

The unwitting muse: Jakob von Uexküll's theory of Umwelt and twentieth-century literature

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When Aldous Huxley, scion of a family of distinguished scientists and a writer of many talents, reflected on the various ways of writing about nightingales, he felt that twentieth-century authors like T. S. Eliot had completely disregarded the groundbreaking findings of such ethologists as Eliot Howard and Konrad Lorenz (Huxley 1963: 94–99). He accused Eliot of raking up the same old myths used by Keats and many others before. Eliot, he argued, could have drawn on the research of scientists like Howard and Lorenz, and could thus have avoided the old anthropocentric way of dealing with nightingales within a culturally determined human frame of reference.

Huxley goes on to expound the insights offered by a modern ethology that is inspired by Uexküll's biological theory: 'Man is the measure of all things. How true — for us! But for nightingales, the measure of the nightingale-universe is nightingales ...' (1963: 97). Ethologists were finally able to explain how, when, and to what purpose nightingales sang, and Huxley clearly wanted to see some degree of informed bird-watching practiced among his fellow writers. At any rate, he advised his colleagues to catch up with the new insights of science because 'to the twentieth-century man of letters this new information about a tradition-hallowed piece of poetic raw material is itself a piece of potentially poetic raw material. To ignore it is an act of literary cowardice' (1963: 98). In Huxley's view, it was the duty of the twentieth-century writer to harmonize the old myths with the findings of modern science, something which required the 'purification' of scientific and literary language into

a many-meaning language capable of expressing simultaneously the truth about nightingales, as they exist in their world of caterpillars, endocrine glands and territorial possessiveness, and the truth about the human beings who listen to the nightingale's song. It is a strangely complex truth about creatures who can think of the immortal bird in strictly ornithological terms and who at the same time are overcome (in spite of ornithology ...) by the magical beauty of

that plaintive anthem as it fades 'past the near meadows, over the still stream'. (Huxley 1963: 98–99)¹

The phenomenological nature of Jakob von Uexküll's theory of *Umwelt* and his own engaging style of writing make this unusual biologist a likely mediator between science and literature in the way envisaged by Huxley. Not only does it become clear from Uexküll's own writings that he was fascinated by the beauty of nature and saw biology as a way of appreciating her wonders (e.g., 1907: 661; 1919: 147). The idea of there being myriads of different worlds out there inevitably appeals to the imagination. Huxley, following Uexküll, describes the reality we normally perceive as defined by the biological equipment of our bodies, our social conventions, and linguistic heritage:

The ideas contained in von Uexküll's classical book on *Umweltlehre* or 'environmentology' are fundamental in this context. The paramecium, the sea urchin and the dog — each has its universe, and each of the universes is very different from the others. Man's biologically, socially and linguistically conditioned universe is much richer than that of the other animals; but it is still only a small slice of the melon. (Huxley 1969: 785–786)

Uexküll's combination of physiology of perception and Kantian epistemology in a conception of reality as an *Umwelt* (self-world, perceptual or phenomenal world) created by the subjective perception of the individual organism — whether it be sea urchin or human — made his theory an eminently attractive model for combining individual expression and universally valid truth. Thus, it comes as no surprise that his biological thought and language were more widely received in literary circles than has so far been known. The particular appeal his ideas had for writers as different as Gottfried Benn, Thomas Mann, Rainer Maria Rilke, or Raoul Hausmann has so far not been investigated. The two most recent monographs on Uexküll (Schmidt 1980; Helbach 1989) do not examine Uexküll's influence on contemporary culture and literature in any detail, and there is only one — if comprehensive — article on the political and historical context of Uexküll's ideas (Harrington 1996).

From the present study, Uexküll emerges in a dual role: as the authors' enthusiastic and eloquent guide to the science of life, and as their unwitting muse, whose inspiration extended to artistic movements he disapproved of. A sweeping survey of this kind necessarily has to remain incomplete (for instance, the fascinating area of biological language in political rhetoric had to be left out). Thus, it is intended as a first overview of the relations between Uexküll's theories and some twentieth-century writers — from classical modernism (Rilke, Mann) to avant-garde

(Expressionism, Dada) and contemporary literature (Peter Høeg) — and to serve as a starting-point for future explorations that can go into greater detail.

‘Diese köstliche Biologie’: Uexküll and Rilke

‘Rater und Helfer’

In the years 1903–1904, Rainer Maria Rilke was desperately seeking guidance and new inspiration. In 1903 he wrote to his friend Lou Andreas-Salomé about a crisis he was going through:

Vielleicht waren es zu abstrakte Wissenschaften, an denen ich mich versuchte, und vielleicht kommen aus anderen neue Dinge ... ? Aber zu alledem fehlen mir Bücher und zu den Büchern die Wegweiser. — Aber daß ich so wenig weiß, quält mich oft; vielleicht nur, daß ich so wenig von den Blumen weiß und von den Thieren und von den einfachen Vorgängen, in denen das Leben wie Volkslied aufsteigt. Und darum nehme ich mir immer vor, besser zu schauen, anzuschauen, mit mehr Geduld, mit mehr Versenkung wie vor Schauspielern vor dem Geringen zu stehen, an dem ich oft vorbeigegangen bin. ... Und wenn ich nur lernen könnte, täglich zu schauen, dann wäre auch die tägliche Arbeit nicht mehr fern, nach der ich mich so namenlos sehne ... (Rilke 1975: 106–107).²

Rilke decided to study the life sciences: ‘Ich will naturwissenschaftliche und biologische Bücher lesen und Vorlesungen hören, die zum Lesen und Lernen solcher Dinge anregen. (Experimente und Präparate sehen)’ (Rilke 1975: 165). But for this, he needed a reliable guide: ‘Denn: sich an jemanden Wissenden von Fall zu Fall direkt und fragend wenden dürfen, wäre unendlich viel für mich, unendlich lebendiger Zufluß und große Ermuthigung’ (168). The conditions are clear: to be useful to Rilke, science has to be *anschaulich* (graphic, intuitively self-evident), not abstract; he needs specialist literature and a guide (the ‘Rater und Helfer’ he then found in Uexküll); he wants to devote his attention to the small and humble things, in which he hopes to discover the law of being. On 19 October 1904 he wrote to Lou: ‘Dann, zum Sommersemester, will ich an eine Universität gehen und studieren: Geschichte, Naturwissenschaften, *Physiologie*, *Biologie*, *experimentelle Psychologie*, etwas *Anatomie* u.s.w.’, and he emphasizes that he is adamant ‘Eine Persönlichkeit zu entdecken, die mir hilft, so daß die Sache aus einer allgemeinen zu einer Angelegenheit von Mensch zu Mensch wird’ (189). Rilke had in 1896 heard August Pauly’s lectures on Darwinism at the University of Munich (Schnack 1990: 51), but they do not seem to have made a lasting impression.

As we know from Rilke's letters and Gudrun von Uexküll's biography of her husband (Uexküll 1964), Rilke was soon to find a guide to the science of biology in Jakob von Uexküll. Rilke first met Uexküll's mother-in-law, Countess Luise von Schwerin, at a health resort near Dresden in March 1905 (Schnack 1990: 206). A lively correspondence followed, and soon afterwards he visited Schloß Friedelhausen. He was looking forward to meeting Uexküll, 'der Naturforscher ist, mit dem ich viel zu sprechen und von dem ich manches zu lernen hoffe' (Rilke 1993: 157). In a letter to Luise von Schwerin he expressed doubts about his future work, only to conclude expectantly: '... und fast scheint es mir, nach allem, was ich durch Sie, liebe Gräfin, weiß, und nach dem, was ich darüber hinaus ahnend empfinde, als müßte Baron Uexküll mir, wenn wir einander im Sommer begegnen, der Rater und Helfer werden, auf den ich mit allem Meinen warte' (Rilke 1939: 71). During Rilke's stay at Friedelhausen from 28 July until 9 September, he met Uexküll and, in the judgement of Gudrun von Uexküll, the poet and the biologist 'fanden einander bald auf der Ebene der rechten Betrachtung der Natur und des "richtigen Sehens"' because both men shared 'die Gabe der Beobachtung und des bildhaften Sehens' (Uexküll 1964: 56, 129). They also immersed themselves in philosophy and regularly met to study Kant together: 'und der Nachmittag brachte unsere Kant-Stunde, die am letzten Tage auch das Buch zu Ende führte, das wir uns vorgenommen hatten' (Rilke 1939: 85). The Rilke-Archiv in Gernsbach has a copy of the second edition of Kant's *Kritik der reinen Vernunft*, edited by Karl Kehrbach, which contains markings up to page 120 and the following dedication: 'Zur Erinnerung an die Kantstunden in Friedelhausen, Aug. 1905 Jacob Uexküll' (Rilke 1993: 368). According to Gudrun von Uexküll, her husband *stimulated Rilke's interest* in biology during their time at Friedelhausen (Uexküll 1964: 129). In going *ad fontes* to study Kant, he is certainly more conscientious than the aesthete and intellectual Hugh Ledwidge in Aldous Huxley's *Eyeless in Gaza* (1936), who recommends the woman he adores to skip Kant's original work and instead read Uexküll's *Theoretische Biologie* (1920b):

'I won't inflict Kant on you', said Hugh indulgently. 'But I think ... you'll have to read one or two of the modern Kantians. Vaihinger's *Philosophy of As If*, for example, and von Uexküll's *Theoretical Biology*. You see, Kant's behind all our twentieth-century science. Just as Newton was behind all the science of the eighteenth and nineteenth ...' (Huxley 1936: 189–190)

Besides avoiding the difficulties of Kant's work, reading Uexküll in English translation had an additional advantage. When Gudrun von Uexküll told her husband that she found the English edition of

Theoretische Biologie much easier to understand, he replied: 'Nun ja, die englische Sprache zwingt eben zur Vereinfachung' (Uexküll 1964: 134).

'Biologische Briefe'

Rilke's correspondence testifies to his enduring if amateurish interest in science. From 1905 on, the Uexkülls and Rilke exchanged many letters, they sent him one or the other book, and he dedicated his *Cornet* to Gudrun and the memory of her mother (Schnack 1990: 260). In these letters, Rilke rarely alludes to Uexküll's theories. Neither does Uexküll, when he reminisces about Rilke's visit much later in *Niegeschaute Welten* (Uexküll 1957: 155–158). In a letter of 19 August 1909 to Uexküll, Rilke replies to critical remarks his correspondent must have made in a previous communication (Rilke 1991, 1: 329–230). Apparently, Uexküll, who was fond of the *Stundenbuch*, had criticized the newly published *Neue Gedichte* (1907–1908). It is probably he whom Rilke refers to in a previous letter to one of his aristocratic friends: 'In den letzten Wochen hab ich mehrere Briefe bekommen, zufällig, drin halbnahe Menschen an meinen letzten Arbeiten rücken und tadeln und mich warnen vor Kälte, vor Künstlichkeit ...' (Rilke 1991, 1: 327; cf. also 2: 515). In his letter to Uexküll, Rilke rebuts the criticism and defends the 'harte Sachlichkeit und Ungefühlsmäßigkeit des Dargestellten' as his personal way of writing:

Es kann im Schrecklichen nichts so Absagendes und Verneinendes geben, daß nicht die multiple Aktion künstlerischer Bewältigung es mit einem großen, positiven Überschuß zurückließe, als ein Dasein-Aussagendes, Sein-Wollendes: als einen Engel. An diese Verwandlung haben Sie beim 'Stunden-Buch' geglaubt, Sie haben sie eingesehen; in den letzten Büchern aber, darin Der nicht genannt ist, um dessentwillen sie geschieht, möchten Sie dazu hinneigen, für ein Spiel zu halten, was immer dieselbe große Not ist; und was darum recht haben muß ... (Rilke 1991, 1: 330)

However, mutual respect for the other's taste prevailed, and a day later Rilke receives from Uexküll 'einen seiner schönen Briefe, der ganz nur vom Requiem handelt; nun wünsch ich mir, ich könnte es einmal von seiner Stimme gesagt hören, die wunderbar diejenigen Gedichte, von denen er überzeugt ist, zu tragen weiß' (Rilke 1909b). Notwithstanding their different ideas about poetry, Rilke assures Uexküll in his reply that he welcomes the 'herzliche Aussprache und Zustimmung' and is glad 'daß wir einander gleichwohl im Augenblick erreichen und geistig begegnen konnten' (Rilke 1909a). His interest in biology persists and he continues to rely on Uexküll as a guide. A letter to Lou in June 1909 records

his reading of Xavier Bichat's *Recherches physiologiques* (a marked copy is preserved — Schnack 1990: 329). In 1912 he writes to Gudrun von Uexküll about his desire to meet them again and to read her husband's *Umwelt und Innenwelt der Tiere* (1909) together with him, because 'allein ist's zu schwer für mich, zu sehr ohne Anschluß, gemeinsam wärs ungeheuer nahrhaft (wie vor Zeiten der Kant)' (Rilke 1912).³ In 1914, Rilke writes to Elisabeth von der Heydt to thank her for a book she had sent him at Uexküll's request:

Kam denn das Buch von Ihnen? Kam es von Uexküll? Gleichviel, wenn ich auch jetzt noch nicht dazu komme, ich seh voraus, daß es mich sehr beschäftigen wird, mehr daß es in mich eingreifen wird wie etwas, was zu seiner Zeit hereinwirkt und recht hat, und dann versteh ich überhaupt, wie ichs nur aufschlage, daß es eine große Sache ist. Vielleicht kann einem etwas derartig Gewußtes und Lauteres den mächtigsten Dienst thun, in einer Zeit, die mich immer mehr anmüthet ... als wäre man beständig bei Wertheim und träte von einer rotierenden Treppe auf die andere. (Rilke 1986: 194)

The book that prompted such a positive response was Uexküll's *Bausteine zu einer biologischen Weltanschauung* (1913a) — of all his books probably the favorite with authors, as we shall see. It was also, it appears, delightful bedtime reading, since Frau von der Heydt remarks in her reply to Rilke's letter that she enjoyed it 'in drei Nächten ganz besonders' (Rilke 1986: 393).

In 1921 Rilke wrote to the Swiss zoologist Jean Strohl to express his regret at not being able to attend a lecture by Uexküll in Zürich, 'dont la présence eût évoqué tant de souvenirs d'autrefois' (Rilke 1921). Rilke had met Strohl in 1920 and they remained friends until his death. Occasionally, Rilke touched on scientific matters in his letters to Strohl to ask for advice or a book (again a result of Rilke's desire to have a 'guide' for science). He expresses his interest in Flammarion, Vaillant, and Duhem's 'Histoire des Sciences' (Rilke 1920); he is charmed by the 'tact parfait' of Albert Einstein, whom he regards as 'plein de mesure et d'équité', and acknowledges the 'très-belle victoire' for Einstein's discoveries (Rilke 1992: 381). In 1922, Rilke writes to Strohl that he would like to keep Uexküll's *Biologische Briefe an eine Dame*, which he had borrowed from him, a bit longer because 'je ne me suis pas encore occupé assez tranquillement' (Rilke 1992: 381). The title of this series of articles alludes to the popular epistolary form, which was often used in the eighteenth and nineteenth centuries and was aimed at educated ladies like von der Heydt. (Even if he had conformed to the conventions of the genre — which he did not — Uexküll would not have been the first one to write letters about science: in 1848 Carl Bischof published the first

volume of his *Populäre Briefe an eine gebildete Dame über die gesamten Gebiete der Naturwissenschaften*.) In 1917, Rilke had devoted a great deal of time to studying a 'biologisch bedeutender Aufsatz' in the *Neue Rundschau*; the article in question is 'Der Einzelne und das Erlebnis' by Adolf Koelsch, a science writer, whom Rilke later met on several occasions (cf. Schnack 1990: 572, 648, 663). As a result of reading Koelsch's article, Rilke wrote to Uexküll for advice regarding biology:

... so herzlich entzückt über einen Aufsatz von Adolf Koelsch in der Rundschau! Er scheint mir neben Ihren Schriften das schönste, was über verwandte Gegenstände geschrieben worden ist ... Wie beglückend wäre es, bei dieser Wissenschaft in die Lehre zu gehen, gerade für mich und erst recht in einer Zeit, da das öffentlich Menschliche in so böser Gärung aufgegangen ist. Ob unsereins wohl einen näheren Zutritt sich erringen könnte? Hätten Sie einen Rat für mich, der mich zu einer tätigen Berührung und Befreundung mit den Gegenständen dieser köstlich jungen Biologie anwiese, oder mindestens mich zu einem besseren Leser machte, als ich bisher in diesem Fach gewesen bin? Ich kann keine Arbeit auf diesem Gebiet lesen, ohne ein Gefühl unerhörter Versäumnis. Denn es geschieht jetzt wohl nirgends mehr, und nirgends bringt die einfache, reine Beobachtung Tatsachen an den Tag, die so wie sie sind, den tiefsten Begegnungen entsprechen, die je durch das Gemüt der Menschheit gegangen sind ... Was für ein Vorzug übrigens für eine Wissenschaft, keinen behäbigen Apparat aufzuregen, in jeder Entdeckung noch ganz zu sein, zu jedem Funde sich gleichsam mit ihrem ganzen jungen Körper zu bücken ... Ich habe mir den anderen früheren Essay, auf den Koelsch selbst hinweist, heute gleich bestellt. Was aber gibt es Neues von Ihnen? Es könnte sein, daß ich vieles übersehen habe. (Uexküll 1964: 129–130)

What is particularly interesting here is Rilke's emphatic embracing ('herzlich entzückt', 'beglückend', 'Befreundung') of the 'köstlich junge Biologie', which he wants to get actively involved with — or at least he would like to become a better reader in this field. His emphasis on the fruitfulness of 'einfache, reine Beobachtung' highlights one of the most important features of this new ethological biology: the principle of *Anschaulichkeit*, which Rilke had so far failed to find in science. Consequently, this time Uexküll's reply to Rilke is more favorable:

Der Kampf der Geister hat begonnen ... In diesem Kampf wird die Biologie die Führerin sein, weil sie den Kampf mit Physik und Chemie aufnehmen muß, die bisher die Rüstkammer der Menschen füllen. Und der Monismus war das Feldgeschrei jener Menschen, die alles Geistige, Künstlerische nur als Genußmittel gelten lassen, das man erkaufen kann. Den Aufsatz von Koelsch kenne ich nicht ... aber daß Sie ein hervorragendes Talent für Biologie und speziell für die vergleichende Psychologie besitzen, haben Sie in Ihrem Gedicht 'Der

Panther' bewiesen. Die Beobachtung, die Sie dort entwickeln, ist meisterhaft. Vielleicht versuchen Sie es, einen Philosophen von der psychologischen Schule zu hören — aber ich glaube, Sie sind bereits zu sehr Meister, um noch Schüler zu sein. (Uexküll 1964: 132)

Poetry as biology

It may be no coincidence that Rilke was so fascinated by Koelsch's article when he was re-reading Goethe at the same time (cf. Schnack 1990: 572). Keen observation and 'Anschauung' (or simply 'Schauen') were the cornerstones of Goethe's scientific method, and they also informed his artistic principles. In her study of the phenomenological structure of Rilke's poetry, Käte Hamburger remarks that 'das Schauen, auch das Anschauen gewinnt den Charakter eines Grund- und Schlüsselworts, die Bezeichnung einer als dominierend empfundenen Bewußtseinsstellung' and links it to Husserl's phenomenology (1971: 86). This explains why Uexküll's biology was so attractive for Rilke — both the writer (in Rilke's understanding, that is) and the biologist are attentive observers of life, recording the movements of humans and animals in minute detail and fitting their observations into a phenomenological frame of thought.

For Rilke the presence of these qualities was evident in Rodin's 'tiefe Übereinstimmung mit der Natur' and his 'unfehlbare Kenntnis des menschlichen Körpers' (Rilke 1996, 4: 409, 411). Since Rodin's art is an important model for Rilke's poetry, it is worth taking a brief look at his description of the sculptor's technique, the more so because his first visit to Friedelhausen was at the time when he worked for Rodin and was still very much under the impression of his experiences with the master (Uexküll 1964: 127). In a vein similar to Huxley's criticism of the enduring topos of the nightingale, Rilke states that art as a 'gewissenhafte und gläubige Auslegung des Lebens' (1996, 4: 417) had to avoid the conventional representationalism 'der Modelle, der Posen und der Allegorien, das leichte, billige und gemächliche Metier, das mit der mehr oder weniger geschickten Wiederholung von einigen sanktionierten Gebärden auskam' (415). Rodin's aim is to capture the 'Fülle von Leben' (415) in his subjects and convey it with 'Stärke des Ausdrucks' (432). Instead of pointing a finger at meanings outside the object's realm (as in the *signatura rerum* of Baroque art), Rodin conveys his sculptures' relation to their environment infinitely more subtly.⁴ In order to do this, a close observation of the sensual characteristics of an object's surface is essential insofar as this surface is an expression ('Ausdruck') of laws

inherent in the object. As the following passage shows, this not only extends to principles of growth and structure, but also to spiritual qualities:

Aber lassen Sie uns einen Augenblick überlegen, ob nicht alles Oberfläche ist was wir vor uns haben und wahrnehmen und auslegen und deuten. Und was wir Geist und Seele und Liebe nennen: ist das nicht alles nur eine leise Veränderung auf der kleinen Oberfläche eines nahen Gesichts? Und wer uns das geformt geben will, muß er sich nicht an das Greifbare halten, das seinen Mitteln entspricht, an die Form, die er fassen und nachfühlen kann? Und wer alle Formen zu sehen und zu geben vermöchte, würde der uns nicht (fast ohne es zu wissen) alles Geistige geben? ... Denn alles Glück, von dem je Herzen gezittert haben; alle Größe, an die zu denken uns fast zerstört; jeder von den weiten umwandelnden Gedanken — : es gab einen Augenblick, da sie nichts waren als das Schürzen von Lippen, das Hochziehn von Augenbrauen, schattige Stellen auf Stirnen (458)

By concentrating only on what is actually visible, the artist tries to avoid the compromised perception that working with preconceived notions about his subject would entail. The highly concentrated and watchful gaze does not try to see something into an object ('an das Greifbare halten!') or to superimpose an artificial representation on its natural appearance. Just like a behavioral zoologist, the *Dingdichter* tries to be as detached and objective as possible and takes only his observations as a basis for conclusions about more general phenomena — though they are, it has to be said, different in that the poet can still make use of poetic licence if desired. Just as in the case of Goethe's *ideelle Gestalt*, which is not a mere theoretical idea divorced from all material basis, the visual and palpable appearance of things for Rilke remains an important feature because it is, as it were, the window through which we can with our senses perceive their nature. This is also important with regard to technique, since the poems have to make these things visible before our eyes again — just as Rodin's sculptures do.

Rilke's poem 'Der Panther' is an interesting example of physiologically accurate observation and its poetic application:

Im Jardin des Plantes, Paris

Sein Blick ist vom Vorübergehn der Stäbe
so müd geworden, dass er nichts mehr hält.
Ihm ist, als ob es tausend Stäbe gäbe
und hinter tausend Stäben keine Welt.

Der weiche Gang geschmeidig starker Schritte,
der sich im allerkleinsten Kreise dreht,

ist wie ein Tanz von Kraft um eine Mitte,
in der betäubt ein grosser Wille steht.

Nur manchmal schiebt der Vorhang der Pupille
sich lautlos auf — . Dann geht ein Bild hinein,
geht durch der Glieder angespannte Stille —
und hört im Herzen auf zu sein. (1960: 505)

The panther is not portrayed in the traditional fashion of a gloriously mighty and dangerous animal, as for instance in Blake's 'The Tyger'. These qualities are, nevertheless, evoked by the suggestion that they are absent or paralyzed because the panther's will is 'numbed'. The panther's natural habitat — the wide hunting-grounds it used to roam in search of prey and to which its sense-apparatus is perfectly adapted — is replaced by the bars of the cage which now confine not only the panther's physical but also its perceptual space ('und hinter tausend Stäben keine Welt'). Forced to exchange the vast forests of its natural habitat for the narrow confines of a cage in the zoo, the panther's perception gradually deteriorates and the animal becomes indifferent. The artificiality of its prison environment is aptly described in the image of an abstract world of bars behind which nothing is to be found. The enormous physical potential of power and grace ('Tanz von Kraft') is paralyzed because the panther's 'will' is numbed. All this is evoked with a naturalistic detail and accuracy of observation that has found the approval of zoologists such as Uexküll or Hans Mislin, who writes:

Das Pantherwesen ist sowohl konkret, sensuell-motorisch, wie archaisch-symbolisch erfasst. Die Bewegung des Panthers ist physiologisch und physiognomisch bis in die Einzelheiten des Muskeltonus registriert. Augen- und Pupillenmimetik werden im sinnesphysiologischen Zusammenhang gesehen, in echter Ganzheitsforschung verfolgt. Tatsächlich wird alles am Panther, was den Naturforscher fesselt und bewegt, verbucht. (Mislin 1974: 48)

At the time Rilke wrote the 'Panther', he was regularly and 'mit ziemlichem Eifer' attending lectures in anatomy at the *École des Beaux-Arts*: 'wobei mich nicht so sehr das vielfältige Geflecht der Muskeln und Sehnen oder die vollkommene Verabredung der inneren Organe anzusprechen schien, als vielmehr das aride Skelett, dessen verhaltene Energie und Elastizität mir damals schon über den Blättern Lionardos [sic] sichtbar geworden war' (Rilke 1996, 4: 700). It is interesting to note how the keen observation that Rilke developed during his time with Rodin and through his studies at the *École des Beaux-Arts* informed his perception of animals to a degree that won him laurels from these

biologists. His example shows how artistic perception and scientific knowledge are not necessarily disparate areas of training and practice, but (as in the case of Leonardo) can benefit from and complement each other. Though it would be nice to attribute this achievement to Rilke's acquaintance with Uexküll, this cannot be the case. The poem was written during Rilke's first months in Paris (18 August 1902 to 1 July 1903) and published in 1903 (cf. Rilke 1996, 4: 933). However, even though we are unable to show an explicit genetic relation between Uexküll's *Umweltlehre* and Rilke's 'Panther', a 'biological' reading of the poem in the light of Uexküll's ideas reveals striking similarities between poetic and ethological views of animal behavior. Thus, in Rilke's poetry we seem to have a case of what Michael Titzmann called a 'pre-theoretical form of cultural knowledge' that as yet has not found its way into the officially sanctioned theoretical discourse of science because it is at odds with the basic premises and methods this discourse currently works with (Titzmann 1989). According to Titzmann, such pre-theoretical knowledge already articulates an intuitive understanding that will later be established explicitly and systematically in a new scientific discourse. In Rilke's case this new discourse is the science of ethology (inspired by Uexküll and developed by Lorenz) that Aldous Huxley praised as an inspiration for writers! David Lavery goes as far as attributing 'an ethologist's sensitivity to the Umwelten of living creatures' to Rilke and concludes that 'in the work of Rilke, poetry becomes a kind of ethology' (1987: 65).

Der Ball

DU Runder, der das Warme aus zwei Händen
im Fliegen, oben, fortgiebt, sorglos wie
sein Eigenes; was in den Gegenständen
nicht bleiben kann, zu unbeschwert für sie,

zu wenig Ding und doch noch Ding genug,
um nicht aus allem draußen Aufgereihten
unsichtbar plötzlich in uns einzugleiten:
das glitt in dich, du zwischen Fall und Flug

noch Unentschlossener: der, wenn er steigt,
als hätte er ihn mit hinaufgehoben,
den Wurf entführt und freiläßt —, und sich neigt
und einhält und den Spielenden von oben
auf einmal eine neue Stelle zeigt,
sie ordnend wie zu einer Tanzfigur,

um dann, erwartet und erwünscht von allen,
 rasch, einfach, kunstlos, ganz Natur,
 dem Becher hoher Hände zuzufallen. (1960: 639–640)

An example of pre-theoretical intuition is Rilke's precise distinction between a mere *Gegenstand* and the *Ding*. The latter is characterized by its specific mode of being (Seinsform) which allows it, as in the poem 'Der Ball', 'in uns einzugleiten' or to become 'innig' as it says in the *Duineser Elegien*. In Dieter Lamping's words, it is the aim of the *Dinggedichte*, 'solche "innige" Verwandtschaft oder Ähnlichkeit zwischen Mensch und Ding jeweils aufzuspüren' (1991: 27–28). Thus, what constitutes a *Ding* as opposed to a *Gegenstand* is its relation to the observer, who plays with the ball and thereby defines its *Dinglichkeit* by placing it, technically speaking, in a perceptual, functional context as a thing. Käte Hamburger points out 'wie das Wesen Ball, das noch nicht allein dadurch bestimmt ist, daß er rund ist, sich erst im Ballspiel offenbart' (1976: 32). The functional distinction between thing and object is, if slightly differently, endorsed by Uexküll in 'Biologische Briefe an eine Dame' (1919). In the first five letters of this series, Uexküll explains how the apperception of sound, color, time, space, and *Gestalt* works. He then goes on to show how physical and physiological conditions impinge upon the Umwelt that is perceived by a creature. The incoming sense data are first ordered into objects with distinctive qualities such as sound, smell, color, etc. But apperception does more: it also categorizes objects according to their functionality, or 'Gegenleistung'. Thus, a car serves as a driving device, a chair as a seating device, etc., and Uexküll, therefore, calls them 'Gegenstände' rather than mere 'Objekte' which exist independently of human beings. He points out that a naive observer is unlikely to make a clear distinction between 'Objekt' and 'Gegenstand' and tends to anthropomorphize:

Für ihn sind alle Objekte Gegenstände, da er sie nur in ihren Beziehungen zu den Menschen betrachtet ... Erst die wissenschaftliche Betrachtung der Dinge, die von diesen Beziehungen absieht, zeigt uns, daß es im Gegensatz zu unseren Gebrauchsgegenständen, die ohne den Menschen gar nicht existieren können, auch noch Objekte gibt, die ein eigenes Dasein führen, das vom Menschen ganz unabhängig ist. Von den Objekten gehen wohl verschiedene Wirkungen aus, die sich aber zu keiner einheitlichen Wirkung vereinigen und daher weder Leistungen noch Gegenleistungen genannt werden können. (1919: 143)

Rilke places the ball in a human context, but he does not anthropomorphize it. In fact, he avoids that precisely by exploring the movements of the ball through and beyond our perception, showing its

functional relation to the thrower's Umwelt and its departure from the ballplayer's subjective universe ('der, wenn er steigt,/als hätte er ihn mit hinaufgehoben,/den Wurf entführt und freiläßt'), abstracting qualities of movement into new sensations ('und den Spielenden von oben/auf einmal eine neue Stelle zeigt'), and finally returning to common, 'naive' conceptions we all rely on when playing ball games ('und dann, erwartet und erwünscht von allen,/rasch, einfach, kunstlos, ganz Natur,/dem Becher hoher Hände zuzufallen.'). Thus, for the short moment the ball is suspended in the air and freed from immediate 'Gegenleistung', it shows 'eine neue Stelle', the actual *Dinglichkeit* of its own being. Rilke's poem shows the ball's relation to the ballplayer's subjective *Merkwelt* and the objective *Wirkungswelt* of nature they are both part of. This overlapping of subjective and objective spheres applies to the poem itself too, if it is understood as a poetological statement as in Judith Ryan's comment: 'Das Kunstwerk ist nämlich nicht nur ein Produkt der Subjektivität, sondern gleichzeitig auch eine Manifestation der Natur selber. In der simultanen Verwandlung von Subjekt und Objekt kommt die Natur erst zu sich selber' (1972: 48). The unprejudiced concentration on individual subjects (*Subjekte*) and their relation to their peculiar environment is Uexküll's main challenge to traditional biology. Similarly, from his time in Worpswede on, Rilke tries to focus on the single thing: 'Immer schienen die Dinge mir wie Arme und Enden, zusammenhängend mit dem großen Körper der Erde; hier aber gibt es viele Dinge, welche inselhaft sind ...' (Rilke 1942: 223).

Since human ideas about animal behavior are often misguided and anthropomorphic, Uexküll goes on in 'Biologische Briefe', we need to focus on the animals' sense perception. We can observe that certain properties of the environment act as *Merkmale* to certain animals (those characteristics of an object which act as stimuli in the animals' sensory apparatus), but we do not know anything about their feelings:

Das Gemütsleben der Tiere, das uns die Dichter so anmutig zu schildern verstehen, weil sie sich in die Seelen der Tiere hineinversetzen, bleibt dem beobachtenden Naturforscher verschlossen, der nur das, was seinen eigenen Sinnen zugänglich ist, erforschen kann und sehr wohl weiß, daß ihm andere Empfindungen als seine eigenen keine Erfahrung jemals wird lehren können. Um das Subjekt Tier in dem Teil seiner Außenwelt, mit dem es allein in Beziehung steht, und den ich seine 'Umwelt' nenne, zu untersuchen, stehen dem Biologen sowohl die physikalischen Faktoren der Außenwelt wie die physiologischen Faktoren des Tierkörpers zur Verfügung; auf den psychologischen Faktor muß er verzichten. (1919: 144)

Uexküll then draws up a *Situationsplan* of the animal in its environment: the central nervous system in its center consists of a *Merkorgan*

(the nervous center) for receiving stimuli via the sense organs) and a *Handlungsorgan*, which transmits signals to the *Effektoren* that are responsible for bringing about a reaction. Both *Merkorgan* and *Handlungsorgan* are connected through the *Steuerorgan*, and all together form the *Innenwelt* (inner world) of the animal. The *Außenwelt* (exterior world) contains *Merkmalsträger* — objects or living beings that have a mutual relation to the animal as a) *Merkmale* which are perceived by the sensory organs, and b) objects that are ‘treated’ by the effectory organs of the animal. When an animal receives stimuli from certain characteristics of objects in its environment, this information is processed within the animal’s *Innenwelt* and then emerges again as (re)action with consequences for the *Außenwelt*. If we apply this terminology to Rilke’s ‘Der Panther’, we can immediately see how the paralysis of will in the Panther’s *Innenwelt* is affected by a lack of appropriate stimuli it receives from the *Außenwelt*. With the ‘großer Wille’ Rilke poeticizes and mythicizes a function that, in physiological terms, is equivalent to that of the central nervous system, which cannot process any relevant information and, therefore, spins around itself just as the panther turns around in circles under the impression of the seemingly endless line of bars that make up its new *Umwelt*. The bars as *Merkmale* have a different function for different creatures in their respective *Umwelten*; in the case of the panther, the human visitors to the zoo surely perceive the bars as a secure means of separation from the dangerous animal. But there is no word about that other *Umwelt* which the poet as observer actually inhabited while he was watching the panther — Rilke tried to completely put himself in the panther’s *Umwelt*.

According to Uexküll, the result of an animal’s interaction with its environment is always the disappearance or transformation of a *Merkmalsträger* from the animal’s *Umwelt* — the prey is either devoured or manages to flee (1919: 145). This full interaction is not possible in the case of Rilke’s panther, as the world around it does not show any signs of change or diversity; nor is it possible for the predator to follow its instinct to kill. The hapless state of the animal is emphasized by the fact that it does not even perceive the omnipresent bars as static any longer, but as if they were moving: in the first line of the poem it is the bars which are passing by, and it is thus clear that the tiring effect upon the gaze of the panther is not really caused by its restless movement but in effect by the endless monotony of the *Merkmale* it perceives — i.e., by its environment.⁵ For Uexküll, the animal and its *Umwelt* are inextricably linked through the *Funktionskreis* of perception and reaction, and both form an entity which is separate from the other *Umwelten*. He compares the extent of the animal’s *Umwelt* to an eggshell that marks the confines

of its *Außenwelt*:

Innerhalb der Eierschale befindet sich das Tier rings umgeben von seinen Merkmalsträgern, mit denen es durch seine Funktionskreise verbunden ist. Während des Ablaufs seines Lebens kommt das Tier mit immer neuen Merkmalsträgern in Berührung, die seinen Lebensweg nicht bloß umzäunen, sondern nach allen Seiten hin abschließen. Dadurch dehnt sich die Umwelt immer weiter aus und wird zu einem Tunnel, der das ganze Leben einschließt. (1919: 146)

If we apply this model of animal life to Rilke's panther, it highlights the wretchedness of the creature's cruel imprisonment in the cage. Looking at it from the point of view of *Umwelt*, it becomes clear that, though the panther may be fed well and be in good health, its organism does not work at all since it lacks its corresponding *Umwelt*. Through its forced dislocation, the panther's organism is virtually deprived of any meaningful operation, i.e., a mode of behavior that allows it to interact with its environment in the way that its body is designed for. Even if a 'Bild' enters through its sensory organs, it quickly vanishes without a trace: 'der Glieder angespannte Stille' suggests that there is no reaction caused in the functional cycle. Only in the last stanza does Rilke come near to the 'Gemütsleben der Tiere' Uexküll associated with animal poetry; but even this trace of emotion is annulled as the 'Bild' leaves no trace in the heart either.

Rilke's concentration on the physiological 'point of view' of the animal is a significant change from the anthropocentric perspectives and analogies normally employed in poetry dealing with animals. It is not the relation between observer and animal which is the poem's theme (as might be expected in a poem set in a zoo); the description concentrates entirely on the creature's existence itself in that specific situation. From this arise possible consequences for the reader who is presented with the strange and uncommon *Umwelt* of the panther for the first time. Instead of superimposing anthropocentric standards of reference on the panther to illustrate a human problem 'in a different light', the reader may compare his experience in the zoo with that of the animal and consider possible similarities with his own situation. Instead of alienating the reader from the panther, the accurate evocation of the animal's strange *Umwelt* has the opposite effect of familiarizing the reader with a different world — without making this world artificially human. Instead of merely looking at his own mirror-image in an object or animal, Rilke wants real progress of knowledge in the terms he describes in his poem 'Fortschritt':

Immer verwandter werden mir die Dinge
und alle Bilder immer angeschauter.

Dem Namenlosen fühl ich mich vertrauter:
 Mit meinen Sinnen, wie mit Vögeln, reiche
 ich in die windigen Himmel aus der Eiche,
 und in den abgebrochnen Tag der Teiche
 sinkt, wie auf Fischen stehend, mein Gefühl. (1960: 402)

The poet wants to understand the ‘Naturdinge’ in their own right. The scientist and the poet here have something else in common: neither is narcissistic. The lyrical persona constitutes itself not through reflection in a pond, it sinks into the phenomena it observes. The highly developed and versatile sensory organs of the poet explore the Umwelten of different animals with the aim of becoming part of that environment in the course of writing. Uexküll’s *Umweltlehre* and modern ethology rest on similar principles: understanding through detached observation is a universal tenet of modern science. In contrast to the physicist or chemist, however, the ethologist has to put himself in the place of the animals he observes — sometimes quite literally by disguising himself for close-up observation, sometimes by trying to think in terms of ‘their world’ in order to understand their behavior and not apply human standards. The difference between humans and animals that this approach brings to light also points to what they have in common. Konrad Lorenz begins the first chapter of his study on aggression with a description of himself snorkelling in the sea:

Dabei bewege ich mich nicht, wie der philisterhaft auf seine Würde bedachte Mensch es sich schuldig zu sein glaubt, mit dem Bauch voran und dem Kopf nach oben, sondern in der durch uraltes Herkommen geheiligten Wirbeltierhaltung mit dem Rücken zum Himmel gewendet und mit dem Kopf nach vorn. Will ich vorwärts schauen, so werde ich durch die Nackenbeuge daran erinnert, daß ich eigentlich Bewohner einer anderen Welt bin. Ich will dies aber gar nicht, oder doch nur selten, vielmehr ist mein Blick, wie das dem irdischen Forscher ziemt, meist abwärts, auf die Dinge unter mir gerichtet. (1998: 11)

The common evolutionary ancestry is a bond between humans and animals as is their dependence on biological diversity and an intact natural environment. History offers us numerous examples of species which were extinguished wilfully or because the conditions for their survival had been adversely affected. With regard to these issues, Aldous Huxley’s call for a literature expressing simultaneously the truth about animals as they exist in their world, and the truth about the human beings who watch them is all the more topical. The poet Rilke and the biologist Uexküll can be seen as two congenial artists evoking the *niegeschauten Welten* that surround us.

United against mechanism? The Baron's biology and the avant-garde

The 'Schlacht der Weltanschauungen'

In the hotchpotch of ideas that were discussed in intellectual circles around the turn of the century, scientific theories had a prominent place. Above all, Darwinism and its ideological offshoots were issues whose consequences for politics, society, religion, and art were hotly debated. The Naturalist movement in literature (Hauptmann, Holz, Schlaf) had exploited its ideological potential for their social criticism by espousing the importance of *Milieu* on human behavior. Stylistically, the Naturalists used realistic methods and subjects to convey the belief that everything in nature is causally linked and determined by its position in a universal pattern of dependence. A letter from Arno Holz illustrates the almost religious fervor with which the Naturalists followed Darwin:

Ich huldige der neuen Lehre Darwins und schrecke vor keiner ihrer Konsequenzen zurück; die ja auch keineswegs für einen denkenden Menschen entmuthigender sind — im Gegenteil! Diese neue Religion — denn das ist sie bereits — versöhnt uns mit uns selbst und der Natur und macht den schwarzgalligen Pessimismus, an dessen Wurzeln noch keine der bisherigen Religionen die Axt anzulegen vermochte, geradezu unmöglich. Denn sie weist mit mathematischer Unfehlbarkeit nach, daß alles, was heute *ist*, einst unvollkommener existiert hat und ergel Anspruch und Aussicht darauf hat, sich in Zukunft noch weit höher zu organisieren. (cited in Scheuer 1971: 40–41)

Thus, Darwin's theory was interpreted teleologically as a theory of progress which could be adapted to social and political programs. Furthermore, it could help to overcome the frightening idea of a cold and soulless universe put forward by late nineteenth-century physics, and to reconcile man with nature. The Naturalists for their own part believed in man's control over nature, human perfectibility, and scientific progress to such an extent, that they even proclaimed the application of science to poetry (Bölsche 1887). The new view of Nature emerges most fully from the pantheistic Monism of the turn of the century, of which Ernst Haeckel's illustrated book *Kunstformen der Natur* is an example (cf. Kockerbeck 1986). Haeckel was one of the most ardent advocates of Darwinism in Europe, and his messianic aspirations went beyond scientific explanation towards a more integrated knowledge of life based on its material aspects. Consequently, instruction and edification are both aims of Haeckel's popular works and indicative of the way he anthropomorphizes Nature in an evolutionary aesthetics influenced as much by *Jugendstil* as *Jugendstil* was influenced by it. Artists copied Haeckel's depictions of

medusae, jellyfish, and polyps not only for reasons of form (line and ornament); the Darwinian exploration of our animal ancestors served a specific human curiosity about origins, as Ernst Michalski states: 'Man wollte das Leben auf seinen niedersten Stufen, an seinen Quellen erhaschen' (1971: 15–16). The organic biological idyll of the sea was recreated on the new exciting level of marine microorganisms. For the enchanted viewer this was, as it were, a return from the cold and soulless universe to the warm pond, the womb of creation. 'Leben' and 'Einheit'. The pictorial and descriptive material provided by popular science was a welcome occasion for *Kleinbürger* and artists alike to fraternize with our primeval ancestors.

This is where Uexküll comes in, criticizing the deliberate anthropomorphism inherent in such a view and attacking the 'zersetzenden Einfluß des Haeckelismus auf das geistige Leben' (1907: 646). In the romantic tradition he styled himself as a champion of a particular brand of 'idealistic' biology against Haeckel's 'typically short-sighted' materialism, and in a series of remarkable counter attacks he joined the 'Schlacht zwischen Physik und Biologie' (Uexküll 1913b: 1089, 1084). Haeckel's materialistic world-view suggested for him that the heavens were a 'sinnlose Sternmaschine', a lifeless mechanical apparatus (which in a remarkable neologism he also termed 'Gorillamaschine') ruled by forces such as the 'Formelgottheit Einsteins' (Uexküll 1926: 236–237). The reach of his popular writings was wide: between 1907 and 1915 he published nearly a dozen articles in the *Neue Rundschau* — a journal widely read by intellectuals and artists such as Thomas Mann, Kafka, Rilke, and many others — and from 1915 on he wrote more than twenty pieces for the slightly more conservative *Deutsche Rundschau*. The articles in these two journals are likely to be the main source of Uexküll's influence on art, and two of them are of particular interest in a cultural context: 'Die Umriss einer kommenden Weltanschauung' (1907) and 'Die Aufgaben der biologischen Weltanschauung' (1913a). These articles were written in a formative period of Uexküll's biological thought which led to the publication of his influential book *Bausteine zu einer biologischen Weltanschauung* in 1913. In the first of these articles, Uexküll distinguishes dualism and monism as philosophical systems which make statements about the relation between the world of objects (*Körperwelt*) and the world of the mind (*Geisteswelt*). Of the two, monism can take the shape of materialism or idealism. He then awards the 'Meisterschaftspreis menschlicher Weltanschauung' to idealism, whose role for the 'Geistesentwicklung der Menschheit' he emphasizes, and proposes an idealistic monism as the antidote to the newly reawakened materialism, 'der sich mit dem Löwenfell bekleidet hatte und sich als den neuen und einzigen

Monismus präsentierte' (Uexküll 1907: 641–643). According to Uexküll, physics and chemistry, which are purely quantitative sciences, and 'objective biology', which deals with the functional structure of organisms, have to be complemented by a new 'subjective biology', which focuses on the qualities and characteristics of objects and how they are perceived by an organism: 'Sie behandelt die uns nur durch persönliche Erfahrungen unseres Seelenlebens bekannten Qualitäten und ihre Umwandlung zu Gegenständen' (1907: 654). Stimuli are selected and regulated in a peculiar way by different organisms and even different individuals of the same group with the result that every individual has a peculiar perception of its environment. What is interesting in Uexküll's argument is his insistence on the cultural benefits of his *Weltanschauung*: it draws on the immense achievements of Kant's idealism, who showed that the mind ('Seele') was a wonderful, harmonious structure. Since the mind now plays an important role in the perception of ourselves and our environment, we find ourselves located again in a purposeful and harmonious natural context: 'Der Mensch und die ihn umgebende Natur bilden zusammen eine planvolle harmonische Einheit, in der alle Teile in zweckmäßiger Wechselwirkung stehen' (1907: 653). Through his subject-oriented conception of biology, Uexküll makes aesthetics (which derives from the word for the Greek 'perceiving') an important part of the knowledge we can gain about our purposeful existence in the universe: 'So entsteht im Menschen die feste, freudige Zuversicht, daß er für die Welt und die Welt für ihn da ist — ja, daß sie beide zusammen eine wundersame Einheit bilden, die er nicht versteht, deren Schönheit er aber empfindet. ... Überzeugung der eigenen Zweckmäßigkeit ist Glück und die empfundene Zweckmäßigkeit in der Umwelt ist Schönheit' (1907: 651). Uexküll sets out not to deny the factual accuracy of physics and chemistry, but to attack the materialistic world-view that is raised on their basis and which he sees as running counter to our personal interests and needs as individual human beings (1907: 653). Consequently, there is also a strong pedagogical impulse behind his theory: he sees *Bildung* — the 'planvolle Ausgestaltung einer Persönlichkeit' (1907: 647) — and individuation as the main aims of idealism that have to be defended against the intellectual and sensual impoverishment going along with materialism. He warns 'wie leicht die Umwelt, wenn sie nicht gepflegt wird, verkümmern kann, und deshalb ist die Lehre von einer einzigen Welt, in der es nur tanzende Atome gibt, so gefährlich, weil sie unser Anschauungsvermögen lähmt und unsere Umwelt verwüstet' (Uexküll 1913b: 1086). Since we 'create' our environment by reworking the stimuli we receive into notions of objects (a process Uexküll terms 'Gegenstandsbildung'), the fine tuning and training of these senses is paramount in developing

not only acute perception, but also a rich and diverse personality:

Wenn die Tätigkeit unserer Sinnesorgane erlahmt, so werden wir, wie allen bekannt ist, stumpfer und unbrauchbarer, weil wir die feineren Differenzen nicht mehr wahrzunehmen vermögen. Noch gefährlicher ist es, wenn die Gegenstandsbildung selbst vernachlässigt wird und wir uns mit dem Anklingen der Schemata beruhigen. Dann hören wir auf zu beobachten und begnügen uns mit dem bloßen Wiedererkennen. (Uexküll 1907: 660)

Uexküll's theory amounts to a creative ecology of the mind, which helps us to diversify our Umwelt through education and training. Our Umwelt is a living part of ourselves,

den wir nicht entwerten können, ohne selbst zu verarmen, den wir aber durch eigene Arbeit immer reicher und lebendiger gestalten können, der mit uns wächst und sich ausbreitet und fähig ist, immer erlesenere Gefühle in uns zu erwecken. (Uexküll 1913b: 1091)

In the second article on biological *Weltanschauung*, Uexküll continues his rescue of a meaningful human existence against the doctrine of the world as an aimless dance of atoms. An organism's functional integration into its environment is the evidence of nature's purposefulness, its 'extramaterial plan' (1913b: 1084). Uexküll's attacks on the number crunching of the materialists become more acerbic; he condemns their view that there is only one world, 'weil sie unser Anschauungsvermögen lähmt und unsere Umwelt verwüstet' (1913b: 1086). In contrast, his intellectual conservation ethic allows for both the materialistic outer world ('Wirkungswelt') and its meaningful appropriation through perception into an interior world, 'weil nur die Beziehung zum Subjekt den Dingen irgendwelchen Sinn verleiht' (1913b: 1087). Only the biological point of view enables us, Uexküll claims, to sustain notions such as meaning, morals, and aesthetics in the face of an ultimately meaningless causality of the material world:

Während in der kausalen Wirkungswelt allein das 'Muß' regiert, herrscht in der planmäßigen Umwelt das 'Soll'. In der Wirkungswelt gibt es bloß Ursachen, in der Umwelt Beziehungen. Nur die planmäßigen Dinge sind fähig, ästhetische und moralische Gefühle in uns zu erwecken. Diese ganze Seite des menschlichen Lebens spielt sich nur in der Umwelt ab. (1913b: 1084–1085)

Thus Uexküll effectively 'cultivates' nature in that he (admittedly and openly) endows it with meaning, and he creates an interesting variation on Heinrich Rickert's neo-Kantian writings about *Kulturwissenschaft und Naturwissenschaft* (1899), working on the borderline between nature and culture which has occupied cultural theorists ever since. In the face of

a universal materialism which ultimately denies all human achievements such as the family, the state, and the *Volk*, biology is the savior of culture and meaning:

Wo die Wirkungskwelt die Umwelt verdrängt, wo physikalische und chemische Kräfte unumschränkt walten, entsteht notwendig das Chaos. Deshalb wirkt es wie eine Erlösung, wenn man sein Auge von der Physik ab und der Biologie zuwendet, denn sie allein ist fähig, uns aus der drohenden Hölle von Langeweile und Roheit zu retten, indem sie das häßliche Phantom der Atomwelt zerstört und uns lehrt, daß nicht nur wir selbst eine eigene farbige, tönende, duftende Umwelt besitzen, sondern daß es rings um uns Tausende und aber Tausende von Umwelten gibt, die zu erforschen die reinste Freude gewährt. (Uexküll 1913b: 1091)

What is evident in this paragraph is Uexküll's almost messianic drive to save man from the spiritual devastation of materialism — a message which he proclaims with a zest and fury worthy of Nietzsche, who wrote in the *Geburt der Tragödie* that, art — Greek tragedy in this case — was the savior of man who, in the face of the remorseless inevitability of natural forces, is in danger of becoming paralyzed by *Erkenntnisekel*. This is a solution quite similar to that which Uexküll suggests at the end of his article (and the phrasing of his criticism certainly suggests disgust with the consequences of a universal materialism), namely that biology teaches us, 'daß diese Welt als unsere Umwelt ein lebendiger Teil unserer selbst ist, den wir nicht entwerten können, ohne selbst zu verarmen, den wir aber durch eigene Arbeit immer reicher und lebendiger gestalten können, der mit uns wächst und sich ausbreitet und fähig ist, immer erlesener Gefühle in uns zu erwecken' (1913b: 1091). Consequently, Uexküll's *Umweltlehre* could be construed as a kind of necessary human fiction — that which starts where a positivistic physiology of the senses stops. This does not contradict the theory's own premises since Uexküll openly admits to finding salvation in the subjectivity of the senses. Monika Fick (1993: 68–71) has pointed out the affinity between Uexküll's theory and two very influential modes of thought of the time: Nietzschean vitalism and what she calls the 'psychophysical monism' of the turn of the century. In fact, the similarities with Nietzsche do not only extend to verbal fervor and vitalistic ideas: Uexküll himself uses the metaphor of the theatre to explain the world view created by different Umwelten. In a letter to his son Gösta, Uexküll writes:

Die Lebensdramen der Tiere werden seit undenklichen Zeiten immer von neuem aufgeführt. Die Schauspieler wechseln — die Dramen sind immer die gleichen. Die Textbücher der Lebensdramen sind ihrerseits ineinander komponiert. ... Sicher ist, daß auch wir Menschen nur Rollenträger im großen Naturdrama darstellen,

die eine Zeitlang mitwirken. Die meisten Menschen haben davon keine Ahnung und laufen wie die Fliegen auf dem Schreibtisch Gottes, der Natur, herum, ohne sich je Rechenschaft davon abzulegen, was die Naturdinge zu bedeuten haben. (cited in Uexküll 1964: 213–214)

Uexküll then deals with the physiological model of the sea-urchin to explain the coordinated *Bauplan* (underlying plan) of animals and humans. The distinct organs of the sea-urchin had different roles in its *Bauplan*, and this hierarchy could be extended to man and beyond — there being always a superordinate entity which reduces its subordinate units to *Rollenträger*. In Greek myth, he points out, the sea, mountains, moon, and stars together formed an all-embracing *Vitalperson*, which brought together all the *Lebensdramen* acted out on earth, and in which the gods were playing the great roles that were the same in all dramas. Uexküll now shortcircuits the two ends of this hierarchy and likens the earth to the aforementioned sea-urchin: ‘So ist für mich die Erde nach dem Vorbild eines riesigen Seeigels gebaut, in dem alles lebendig ineinander hängt’ (Uexküll 1964: 215). Here the literary formulation is crucial. The effect of a ‘Welt als Seeigel’ on the reader is obvious: Uexküll’s quip provokes the imagination and challenges our image of the good old earth.

Thus we have established several characteristics of Uexküll’s writing that make him a likely influence on the art of his time: by publishing in cultural journals such as the *Neue Rundschau* and the *Deutsche Rundschau*, he reached a large audience of non-scientists. His idea of a subjective science (‘eine rein subjektive Wissenschaft’, 1907: 654) which looks at the individual as an important source of scientific knowledge has the scientist doing a job which, in general terms, is quite similar to that of the novelist, who, in George Steiner’s words is ‘the eminent translator of the particular into the general: he imagines and senses ahead of us’ (1971: 688). For many writers, the notion of ‘objectivity’ had fallen into discredit,⁶ and Uexküll’s idea of a subjective, but nevertheless rigorous science was an interesting new enterprise. The new ‘objectivity’ of modernism may be translated by ‘Dinglichkeit’, and the difference between the empathizing artist of old and the new ‘objective’ poet is that the latter is coolly analytical, scientifically informed, and highly reflexive. However, what drives him is not the quest for scientific truth, it is the urge to explore and express himself through the discovery of new worlds. That is why scientists and artists, after reverently courting each other, so often disagree about the results of their cooperation.

In addition to his strongly anti-Darwinian world-view it is precisely Uexküll’s vivid imagination and the sensuality (in the word’s full sense) inherent in his philosophical conception of a physiology of the senses

which will have appealed to writers. His aims to refine perception through ever attentive *Anschauung* and to go beyond the perceptual 'idleness' of casual observation are shared by modernists such as Rilke who immersed themselves in their environment to ultimately become one with it again. A new harmony of man with himself and his environment is also Uexküll's goal (1907: 659–661), and his criticism of life in the city as numbing the senses and impoverishing the perceptual *Umwelten* of its inhabitants (1907: 645, 660) finds an apt literary parallel in Rilke's *Malte*. A refined perception of *Umwelt* is the counter force to this desolate situation. In the introduction to a reading of his poems, Rilke voices this desire for a perception that is more congenial to the objects it is employed upon:

Denn: ja! zu einem derartigen Zeugnis hoffte ich mir das Gedicht zu erziehen, das mir fähig werden sollte alle Erscheinung, nicht nur das Gefühlsmäßige allein, lyrisch zu begreifen — : Das Tier, die Pflanze, jeden Vorgang; — *ein Ding* in seinem eigentümlichen Gefühls-Raum darzustellen. (1996, 4: 708)

Rilke's poetic vision is underlined by Uexküll's statement that 'daß alle Gegenstände unserer Umwelt in persönlichen Beziehungen zu uns stehen, auch einen gewissen Gefühlswert besitzen' (1913b: 1087).

'Niegesehaute Welten': Biology and Cubism, Expressionism, Dada

By the turn of the century, Darwinists such as Ernst Haeckel and Wilhelm Bölsche had promoted the rise of a pantheistic monism which re-enchanted and aestheticized nature. This movement had developed into a mass culture (Uexküll derides Darwinian materialism as an 'Evangelium der Massen', 1907: 648), and in what was probably the first case of universal mass merchandising, harmless evolutionary bric-à-brac in every bourgeois household reduced nature to a decorative commodity one could be at ease with. A new generation of artists faced the task of breaking free from the aestheticized and re-enchanted idylls to look for new forms in order to express man's role in society and nature. These new forms could be found in what Günter Blöcker called the 'Neue Wirklichkeiten' of hitherto unseen worlds: 'Ein neuer Begriff des Realismus bahnt sich an, der mit Wirklichkeitsnachahmung und augentäuschender Illusion nichts mehr zu schaffen hat. Der moderne Künstler sucht den Einklang mit der Natur, ohne sie zu kopieren. Auch das Ungegenständliche kann realistisch sein' (1957: 13–14). This is why science was such a fruitful inspiration to the modernists' program; the painter, writer, or sculptor could counter the

alienation of man from nature by going back to its creatures and sources — albeit not the idealized nature of the eighteenth and nineteenth centuries. If Naturalism and Darwinism were, as Walter Müller-Seidel remarks, ‘Wahlverwandte’ (1984: 152), then Uexküll’s imaginative environmentology was the modernists’ natural choice. Biology was the mind’s umbilical cord to nature, and its language and ideas provided a fascinating new repertory which would, nevertheless, avoid sentimental kitsch and mere representationalism. To borrow the title of Uexküll’s last book: science drew the curtain from hitherto *Niegeschaute Welten*; a simple look through the microscope could open up to the eye fascinating new worlds at once strange and real. In his *Cahiers*, Paul Valéry writes: ‘Vu dans le microscope, la myriade de mes têtards’ (1957: 424). The exploration of the deep sea revealed the existence of bizarre creatures which were real but at the same time not, in a sense, representational (gegenständiglich). We often feel a strange sense of wonder when biologists present their pets, as is illustrated by Alice Faehndrich’s report about a visit to Uexküll’s aquarium in Neapel:

Dann nahm uns Baron Ue. mit in sein Sanktuarium und zeigte uns dort Wunder über Wunder! ... Durch eine wundervolle Lupe sehen wir nun mit geradezu ehrfürchtigem Staunen, mit welch sagenhafter Vollkommenheit die Natur die kleinsten Teile ihrer Lebewesen geformt hat. Der Stachel eines Seesterns, wie aus feinstem Cristall gesponnen. Das Knochengerüst eines Seeigels, das wie eine wundervoll architektonisch gegliederte Marmorblume aussah; — natürlich sahen wir auch den berühmten ‘Sipunculus’, der sich mit Fug und Recht beklagen kann, daß man nie von ihm gehört hat, da die schlichte Wurmform, in welche sich seine interessante Wesenheit gekleidet hat, in den bezauberndsten Metallfarben schimmert. (Faehndrich 1903)

Faehndrich’s idyllic description is very much in the tradition of Haeckel’s beautiful renditions of organisms. But devotion and rapt attention before the sacred wonders of nature often go along with an uncanny feeling that it is forbidden to unveil her secrets. In *Doktor Faustus*, Thomas Mann describes the ‘Gefühl der Indiskretion, ja der Sündhaftigkeit’ which Adrian Leverkühn feels when looking at the ‘Geheimfratzen des Organischen’ in the deep sea:

Allzu deutlich war, daß die unglaublichen, teils grausigen, teils lächerlichen Exzentrizitäten, die Natur und Leben sich hier geleistet, Formen und Physiognomien, die mit den oberirdischen kaum noch Verwandtschaft zu haben und einem anderen Planeten anzugehören schienen, das Produkt der Verstecktheit, des Pochens auf das Gehülltsein in ewiges Dunkel waren. (1990, 4: 356–357)

The strange ‘new realities’ discovered with these grotesque animals soon engaged the artist’s eye. The younger generation of writers around 1900,

who had increasingly come to be alienated from a unified, understandable, and meaningful idea of ‘mother nature’, adhered to a vitalism deriving from Nietzsche and desperately pursued ‘life’ through ‘Anschauung’, ‘Rausch’, and ‘Erlebnis’ — ‘form’ was their new battlecry. Gottfried Benn (1977–1981, 4: 14) spoke of the ‘formfordernde Gewalt des Nichts’ — in the face of nihilism, form is everything, and new, real forms could be found in nature. There is a curious passage in Benn’s autobiographical writings, in which he explains the method used by the Expressionist writer to create a poem. In an extraordinary analogy, the artist is compared to marine protists:

Es gibt im Meer lebend Organismen des unteren zoologischen Systems, bedeckt mit Flimmerhaaren. Flimmerhaar ist das animale Sinnesorgan vor der Differenzierung in gesonderte sensuelle Energien, das allgemeine Tastorgan, die Beziehung an sich zu Umwelt des Meers. Von solchen Flimmerhaaren bedeckt stelle man sich einen Menschen vor, nicht nur am Gehirn, sondern über den Organismus total. Ihre Funktion ist eine spezifische, ihre Reizbemerkung scharf isoliert: sie gilt dem Wort, ganz besonders dem Substantivum, weniger dem Adjektiv, kaum der verbalen Figur. Sie gilt der Chiffre, ihrem gedruckten Bild, der schwarzen Letter, ihr allein. (1977–1981, 4: 11–12)

Benn here invites us to imagine the radical consequences of a writer’s highly specialized perception of language by conjuring up the peculiar *Umwelt* of a protist. Similarly, Valéry likened the mind to an ‘animal with instincts’ (Blöcker 1957: 25). Since Uexküll’s *Umweltlehre* exposed ‘reality’ as a mere construct produced by symbolic sensual perceptions, these perceptions themselves can now become the very real material the artistic mind works upon: the modern artist ‘abstrahiert nicht, er arbeitet mit der vollen Körperlichkeit der Welt; sie ist für ihn nicht Thema, sondern das Material, in welchem er denkt. ... Dinge und Formen werden als sichtbarer Sinn des Gedankens begriffen’ (Blöcker 1957: 10). Yet at the same time, Uexküll’s phenomenological approach is not reductionistic or materialistic, it is strongly anti-Darwinian as Benn approvingly observed. In ‘Zum Thema Geschichte’ (1943), Benn refers to Uexküll and Oscar Hertwig (1918) as two prominent anti-Darwinian writers (1977–1981, 1: 385). Reversing his earlier quasi-racist commitment, he rejects the ‘biological principle’ of breeding (*Züchtung*) and postulates the ‘intellectual principle’ of education (*Erziehung*) as the method most suited to keeping human development in check. Subsequently he acknowledges man’s ultimate inability to better understand the ways of the universe and emphasizes that expression through art (‘die Arbeit an der Ausdruckswelt’) is the only task we can achieve. His anti-Darwinism is apparent, for instance, in the line ‘die Wissenschaft / so eingleisig / ganz aus angelsächsischem Material’ from the poem ‘Der Gedanke’ (1977–1981, 3: 459).

On reading Uexküll's *Theoretische Biologie* in 1921, Thomas Mann noted 'daß die Beschäftigung mit biologischen Dingen, auch wenn sie neuer, geistfreundlicher, antidarwinistischer Art ist, in politicus konservativ und streng macht' (1979: 487–488).⁷ This statement highlights again the literary values of Uexküll's theory, which is 'geistfreundlich', new, anti-Darwinian.

In a letter to his friend Houston Stewart Chamberlain, Uexküll himself pointed to another feature of biology which made it a useful tool for writing: 'denn ich habe bemerkt, daß die biologische Ausdrucksweise unserem Zeitgenossen näher liegt als die abstrakt philosophische' (21 October 1921). Biological language easily (sometimes dangerously) lends itself to political and social discourses, and an analysis of Uexküll's use of bio-political language will be an interesting task for scholarship. Thomas Mann, for instance, made use of organic imagery, ideas of heredity, and embryology when he publicly turned away from monarchism towards republicanism in his speech 'Von deutscher Republik'; and the Spanish philosopher and writer José Ortega y Gasset, together with LeBon, one of the most influential conservative theorists of mass culture and group behavior at the time, also drew on biological thought and Uexküll in particular. In a review of the Spanish translation of *Bausteine*, Ortega praises Uexküll's biological system of ideas as the best contemporary approach to the study of the problems of life ('un sistema de ideas biológicas que representa mejor que ningún otro la manera actual de acercarse a los problemas de la vida' [Ortega 1964: 308]). Ortega characterizes this influence not only as scientific but 'cordial', and emphasizes the usefulness of this new biology to impose a healing order on the confusion of the modern soul: 'No conozco sugerencias más eficaces que la de este pensador, para poner orden, serenidad y optimismo sobre el desarreglo del alma contemporánea' (1964: 308). Language and argument are reminiscent of Rilke and the Expressionists, which goes to show that, however different Uexküll's followers in the arts and philosophy were, they regarded the new biology as a treasure trove of ideas that could be exploited for their respective political, artistic, and philosophical aims. Ortega, incidentally, not only read popular works by Uexküll like *Bausteine* and the 'admirable book' *Umwelt und Innenwelt der Tiere*. In his philosophical affinity to the German biologist he even devoted attention to more worldly topics Uexküll had treated in his youth at the zoological station at Naples (for instance, 'Die Schwimmbewegungen von *Rhizostoma pulmo*'; cited by Ortega 1963: 297). (For a detailed analysis of Ortega's interest in Uexküll cf. Durán [1996].)⁸

Whatever the precise political implications of biological theories and language (and Darwin's works testify to the ambivalence of biological

thought which makes it so easy to adapt or misrepresent), for a new generation of artists, biology, and especially Uexküll's biology, was a source of new forceful images and a vigorous expressiveness. For no literary movement is this more true than for German Expressionism. Though Uexküll himself rejected Expressionism and Dadaism, he had quite some influence on those movements. He wrote for the literary supplement 'Literatur und Wissenschaft', which was published by the *Heidelberger Zeitung* in 1910 and 1911 and also received contributions from Expressionists (cf. Picard 1965: 144). The 'Dadasoph' Raoul Hausmann turned to a variety of scientific and pseudo-scientific theories to find inspiration for a revolutionary reconciliation of man with a holistic world through art, among them Uexküll's *Umweltlehre*. In a letter to a fellow artist he points out 'dass ich sowohl Mach, wie Uexküll, Marx-Engels, wie auch Lenin, Materialismus-Empiriekritizismus, kenne und gerade wieder einmal durcharbeite. ... Ich habe meine, wenn Sie wollen "biologische", Anschauung über die Rolle der Abstraktkunst und andererseits den intellektuellen Zwiespalt der abstrakten Künstler genaustens fixiert ...' (Hausmann 1998: 318). Hausmann had expounded his 'biological view' of abstract art in his manifesto *Zweite Präsentistische Deklaration—Gerichtet an die internationalen Konstruktivisten*, in which he demands 'die Erweiterung und Eroberung aller unserer Sinne' and an 'Erweiterung und Erneuerung der menschlichen Sinnesemanationen' to achieve universal significance in art on the basis of physical and physiological problems in man and nature (1982: 85). In *Denken und Darstellen II*, Hausmann associates Engel's denial of teleology with Darwin and contrasts them both with Kant 'und den auf ihm basierenden Machisten, wie etwa Uexküll, der als unerkennbare Ursache den 'immateriellen Faktor' ansetzt, also ein Gesetz der Sinnhaftigkeit der Formen, der Dinge, etwa das, was Kant die Noumen nennt ...' (1982: 170–171). Thus, Uexküll was one of the main representatives of anti-Darwinism — his theory and ideas were 'in the air' and discussed in literary circles. They fitted an intellectual environment which saw a metaphysical silver lining on the horizon of the new physics, and Gottfried Benn consequently quipped about Uexküll's religiousness: 'Gott ist lebendiger denn je, sogar die Quantentheorie hat ihn als das 'Endgültig Reale' zurückgerufen und es ist sogar ein franziskanischer Gott mit von Uexküll untersuchten Umweltsinteressen für Lippenblütler und Regenwürmer' (1977–1981, 2: 281).

Without going into further detail about these and other observations, we turn to the more interesting question in our context, namely, whether the reception of Uexküll had any evident impact on Expressionist ideas about art. Here, the two articles about a biological world-view and his

book *Bausteine zu einer biologischen Weltanschauung* (the one also read by Rilke) are the most important sources. Felix Groß's introduction to *Bausteine* gives us a clue to what made it so attractive to artists at the time. Groß presents modern biology as the science of a new age, in which the dated monistic doctrines of materialism and psychism (*Psychismus*) are replaced by the study of organic life, which incorporates both mind and matter. The idea that in a reductionistic evolutionary theory spiritual phenomena can ultimately be explained as a function of matter is seen as an 'idée fixe unserer Zeit', discredited through Haeckel's deceitful use of printing blocks in the *Anthropogenie* and a continuing series of wilful self-deception and deception: 'Durch diese Fälschung ist unsere ganze Kultur krank geworden und die moderne Biologie hat eine ganz entscheidende Kulturtat zu vollbringen, indem sie jene Fälschung aufdeckt. Es gelingt ihr aber durch den unerschütterlichen Nachweis — der *Autonomie des Lebens*' (Uexküll 1913a: 12). The 'entscheidende Kulturtat' of modern biology will be the creation of a new unified *Weltanschauung* of the future, and the 'populären Parerga Jakob von Uexkülls, des eigentlichen Begründers unserer modernen "experimentellen Biologie" in Deutschland' are an important preliminary work on the way.

Bausteine was reviewed in the year of its publication by Max Scheler in the first number of the important Expressionist journal *Die Weissen Blätter*. Scheler voices the need of modern biology for a sound philosophical basis and writes that, next to Roux, Driesch, and Bergson, no one was more competent than Uexküll to achieve this task. Although he criticizes some philosophical shortcomings and the lack of conceptual rigor in Uexküll's argument, he praises its 'wundervolle Klarheit und Anschaulichkeit' and independence from academic tradition (1913–1914: 120). In essence, he confirms what Groß wrote in his introduction to *Bausteine*. The main attraction of Uexküll's popular writings was that they brought something new (Scheler writes of Uexküll's 'ernste Wille zum Neuen', [1913–1914: 120]) after decades of pan-Darwinian populism à la Haeckel and Bölsche; and he was an entertaining writer: 'In der Zeichnung und Ausmalung dieser "Merkwelten", die dem Aktionssystem des Tieres genau entsprechen, bekundet Uexküll eine besondere künstlerische Begabung' (1913–1914: 121–122). Uexküll's biological theory had developed into a 'comprehensive world view operating at once as a biological, political, and spiritual principle' as Anne Harrington remarked (1996: 40), to which we may add the literary principle, for it is the literary and aesthetic merits that commended Uexküll's ecology in the new cultural environment of Expressionism. To what extent, then, can Uexküll's *Umweltlehre* be applied to Expressionist art theory?

In 1915 the art critic Adolf Behne published a pamphlet *Zur neuen Kunst*, in which he outlined the universal aims of Expressionism as a 'Neuorientierung des Denkens und des Schaffens', which will impact all fields of thought and culture: 'In der Dichtung haben wir in den Brüdern Mann ein Beispiel. Dem Impressionisten Thomas steht der Expressionist Heinrich gegenüber. Schließlich muß ich die biologischen Untersuchungen I. v. Uexkülls [sic] als ihrem Wesen nach expressionistisch bezeichnen' (1915: 28–29). The main difference between the Expressionist and the Impressionist mode is that the latter subordinates art to extraneous, 'natural' categories by trying to evoke the inner 'truth' through representation of the exterior. Expressionism, in contrast, starts from the inside, the experience, and uses symbolic means to create the outer form (Behne's text is rife with organic vocabulary such as 'wachsen', 'bilden', 'gestalten', 'schaffen'). It is important for the artist to become aware of the inherent possibilities of his craft in order to avoid a 'Verkümmernlassen der Mittel': 'Im Schaffen des Expressionismus steht die innere Wahrhaftigkeit in der Verwendung der Mittel unbedingt höher als die Wahrhaftigkeit in den Beziehungen zur Außenwelt' (1915: 22). It is evident why Behne calls Uexküll an Expressionist: his lament over the cultural decline brought about by materialism, his call for a re-orientation and his new idealistic and 'subjektive Biologie' could have made them brothers-in-arms in the fight against the dominating spirit of their time. In 1918 Behne still maintained that *Umweltlehre* would soon be 'Allgemeingut der Künstler' (51). However, the relation was uneasy. Uexküll's largely conservative leanings did not go well with the revolutionary spirit of the Expressionists, and even though Behne in a later book still praised the basic virtues of the biologist's *Umweltlehre*,⁹ he could not ignore the politically motivated writings Uexküll published during and after the First World War.¹⁰ Likewise, the Baron wanted nothing to do with the young radicals. In his view, scientists, doctors, and teachers should forsake the doctrine of chance enshrined in Darwinism and become 'Verkünder einer höheren Macht' to forestall disorderly conduct and mass upheaval: 'Dann wird auch der einfache Mann wieder Einkehr zu halten lernen' (Uexküll 1927). 'Einkehr', though, hardly was the aim of the avant-gardists, who saw the conservative world of classical idealism falling to pieces. Drawing in their aesthetics on the biologist's theory, they had to willingly ignore the baron's political program. Uexküll's conservative politics were most fully expressed in his *Staatsbiologie* (1920a), which he published at a time when biological metaphor was rife as he himself had acknowledged in the letter to Houston Stewart Chamberlain. (The German physiologist Nicolai had published his pacifist book *Die Biologie des Krieges*, and Spengler's morphological history *Der Untergang des Abendlandes* was a huge public

success.) Uexküll's political views were matched by fairly old fashioned literary tastes, and his temper led him to rant at all manner of avant-garde movements. In a letter to Chamberlain he expressed his hope for a rescue of traditional poetry, 'die eben im ekelen Absyntdampf der Kaffeehäuser erstickt und zum kindischen Lallen der Dadaisten geworden ist' (10 April 1921). In another letter to Chamberlain, he directs a veritable barrage of abuse at some of the major literary figures of the day:

Thomas Manns hoffnungsvoller Sohn hat mit 18 Jahren ein Drama geschrieben, in dem er selbst und ähnliche Jünglinge und Jungfrauen auftreten. Die Erstausführung wurde hier in Hamburg mit großer Reklame in Szene gesetzt. Urteilsfähige Hörer sagten mir, das Stück sei zugleich schamlos und pervers. Doch wurde es vom Publikum, das der Hauptsache nach aus Juden bestand, mit Begeisterung aufgenommen. Es ist zum Glück nicht die deutsche Jugend, die sich für diese Dinge begeistert. Aber wünschenswert wäre es doch, diese Schädlinge loszuwerden. Solche Sumpfgewächse können sich aber nur deswegen emporwagen, weil Deutschland keinen wirklichen Dichter besitzt. Nicht einmal einen Shaw, geschweige denn einen Pirandello können wir aufweisen. Das greisenhafte Geschwür eines Gerhart Hauptmann kann man nicht ernst nehmen. Man hätte ihn überhaupt nie ernst nehmen sollen, dann wäre vielleicht etwas aus ihm geworden. Rilke ist ein Schwächling. Die wirklichen Talente sind im Krieg gefallen bis auf Molo, der ernst und echt ist, aber kein Genie. (27 October 1925)

Nevertheless, Uexküll was an unwitting muse of Expressionism, as Behne's article 'Biologie und Kubismus' (1915–1916) shows. It starts with the verdict that the age of science ('das naturwissenschaftliche Zeitalter') is dead and gone, its former vitality killed off by the enormous popularization of an intellectually unchallenging positivism devoid of all 'Ehrgeiz des Denkens'; through endless experiments the sciences have produced an enormous mass of material, which is, alas, 'bedeutungslos, taub und stumm für jede tiefere Erkenntnis' (1915–1916: 68). However, there is a 'revolutionary work' by a 'Denker' and 'Seher', which represents an 'in seiner Bedeutung gar nicht zu überschätzenden Vorstoß gegen die geistesverarmte Naturwissenschaft von Heute'. Behne is not talking about Freud, Nietzsche, or other heroes of the young generation; he is referring to Uexküll's *Bausteine*, which offers 'wundervolles Material' for Expressionist art. Behne is careful to get round a possible contradiction: he admits that Uexküll publicly dismisses Expressionism but goes on to suggest that a seer like Uexküll whose work comes into being and grows like a work of art need not be aware of each and every consequence of his thought. Besides, he suspects, Uexküll may only know the 'halbneue, dekorative Art etwa der "Brücke"' but not the revolutionary works of Delaunay, Marc, Mense, Léger, Chagall, and Kokoschka which were the true representatives of the new art (1915–1916: 69).

Behne reinforces his view of Uexküll's biology as an intellectual lodestar of the young generation in their quest for a renewal of art and culture and stresses that 'die Gesinnung seines Werkes ist völlig aus gleichem Geiste geboren, wie die Gesinnung unserer jungen Kunst'. Behne's straightforward appropriation of Uexküll's theory against the author's express will illustrates an important factor that often comes into play when artists draw on scientific material: since artists and scientists have different objectives and follow distinct modes of operation in their respective fields, a transgression of boundaries very often leads to severe misunderstandings and accusations of misappropriation. This problem can be avoided by allowing for the difference of contexts in which an idea is placed. When looking at literary receptions of scientific ideas it is advisable to assess the accuracy with which an idea has been transposed; much more important, though, than factual accuracy is the usefulness of a given idea in the literary context, i.e., its role in the work of fiction, and its significance for the artist as a human being — that, after all, is an area in which science does not have unlimited authority but which instead lives precisely by the plurality of contrasting voices. It is imperative to give Behne's interpretation of Uexküll a fair hearing if we want to understand the cultural implications of *Umweltlehre* and see if it has any cultural concerns in common with art. Thus, a look at biology can illuminate more clearly individual tendencies in art, and a comparison of biology with art can highlight certain characteristics of that science which are an expression of the time.

According to Behne, one of the fundamental shortcomings of modern positivistic science is that its view of nature ('Naturbetrachtung') no longer has any relation to the human being and has thus lost its 'center' (its 'Schwerpunkt' in Uexküll's words). Such a peripheral world-view without a center is, in stark contrast to Expressionism, necessarily impressionistic and left to float 'im Geschaukel wogender Eindrücke' (1915–1916: 69). In the case of Expressionism, on the other hand, a formative 'Wille' emanates from that center *eo ipso* and from that will springs the 'Kraft des Ausdrucks' — a virtue of all art that gravitates toward a center, not only Expressionism. Behne then identifies the organic form ('das Organische') as the fundamental principle of life and the center of Uexküll's theory, rejecting all attempts to derive the organic from the inorganic in a theory of evolution. What is important for the modern artist is not extraneous criteria like accurate representation, but inner harmony and beauty ('Dienst der Schönheit, statt der Richtigkeit'). In fact, literal representation of everyday perceptions is not only superficial but superfluous:

Für Uexküll ... ist der 'Gegenstand' schon selbst etwas von uns Geformtes, nämlich durch unsere Sinnesorgane und unser Zentralnervensystem. Hat es nun

irgendeinen Sinn, etwas Geformtes noch einmal, nämlich künstlerisch, zu formen? Solange man den Gegenstand als etwas außer uns Gegebenes, Objektives, Absolutes ansah, mochte das Gegenständliche in der Kunst vielleicht noch einen Sinn haben. Aber den hat es nicht mehr, nachdem wir erkannt haben, daß die Existenz jedes Gegenstandes ja bereits eine produzierende Leistung, eine Formung unseres Geistes ist. Die Kunst wird sich also schönere Aufgaben suchen. (1915–1916: 70)

The ‘Anschauung’ of Goethe’s science is revived as a new mixture of experience (‘Erlebnis’) and perception with which the modern artist takes in the world. The resulting work of art is a ‘geistiger Organismus’ and as such subject to what Uexküll called ‘immaterial factors’ and the meaningful correlations in its *Bauplan*: ‘Wie in einem körperlichen Organismus jeder Teil in fester, sinnvoller Beziehung steht zu jedem anderen, so auch im geistigen Organismus eines Kunstwerkes’ (1915–1916: 69). Biology — the science of *life* — comes in handy for a group of artists whose principal aim is the undiluted experience of nature herself as opposed to derivative and artificial representations of it, and a good work of art follows the principles of natural growth rather than being manufactured:

Ich finde gerade jene Sätze Uexkülls so überaus schön, in denen er die Kluft aufdeckt zwischen der Welt in der alles ‘gemacht wird’, und der Welt, in der alles ‘entsteht’ [he quotes Uexküll] Prachtvolle Sätze, die jeder Freund der neuen Kunst dankbar aufnehmen wird. Denn das gerade ist das Schöne dieser neuen Kunst, daß ihre Werke von innen heraus ‘wachsen’. (1915–1916: 69)

Uexküll’s thinking is organic, and Scheler also pointed out in his review that ‘Uexküll gehört nach Geistesart, Charakter, Herkunft usw. ganz der Welt an, wo alles entsteht und wächst’ (Scheler 1913–1914: 121). For Behne the artist is not the original source of his work but the breeding ground for its natural growth. Despite their seemingly strict composition, Cubist and Expressionist works of art are no more artificially ‘constructed’ than the natural forms of primitive or children’s art; they do not follow rules of superficial likeness but the natural laws of organic growth instead. The animals of Franz Marc, for instance, are all but unnatural constructions: ‘Müßte sie nicht Uexküll zuerst verstehen können, der die Sätze schreibt: “Das Wesentliche am Tiere ist nicht seine Form, sondern die Umformung, nicht die Struktur, sondern der Lebensprozeß. Das Tier ist ein bloßes Geschehnis”’ (Behne 1915–1916: 71). Thus, Uexküll’s biological thought provides a tool for the Expressionists and Cubists to rationalize their experiential and living designs as truthful representations of nature; *Umweltlehre* is seized upon as a vindication of the experience and expression of a *Wirklichkeit* different from that claimed by representational

art.¹¹ Uexküll's aim was to revolutionize the way we look at nature. Even though he tried to convey this new view in his popular writings with the use of metaphor, analogy, and other devices, he saw them as part of a rigorous intellectual discourse, not an artistic one. Although he himself often played on the ambivalence of his own terminology, he would have disapproved of avant-garde artists messing about too freely with the 'Doppeldeutigkeit des Lebens' (Behne 1918: 50) they saw endorsed by his theory, if that ambivalence meant deliberately allowing a lack of clarity — one of his first publications was a plea for the use of an unequivocal 'objectivierende Nomenklatur' in sensory physiology (Beer, Bethe, and Uexküll 1899). Even though he did not intend to revolutionize literature or painting, he could not prevent his ideas taking on a life of their own in modernist art.

On the basis of Uexküll's conjecture about genes as the source of genius,¹² Behne locates the artistic impulse in the genes themselves and arrives at the conclusion that art and life are no longer divorced from one another: 'Die Erkenntnisse Uexkülls berechtigen uns, die Mauer zwischen Kunst und Leben einzureißen, die Kunst mit dem Leben zu verbinden, ja, sie mit dem Leben zu identifizieren. ... Die Kunst ist die wahre Welt des Menschen, für die alles "wird", nichts aber "gemacht" wird' (Behne 1915–1916: 70). To an extent, this idea of art springing from genes resembles what Ernst Haeckel, following Goethe's idealistic morphology, called the 'Kunsttrieb' in nature. Haeckel developed the idea of an artistic drive present in all organisms but only consciously felt by human artists in his book *Die Natur als Künstlerin* (1913). The main difference is, of course, that Haeckel derives the morphological principles of growth from evolutionary development instead of positing a phenomenological correlation between an organism's form and the extended body of its *Umwelt* as Uexküll proposes. Even though Uexküll does not explicitly assign any duty to art in the grander scheme of things (which probably explains his scepticism towards the young avant-garde), his insistence on the values of aesthetics and beauty indicates that his *Umweltlehre* has implications for art. For Behne, Uexküll's environmentology is the creative salvation from the dull world of materialism and Darwinism, 'die als Welt physikalischer und chemischer Ursachen und Wirkungen allen Wesen gemeinsam ist' (Behne 1915–1916: 70):

So ergibt sich ein Weltbild von einer ungeheuren Beweglichkeit und Vieldeutbarkeit, ein in seiner Fülle herrlicher Kosmos, eine unendliche, in ihren zahllosen Funktionen *schwingende* Welt. An ihr zersplittert jeder Rationalismus und jede Rezeptwissenschaft. Das ist eine Welt, die wir *erleben*, die unsere Phantasie erregt, wieder zu unseren lebendigen Sinnen spricht und uns von der Kälte registratorenhafter Überlegenheit erhebt zur Wärme einer religiösen Bindung. (Behne 1915–1916: 70)

By recreating and enacting the multitude of virtual Umwelten, the modern artist follows essentially the sacred ritual of Greek tragedy as Nietzsche saw it. In *Die Geburt der Tragödie*, published in 1872, Nietzsche had argued that the replacement of the old harmonious world order with the Darwinian notion of a struggle for existence leads to paralyzing disillusionment, a problem which could only be solved by art, 'denn das Problem der Wissenschaft kann nicht auf dem Boden der Wissenschaft erkannt werden' (1988, 1: 13). The art he has in mind is Greek tragedy or, more specifically, the chorus of satyrs:

Mit diesem Chore tröstet sich der tiefsinnige und zum zartesten und schwersten Leiden einzig befähigte Hellene, der mit schneidigem Blicke mitten in das furchtbare Vernichtungstreiben der sogenannten Weltgeschichte, eben so wie in die Grausamkeit der Natur geschaut hat und in Gefahr ist, sich nach einer buddhaistischen Verneinung des Willens zu sehen. Ihn rettet die Kunst, und durch die Kunst rettet ihn sich — das Leben. (56)

As the science of *life*, biology becomes the script for the Dionysian artist who admires, celebrates, and glorifies life in the ecstatic rhythm of his work and through this process saves himself from the nihilistic devastations of a materialistic outlook on the world. Among the natural sciences, biology is closest to human beings, and the idea of organic form is particularly attractive for us because, in Philip C. Ritterbush's words, it bespeaks 'a harmony with the world that gave us birth and a heightened sense of affinity with living nature' (1972: 52).

Conclusion

Clearly, the writers discussed above found these and more qualities in Uexküll's *Umweltlehre*: in addition to speaking of the wonder of life and evoking a marvellous plurality of imaginary, yet real worlds, Uexküll's ideas were intellectually stimulating and offered a sound philosophical basis in Kant's epistemology. His science can aptly be called a creative biology or indeed a biophilosophy which still appeals to writers today. The latest example is the Danish novelist Peter Høeg, who refers to Uexküll's ideas about time as contained in *Theoretische Biologie* (Uexküll 1920b: 70–92). Høeg's novel *Borderliners* (1996) is about the world as experienced by three children at an experimental school. Towards the end of the book, the narrator introduces the theory and the person: 'Jakob von Uexküll, a difficult name. Although it feels good to write it' (214). Høeg also seizes on Uexküll's ability to create striking aphorisms by drawing analogies between animal and human world: 'Uexküll said that

man is not that much better than a spider' (227). The chapter revolves around Uexküll's biological theory as much as around his personality. He is seen as a gentle and sincere scientist and clear writer, and again we find the image of the scientist as a friendly guide: 'Johan Asplund [a psychologist] and Jakob von Uexküll. You read what they have written, and it is like a friend reaching out a hand to you, even though you will never get to meet them' (217). The scientist as the artists' friendly guide and (sometimes unwitting) muse — it would be astonishing if this productive influence did not continue in the present and the future.

Notes

1. Huxley is quoting from Keats' *Ode to a Nightingale*.
2. 10 August 1903. The narrator in *Malte Laurids Brigge* (1910) also makes a point of learning to see: 'Ich lerne sehen. ... Habe ich es schon gesagt? Ich lerne sehen — ja, ich fange an. Es geht noch schlecht. Aber ich will meine Zeit ausnutzen' (Rilke 1982: 10–11).
3. I am indebted to the following people for making copies or transcriptions of manuscript sources available to me: Anne Harrington/Harvard University (Uexküll-Chamberlain correspondence), Klaus W. Jonas/München (Rilke's letters to Jean Strohl), and Anna Gräfin von Schwerin/Londorf (Rilke's letters to Jakob and Gudrun von Uexküll and to Frau Nonna; Alice Faehndrich's notes). For an interdisciplinary study such as this, the author is necessarily indebted not only to his peers in literary scholarship but also to colleagues working in fields other than his own. During my research on Uexküll's ties with the literary world, the following persons have been of invaluable help: Jim Reed, Richard Sheppard, Thure von Uexküll, Renate Scharffenberg, Kalevi Kull, Francisco LaRubia-Prado, Eckart Krause, and Marco Fuhrländer.
4. Rilke describes a panther in Rodin's atelier: '... wenn man unter seinem Leibe durch von vorn in den Raum blickt, der von den vier geschmeidigstarken Tatzen gebildet wird, kann man glauben, in die Tiefe eines indischen Felsentempels zu sehen; so wächst dieses Werk und weitet sich zur Größe seiner Maße' (Rilke 1996, 4: 429). Here, the viewer is prompted by the panther's build and posture to imagine the environment that its life is suited to or normally surrounded by (though in this case that is not its natural habitat).
5. In a similar vein, Durs Grünbein recreates the *Umwelt* of dogs: 'Hundsein ist Kampf mit dem stärkeren Gegner/Zeit, die dich schwachmacht mit rennenden Zäunen' (1996: 95).
6. The narrator in Gottfried Keller's *Der Grüne Heinrich*, for instance, dislikes the 'fremde und kalte Wort "objektiv", welches die Gelehrsamkeit erfunden hat' (Keller 1996: 450). Cf. also Nietzsche's attack against 'die Ewig-Objectiven' in *Unzeitgemäße Betrachtungen* (1988, 1: 284).
7. Years later Mann read Uexküll's *Niegeschaute Welten*, which apparently proved to be less enjoyable. A diary entry on 2 February 1950 reads: 'In einem Buch des Prof. Uexküll, bei Suhrkamp erschienen: Albernese über den Fürsten Eulenburg und andere. Schlechtes Buch!' (1991: 163).
8. Two other authors who read Uexküll should not go unmentioned. Miguel de Unamuno's library contained a copy of Uexküll's *Bausteine* in Spanish translation (Uexküll 1922; cf. Valdés 1973: 245). In a letter to his friend Wallace Stevens, the Cuban writer Jose Rodriguez Feo mentions Rilke's *Sonnets to Orpheus* and the *Duino Elegies* alongside

- 'a wonderful book, *Ideas for a Biological Conception of the World* by the Baron Jakob von Uexküll [sic]. There this great biologist comes to the conclusion that life's origin cannot be explained by material motives, refuting Darwin, and that Plato was nearer to the truth when he imagined the archetypes as the sources of all our ideas and beings. Curious, eh?' (cf. Coyle 1986: 69).
9. Behne refers to Ernst Marcus and Uexküll as two thinkers who take a fresh, original, and unacademic look at nature replacing the 'dünne Geometrie' of the current materialistic world-view with a 'kosmisches Geschehen': 'Und Jakob von Uexküll setzt an die Stelle der chemisch-physikalischen Einheitswelt, der Normalwelt, einen wundervoll reich gegliederten Bau übereinander und durcheinander greifender zahlloser Merkwelten, die der allgemeinen Wirkungswelt eingeordnet sind. An Stelle der breiten lexikonartigen Welt des Nebeneinanders tritt ein unendliches Verbobensein, eine Doppeldeutigkeit des Lebens, die tief zur Andacht stimmt' (1918: 50).
 10. In *Die Wiederkehr der Kunst* (1918: 85), Behne mentions the 'modernen Herrenmenschen und Verächter der Masse, denen sich leider auch Jakob von Uexküll mit einem bedauerlichen Aufsätze in der "Deutschen Rundschau" beigesellt hat ...'. He probably refers to 'Biologie und Wahlrecht' (Uexküll: 1918). For Rilke, too, Uexküll's conservative political attitudes were sometimes hard to swallow, and after a meeting in 1917 he writes: 'trotz seiner "alldutschen" Einstellung war mir recht freundschaftlich mit ihm zu Mut' (Rilke 1992: 193).
 11. Incidentally, it could also serve as an ethological piece of *Rezeptionsgeschichte*. With regard to the relation between *Merkwelt* and *Wirkungswelt*, Behne remarks: 'Ist nicht auch in diesem Punkte das Geistesleben ganz analog? ... Beispiel: Jemand sieht ein Bild von Kandinsky. Er ist in stände, lange logische, psychologische, ästhetische Reden zu halten, hat aber das Bild noch gar nicht "gesehen". Kann man also nicht auf viele Kritiker moderner Kunst anwenden, was Uexküll von den Seeigeln schreibt? "Die Seeigel verstehen es, mit Sicherheit ihre Giftzangen in die Haut des Feindes zu schlagen. Welches aber sind die Merkmale, die ihre Rezeptoren beim Herannahen des Feindes aufnehmen? Eine einfache Reizkette: schwacher chemischer Reiz, starker chemischer Reiz — Stoß!" Wer denkt nicht an das Publikum, wenn er liest: "Jede Erregung, die vom Auge ausgeht, ruft einen Fluchtreflex, oder eine Verteidigungsstellung hervor". Darin haben sich unsere Ausstellungsbesucher noch nicht sehr über den Zustand der Seeanemone hinaus "entwickelt"' (1915–1916: 71).
 12. 'Wer weiß, ob nicht die überragende Stellung gewisser Genies über ihre Mitmenschen auf dem planmäßigen Wirken neuer Gene beruht?' (quoted by Behne 1915–1916: 70).

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