that, since the blind man and the dog move in two different subjective environments, the trainer must take into account the perceptual and cognitive differences that exist between them. For the guide dog, for example, the height of doors is not a relevant factor, while it is for the blind human. The method developed by Uexküll and Sarris consists in tuning the two different perceptual environments together: the environment of the dog should be extended upward – by making the dog pull a cart on which is placed a mannequin as tall as a man. Every time the space the dog tries to go through is too low, the mannequin will make it impossible. Even if Uexküll and Sarris’ method is a work of behaviour remodelling, it is very attentive to the subjective aspects of perception and animal cognition.

In a private note written a few years later, Uexküll retrospectively remembered some of the scholars who operated in the institution he founded:

The *Institut für Umweltforschung* throbbed with scientific life very early. Frank³⁴ developed models of the swimming motion of waterfowls, which showed their expertise as divers in a large tub of fresh water at the aquarium. Kriszat³⁵ managed to get a mole out of its burrow using the sound of bells, which enabled him to observe in detail the movements that the animal performs in order to dig. Lissman³⁶ succeeded in identifying the distinctive features fighting fishes recognize to distinguish the female fish from enemies. Brecher³⁷ studied short-term moments in fish and long-term in snails. [...] Kühl³⁸ highlighted the difference between running crabs and swimming crabs. Beniuc³⁹ investigated the difference between the paths that fighting fish take in unknown territories and those they trace in their own territory, showing how the former appear to be more static. Brock analyzed and recorded the behaviour of mice while they were trained to perform in a circus. Sarris laid the foundation of knowledge of the dog's environment, which then served to develop a scientifically founded dog training method (von Uexküll 1964: 145; Brock 1934).

Even just from this brief review we can see how the scientific activities carried out by the *Institut für Umweltforschung* went in the same direction as the early ethology did, in the same years but with other theoretical assumptions. It was not a coincidence if even Konrad Lorenz displayed serious interest in the Institute's

³⁴Harry R. Frank was a zoologist who studied at the *Institut für Umweltforschung* between 1928 and 1929 thanks to a grant from the *Kaiser-Wilhelm-Gesellschaft* (Mildenberger 2007: 136; Frank and Neu 1929: 599–526).

³⁵Georg Kriszat was a Swedish zoologist. He began working with Uexküll in 1932, and soon became Uexküll's closest pupil, as goes to show the fact that in 1934 he appeared as the co-author of one of Uexküll's most famous texts, *A Foray into the Worlds of Animals and Humans* (von Uexküll and Kriszat 1934; English edition, von Uexküll 2010b), in which, however, he only dealt with the illustrations. This explains why the latest Italian and English editions of the text mention Uexküll as the sole author (von Uexküll 2010a, b). After the war, Kriszat remained true to the Uexküllian approach: in the biographical note ("Enzyklopädisches Stichwort") he dedicated to Uexküll in the 1956 edition of *A Foray into the Worlds of Animals and Humans* he tried to relate later studies by Konrad Lorenz and Nikolaas Tinbergen to his master's *Umweltlehre* (they, however, did not take position about the issue) (von Uexküll and Kriszat 1956: 163–169; Mildenberger 2007: 150, 170, 227–228; Kriszat and Ferrari 1933).

³⁶Hans Werner Lissman (1909–1995) was a German biologist who left Germany in 1936 for political reasons and continued his career in England. In the period he collaborated with Uexküll his field of study lay in the motion of fish (Mildenberger 2007: 171; Lissman 1932: 65–111).

³⁷The zoologist Gehrard Brecher was Uexküll's student at the *Institut für Umweltforschung* for 2 years (1928–1929) thanks to a grant from the *Kaiser-Wilhelm-Gesellschaft* (Mildenberger 2007: 136; Brecher 1933).

³⁸Heinrich Kühl was a zoologist who worked at the *Institut für Umweltforschung* in the early 1930s (Kühl 1965).

³⁹Mihai Beniuc was a Romanian zoologist and ethologist who collaborated with the *Institut für Umweltforschung* in the early 1930s. He was the first Romanian scholar to earn a doctorate in animal psychology. After the war he continued his scientific work at the University of Bucharest, establishing contacts with the emerging Lorenzian ethology (Beniuc 1933, 1970).

activities, which he probably visited in the first half of the 1930s, and entertained a significant personal and epistolary relationship with Uexküll.⁴⁰

In 1928, Uexküll learnt that the Estonian government was prepared to grant compensation to the owners whose property had been confiscated due to the revolution. In the case of Uexküll, government authorities decided upon a partial restitution of land. Since the law provided for the restitution of fifty hectares for the former landowner (plus another 50 for each child), the material value of the small retrieved funds was limited. Among them, however, was the island of Pucht, which possessed great sentimental value for the Baron and which he was granted as summer residence and research station. The island is still known for the famous monument to Schiller that stands on it.

With the beginning of the 1930s, official German zoology grew even more hostile toward Uexküll. The University of Hamburg stopped accepting as doctoral theses scientific works that fell within the field of research of the *Umweltforschung*, thus preventing their authors, often belonging to the institute founded by Uexküll, from sitting the doctoral examination and obtaining the corresponding title. Those academic difficulties were worsened by the chronic lack of money that afflicted both the research institute and the aquarium, which is even more significant when one considers that the Nazi regime funded research in biology generously (it is estimated that in Germany the government contributions to biological research increased tenfold between 1932 and 1939).⁴¹ In the same period, however, signs of appreciation from important figures in the European cultural world became

⁴⁰Konrad Zacharias Lorenz (1903–1989) was the Austrian zoologist, of Darwinian mindset, who was the founder of the comparative study of animal behaviour (the discipline commonly known as ethology). The most intense phase of the relationship between Uexküll and Lorenz took place in the first half of the 1930s. They met in 1933 in Vienna, where Uexküll was attending a conference, and he visited Lorenz twice in Altenberg (where Lorenz conducted his experiments on jackdaws (*Corvus monedula*) in the family home). In 1934, Lorenz dedicated his study *Companions as factor in the bird's environment* to Uexküll, which might denote the theoretical connection between the two scholars at its strongest. This issue is so important in relation to the development of the Lorenzian ethology that it will be covered in Chap. 7 (see Mildenerger 2005, 2007: 159–160, 165, 169, 173, 175, 179, 199–200, 213–214, 216–217, 221–222, 224, 228, 234–235, 240; Rütting 2004: 46; Föger and Taschwer 2001: 68–69; Lorenz 1935).

⁴¹Deichmann 1992: 76–78. Deichmann's sources make it clear that Uexküll's antidarwinism made his theories of little use to the Nazi regime. The table in which Deichmann reports in an analytical way the amount of funding granted to German biologists between 1935 and 1945 shows that Uexküll and the institute got the modest sum of 3,700 *Reichsmark* in the first half of this period, and only 425 RM in the second half. The funds granted to Uexküll fell under "Physiology", a subject area of minor importance to the Nazis: between 1935 and 1939 physiologists received in all 62,545 RM, compared with 115,711 RM awarded to genetics and 93,854 for research on mutations. Between 1940 and 1945 physiology was granted 90,955 RM, compared with 244,273 destined to genetics and 655,728 to research on mutations.

more prominent: Frobenius,⁴² Buytendijk,⁴³ Ortega y Gasset,⁴⁴ Spemann⁴⁵ and Portmann⁴⁶ are amongst those who valued Uexküll for his works and his research activities.

2.5 Frictions with the Nazi Regime and Death

As far as Uexküll's attitude toward Nazism is concerned, we must say that he initially welcomed the appointment of Hitler as chancellor. This can be explained on the one hand by political motivations – fear for the expansion of communism and a certain aristocratic aversion to the parliamentary system and democratization of the German society – but also by the knowledge that the new regime was in favour of the use of biological concepts in the interpretation of social phenomena and in state administration. In 1933, this awareness made Uexküll republish his work *Staatsbiologie*, in a very re-edited version (von Uexküll 1933). The book was acclaimed by Ernst Lehmann (1888–1957), president of the League of German biologists (a body with a clear long-standing National Socialist faith). As Mildenberger claims, in the introduction to this work:

Uexküll pointed out that the state was threatened by “new diseases”, [...] in particular the “flood” of an alien “race” and the danger of a “mass” of people out of their environments. Moreover, he despised the principle of equality, because this approach contradicted biological reality. According to him, every person was to serve the state in view of their environmental position [...]. As a conclusion, Uexküll called for a “state medicine” that would be able to eliminate all evil, of which he believed he had outlined the basic plan (Mildenberger 2007: 157).

⁴²The German ethnologist, anthropologist and philosopher Leo Frobenius (1873–1938) was one of the main representatives of the historical school in German anthropology.

⁴³Frederik Jacobus Johannes Buytendijk (1887–1974) was a Dutch physician, physiologist and psychologist. He was strongly influenced by Husserl and researched psychology and perception in animals and humans. We can find major references to Uexküll in Buytendijk and Plessner 2003: 67–129.

⁴⁴From as soon as the early 1920s, the Spanish philosopher José Ortega y Gasset (1883–1955) encouraged the translation into Spanish of some of Uexküll's works, for which he wrote the introductions (von Uexküll 1922, 1944).

⁴⁵The German biologist Hans Spemann (1869–1941) was particularly devoted to embryology, and he discovered the existence in the embryo of organiser centres that determine the development of the surrounding cells (Spemann 1938).

⁴⁶The Swiss zoologist and philosopher Adolf Portmann (1897–1982) tried to counter the dominance of the Darwinian theory of evolution by means of an approach based on the importance of the morphological connections between the different living beings (thus recovering the legacy of Goethe). Portmann wrote the preface to the 1956 edition of *A Foray into the Worlds of Animals and Humans*, where Uexküll is defined as a “pioneer of new biology” (Portmann 1956: 7).

This being said, we must however stress the fact that Uexküll never associated with the anti-Semitic and openly racist tendencies of the regime, and that as early as the autumn of 1933 he showed clear disapproval of the National Socialist policy and ideology. From then on, the biologist tried to keep away from political issues, although it proved impossible in some instances.

Frictions between Uexküll and the Nazi authorities began to show during the conference *Das Duftfeld des Hundes* [*The dog's olfactory field*], held by the biologist in 1933. The conference focused on the theory, which was then universally accepted, that dogs use urine and feces as olfactory signals to mark their territory.⁴⁷ Though bearing no political implication, the conference caused a fierce reaction from Joseph Goebbels, the newly appointed Minister of Propaganda, who wrote an article on *Völkischer Beobachter* entitled *Köteraien eines deutschen Professors* [*Excremental excesses of a German professor*]. Goebbels viewed Uexküll's conference as clear testimony to the fact that German university professors were still far from having recognized "the imperative of the now": instead of "dealing with foolish and misleading things", they ought to "be urging the Germans to face their veritable duties" (von Uexküll 1964: 169).

In order to understand Uexküll's own position towards the Nazi ideology we should consider two significant pieces of evidence. The first is a letter Uexküll wrote to one of his former assistants, Lothar Gottlieb Tirala,⁴⁸ who embraced the Nazi vision of the world and became the director of the *Institut für Rassenhygiene* [Institute for Racial Hygiene] in Monaco (Mildenberger 2007: 159). The following is the most relevant part of this document.

In the viewpoint of the [National Socialist] doctrine race there is only one rational medicine, which is to kill all the sick people – in that case the population is certainly 100 % healthy. This is a glib truth. For good measure, we should also eliminate the consequences of domestication, which is known to lead to the appearance of harmful mutants, and return

⁴⁷ At the end of the conference, the philosopher Ernst Cassirer, who moderated the event, opened the discussion with this sentence: "Rousseau said that the first man who, having enclosed a piece of ground, bethought himself of saying 'This is mine' should have been killed. After Professor von Uexküll's lecture, we know that this would not have sufficed. The first dog would have had to be killed too" (von Uexküll 1964: 24; Mazzeo 2010: 16–17).

⁴⁸ Lothar Gottlieb Tirala (1886–1974) was an Austrian biologist and physician and a pupil of Uexküll. In the 1930s he became friends with Chamberlain (probably through Uexküll). A convinced Nazi, in 1933 he was appointed professor at the Institute of Racial Hygiene, University of Monaco. In his works he repeatedly tried to compare the Uexküllian theoretical biology to the National Socialist biological vision of the world. In his book *Rasse, Geist und Seele* (Tirala 1935) Tirala used the Uexküllian concept of environment for political purposes, stating that human races live in different Umwelten and are therefore radically separated from each other. Unlike Uexküll, Tirala claims, however, that the environments of different races are hereditarily determined. After the war, Tirala's scientific activities and publications turned to alternative medicine and therapies based on breathing (Stella and Kleisner 2010: 47; Mildenberger 2004).

to the primary forest. And this is indeed the ideal of many race theory enthusiasts. But these youths, from the vantage point of those principles, also wish to eliminate all the individuals with “foreign blood” in their veins. That is where miserable materialism that spread with the doctrine of the race reaches. Now only the hereditary material is taken into account, and the construction plan [*Bauplan*] of the organism is utterly ignored. But the Darwinists already did just that (von Uexküll 1964: 169)⁴⁹

The second expression of Uexküll’s attitude regarding National Socialism is a letter dated May 1933 which the biologist addressed to the widow of Chamberlain,⁵⁰ a scholar with whom Uexküll had entertained a friendly epistolary relationship (Mildenberger 2007: 92). He chose to write to Eva Chamberlain⁵¹ because she belonged to the circle of direct acquaintances of Hitler, so this letter was Uexküll’s attempt to be heard by the highest levels of the government. Below are some of the most significant passages.

I am turning to you prey to a very serious concern, that of maintaining the purity of the reputation of the great man who was your husband. [. . .] Due to the fact that he developed a superb race theory in his book *The Foundations of the Nineteenth Century*, particularly concerning the Jew issue, friends and foes now believe that he was the intellectual promoter of the anti-Jewish measures taken by Hitler’s government. Actually, what is happening is heading in the opposite direction compared with what he professed [. . .].

If Chamberlain could see what is taking place today, he would vehemently protest and would use all the authority granted to him by his moral stature against the idea that he, who all his life was the supporter of the purest idealism, is now regarded as the promoter of the pettiest materialism.

What happened?

The University of Hamburg dismissed the world-renowned philosopher, Prof. Cassirer,⁵² although should be given credit for giving a new life to the philosophy of Kant. [. . .]

⁴⁹It should be noted that the fear that the comforts of modern life could have the same degenerative effects on humanity as those domestication seems to have on animals was taken seriously by many naturalists of the time. The most significant case is perhaps Konrad Lorenz, who (on a theoretical level) explained the reasons for adhering to the National Socialist Party and supporting the *Anschluss* of Austria in the hope that the Nazi regime would somehow be able to oppose this process (Föger and Taschwer 2001: 99–119).

⁵⁰The correspondence between Uexküll and Chamberlain was analyzed by Schmidt who detected anti-Semitic positions in both authors (from which Uexküll later distanced himself; *cf. below* 37–38) (Schmidt 1975: 121–129).

⁵¹Eva Wagner Chamberlain (1876–1942), daughter of Richard Wagner, married Chamberlain in 1908.

⁵²Ernst Cassirer (1874–1945) was a German Jewish philosopher. His field of study ranges from a Kantian epistemology to the philosophy of symbol and culture. After taking refuge in the United States in 1941, he taught at Yale University and Columbia University until his death. On the relationship between Uexküll and Cassirer *cf. below*, 188; van Heusden 2001.

Gone is also the brilliant Jew Haber,⁵³ who managed to separate nitrogen from the air and employed it for the manufacture of ammunition. [...] The most talented urbanist in the world, Schumacher,⁵⁴ was recently dismissed. [...]

[They and many others] were honest and conscientious people, who had dedicated their lives for the good and honour of Germany. Those who do not have at least 75 % Aryan blood are expelled. This is the worst form of barbarism.

[...] The thesis of the *Studentenschaft* in Berlin “If a Jew writes in German, he is lying” is now regarded as the quintessence of Chamberlain’s doctrine. Thus, all that is actually achieved is the destruction of the profound truth that Chamberlain announced: “Respect for the individual, whether they are Aryan or Jewish, is the highest moral precept”.

[...] My most esteemed friend, you have influence over Hitler. Please write to him, and urge him to utter a word of conciliation in order to strike this so un-German situation like a thunderbolt and to put an end to it.

In great fear for Germany and in memory of my true friend,

Yours devotedly,

J. v. Uexküll (reported in von Uexküll 1964: 173; see also Mildenerger 2007: 158–159; Rütting 2004: 42; Schmidt 1975: 127)

This letter remained unanswered.

In 1934, by then in his seventies, Uexküll published with Kriszat his work that was to become the most successful in terms of readers, *A Foray into the Worlds of Animals and Humans* (von Uexküll 2010b). The book is dedicated to his friend Otto Cohnheim who “lost his appointment as a university professor because of racial politics” (von Uexküll 1964: 187). The same year, on his seventieth birthday, Uexküll received a case containing scientific papers published by international scholars,⁵⁵ as well as an honorary doctorate from the University of Kiel (the third one in his life. He was awarded the fourth one by the University of Utrecht in 1936).

Another disagreement opposed Uexküll and the supporters of the National Socialist worldview in 1936. Upon the invitation of the Academy of German law, the biologist held a conference on philosophy of law at the *Nietzsche-Haus* in Weimar. Before taking part, Uexküll required a clear statement that the Academy had not invited him to teach him a lesson, but only to listen to his contribution. Reassured by the university authorities, Uexküll decided to put in a word in defence of freedom

⁵³Fritz Haber (1868–1934) was a German Jew who specialized in the thermal reactions of gases. Haber was professionally active both in the German academic world and in the industrial one. Part of his research led to the development of gases for war purposes. In 1919, he was awarded the Nobel Prize for chemistry. Despite having converted to Christianity in 1900 and enjoying a good reputation in Germany, he had to emigrate in 1933 to escape the anti-Semitic policies of the Nazi regime.

⁵⁴Fritz Schumacher (1869–1947) was a German Jewish architect and urban planner. Professionally active in Dresden and Hamburg, he made a significant contribution to the understanding of urban problems posed by the development of modern industrial cities (Schumacher 1940).

⁵⁵*Festschrift*, published in a special issue of the journal “Sudhoffs Archiv” (journals 3/4 dated 1934), involved Lorenz, Meyer-Abich, Brock, Tirala and others (Mildenerger 2007: 163–166).

of teaching and research – just as German universities were being covered in posters bearing slogans like “Against the enfeebling caused by the debilitating objectivity of science” (von Uexküll 1964: 174).

The cultural event was opened by Nietzsche’s sister, Elisabeth, and it soon became clear that the situation was not prone to express any opinion that differed from the directives of the party. Uexküll was allowed to continue until he pronounced the following statement:

Nowadays, as a criterion of vitality and skill we are expected to return the blow we receive. This criterion, however, as biology teaches us, only applies to effector organs. The eye that is punched can only become blind, but cannot punch back. And the task of universities is precisely to be the eyes of the state (von Uexküll 1964: 175)

At that stage the audience interrupted Uexküll’s presentation and he left, but not without recommending (in private) the organizers read Chamberlain’s work *Worte Christi* [*The words of Christ*] (Chamberlain 1901). From then on Uexküll was constantly watched by the party. His book of personal recollections *Nie geschauten Welten* [*Worlds never seen*], which contained words of appreciation for the Russian Jews and the Baroness Rothschild (von Uexküll 1936: 216), was officially banned from being displayed in the windows of bookshops. As a scientist Uexküll was accused of professing a Marx-inspired theory of environment, and to consider man as a product of his social context (milieu). This accusation, which fundamentally misunderstands the Uexküllian theory of environment (Umwelt), made the public regard the biologist even more suspiciously.

In April 1936 Uexküll was dismissed on account of his age with a very small pension (145 marks). The summer of 1939, which he spent with his family on the recovered island of Pucht, is the last relatively peaceful time for the biologist. In 1940 his heart problems he had been lamenting for some time got worse, so Jakob and his wife decided to move to Italy to enjoy a healthier climate. The chosen destination was the island of Capri, where Uexküll died on July 24th, 1944. The U.S. authorities, who were occupying the island after the liberation of Naples and who had established a friendly relationship with the elderly couple, offered the only priest available, a young rabbi from Vienna, who celebrated a simple ceremony in the presence of a small number of people. Invited to deliver a short commemorative speech, the mayor of the island recalled his last conversation with the deceased (dedicated to the structure of a flower) and concluded the funeral service with the words: “This man maintained a constant dialogue with the Creator” (von Uexküll 1964: 264). Jakob von Uexküll’s grave is on the island of Capri.

The *Institut für Umweltforschung*, despite the academic authorities’ intent to have it suppressed, managed to survive thanks to the services rendered training guide dogs for the blind. This field of activity, directed by Emilie Kiep-Altenloh, imparted strategic importance to the institute in time of war. In 1940, the helm was taken by Friedrich Brock, but he was immediately enlisted and was left unable to continue the scientific research that characterized the school in previous years. Thanks to the laws of time, which encouraged the career of scholars who served in the military, on his return Brock was appointed extraordinary professor of *Umweltforschung* at the University of Hamburg.

With the end of the Third Reich, the *Institut für Umweltforschung* lost its main sponsor, the National Socialist state, whereas its training dogs for the blind service was more necessary than ever. In view of these difficulties, the end of 1945 witnessed a phase of intense disagreements and oppositions between Uexküll's followers: Emilie Kiep-Altenloh, whom the rector of the University of Hamburg appointed as interim director of the *Institut* until Brock returned from captivity, separated the dog training activity from the scientific research (for the former she founded a specific foundation, the Jakob von Uexküll Foundation for the training of guide dogs). From a theoretical point of view, she also wanted to substantially alter the Uexküllian environment theory, by connecting it to the findings of contemporary biology. On his return, Brock regarded Kiep-Altenloh's choices as a sort of betrayal, and in 1947 (with the help of another of Uexküll's pupils, Heinz Brüll) he succeeded in excluding her from all of the institute's activities and Brüll took her place at the head of the institute (Mildenberger 2007: 210–211).

Under the direction of Brüll, not one of Uexküll's brightest brilliant students, the institute began going downhill. In the early 1950s, Sarris put an end to his activities at the University of Hamburg and broke all ties with the institute, which thus lost its last valid scientific assistant. From 1952 onwards, leadership of the institute was taken on by Brock, who proved neither able to foment scientific research, nor to defend Uexküll's theses on a theoretical level (by the mid-1960s, such theories were abandoned, being deemed old-fashioned and utterly unscientific). With the death of Brock, in 1958, the *Institut für Umweltforschung* was permanently closed. Finally, in 1964, the University of Hamburg replaced the chair of *Umweltforschung* Brock had held until his death, with Ethology (taught by the Department of Psychology). The disappearance of the institute and the lack of a real Uexküllian school do not mean, however, that Uexküll's work stopped influencing biology, anthropology, ethology, philosophy and semiotics in the following decades, starting from the 1970s. For a closer look at the "rediscovery" of Uexküll and the many contributions that the concept of *Umwelt* volunteered to contemporary thought, we refer to Chap. 7 of this work.

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