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The White Horse Press

Full citation:

Denham, Helen. "The Cunning of Unreason and Nature's Revolt: Max Horkheimer and William Leiss on the Domination of Nature." *Environment and History* 3, no. 2, "Ecological Visionaries/Ecologised Visions" special issue (June 1997): 149–75. <http://www.environmentandsociety.org/node/2925>.

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The Cunning of Unreason and Nature's Revolt: Max Horkheimer and William Leiss on the Domination of Nature

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SUMMARY

The *domination of nature* is a concept now fraught with negative connotations; however, it was not always thus. In this article I explore the positive, neutral, and negative meanings attached to the idea of mastery and domination of nature as it was used by Max Horkheimer, director of the Institute of Social Research from 1931-1959, and by a second generation of the Frankfurt School, William Leiss. At issue are two questions. First, what were the social conditions considered by Horkheimer and Leiss that turned human interaction with and control of non-human nature into an exploitative relationship? And second, what did it mean for them to conceive of non-human nature as an active agent in its own right?

We know only a single science, the science of history. History can be viewed from two sides, can be divided up into the history of nature and the history of mankind. The two sides must not thereby be separated; as long as men exist, the history of nature and the history of men condition each other mutually.

Karl Marx and Friedrich Engels, *German Ideology*¹

The historical modification of nature ... environmental change ... degradation. These are the conditions that in recent decades have captured the global imagination and taken it to new levels of concern and anxiety. Those engaged in the debate over the nature of such changes – their causes and consequences – attach high stakes to its resolution. And with good reason. *Nature* is one of the more multifaceted concepts, embedded with diverse and fluid meanings. It has become commonplace to recognise that attitudes toward nature are historically conditioned. Perceptions of change are neither uniform nor given equal weight; much depends on the location of the historical agents in time, space, social standing, cultural context, and so on. It has also become commonplace to acknowledge that human societies depend on their material environments for survival. Change within these environments, if it is perceived to threaten *or* to

improve the viability of the biotic community, ceases to be a neutral concept and becomes normative.

In recent Western intellectual history, this normative judgment has taken a dramatic turn, swinging away from technocratic optimism, in which human hands (and their accompanying tools) modify nature for the increased benefit of the many, and toward a stark pessimism where all but a few human societies are seen as destroying their surroundings and oppressing their human inhabitants. With increasing fervour, critics of existing conditions are issuing warnings about the irreversible damage being done to human and nonhuman environments alike. In this broad sense, the history of nature – and its changes – matters only so long as humans continue to exist.

The purpose of this essay is to examine a particular episode in this normative shift – all the more unusual because it is reflected in the work of a single individual, Max Horkheimer – and to explore the philosophical ramifications of this transformed outlook especially as it was taken up by a second generation in the work of William Leiss. Of concern here, in particular with Horkheimer, the longest standing director of the Institute of Social Research, is the changing connotation of the concept of *mastery* (as in ‘mastery of nature’) as it went from having at times neutral and at times positive meanings to a point when it was understood in an entirely negative light. Within this shift was contained an equally important subtext in which the very *idea* of nature was transformed and the concept of nature as an active agent was introduced.

I. CRITICAL THEORY AND THE ECLIPSE OF REASON

In the spring of 1944, Max Horkheimer offered a series of public lectures at Columbia University intended to convey significant portions of ‘a comprehensive philosophical theory’ that he and Theodor Adorno had developed over the previous few years of collaboration.² In 1947, Horkheimer published these in modified form under the title, *Eclipse of Reason*. According to Horkheimer, the aim of the essays was to ‘inquire into the concept of rationality that underlies our contemporary industrial culture’, in particular to investigate possible tensions and contradictions contained within the concept.³ This trajectory in his thinking, he claimed, was inspired from the realisation that despite increased technological knowledge and its application, ‘[man’s] autonomy as an individual, his ability to resist the growing apparatus of mass manipulation, his power of imagination, [and] his independent judgment appear to be reduced’. This trend he characterised as a process of ‘dehumanisation’ which ‘threaten[ed] to nullify the very goal it [was] supposed to realise – the idea of man’.⁴

Horkheimer’s examination of reason stemmed from an enduring desire to develop a ‘critical theory of society’ which would ‘throw the light of consciousness upon even those human relations and modes of response which have

become so deeply rooted that they seem natural, immutable, and eternal'.⁵ It was *critical*, as opposed to *traditional*, theory that held the promise for Horkheimer of unmasking the social structures and behaviours that lay at the roots of injustice. Traditional theory, in his view, tended to offer 'ahistorical' justifications and 'reified' categories.⁶ This resulted in a false sense of security that what one understood from these theories encompassed all of 'reality' rather than just 'a paltry snippet'.⁷ Traditional theory was thus unable to deal adequately with historical change and, by extension, with complex and dynamic social realities.

Horkheimer's critical theory of society, as he articulated it in the late 1930s, was at once a method for engaging with and explaining existing social relations.

Critical thinking is the function neither of the isolated individual nor of a sum-total of individuals. Its subject is rather a definite individual in his real relation to other individuals and groups, in his conflict with a particular class, and, finally, in the resultant web of relationships with the social totality and with nature.⁸

By employing a 'dialectical logic', the critical theorist could expose contradictions between what was and what ought to be. Human progress would not be measured solely in terms of technological achievements, since even with these 'man may be materially, emotionally, and intellectually impoverished',⁹ but rather in terms of individual autonomy and human welfare. According to Horkheimer,

If ... the theoretician and his specific object are seen as forming a dynamic unity with the oppressed class, so that his presentation of societal contradictions is not merely an expression of the concrete historical situation but also a force within it to stimulate change, then his real function emerges.

In other words, critical theory, at its best, partnered with critical *behaviour*.¹⁰

One of Horkheimer's intentions in examining the *eclipse of reason* was to highlight an historical trend that deeply disturbed him: the process by which human society seemed to have lost sight of normative truth and thereby also lost the ability to make decisions based on the 'desirability of any goal in itself'. Horkheimer argued that this loss was a consequence of the subordination of 'objective' to 'subjective' reason, a process that had begun to reach 'crisis' proportions.¹¹

In Horkheimer's framework, reason, historically, was meant 'to regulate our preferences and our relations with other human beings and with nature. It was thought of as an entity, a spiritual power living in each man. This power was held to be the supreme arbiter – nay, more, the creative force behind the ideas and things to which we should devote our lives'.¹² Reason enabled humans not only to understand the most appropriate forms of behaviour, but to choose them. In other words, reason offered 'universal insight' into 'a structure inherent in reality' which allowed society to identify and live by certain principles such as 'justice, equality, happiness, [and] tolerance'.¹³

Through a variety of diverse historical processes, reason lost its comprehensive nature – its ‘autonomous’ or ‘objective’ nature in Horkheimer’s words – and became a mere instrument ‘harnessed to the social process’.¹⁴ In an ideal situation objective reason would act as an over-arching framework that guided conduct among humans and within human-nature interactions; however, at present what existed was subjective reason acting in the absence of any objective content. As a consequence, ‘reasonable’ behaviours and actions were determined through appeals to individual preference, majority opinion, and, more and more frequently, manipulation and force. In other words, concepts such as freedom and justice which were once rooted in objective reason now depended entirely on subjective preferences for their very existence.¹⁵

Thomas McCarthy has argued that Horkheimer’s concern to critically reconstruct ‘Enlightenment conceptions of reason and the rational subject’ arose from a rejection of both absolute truth and relativity. ‘What was needed’, he writes, ‘was a new concept of truth which, while renouncing any God’s eye view, retained the dichotomy between the true and the false, albeit in a more modest, suitably human form’.¹⁶ Within this context, objective reason and ‘critical theory’ seem to share certain qualities. The role of critical theory in deriving a better understanding of critical action corresponds with the idea that through objective reason one could derive a concept of ‘human destination’.¹⁷ Objective reason, in other words, facilitated through ‘dialectical thinking’ an understanding of ethical behaviour. It rejected relativism as the sum-total of reality and rooted itself in the stability of the concepts which it was able to generate via its use, i.e. justice, fairness, equality, and so on.

Subjective reason, then, could be seen to correlate with traditional theory. Where objective reason was concerned with values, goals, and principles, subjective reason was concerned with ‘the ability to calculate probabilities and thereby to coordinate the right means with a given end’.¹⁸ Like traditional theory, subjective reason fell victim to the ‘disintegration of knowledge of the totality’.¹⁹ However, once the function of both subjective and objective reason was understood then ‘the task of philosophy [was] not stubbornly to play the one against the other, but to foster a mutual critique and thus, if possible, to prepare in the intellectual realm the reconciliation of the two in reality’.²⁰ Within this framework, where philosophy served as a mediator between objective and subjective reason, Horkheimer also offered a new analysis of his earlier understanding of nature and its domination.

II. MASTERY AND DOMINATION OF NATURE

During the years 1938 to 1942, Horkheimer underwent a marked transition in his conceptualisation of nature. This transformation interestingly accompanied a wider shift away from a direct emphasis on Marxist materialism and an ‘historically informed theory of society’, and toward a ‘radical critique of reason

that denounce[d] the intimate connection between reason and domination'.²¹ Historian Wolf Schäfer has offered one interpretation of this transition:

[T]he young Horkheimer of the 1930s, was a fairly orthodox Marxist philosopher who had learned his materialist lesson and repeated it as well as anyone else ... Horkheimer I did not criticise the mastery of nature (as the later Horkheimer would do with a vengeance); in fact, he affirmed that it [was] the only 'function of knowledge which [would] continue to be necessary even in a future society.' ... Horkheimer II, the mature Horkheimer, emerged in the early 1940s as a disenchanting social philosopher, both a socialist intellectual haunted by the thought that Stalinism might represent the future of fascism and a critical theorist ever more drawn to Schopenhauer's skeptical and gloomy humanism ... Horkheimer II had lost all previous faith in the future of human history, including his earlier belief in the intrinsic benevolence of the technoscientific mastery of nature.²²

It is this interpretation which I believe needs further examination. What, in fact, constituted this *mastery of nature* that Horkheimer believed would be a *necessary function* of knowledge in a *future* society? Was it the same set of conditions that he later condemned *with a vengeance*? Without a doubt, Horkheimer underwent a transformation, but how did this affect his analysis of nature/humanity relationships?

The conceptual duality between nature and humans played a key role in Marx's and Engel's writings, one of the fundamental intellectual foundations upon which Frankfurt School members built. 'Nature is man's inorganic body', wrote Marx in his *1844 Manuscripts*.²³ Engel's wrote of the 'alteration of nature by men' as well as nature's alteration of men.²⁴ In this way, they made use of two categories that allowed for a discussion of nature-human interactions, the historicity of their changes, and the necessity of thought to mediate between the two. Whatever might distinguish these authors' writings, they shared the view that humans were distinctly of nature even if they might try to separate from it.²⁵

Horkheimer embraced a nature-humanity duality as well, and, using this framework, criticised those who took social structures to be natural.

There will always be something that is extrinsic to man's intellectual and material activity, namely nature as the totality of as yet unmastered elements with which society must deal. But when situations which really depend on man alone, the relationships of men in their work, and the course of man's own history are also accounted part of 'nature', the resultant extrinsicality is not only not a suprahistorical eternal category (even pure nature in the sense described is not that), but it is a sign of contemptible weakness. To surrender to such weakness is nonhuman and irrational.²⁶

Here, Horkheimer conceived of 'nature' as 'the totality of as yet unmastered elements with which society must deal', suggesting that nonhuman nature was an appropriate arena for human mastery. That he simultaneously objected to naturalising socially created class relationships and that he acknowledged that

even pure nature could not appropriately be called a 'suprahistorical eternal category', demonstrates his sensitivity to the existence of an ongoing and ever-changing relationship between humans and nature. Horkheimer was justifiably cautious in labelling any object 'natural' for that seemed to imply its impermeability to *human-induced* change. At the same time, he refused to reduce nature itself to a static object even as he was willing to justify its mastery.

Horkheimer's early views largely corresponded to those of his Marxist contemporaries. Like them, he was especially hostile to naturalism and willing to recognise nature itself as a socially mediated concept. Georg Lukács expressed this very position early in the 1920s in his highly influential text *History and Class Consciousness*:

Nature is a societal category. That is to say, whatever is held to be natural at any given stage of social development, however this nature is related to man and whatever form his involvement with it takes, i.e. nature's form, its content, its range, and its objectivity are all socially conditioned.²⁷

Likewise, the idea of mastery of nature was commonplace for the period. In Marx and Engels' analysis, socialism was meant to usher in a form of human relations that enabled mastery to continue for the full benefit of humankind. This reading of their work was carried into the twentieth century as a central theme so that it was often accepted that even 'in a classless society ... the problem of nature, as an object to be mastered, continue[d] to exist for men in their new-found solidarity'.²⁸

This particular construction of the mastery of nature deserves closer attention, however, for it was with this view that Horkheimer grappled. It will be helpful to juxtapose two passages from his early writings that highlight many of his initial assumptions about both nature and human society, the first written in 1935, the second in 1937:

The concept of having power over something includes deciding for oneself and making use of it for one's own purposes. But domination over nature is not exercised according to a unified plan and purpose, but merely serves as an instrument for individuals, groups and nations which use it in their struggle against one another and, as they develop it, at the same time reciprocally circumscribe it and bend it to destructive ends. Thus, the bearers of this spirit, with their critical capacity and their developed thinking, do not really become masters but are driven by the changing constellations of the general struggle which, even though summoned up by men themselves, face them as incalculable forces of destiny.²⁹

Because of its situation in modern society the proletariat experiences the connection between work which puts ever more powerful instruments into men's hands in their struggle with nature, and the continuous renewal of an outmoded social organisation. Unemployment, economic crises, militarisation, terrorist regimes – in a word, the whole condition of the masses – are not due, for example, to limited technological

possibilities, as might have been the case in earlier periods, but to the circumstances of production which are no longer suitable to our time. The application of all intellectual and physical means for the mastery of nature is hindered because in the prevailing circumstances these means are entrusted to special, mutually opposed interests.³⁰

In this context, Horkheimer saw nonhuman nature as the object of social conflict. Explicit, for him, was the idea that conditions external to humans were such that they required struggle and mastery. The barrier to a society in which all individuals could fully realise their potential –*through* the mastery of nature – was the existence of ‘individuals, groups, and nations’ which continued to benefit from severely stratified social relations. If this barrier, this ‘outmoded social organisation’, were reformed, then the mastery of nature could proceed unhindered, ‘according to a unified plan and purpose’. In other words, making use of nature for the unified purpose of human autonomy, through an egalitarian production process, was a project which, at least initially, received Horkheimer’s full support.

Looking more closely at Horkheimer’s meaning here one can see its resonance with Marx and Engels. On the one hand, Horkheimer was acknowledging a need to recognise the *social* roots of social problems. While the proletariat might themselves contribute to injustice and social contradiction, their experiences – of suffering and oppression – were a consequence of social structures that denied them their own freedom.³¹ On the other hand, he saw humanity’s ‘struggle with nature’ as a struggle to remove the obstacles in the path of human survival. Mastery, seen from this light, was a form of interaction that depended on complete human emancipation for it to succeed; otherwise, those with greater power in unequal relations could ‘bend [nature] to destructive ends’. Engels anticipated this point (and was likely a source of inspiration for Horkheimer) in a hypothetical discussion of how nature/humanity dynamics would change when the means of production were ‘seized’:

The conditions forming man’s environment, which up to now have dominated man, at this point pass under the dominion and control of man, who now for the first time becomes the real conscious master of Nature, because and in so far as he has become master of his own social organisation.³²

Horkheimer reiterated this sentiment in his definition of critical theory, arguing that such a theory relied on ‘the idea of self determination for the human race, that is the idea of a state of affairs in which man’s actions no longer flow[ed] from a mechanism but from his own decision’.³³ In emphasising a transition from reaction to self-determination, Horkheimer argued for a corresponding shift from ‘blind’ to ‘meaningful’ necessity:

[T]o the extent that the subject does not totally isolate himself, even as a thinker, from the social struggles of which he is a part and to the extent that he does not think of

knowledge and action as distinct concepts, necessity acquires another meaning for him. If he encounters necessity which is not mastered by man, it takes shape either as that realm of nature which despite the far-reaching conquests still to come will never wholly vanish, or as the weakness of the society of previous ages in carrying on the struggle with nature in a consciously and purposefully organised way. Here do we have forces and counterforces. Both elements in this concept of necessity – the power of nature and the weakness of society – are interconnected and are based on the experienced effort of man to emancipate himself from coercion by nature and from those forms of social life and of the juridical, political, and cultural orders which have become a straitjacket for him. The struggle on two fronts, against nature and against society's weakness, is part of the effective striving for a future condition of things in which whatever man wills is also necessary and in which the necessity of the object becomes the necessity of a rationally mastered event.³⁴

In this passage, three of Horkheimer's underlying assumptions become more evident. First, and perhaps most provocative, he admitted that despite 'man's' attempts at its conquest and mastery, nonhuman nature would 'never wholly vanish'; or in other words, would never be wholly conquered. Second, he asserted that a weak society was one which was unable, for whatever reasons, to struggle with nature 'in a consciously and purposefully organised way'. By contrast, a society without this weakness was presumably one which *did* struggle with nature consciously and purposefully. This latter society was obviously the type Horkheimer preferred. Finally, Horkheimer suggested that true freedom emerged when humans simultaneously attempted to emancipate themselves from the 'coercion by nature' on 'man' *and* from the injustices of unequal social relationships – because they interacted dialectically.

In volume three of *Capital*, Marx offered a parallel construction of necessity and freedom in which he argued that nonhuman nature might in fact be mastered, but would never cease to exist:

Just as the savage must wrestle with Nature to satisfy his wants, to maintain and reproduce life, so must civilised man, and he must do so in all social formations and under all possible modes of production. With his development this realm of physical necessity expands as a result of his wants; but, at the same time, the forces of production which satisfy these wants also increase. Freedom in this field can only consist in socialised man, the associated producers, rationally regulating their interchange with Nature, bringing it under their common control, instead of being ruled by it as by the blind forces of Nature ... Beyond it [the realm of necessity] begins that development of human energy which is an end in itself, the true realm of freedom, which, however, can blossom forth only with the realm of necessity at its basis.³⁵

As this passage makes clear, socialism, for Marx, offered the greatest opportunities for human freedom to exist simultaneously with a rational control of nature. Mastery, in this context, lacked negative connotations and corresponded to a definition offered by Engels: to change external nature in order to make it

‘serve [human] ends’.³⁶ In other words, change and control – for a particular human purpose – became the operative concepts underlying Marx’s, Engels’, and Horkheimer’s understanding of mastery.

Thus we see Horkheimer in 1937 offering a philosophy of nature remarkably in line with dominant threads of Western Marxism. The question must be raised then, how did he arrive at a point in 1940 where he could write: ‘The propositions of idealistic philosophy that reason distinguishes man from the animal ... contain the truth that through reason man frees himself of the fetters of nature. This liberation, however, *does not entitle man to dominate nature (as the philosophers held) but to comprehend it.*’³⁷ From this, further questions arise: did change and control continue to play a role in his definition of domination? Was this passage a rejection of his former position? Given that mastery was originally justified with discussions of human self-determination and a struggle with external nature, how was nature and its relationship to humans portrayed in this new construction? Finally, were there specific intellectual and social forces to which Horkheimer was responding?

III. THE REVOLT OF NATURE

Max Horkheimer’s intellectual project of critical theory required that he engage empirically with the external world. From his earliest pronouncements in 1931, as the director of the Institute of Social Research, he expressed a desire to interpret ‘human fate’ making use of ‘an ongoing dialectical permeation and evolution of philosophical theory and empirical-scientific praxis’.³⁸ In 1933, he said it was his aim to understand ‘the wretchedness of our own time’ through an investigation of ‘the structure of society’.³⁹ That same year, the Institute’s headquarters were occupied and closed by the state police and Horkheimer was fired from his position as Chair of Social Philosophy at the University of Frankfurt. He and his colleagues found themselves exiled from their homeland and distant witnesses to the horrors of labour and concentration camps, Hitler and Stalin, and World War II.⁴⁰

If a pessimism began to pervade Horkheimer’s writings in this period of his life it was intimately connected to his concerns regarding the pervasiveness of ‘direct forms of domination’, of the ‘concentration of power’, of the ‘injustice’ and ‘madness’ of totalitarianism, of the destruction of ‘entire populations’, of the ‘ravag[ing of] continents for reserve supplies’, of the ‘new order of fascism’.⁴¹ Unlike Marxists of the preceding generation who took hope from the formation of the Soviet Union and the strengthening of labour movements in Western Europe, Horkheimer saw few promising trends on the horizon. Even as he was attempting to explain that ‘crises [took] the guise of natural and inevitable phenomena’, leaving the individual with a sense of ‘helplessness’, he, himself, seemed to succumb.⁴²

Horkheimer's diminishing optimism stemmed from a source closer to home as well: the gradual dissolution of the Institute's inner circle. Arguably, from the moment the Institute's doors in Germany were closed and its members dispersed, Horkheimer's original vision for a genuinely multidisciplinary project would remain unfulfilled. Even so, his efforts for the remainder of the decade, to coordinate the members' research and continue producing the *Journal of Social Research*, were valiant. Looking back on this period, Jürgen Habermas has commented with some admiration on Horkheimer's handling of the disruptions:

In those years, Horkheimer must have been quite imposing as a person and as an intellectual stimulator, original thinker, philosopher, and scientific administrator; otherwise, he would have not been able to hold together over the years so many productive and highly talented thinkers who differed so much in temperament, background, and orientation.⁴³

Despite these skills, the group could not be held together permanently and with the US entry into World War II, the Institute lost a number of its members to the federal government's war effort. Undeniably more painful to Horkheimer, though, was the almost simultaneous loss of Walter Benjamin, who in 1940 committed suicide in a small border town in Spain after a failed attempt to escape fascist captors.⁴⁴ It was in fact in Horkheimer's essay 'The End of Reason', written on the heels of Benjamin's death and dedicated to him in a small collection of articles, that Horkheimer's metamorphosis with respect to nature was first expressed.

Martin Jay has observed that this transitional period, from the late thirties to the early forties, was marked by at least two tensions within the Frankfurt School's work.⁴⁵ The first he identifies as an increasingly strained commitment within critical theory to political practice and the second, as a growing inconsistency between their theoretical and empirical writings. These tensions, present in their work from the start, seemed to have been aggravated by the external political environment in which the 'truths of theory' began to be seen as a refuge from the 'half-truths of political practice'. According to Jay, 'This increased fear that negation was being systematically eliminated from culture and society meant a critical change in the *Institut's* attitude toward political activism.'⁴⁶ For Horkheimer, in particular, this fear was acute; so much so, that in 1940 he could write, 'Thought itself is already a sign of resistance.'⁴⁷

It is in this context that Horkheimer's metamorphosis can best be understood, for both the *Eclipse of Reason* and *Dialectic of Enlightenment* were critiques of the present and past, omitting almost any mention of possibilities for the future. Significantly, Horkheimer's previous optimism for the mastery of nature was only ever an optimism for a *future* mastery, once socialism had been achieved. With the looming threat of annihilation, even these possibilities seemed unimaginable and were replaced by a reworked, and somewhat inconsistent, definition of domination.

The phrase, ‘mastery (or domination) of nature’ was initially used by Horkheimer to describe a potentially emancipatory process, assuming that the obstacles of social division could be removed. In the *Eclipse of Reason* it took on a more complex configuration where ‘nature’ no longer referred solely to the nonhuman world, but instead incorporated both external *and* internal nature. This change was one of the more fundamental in his new framework. Horkheimer made this explicit within the text:

[T]he more all nature is looked upon as ‘quite a mess of miscellaneous stuff’ (‘mess’ doubtless only because the structure of nature does not correspond to human use), as mere objects in relation to human subjects, the more is the once supposedly autonomous subject emptied of any content, until it finally becomes a mere name with nothing to denominate ... The human being, in the process of his emancipation, shares the fate of the rest of the world. Domination of nature involves the domination of man. Each subject not only has to take part in the subjugation of external nature, human and nonhuman, but in order to do so must subjugate nature in himself. Domination becomes internalised for domination’s sake.⁴⁸

With the rise of subjective reason, Horkheimer argued, came an attendant rise in the domination of inner and outer nature. ‘The triumph of subjective, formalised reason is also the triumph of a reality that confronts the subject as absolute, overpowering.’⁴⁹ No longer did nature or the human subject have meaning and purpose in and of themselves; instead, humans existed for the sole aim of self-preservation, ‘emptied of all substance’, while nature had been ‘degraded to mere material, mere stuff to be dominated’.⁵⁰

Comparing this new formulation with his previous framework, most clearly expressed in ‘Traditional and Critical Theory’ and ‘On the Problem of Truth’, we see more theoretical continuities than ruptures. Horkheimer had become fixated on the idea that human ‘power over nature’, if blocked by social stratification turned mastery – which had the potential to be a positive relationship – into the potential for sheer destruction.⁵¹ This analysis was in fact only a more developed, and arguably foreboding, expression of his earlier assertion that in a class society those with greater power could ‘bend [nature] to destructive ends’.⁵² Horkheimer began to articulate more carefully the complex interactions between human psychology and modern ‘methods of production’, arguing that repressive conditions could be perpetuated by those who were themselves dominated, through the domination of others, of nonhuman nature, and of self (i.e. internalised repression).⁵³ He called this phenomenon the ‘liquidation of the subject’.⁵⁴ Again, in his essay on ‘Traditional and Critical Theory’ Horkheimer was already attentive to the varied roles of oppressor and oppressed; in *Eclipse of Reason* he took these concerns to new heights, however, implicitly relying on Freudian psychoanalysis and Eric Fromm’s ‘analytical social psychology’ to examine simultaneously human and nonhuman nature and their relationship, one to the other.⁵⁵

According to Horkheimer, 'since the subjugation of nature, in and outside of man, [went] on without any meaningful motive, nature [was] not really transcended or reconciled but merely repressed'.⁵⁶ For that reason, modern civilisation could best be characterised as 'rationalised irrationality', where the means were rational and the ends irrational.⁵⁷ In this new framework, perhaps the most distinct feature to emerge was Horkheimer's insistence that not only humans, but nonhuman nature had the potential to act. He called this agency 'the revolt of nature'.

'Revolt', Horkheimer asserted, was a consequence of repressive and oppressive conditions; it stemmed from direct antagonisms within society and between society and the nonhuman world. Within the human realm, revolt could take the form of 'social rebellions', 'crime', and 'mental derangement'.⁵⁸ In other words, oppression had the potential to catalyse organised (and unorganised) resistance. However, oppression was just as likely, or more, to drive individuals to submit.⁵⁹ To demonstrate how these dynamics played themselves out in society, Horkheimer described a hypothetical scenario of a young man attempting to make sense of the world around him:

What fills the adolescent with distress is, above all, his dim and confused realisation of the close connection or near-identity of reason, self, domination, and nature. He feels the gap between the ideals taught him and the expectations that they arouse in him on the one hand, and the reality principle to which he is compelled to submit on the other. *His ensuing rebellion is directed against the circumstance that the air of godliness, of aloofness from nature, of infinite superiority, conceals the rule of the stronger or of the smarter.* This discovery may add either one of two important elements to the character of the individual who makes it: resistance or submission. The resistant individual will oppose any pragmatic attempt to reconcile the demands of truth and the irrationalities of existence ... [H]e will insist on expressing in his life as much truth as he can, both in theory and in practice. His life will be a life of conflict.⁶⁰

Once again, it is clear that Horkheimer's main concern was the glaring contradiction between rhetoric and reality; or, to put it in another way, the ability of various social groups to conceal or mask dynamics within society and between society and 'nature'. Most important to him was that people realise that these dynamics 'derive from interhuman relationships rather than from innate human qualities', and that their current manifestation was irrational.⁶¹

Among non-humans, the manifestations of 'revolt' were left in vaguer terms. According to Horkheimer, 'Today nature's tongue is taken away'; it had been 'stripped of all intrinsic value and meaning'.⁶² 'It is true', he wrote, 'that in this process nature has lost its awesomeness, its *qualities occultae*, but, completely deprived of the chance to speak through the minds of men even in the distorted language of these privileged groups [i.e. intellectuals], nature seems to be taking its revenge.'⁶³ Horkheimer rejected the view of nature as solely 'an object in relation to human subjects'.⁶⁴ Instead, he wished to conceive of it as its own

subject, no longer ‘the object of total exploitation ... [with] no limit’.⁶⁵

[N]ature is today more than ever conceived as a mere tool of man ... Man’s boundless imperialism is never satisfied. The dominion of the human race over the earth has no parallel in those epochs of natural history in which the animal species represented the highest forms of organic development ... [T]he totalitarian attack of the human race on anything that it excludes from itself derives from interhuman relationships rather than from innate human qualities.⁶⁶

To achieve a change, Horkheimer recognised that there had to be a transformation in the social system such that nature was endowed ‘with an organ for making known her sufferings, or, we might say, to call reality by its rightful name’.⁶⁷ In other words, if society were to acknowledge the need to change human/nonhuman relationships, it had to also be willing to acknowledge that its own social structures needed changing as well. This new outlook toward outer nature required that humans accept its potential for revolt by adopting toward it a ‘spirit of humility’.⁶⁸ In this way, nature could be ‘reconcil[ed] ... with man’.⁶⁹ The best way ‘of assisting nature’, wrote Horkheimer, was ‘to unshackle its seeming opposite, independent thought’.⁷⁰ In other words, the emancipation of reason itself – so that reality could be called for what it was – would ultimately be the best catalyst to address human/nature interactions.

In these excerpts, Horkheimer was echoing a sentiment long before expressed in the Marxist tradition by Engels. In the *Dialectics of Nature*, Engels had already explicitly connected nature’s conquest to its *revenge*:

Let us not ... flatter ourselves overmuch on account of our human conquest over nature. For each such conquest takes its revenge on us. Each of them, it is true, has in the first place the consequences on which we counted, but in the second and third places it has quite different, unforeseen effects which only too often cancel out the first ... Thus at every step we are reminded that we by no means rule over nature like a conqueror over a foreign people, like someone standing outside nature – but that we, with flesh, blood, and brain, belong to nature, and exist in its midst, and that all our mastery of it consists in the fact that we have the advantage over all other beings of being able to know and correctly apply its laws.⁷¹

Engels’ views, here expressed, reflected an undercurrent in his and Marx’s philosophy of nature in which humans were clearly considered *of* nature and not above it. This perspective was nevertheless in dynamic tension with their accompanying view that humans were productive forces able to transform nature through their labour. Robyn Eckersley has highlighted this point:

While the notion of humans as *homo faber* remained a central theme in the writings of the mature Marx, he came to the view ‘that the struggle of man with nature could be transformed but not abolished.’ That is, the complete ‘reconciliation’ with, or ‘humanisation’ of, nature was no longer considered possible, because although labor could be reduced to a minimum, Marx took the view that it could never be totally dispensed with. Although more and more areas of nature would come under human

control through technological development, the *antagonistic* dialectic between humanity and nature would never be entirely resolved.⁷²

Marx's orientation corresponded easily with Horkheimer's more youthful writings in the nineteen-thirties; in fact, on close examination, Horkheimer seems never to have fully rejected this view. It was not a generic human 'struggle with nature' or humans as 'productive forces' that prompted Horkheimer's fierce critique of domination beginning in the early nineteen-forties. His greatest objections were the *degree* of control exerted and the *scale* of human and nonhuman destruction that occurred, *in the absence* of any meaningful (i.e. socialist) aims. In other words, Horkheimer's transition was not an acceptance of the idea that human modification of nature was inevitably negative and therefore *wrong*, but was instead a rejection of a specific set of social and political conditions that he believed were overly exploitative of both humans and nonhuman nature. The 'mentality of man as the master', accompanied by a 'modern insensitivity to nature' allowed 'the principle of domination ... [to] become the idol to which everything [was] sacrificed'.⁷³ In this context, nonhuman nature did in fact lose all intrinsic value as did the individual and it was against this that Horkheimer was ultimately protesting.

IV. THE CUNNING OF UNREASON AND THE REVOLT OF NATURE

In the nearly fifty years since Horkheimer's *Eclipse of Reason* was first published it has 'fallen into the background of the history of critical theory'.⁷⁴ One of the main reasons for this was Horkheimer's own reticence to promote it, since he felt the content had already been elucidated in his essay, 'The End of Reason', ultimately published in 1942 as his final contribution to *Studies in Philosophy and Social Science*.⁷⁵ Despite this neglect, several authors have taken Horkheimer's work seriously and explored a few of his key concepts further. One, in particular, was William Leiss, who in the mid-1960s was a graduate student under the tutelage of Herbert Marcuse at the University of California-San Diego. In 1969, Leiss completed his dissertation and published it three years later as *The Domination of Nature*.

Not surprising for a student guided by a founding member of the Frankfurt School, Leiss' research agenda focused on the origins and historical developments of the concept of 'domination of nature'. Leiss remained loyal both to the spirit and content of 'critical theory', echoing Horkheimer's and Marcuse's perspectives while simultaneously attempting to augment them. Where many of his predecessors relied heavily on theories of political economy, the history of philosophy, and psychoanalytic theory, Leiss was equally, if not more, indebted to the burgeoning field of the history of science. It was to this literature, and its subject matter, that he turned to locate the origins of the idea of human mastery of nature.⁷⁶

Beginning with a broad historical survey, Leiss identified a number of roots, 'mythical, religious, and philosophical', that helped explain the ascendancy of a conceptual orientation toward the domination of nature. While he was not in full agreement with Lynn White's assessment that Christianity was at the root of the ecological crisis, he did believe that 'there [was] no more important original source for the idea of mastery over nature' than in Christian thought.⁷⁷ White, however, had not 'attempt[ed] to account for the novel philosophical, methodological, and experimental principles which characterise[d] modern science, since the hegemony of Christianity span[ned] a much wider historical period'.⁷⁸ It was with this later period that Leiss was most concerned since he believed that during this time there 'emerged a qualitative transformation in the human ability to exploit the forces of nature'.⁷⁹ It was also during this time, according to Leiss, that the mastery of nature, as an idea, came to be depicted as an emancipatory project by the likes of Bacon and Descartes:

This formula encompassed two distinct thoughts: (1) the new method [of scientific investigation] would permit an explanation of natural phenomena far superior to what obtained in their day with respect to such criteria as generality, consistency, and conceptual rigor; (2) the fruits of the method would consist in *social* benefits – notably an increased supply of goods and a general liberation of the intellect from superstition and irrationality – that would enable men to control their desires and to pursue their mutual concerns more justly and humanely.⁸⁰

Unlike Horkheimer who centred his analysis on the 'eclipse of reason', Leiss emphasised the 'cunning of unreason'.⁸¹ A phrase he used sparingly, the cunning of unreason helped to explain why the idea of 'the mastery of nature' as a liberating force had never had the expected social effects. According to Leiss, modern science had cultivated the hope that

'scientific knowledge, as the mode of adaptation and of human control over nature, may also be a major instrument of human self-control, by means of rational intelligence.' ... [Unfortunately,] that hope has been consistently frustrated ... Social development continues to defy all attempts at rational control and is governed instead by the puppetry of a hidden dynamic – the cunning of unreason, whose most fateful manifestation is the process whereby the rationalism of modern science and technology becomes caught in the web of irrational social contradictions.⁸²

The cunning of unreason thus conformed to Horkheimer's formulation that irrational social structures must be unveiled in order for interactions between outer and inner nature to be understood and changed. The concept also suggested, on a more abstract level, that rational ideas have the potential to manifest themselves in irrational, unintended, or unpredictable consequences, much as was argued by Engels in *Dialectics of Nature*.

Within this framework, Leiss endeavoured to illuminate the ambiguities and subtle nuances associated with the concept of mastery of nature. Here he has

succeeded in approaching the issues more systematically than Horkheimer; however, much of what he discussed can be found in some form in the latter's writings. One of the first matters Leiss took up was the complexity of the term nature itself. There were two realms of nature to be understood, he argued; the first related to the 'experienced nature of everyday life', and the second, to 'the abstract-universal, mathematised nature of the physical sciences'.⁸³ With respect to the second realm Leiss in fact believed that 'nature *per se* [was] not the thematic object of the investigations pursued in the natural sciences, because there [was] simply no such thing. There [were] instead different perspectives on nature which [were] related to various types of human interests.'⁸⁴

Given Leiss' 'bifurcation of nature' it became clear that the mastery of nature could be attempted in a variety of social arenas. For instance,

the nature which is experienced in everyday life has been the object of mastery in every stage of human development. In general the control of nature in this sense has meant more or less complete disposition over the available natural resources of a particular region by an individual or social group and either partial or total exclusion of others from the benefits (and necessities of existence) available therein. In other words, under the conditions of the persistent social conflict that has characterised all forms of human society, the natural environment always appears either as already appropriated in the form of private property or else as subject to such appropriation.⁸⁴

Echoing Horkheimer's point in his essay 'Traditional and Critical Theory', Leiss argued that the mastery of nature, as described above, 'ha[d] been neither complete nor permanent', requiring constant and often intense human struggle.⁸⁶

Examining the second realm of nature, within the domain of scientific rationality, mastery was 'manifested in [science's] ability to cast a "veil of ideas" over the nature experienced in everyday existence'.⁸⁷ In other words, mastery in this arena entailed developing a unified theoretical framework that offered rational and coherent laws of nature. However, attempts to shift from one realm of mastery to another, i.e. from the nature of experience to that of science, created tensions. And it was to these that Leiss pointed for an explanation of why the cunning of unreason struck. As he put it, rationality, scientific or otherwise, could not impose an order where one did not exist:

Mastery of nature as the outcome of scientific rationality operating in the domain of scientific nature, when it is translated into the mode of mastery in an essentially different domain (practical action within the natural environment), cannot and does not preserve its character intact. The best illustration for this point is provided by the persistent attempts to understand the nature and workings of society by means of a methodology borrowed from the natural sciences ... [H]uman behavior as a whole cannot adequately be comprehended if one strives to maintain the degree of abstractness necessary for mathematical symbolisation at the same time.⁸⁸

Thus when these shifts were made – from the domain of nature examined via

scientific rationality to the domain of experienced nature – Leiss believed that one could, and should, expect unexpected or irrational outcomes.

To find one possible resolution to these unpredictable dynamics, Leiss turned to the concept of the ‘revolt of nature’. From his perspective, Horkheimer’s explanation gave weight to the idea that ‘the growing domination of men through the development of new techniques for mastering the natural environment and for controlling human nature did not go unresisted’.⁸⁹ In other words, for Leiss, the key element to Horkheimer’s ‘revolt of nature’ was the notion of resistance. Yet, Leiss went further than Horkheimer: he saw ‘resistance’ manifested not just on the part of humans, but on the part of the nonhuman world as well.

The revolt of nature means the rebellion of human nature which takes place in the form of violent outbreaks of persistently repressed instinctual demands ... [I]n a different sense the concept of the revolt of nature may be applied in relation to ecological damage in the natural environment. There is also an inherent limit in the irrational exploitation of external nature itself, for under present conditions the natural functioning of various biological ecosystems is threatened ... If it is the case that the natural environment cannot tolerate the present level of irrational technological applications without suffering breakdowns in the mechanisms that govern its cycles of self-renewal, then we would be justified in speaking of a revolt of external nature which accompanies the rebellion of human nature.⁹⁰

Given Leiss’ extension of the original concept, the question arises: how radically has he departed from Horkheimer’s intention? Within the larger context of his argument, it would seem not far at all. Here, Leiss extended agency to external nature in much the same way that Horkheimer had desired. To paraphrase Horkheimer, external nature was seen to have meaning and purpose in and of itself. Like human nature, external nature had the potential to ‘revolt’ against irrational conditions. Such revolt, however, did not require that nature be endowed with purposiveness; in other words, to be characterised as having the potential for revolt, external nature did not simultaneously need to be characterised as having consciousness.⁹¹ The subtlety in this position emerged when Leiss discussed possible paths to liberation. Of particular interest here are the various roles he assigned to humans and the nonhuman world.

Through his descriptions of the role and function of the ‘mastery’ or ‘domination’ of nature, Leiss hoped to shed light on the potential for emancipation. In his view, ‘the idea of the domination of nature must yield up its fond dream of human technological power over nature that remains socially and politically innocent’.⁹² Scientific and technological innovation should no longer provide the impetus behind the ‘mastery of nature’; instead, its ‘principal focus [should be] *ethical or moral development*’.

[T]he reversal or transformation which is intended in the transition from mastery to liberation concerns the gradual self-understanding and self-disciplining of *human nature*.⁹³

Leiss' understanding of the means for liberation sounded remarkably similar to Horkheimer's at the conclusion of his chapter on the revolt of nature. Whereas Horkheimer called his emancipatory principle 'reason', or 'independent thought', Leiss called his 'rationality'.⁹⁴ Most startling, however, was Leiss' return to a vision of society that echoed Horkheimer's earlier optimism for a *future* mastery:

Liberation is equivalent to the nonrepressive mastery of nature, that is, mastery that is guided by human needs that have been formulated by associated individuals in an atmosphere of rationality, freedom, and autonomy. Otherwise, mastery of nature might – and does – serve to perpetuate domination and irrationality.⁹⁵

In this passage, we appear to have come full circle, returning to a view of mastery that depended on a nonhuman nature that would serve human ends. Like Horkheimer, Leiss rejected any appeal to the 'intrinsic benevolence of technoscientific mastery', but unlike him, he could simultaneously offer a critique and an optimistic vision.

Liberation, in Leiss' view, did not extend to nonhuman nature: 'As a rational idea "liberation" can apply only to the work of consciousness, to human consciousness as an aspect of nature, and not to "nature" as a totality.'⁹⁶ Nonetheless, what remained important for him was the desire to emancipate humanity while respecting the power of external nature. Rather than strive to 'dominate nature', he argued, society should master the 'relationship between nature and humanity'.⁹⁷

The task of mastering nature ought to be understood as a matter of bringing under control the irrational and destructive aspects of human desires. Success in this endeavour would be the liberation of nature – that is, the liberation of human nature: a human species free to enjoy in peace the fruits of its productive intelligence.⁹⁸

V. NATURE'S AGENCY

Nearly twenty-five years have passed since the original publication of Leiss' book *The Domination of Nature*, and close to fifty since *Eclipse of Reason*. It is not surprising then that neither Horkheimer's nor Leiss' conceptual frameworks fully satisfy the complexity of the contemporary era. Where Horkheimer's formulation now appears incomplete and fragmented, Leiss' seems too unconcerned with the dynamics of nonhuman systems. Both could be criticised for failing to develop a theoretical framework that could fully explore the interactions between humans and nonhuman nature. Such criticism, however, feels unwarranted given the objectives of their respective works. Neither proposed to undertake such far-reaching goals and in fact, both were well ahead of their time in the way they conceived of the dialectics of social and natural systems.

Horkheimer's critics have argued that his theoretical shift in the 1940s

demoted 'society and history ... in favor of nature, [giving it] theoretical priority'; however, this too seems unfair.⁹⁹ Horkheimer went from locating nonhuman nature on the periphery of his theoretical framework to locating it side by side with social systems. He rejected the idea that nonhuman nature was open to 'total exploitation', and urged instead a 'spirit of humility'.¹⁰⁰ If anything, Horkheimer's transition drew attention to the fact that humans denied their integration with 'nature'. This denial he saw as a source of both psychological and social tensions.

Leiss, on the other hand, seemed less concerned with the *state of nature*, per se, than with human emancipation. His general inattention to ecological disruptions, in favour of a social analysis, has consequences of its own, however. As Ted Benton has argued, Marx and Engels were reluctant 'to recognise nature-imposed limits to human potential in general, and to the creation of wealth in particular'. This reluctance precipitated a 'crucial hiatus' in their writings which 'deprive[d] historical-materialist economic thought of the conceptual means to recognise and explain ecological crises'.¹⁰¹ Though aware of 'an inherent limit in the irrational exploitation of external nature', Leiss' vision of human liberation begged the question of ecological limits. Again, in all fairness, his omission may be excused if only because, with a few exceptions, theorists had yet to explore this new terrain.

In the spirit of critical theory, it seems important to extend the substance of Horkheimer's and Leiss' work into at least the beginnings of a new theoretical dialectic. In this process, however, we should bear in mind the caution that '... the core of truth is historical, [not] an unchanging constant to be set against the movement of history'.¹⁰² In this sense, such a dialectic is not a static, universal theory, but rather a means for understanding, explaining, and conceptualising various dynamics. 'Nature' within this context is embedded with multiple meanings and manifestations: the nature of everyday experience, the nature of the various physical and natural sciences, inner nature (i.e. human psychology), and outer nature, where 'outer' or 'external' can refer to both human society and the environment external to a particular individual.

Looking more carefully at the idea of the 'revolt of nature', we can say safely that it requires that both humans and nonhuman nature be conceived as having agency, or in other words, having the potential to resist oppressive or irrational conditions. Implicit in this configuration is the idea that neither humans nor nonhuman nature can ever be entirely controlled or repressed. Here Leiss' concept of the 'cunning of unreason' fits most appropriately. Attempts to rationally control either outer or inner nature (or both) always have the *potential* for unintended effects. This potential will remain as long as such rational efforts are undertaken within a 'web of irrational social contradictions'.¹⁰³

The manifestations of 'revolt' within the nonhuman realm, however, are less clear. How can we conceive of external nature having such agency? Again a word of caution seems appropriate. According to Anna Tsing,

Naturalising power requires empowering nature. Empowering nature means attributing to nature forms of agency we can understand. Yet 'nature' is also, by definition, that which escapes human attribution.¹⁰⁴

Thus, in finding ways to express nonhuman nature's power and agency, we not only need to evaluate, rigorously, the possible relations of power we might conceal on a social level, but also recall that our *knowledge* of 'nature's' agency is but a human approximation for something we may never fully understand. William Cronon has recently expressed just this sentiment: 'The nonhuman world', he writes, 'is real and autonomous, a place always worthy of our respect and care, but the paradox of our human lives is that we can never know that world at first hand.'¹⁰⁵ To refine Cronon's assessment slightly, it may be more useful to consider nature as *heteronomous*, for while it is, in theory, 'capable of existing independently' and of 'self-government', in practice it is more often 'subject to external controls and impositions'. It is just these controls that a discussion of the mastery and revolt of nature helps illuminate.¹⁰⁶

The need to view nonhuman nature as an 'agent' in its own right stems from contemporary and historical constructions of 'nature' in which it is viewed as a passive setting on which societies' dramas unfold. Such perspectives have arguably allowed particular social institutions, as well as individuals, to become dangerously arrogant in their attitudes and behaviour toward external nature, a condition Martin Jay has referred to as 'species imperialism'.¹⁰⁷ To speak in terms of nature-as-agent forces a recognition of the nonhuman world's reciprocal impact on humanity. It requires that humans acknowledge, or at least debate and contest, the idea of natural limits.

In recognising the 'revolt of nature', it is unnecessary to romanticise 'nature' or endow it with purposefulness; instead one must simply recognise that human experiences tell us that external nature is dynamic and often unpredictable. Efforts to control or pacify nonhuman nature will, therefore, ultimately prove incomplete. By embracing a dialectic between natural and social systems we will not overcome the risks associated with their interactions, but it is possible we may increase the benefits.

NOTES

I owe a debt of gratitude to Carolyn Merchant for introducing me to the work of William Leiss and the Frankfurt School and for supporting and commenting on my original research in this area; her edited volume *Key Concepts in Critical Theory: Ecology* first exposed me to some of the central passages and texts of concern in this article. I am also indebted to Ravi Rajan for his encouragement throughout and to Colin Greer, Debora Hammond, Martin Jay, Rachel Schurman and an anonymous reader for reviewing an earlier draft. Finally, thanks are due to my friends, Miya, Danny, Naomi, Jane, Dee, and Ann for understanding my need to pursue these apparently remote and abstract subjects and only occasionally making fun of me for it.

THE CUNNING OF UNREASON

¹In Alfred Schmidt, *The Concept of Nature in Marx*, p. 167. According to Wolf Schäfer, this sentence was struck out by the authors in the original manuscript, but was reinstated by the editors when the *German Ideology* was first published in full in 1932; it rarely appears in paperback versions of the book. Schäfer, 'Stranded at the Crossroads of Dehumanization', p. 174. Incidentally, Schäfer offers a slightly different translation from the German.

²Horkheimer, *Eclipse of Reason*, p. vii. For a history of the Frankfurt School see, Rolf Wiggershaus, *The Frankfurt School: Its History, Theories, and Political Significance* and Martin Jay, *The Dialectical Imagination: A History of the Frankfurt School and the Institute of Social Research, 1923-1950*. For treatments with greater emphasis on specific philosophies of the Frankfurt School see David Held, *Introduction to Critical Theory: Horkheimer to Habermas*; Douglas Kellner, *Critical Theory, Marxism, and Modernity*, and 'Critical Theory Today: Revisiting the Classics'; and Ben Agger, *The Discourse of Domination: From the Frankfurt School to Postmodernism*. And for edited volumes with a good cross-section of primary material by members of the Frankfurt School (broadly defined) see Stephen Bronner and Douglas Kellner, eds, *Critical Theory and Society: A Reader* and Andrew Arato and Eike Gebhardt, eds, *The Essential Frankfurt School Reader*.

³Ibid., p. v.

⁴Ibid., p. vi.

⁵Horkheimer, 'The Social Function of Philosophy', p. 257.

⁶Horkheimer, 'Traditional and Critical Theory', p. 194

⁷Ibid., p. 198.

⁸Ibid., pp. 210-211.

⁹Horkheimer, 'The Social Function of Philosophy', p. 259.

¹⁰Horkheimer, 'Traditional and Critical Theory', p. 215. The term 'critical behaviour' is not, in fact, used in Horkheimer's essay, though it is used by Hauke Brunkhorst in his article, 'Dialectical Positivism of Happiness'. A few months after Horkheimer wrote 'Traditional and Critical Theory', he published a 'Postscript' at the urging of Herbert Marcuse to address the role of philosophy and dialectics in more detail. In this postscript he wrote, '[Critical theory's] goal is man's emancipation from slavery' (p. 246), a statement which makes absolutely clear his commitment to a radical praxis.

¹¹Horkheimer, *Eclipse of Reason*, p. 7, all quotes.

¹²Ibid., p. 9.

¹³Ibid., pp. 10, 11, and 23. In 'The Social Function of Philosophy' Horkheimer put this same idea slightly differently: 'The real social function of philosophy lies in its criticism of what is prevalent. That does not mean superficial fault-finding with individual ideas or conditions . . . The chief aim of such criticism is to prevent mankind from losing itself in those ideas and activities which the existing organization of society instills into its members. Man must be made to see the relationship between his activities and what is achieved thereby, between his particular existence and the general life of society, between his everyday projects and the great ideas which he acknowledges. Philosophy exposes the contradiction in which man is entangled in so far as he must attach himself to isolated ideas and concepts in everyday life' (pp. 264-265).

¹⁴*Eclipse of Reason*, p. 21. The historical processes to which Horkheimer referred were elaborated on in his earlier article, 'The End of Reason'. Published in *Studies in Philosophy and Social Science* in 1942, this essay was written in 1940 as part of a tribute

to Walter Benjamin, who had that year committed suicide. The title has also been translated as 'Reason and Self-Preservation'.

¹⁵ In 'The End of Reason' Horkheimer offered a similar analysis: 'The difficulties of rationalistic philosophy originate from the fact that the universality of reason cannot be anything else than the accord among the interests of all individuals alike, whereas in reality society has been split up into groups with conflicting interests. Owing to this contradiction, the appeal to the universality of reason assumes the features of the spurious and the illusory.' Horkheimer, 'The End of Reason', p. 30.

¹⁶ Thomas McCarthy and David Hoy, *Critical Theory*, pp. 8 & 10.

¹⁷ Horkheimer, *Eclipse of Reason*, p. 12.

¹⁸ *Ibid.*, p. 5.

¹⁹ Georg Lohmann, 'The Failure of Self-Realization', p. 390. In this article Lohmann offers an interpretation and critique of the *Eclipse of Reason*. For a useful discussion of the concept of totality in Horkheimer's writings see Martin Jay, *Marxism and Totality: The Adventures of a Concept From Lukács to Habermas*, chapter 6.

²⁰ Horkheimer, *Eclipse of Reason*, p. 174.

²¹ Habermas, 'Remarks on the Development of Horkheimer's Work', p. 54.

²² Schäfer, 'Stranded at the Crossroads', pp. 167-68. Schäfer's article was in large part responsible for drawing my attention to Horkheimer's theoretical transition; however, he does not trace the transition in detail.

²³ Marx, *1844 Manuscripts*, in Carolyn Merchant, ed., *Key Concepts in Critical Theory: Ecology*, p. 30.

²⁴ Engels, *Dialectics of Nature*, in Merchant, *Key Concepts*, p. 33.

²⁵ For a discussion of the differences in Marx's and Engel's views on nature see Schmidt, *The Concept of Nature in Marx*. Schmidt is rather critical of Engels and in particular of his book *Dialectics of Nature*. He writes of 'Engel's fateful attempt to extend the dialectic to cover pre-human and extra-human nature', a flawed move in his view since 'it is precisely for materialism to restrict the dialectical method to the socio-historical areas of reality' (Schmidt, p. 166; also see pp. 51-61). Other commentators are more sympathetic. Alvin Gouldner, for instance, writes that '[Engel's] focus on nature was driven by a dialectical sense of man's unity with and difference from nature, his dependence on nature and his effort to dominate it, his separation from it and his being in its very midst, flesh and mind alike part of one whole' (Gouldner, *The Two Marxisms*, p. 264). Gouldner's book delves more deeply into other theoretical differences between Marx and Engels as well. It was Martin Jay's book *Marxism and Totality* that drew my attention to Gouldner.

²⁶ Horkheimer, 'Traditional and Critical Theory', p. 210. To illustrate the transformations in Horkheimer's theoretical framework, it will be necessary to quote him at length from the text.

²⁷ Lukács, *History and Class Consciousness*, p. 234. Alfred Schmidt has argued that Lukács believed that nature was *only* a societal category, that he 'dissolve[d] nature, both in form and content, into the social forms of its appropriation' (Schmidt, *The Concept of Nature in Marx*, p. 96, also see pp. 69-70). This interpretation has been challenged by several authors. While Lukács did misread Marx's conception of nature, he did not ignore nature's independent existence. He did, however, downplay its unique force in human-nature interactions; see esp. Lukács, pp. 231-235. Two excerpts from his work that demonstrate nature's independent existence: '[I]s it not the world-historical mission of the process of civilisation that culminates in capitalism, to achieve control over *nature*?' (p. 233); and, 'This stability in the value of art, the semblance of its nature as something

wholly above history and society, rests upon the fact that in art we find above all a dialogue between man and nature' (p. 235). Martin Jay, in *Marxism and Totality*, has offered a more persuasive reading of Lukács: 'Focusing solely on the "second nature" that was reified history, [Lukács] neglected to probe the role of the "first nature" in human life, a mistake for which Western Marxists of very different persuasions were to take him to task' (Jay, *Marxism and Totality*, p. 116).

²⁸ Schmidt, *The Concept of Nature in Marx*, p. 136. Martin Jay supports this point in a discussion of Antoni Gramsci who 'frequently asserted that socialism meant the rational domination of nature' (*Marxism and Totality*, p. 170).

²⁹ Horkheimer, 'On the Problem of Truth', p. 412.

³⁰ Horkheimer, 'Traditional and Critical Theory', p. 213.

³¹ See *ibid.*, pp. 213-215 for further discussion of this point.

³² Engels, *Herr Eugen Dühring's Revolution in Science*, in Merchant, *Key Concepts*, p. 34.

³³ Horkheimer, 'Traditional and Critical Theory', p. 229.

³⁴ *Ibid.*, p. 230.

³⁵ Robert Tucker, ed., *The Marx-Engels Reader*, p. 441.

³⁶ The full quote reads: 'In short, the animal merely *uses* external nature, and brings about changes in it simply by his presence; man by his changes makes it serve his ends, *masters* it. This is the final, essential distinction between man and other animals, and once again it is labour that brings about this distinction.' Engels, *Dialectics of Nature*, p. 291, emphasis in original; see also pp. 17-19, 172, and 282.

³⁷ Max Horkheimer, 'The End of Reason', p. 47, emphasis added.

³⁸ Horkheimer, inaugural address, Jan 24, 1931, 'The State of Social Philosophy and the Tasks of the Institute of Social Research', p. 31.

³⁹ Horkheimer, 'Materialism and Metaphysics', pp. 23-24.

⁴⁰ On the experience of the Frankfurt School as exiles see Martin Jay, *Permanent Exiles: Essays on the Intellectual Migration From Germany to America*, esp. chapter 3, 'The Frankfurt School in Exile'. For a detailed re-evaluation of Horkheimer's philosophy and role in the Institute of Social Research see Seyla Benhabib, Wolfgang Bonß, and John McCole, eds, *On Max Horkheimer: New Perspectives*.

⁴¹ Horkheimer, 'The End of Reason', pp. 34, 44, 45, 46.

⁴² *Ibid.*, p. 44.

⁴³ Habermas, 'Remarks on the Development of Horkheimer's Work', p. 53. Habermas' comments include the period of exile up until 1941 when Horkheimer moved to California.

⁴⁴ Wiggershaus, *The Frankfurt School: Its History, Theories, and Political Significance*, pp. 310-11.

⁴⁵ Jay, *Permanent Exiles*, pp. 28-40.

⁴⁶ *Ibid.*, p. 33.

⁴⁷ In Jay, *Permanent Exiles*, p. 35. The quotation is from Horkheimer's unpublished manuscript 'Authoritarian State' which also appeared in the collection of articles in tribute to Benjamin.

⁴⁸ *Eclipse of Reason*, p. 93. The quotes in the text refer to an article by Harry Todd Costello, 'The Naturalism of Frederick Woodbridge', in *Naturalism and the Human Spirit*.

⁴⁹ *Ibid.*, p. 96.

⁵⁰ *Ibid.*, p. 97.

⁵¹ This sentiment was also expressed in *Dialectic of Enlightenment* in which the 'domination of nature' helped explain 'why mankind, instead of entering into a truly human

condition, is sinking into a new kind of barbarism'. Horkheimer and Theodor Adorno, *Dialectic of Enlightenment*, p. xi.

⁵² Horkheimer, 'On the Problem of Truth', p. 412.

⁵³ *Eclipse of Reason*, p. 102. The full quote reads, 'The complete transformation of the world into a world of means rather than ends is itself the consequence of the historical development of the methods of production.'

⁵⁴ *Ibid.*, p. 93.

⁵⁵ For the effects of Freud and Fromm on Horkheimer, see Alfred Schmidt, 'Max Horkheimer's Intellectual Physiognomy', esp. p. 34.

⁵⁶ *Eclipse of Reason*, p. 94.

⁵⁷ *Ibid.*

⁵⁸ *Ibid.*

⁵⁹ *Ibid.*, p. 113. The full quote is, 'The other element, submission, is the one the majority is driven to take on.'

⁶⁰ *Ibid.*, p. 112, emphasis added.

⁶¹ *Ibid.*, p. 109.

⁶² *Ibid.*, p. 101.

⁶³ *Ibid.*, pp. 103-04.

⁶⁴ *Ibid.*, p. 94.

⁶⁵ *Ibid.*, p. 108.

⁶⁶ *Ibid.*, pp. 108-09.

⁶⁷ *Ibid.*, p. 101. To be clear, Horkheimer is not espousing a romantic 'return to nature' (p. 109); he had no use for 'sentimental discontent with civilization, and the desire to recall primitive stages of society or human nature' (p. 124), because he believed these prevented genuine 'reconciliation with nature' (p. 127).

⁶⁸ *Ibid.*, p. 124.

⁶⁹ *Ibid.*

⁷⁰ *Ibid.*, p. 127.

⁷¹ Engels, *Dialectics of Nature*, pp. 291-92. In this passage Engels is referring entirely to nonhuman nature.

⁷² Eckersley, *Environmentalism and Political Theory*, p. 79, emphasis in original. Eckersley is quoting from Schmidt's *The Concept of Nature in Marx*.

⁷³ Horkheimer, *Eclipse of Reason*, pp. 104 and 105.

⁷⁴ Lohmann, 'The Failure of Self-Realization', p. 387.

⁷⁵ This was the name given to the *Journal of Social Research* in 1940 when it began to appear in English. Though the title page of the journal says 1941, Wolf Schäfer has noted that the article itself is dated March, 1942. Schäfer, 'Stranded at the Crossroads', p. 180.

⁷⁶ A few of the better known historians and authors of historical works relating to science that Leiss relied upon include Alexandre Koyré, Paolo Rossi, Ernst Cassirer, Joseph Needham, Frances Yates, Lynn White, Lynn Thorndike, Edgar Zilsel, and J.D. Bernal.

⁷⁷ Leiss, *The Domination of Nature*, p. 32. More 'fragmentary and diffuse' sources were to be found in Renaissance natural magic, alchemy, cosmology, and astrology. p. 36.

⁷⁸ *Ibid.*, p. 30.

⁷⁹ *Ibid.*, p. 20. This exploitation was made possible via new technologies and forms of social organisation.

⁸⁰ *Ibid.*, p. 21, emphasis in original.

⁸¹ This phrase had its origins in Hegel's formulation, 'the cunning of reason'. Though it was not his primary motif, Horkheimer, in his article 'The End of Reason', also mentioned

unreason: 'The new order of fascism is reason revealing itself as unreason', p. 46.

⁸²Leiss, *Domination of Nature*, pp. 21-22. Leiss is quoting Marx Wartofsky, *Conceptual Foundations of Scientific Thought*.

⁸³Ibid., p. 136.

⁸⁴Ibid., pp. 136-37.

⁸⁵Ibid., p. 137. The 'bifurcation of nature' was a term Leiss applied to his own analysis.

⁸⁶Ibid., p. 138.

⁸⁷Ibid., p. 139.

⁸⁸Ibid., p. 141.

⁸⁹Ibid., p. 161.

⁹⁰Ibid., p. 161 and p. 164.

⁹¹Horkheimer objected, vehemently, to romantic attitudes toward external nature for these tended to ignore the very real contradictions in human society. '[W]e are the heirs, for better or worse', he wrote, 'of the Enlightenment and technological progress. To oppose these by regressing to more primitive stages [by exalting nature] does not alleviate the permanent crisis they have brought about.' *Eclipse of Reason*, p. 127.

⁹²Leiss, *Domination of Nature*, p. 178.

⁹³Ibid., p. 193, emphasis in original.

⁹⁴Ibid., p. 212.

⁹⁵Ibid.

⁹⁶Ibid., p. 193.

⁹⁷Ibid., p. 198. This phrasing was a direct reference to a closing passage from Walter Benjamin's 1928 book, *One Way Street*. Leiss, himself, does not quote it directly, but it is worth reviewing: 'The mastery of nature, so the imperialists teach, is the purpose of all technology. But who would trust a cane wielder who proclaimed the mastery of children by adults to be the purpose of education? Is not education above all the indispensable ordering of the relationship between generations and therefore mastery, if we are to use this term, of that relationship and not of children? And likewise technology is not the mastery of nature but of the relation between man and nature.' Benjamin, *One Way Street*, p. 104.

⁹⁸Leiss, *Domination of Nature*, p. 193.

⁹⁹Lohmann, 'The Failure of Self-Realization', p. 395. Lohmann is agreeing with arguments made by Michael Theunissen.

¹⁰⁰*Eclipse of Reason*, p. 94 and p. 124.

¹⁰¹Ted Benton, 'Marxism and Natural Limits: An Ecological Critique and Reconstruction', p. 55.

¹⁰²Horkheimer and Adorno, *Dialectic of Enlightenment*, p. ix. This was written for the preface to the 1967 edition.

¹⁰³Leiss, *Domination of Nature*, p. 22. This said, I should emphasise that I do not underestimate the difficulty in identifying and working to resolve such contradictions.

¹⁰⁴Anna Tsing, 'Empowering Nature, or: Some Gleanings in Bee Culture', p. 114.

¹⁰⁵William Cronon, 'Toward a Conclusion', in idem, ed., *Uncommon Ground: Toward Reinventing Nature*, p. 458.

¹⁰⁶I would like to thank Martin Jay for suggesting that I consider the definition of autonomy more carefully. Definitions of autonomous and heteronomous from Webster's *Seventh Collegiate Dictionary*.

¹⁰⁷Jay, *Marxism and Totality*, pp. 170-71 and 214. Jay equates this term with the tendency to 'reduce nature to an object of human exploitation', p. 170.

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