

**BEYOND THE PRESSURE PRINCIPLE: A THERMODYNAMIC
INVESTIGATION OF THE DEATH INSTINCT IN *LA BÊTE
HUMAINE***

Jules Lemaître, writing in *Le Figaro* of 8 March 1890, characterised *La Bête humaine* as 'une épopée préhistorique sous la forme d'une histoire d'aujourd'hui'.¹ This is a familiar theme taken up by many commentators since, notably by Gilles Deleuze, who formulates a complex series of oppositions based primarily on the distinction between epic and drama.²

Certainly, on a very general level, Zola's novel can be seen to be making some sort of 'epic' statement about the fundamental nature of human beings and the movement of humanity towards some unseen destination, using the 'dramatic' terms of reference of the everyday workings of a railway milieu and the actions of the people who inhabit it. However, any overall 'message' which the novel may eventually communicate comes about through a highly complex and problematic system of symbols and metaphors which are informed in no small measure by two of the major scientific developments of the nineteenth century, namely genetics and thermodynamics.

Like the rest of the *Rougon-Macquart* cycle, *La Bête humaine* employs a genealogical system, later explicitly formulated in *Le Docteur Pascal*, whereby certain behavioural characteristics are inherited and are crucial to narrative and characterisation. Where the novel differs from the rest of the cycle is in the presence of the laws of thermodynamics as an implicit symbolic structure, operating in tandem with the hereditary structure, in terms of which human behaviour can be interpreted.

Deleuze argues that there is a double heredity at work in the novel, which mirrors the distinction between *drama* and *epos*. There are the relatively simple, mundane, profane behavioural characteristics such as alcoholism and sexual perversity which are to an extent dependent on socio-historical conditions and are not always transmitted intact from one generation to the next. This is termed 'la petite hérédité', which can be altered, or intensified in certain cases, by the individual's immediate living environment, and which is essentially part of *soma*, or that part of an organism which plays no role in the transmission of genetic 'stock'. What is transmitted without exception, Deleuze holds, and without which the development of the everyday instincts and vices could not occur, is 'la fêlure', or, in other words, 'la grande hérédité', manifested in *soma*'s counterpart, *germen*, which only transmits itself, and which is concealed under any instinct to which an individual might be susceptible:

1. Jules Lemaître, *Le Figaro*, 8 March 1890, quoted in Philippe Hamon, *La Bête humaine d'Émile Zola* (Paris: Foliothèque Gallimard, 1994), p. 168.

2. Gilles Deleuze, 'Zola et la fêlure', in *Logique du Sens* (1969), repr. in Zola, *La Bête humaine* (Paris: Folio Gallimard, 1977), pp. 7-24.

Tout repose sur le paradoxe de cette hérédité confondue avec son véhicule ou son moyen, de ce transmis confondu avec sa transmission, ou de cette transmission qui ne transmet autre chose qu'elle-même.³

However, an important point is that the individual is usually unaware of the *fêlure*, mistaking it for the common or garden instinct with which it is linked, and indeed often suppressing recognition of it. What the *fêlure* in fact is, according to Deleuze, is the Death Instinct, 'l'instinct de la mort, *qui n'est pas un instinct parmi les autres*, mais la *fêlure* en personne, autour de laquelle tous les instincts fourmillent'.⁴ And in *La Bête humaine*, it is particularly marked in the character of Jacques Lantier.

However, Jacques's progression towards destruction is paralleled in that of his locomotive, *la Lison*, and it is in this respect that the theories of thermodynamics are of especial significance, particularly in terms of the reluctance or inability to recognise the presence of the Death Instinct.

The obvious thermodynamic equivalent of the Death Instinct is the tendency towards equilibrium, a tendency quantifiable in terms of entropy, which is a value dependent on the amount of heat energy being transferred in a given system. The tendency to equilibrium causes a running down, a system's reversion to its original state, in the absence of any change in the amount of energy being transferred. In an irreversible process such as the combustion of fuel, entropy will always increase as long as the amount of energy being converted into work remains the same, that is, as long as the system remains closed, with no outside interference. Of course, the equilibrium mentioned here is thermodynamic equilibrium, rather than the simple equilibrium of simple machines.

This is a distinction crucial to the technological changes that came about in the nineteenth century, not least because, as Michel Serres outlines, the optimism of the times conspired in a visualisation of the new technology in the terms of reference of the old.⁵ That is, the motor was seen in terms of the simple machine, the production of energy and movement was seen in terms of the balancing of equal and opposite forces. Once heat had been introduced into the equation with the scientifically misnamed 'pompes à feu' and their more complicated descendants, movement could no longer be considered in terms of simple mechanical cause and effect (nor indeed could heredity, which became subject to nineteenth-century pathology).

3. Deleuze, p. 8.

4. Deleuze, p. 14. The emphasis is Deleuze's.

5. Michel Serres, *Feux et signaux de brume. Zola* (Paris: Éditions Grasset et Fasquelle, 1975), Chap. II, 'Moteur et Circulation', esp. pp. 59-64.

From Carnot onwards, systems were organic. Movement was no longer only horizontal and linear, but also circular and cyclical. By continuing to consider the new forms of movement in terms of the limited vision of the pre-thermodynamic age, however, the naïveté of the nineteenth century perpetuated the myth of perpetual motion, which under such a delusion could be categorised as 'equilibrium'.⁶

According to Serres, the nineteenth-century dream was not to have to submit simultaneously to the two laws of thermodynamics, the fundamental conditions of whose operation are constancy and degradation: 'Le rêve ici est moins celui d'une machine idéale, à rendement égal à un, que de cette machine impossible, absurde au sens technique, dont le jeu de tous les organes aboutirait à s'entretenir elle-même'.⁷ Only by suppression of the Second Law, that of degradation, which parallels the Death Instinct, is perpetual motion possible.⁸ In this way it is made imaginable by the imagined suppression or self-deluding deferral of a system's or organism's tendency towards its original state, making possible what Serres refers to as 'L'auto-alimentation de l'auto-moteur':

Quelle vie normale: ce serait la santé, ce serait le bonheur, ce serait la norme, et voilà, c'est l'absurdité, ce que les physiciens nommeraient le miracle. Le normal vivant est l'anormal physique: la croix de cette fin de siècle. Le naturalisme, en tant que physicalisme de la génétique, doit passer par ce carrefour théorique.⁹

How then, once it is accepted that a system will not function simply, but degenerate, is its degradation to be deferred? The laws of thermodynamics apply to *closed* systems, that is, those to which no exterior source of energy change is available. It is by opening such systems to exterior energy that they may be provided with a simulacrum of perpetual motion, that they may be seen to behave as *machines* in the classical sense, where work matches expended effort, rather than the equilibrium-seeking and energy-dissipating motors, or *locomotives*, which they are in reality.

The dissipation of energy leading to equilibrium must be compensated for externally, and there must be some conduit, crack, or *fêlure* through which this might be

6. The laws of thermodynamics might be summarised briefly as follows: the First Law states that whenever work is produced by heat, a quantity of heat energy is consumed which is proportional to the amount of work done; the Second Law states that in a closed system with constant energy transfer, entropy will always increase, causing the system to degrade towards equilibrium. See *Encyclopedia Britannica*, 15th edn (Chicago: Encyclopedia Britannica, Inc., 1990), Vol XI, p. 702.

7. Serres, p. 63.

8. In fact, although the laws of thermodynamics were not formulated until the nineteenth century, the impossibility of perpetual motion had been intuitively realised as early as 1775, when the Académie des Sciences stopped accepting theses on the subject. See *Histoire de la Science* (Paris: Gallimard, Bibliothèque de la Pléiade, 1957), p. 901.

9. Serres, p. 63.

achieved, through which a potential difference between heat and cold might be created, thus allowing continued functioning and preventing thermal death. According to Serres:

Le fonctionnement normal du moteur demande une différence, un déséquilibre. Dès lors, on peut rêver d'échapper à la mort, par exemple, en ouvrant un peu le système clos, en pratiquant, sur ses parois, une fêlure.¹⁰

This would seem to differ from Deleuze's understanding of the term *fêlure*. It would seem that the property which, according to Serres, facilitates avoidance of the dominance of the Death Instinct is what Deleuze holds to be that very Death Instinct itself. It might be, however, that this apparent contradiction is entirely consistent with the paradox at the heart of Zola's novel, to which attention shall now be turned. This paradox presents itself in terms explicitly genetic, implicitly thermodynamic, at the first mention of Jacques Lantier's *fêlure*:

La famille n'était guère d'aplomb, beaucoup avaient une fêlure. Lui, à certaines heures, la sentait bien, cette fêlure héréditaire; non pas qu'il fût d'une santé mauvaise, car l'appréhension et la honte de ses crises l'avaient seules maigri autrefois; mais c'étaient, dans son être, de subites pertes d'équilibre, comme des cassures, des trous par lesquels son moi lui échappait, au milieu d'une sorte de grande fumée qui déformait tout.¹¹

It is indeed the case here that it is the *fêlure* which causes loss of equilibrium, but this would seem perhaps to have something to do with an apparent misunderstanding by Zola, or at least by Zola's narrator, of equilibrium in its proper thermodynamic sense. Here, equilibrium seems to be equivalent to normal behaviour. Or else, perhaps, the term is being used in its 'lay' sense for a reason which will become clearer later in the novel.

Perhaps, in terms of the *drama*, in terms of 'la petite hérédité' according to which equal doses of 'tare' are weighed up on a simple balance and handed out to everyone in turn, equilibrium is taken to mean the constant, repetitive, unproblematic functioning of a system or organism, in the same way that a motor is assumed to function like a simple, that is, pre-thermodynamic, machine. Equilibrium as the original state of rest to which all organisms return would seem then to be part of the *epos*.

10. Serres, p. 63.

11. Émile Zola, *La Bête humaine* (1886), in *Les Rougon-Macquart. Histoire naturelle et sociale d'une famille sous le Second Empire*, ed. Henri Mitterand, 5 Vols (Paris: Pléiade Gallimard, 1960-1967), IV (1966), p. 1043. This edition and volume hereinafter referred to with page numbers in the text.

It would be strange indeed that Zola, whose painstaking research into the scientific theories of the age, and whose words are to be understood on several levels, should use scientific terms in an incorrect or unscientific way without a specific reason, especially when one considers that thermodynamics was a relatively advanced field of enquiry from the mid-nineteenth century onwards, fundamentally similar to its modern-day equivalent, whereas many of the ideas put forward by nineteenth-century genetics are, by today's standards, fanciful. It could in fact be argued that narratively, occasional irony notwithstanding, *La Bête humaine* is subject to the limited vision of nineteenth-century optimism, whereas, on the grander textual scale, there is manifested (on the part of the implied author, it might be said) an acute understanding of this optimism, of how certain aspects of it are misplaced, and of the full significance of new technological discoveries. As Serres would have it: 'Le naturalisme, contrairement à ce que disent les ignorants, est exactement à l'heure de sa science.'¹²

According to such a proposition, which ultimately prefers a thoroughgoing scientific approach to the 'deplorable looseness' which Tony Tanner claims plagues much use of the terminology of the laws of thermodynamics in literary criticism, there exists a level of implied authorial awareness and understanding of technology at least sufficient to provide textual grounds for analogy with scientific terms used in their correct meaning.¹³ Zola's narrator, on the other hand, is necessarily complicit with the vision of the age, a vision focalised through his protagonists in their inability to see the *fêlure* lurking underneath their instinctual behaviour, or at least to understand fully what it signifies in relation to equilibrium.

This lack of complete understanding, or rather self-imposed unwillingness to understand what he often feels, is what afflicts Jacques. Although of all the characters he has the strongest sense of the *fêlure*, he is most prone to a reluctance to try to understand it. This reluctance is reflected in his relationship with his locomotive, or rather, significantly, his *machine*, la Lison, which is in turn paralleled by his relationship with his mistress, Séverine. What he values most about la Lison are her obedience and her 'marche régulière et continue' (p. 1128), that is, what would seem to be her 'equilibrium' in the non-thermodynamic understanding of the term.

Jacques not only humanises la Lison, he feminises her and enjoys a personal relationship with her, to the extent that he tolerates what he perceives as a vice, 'une faim continue, une vraie débauche', 'un trop grand besoin de graissage' (p. 1128). This 'graissage' usually takes place when the locomotive is stationary; in the novel the exception occurs in the snow when Jacques takes the unusual and dangerous step of leaving the foot plate to administer the grease to the cylinders while the train is moving (with difficulty; p. 1164). Now, what Jacques is doing, thermodynamically, in administering the grease, is counteracting the locomotive's tendency towards

12. Serres, p. 78.

13. Tony Tanner, *City of Words. American Fiction 1950-1970* (London: Jonathan Cape, 1971), p. 141. See especially Chapter 6, 'Everything running down'.

Equilibrium. The closed system of the steam engine fired by a constant supply of fuel will run down unless the necessary dissipation of energy (due to the thermodynamic cycle, which constitutes work produced in addition to the mere movement of the locomotive) is somehow compensated.

Through the introduction of grease (for, presumably, lubrication, the reduction of friction, and seemingly, and importantly, for the blocking of a gap) the cycle will expend less energy, thus enhancing movement, thus creating the impression that the work produced in movement is commensurate with the amount of energy supplied. What Jacques is actually doing, even if he appears to be blocking a gap, is interfering with the closed system: he is making it into an open system. He is 'cracking' it, introducing a '*fêlure*', so that the working of the Second Law of thermodynamics may be disrupted, so that Equilibrium (the capital denotes the thermodynamic, epic meaning) may be deferred, so that perpetual motion may seem a reality. And he passes it off, to himself and to his stoker, Pecqueux, as the indulgence of a minor instinct which is subsidiary to the essential nature of the functioning of his 'machine':¹⁴

Il s'était résigné à lui tolérer cette passion gloutonne, de même qu'on ferme les yeux sur un vice, chez les personnes qui sont, d'autre part, pétries de qualités; et il se contentait de dire, avec son chauffeur, en manière de plaisanterie, qu'elle avait, à l'exemple des belles femmes, le besoin d'être graissée trop souvent. (pp. 1128-1129)

Again there would seem to be a contradiction of Deleuze's scheme of things. The *fêlure* which is introduced staves off the Death instinct. And the locomotive's prime instinct is indeed towards death; its apparent instinct for constant movement manifested in its hunger for lubrication is a social, not a natural, one, introduced by interaction with an exterior agent: it is only a symptom of its innate and defining tendency, decreed by the natural sciences, towards Equilibrium.

However, the *fêlure* can only defer Equilibrium, it cannot eliminate it. And what is more, once it is opened, it can only increase in size. The more the hunger is indulged, the more disordered the system becomes. The more Jacques's habitual dosage of grease increases, the more the tendency towards Equilibrium makes itself felt, albeit appearing to Jacques as the mundane desire on the part of the humanised Lison, shared

14. The ratio of frequency of the word 'machine' to the word 'locomotive' in *La Bête humaine* is 138 to 2. This statistic, along with the observation by Lefèvre (whose *Les Chemins de fer* of 1889 was a major source text for Zola) that railwaymen preferred the former, scientifically inaccurate and simplistic, term, to the latter, is documented in Geoff Woollen, 'Zola: La machine en tous ses effets', *Romantisme*, 41 (1983), 115-124 (p. 118). One of Woollen's main points is that in Zola the *machine*, designated as such, is often capable of much more than is realistically possible.

by Jacques, for the mundane equilibrium of regular and rapid movement. As Deleuze states, 'la fêlure n'est comblée qu'en apparence'.¹⁵

On the whole, therefore, it is not too outlandish or contradictory to suggest that the inevitably paradoxical *fêlure* should be the means of deferral of Equilibrium, and the thermodynamic Death Instinct itself, at one and the same time. This paradoxical principle is made clear by the functioning of la Lison, which is governed entirely by the Death Instinct: in 'natural', thermodynamic, terms (as a closed system) by the operation of the Second Law, and in 'social' terms (as an opened system) by interaction with Jacques's inherited death wish and burgeoning lack of self-control concealed by apparent self-control itself, manifested on the footplate by his stubborn concern for constant speed which will ultimately prove to be his and la Lison's undoing:

Il était tout au souci de garder sa vitesse, sachant bien que la vraie qualité d'un mécanicien, après la tempérance et l'amour de sa machine, consistait à marcher d'une façon régulière, sans secousse, à la plus haute pression possible. Même, son unique défaut était là, dans un entêtement à ne pas s'arrêter, désobéissant aux signaux, croyant toujours qu'il aurait le temps de dompter la Lison. (p. 1162)

The question remains as to what precisely the 'équilibre' which Jacques occasionally loses, on account of his *fêlure*, actually is. Are *fêlure* and *équilibre* two seemingly opposing entities leading paradoxically to the same end, namely *Équilibre*? An answer might well be found in a very basic reading of some of the writings of Freud on the subject of the Death Instinct, which may prove particularly enlightening as far as Zola's novel is concerned. According to Freud, instinct is bound up with the compulsion to repetition. The thermodynamic cycle, particularly as depicted in *La Bête humaine*, provides an ideal example of such a compulsion being merely an expression of the tendency towards an original state of rest, but as in the novel, this conception of compulsion applies to all organic life, for which thermodynamic systems can only provide a roughly analogous model.

According to such a conception, 'an instinct would be a tendency innate in living organic matter impelling it towards the reinstatement of an earlier condition, one which it had to abandon under the influence of external disturbing forces [...]'.¹⁶ Jacques's 'petit équilibre', to paraphrase Deleuze, governed by the 'petite hérédité' of everyday instinct, would thus merely be the simple manifestation of the Death Instinct, the tendency towards the 'grand équilibre' expressed in another form, 'the

15. Deleuze, p. 23.

16. Sigmund Freud, 'Beyond the Pleasure Principle' (1920), in *A General Selection from the works of Sigmund Freud*, ed. by John Rickman (London: Hogarth Press, 1937), pp. 162-194 (p. 183). The emphasis is Freud's.

expression of the conservative nature of living beings', and at the same time the means of deferral of death. His *fêlure* would seem to be the 'short circuit' which would allow him to fulfil his 'life-goal' (i.e. death) sooner, and which, says Freud, it was commonly assumed all living beings strove to avoid.

Such an assumption failed to take into account the sexual instincts, which are unusually resistant to external influences. Although these are life instincts, in that they propagate life and are the most vital of the instincts, they can become fused with the death instincts 'regularly and very extensively'. It is when they become suddenly defused, fragmented, however, that the Death Instinct is most marked, particularly as a result of obsessional neuroses.¹⁷

In *La Bête humaine* it is via the *fêlure* that such a fusion, and its attendant violent defusion, take place. It is because the *fêlure* facilitates, in both la Lison and Jacques, such an intense coextensivity of the life instinct, the instinct toward movement, with the instinct towards Equilibrium (that is, in Jacques's case, of his libido with his death wish), that they become separated in such a violent manner.

Early in the novel, in the incident with Flore, Jacques resists such a fusion. He does not allow himself to become aroused by her advances because he is in some way aware of their inevitable consequences should he do so. In the paragraph prior to the one which informs the reader of Jacques's 'pertes d'équilibre' and of his awareness, albeit limited, of his *fêlure* (through which his *moi*, his ego, escapes, thus leaving his id in the dominant position) the coalescence of the sexual urge with the urge to death is hinted at for the first time:

Tuer une femme, tuer une femme! [...].Comme les autres, sous l'éveil de la puberté, rêvent d'en posséder une, lui s'était enragé à l'idée d'en tuer une. (p. 1042)

Here as elsewhere, Jacques remains confused. However, at this stage (and this is just before he witnesses Grandmorin's murder in the train) there seems to be a willingness on his part to try to understand his problematic compulsion. This becomes progressively less the case; in his relationships with Séverine and with la Lison, he goes out of his way to avoid giving rational consideration to his obsession. Once he becomes involved with Séverine, he mistakenly believes this problem to have been solved, he mistakenly perceives his Death Instinct to have been replaced by the sexual urge, in the same way that he believes the locomotive to be capable of functioning like a simple machine, such that the tendency to death appears to him as a mere desire for enhanced movement, which can be suppressed by the addition of grease. Not only is his own Death Instinct masked in this way; so too is the presence of Death in

17. Sigmund Freud, 'The Ego and the Id' (1923) , in *ibid.*, 245-274 (pp. 261-262).

Séverine. Like the locomotive, she has a hidden secret, and it is Death (narratorially, the death of Grandmorin; textually, and unbeknownst to her, the inevitability of her own death). Like la Lison's secret, it manifests itself as a desire on her part to be 'maintained' with affection; as with la Lison's secret, Jacques is aware of it but attempts to suppress his awareness. Like la Lison, Séverine gives away her secret through her 'vaporisation'; from her 'reins', through the outlet of her respiratory system, she dissipates energy, the loss of which Jacques compensates with the 'graissage' of his affection:

Posséder, tuer, cela s'équivalait-il, dans le fond sombre de la bête humaine? Il ne raisonnait pas, trop ignorant, n'essayait pas d'entr'ouvrir la porte d'épouvante. [...] Lorsqu'elle le serrait d'une étreinte, il sentait bien qu'elle était gonflée et haletante de son secret, qu'elle ne voulait ainsi entrer en lui que pour se soulager de la chose dont elle étouffait. C'était un grand frisson qui lui partait des reins, qui soulevait sa gorge d'amoureuse, dans le flot confus de soupirs montant à ses lèvres. [...] Mais, vite, d'un baiser, il fermait sa bouche, y scellait l'aveu, saisi d'une inquiétude. (p. 1155)

Opening and closure are key motifs here, and are especially important because of their confusion. Closure in one sense, the attempt to 'comblar la fêlure', as it were, only causes the crack to widen, only causes gas to become bottled up within the flanks of the machine, ready to burst out in violent fashion. Also, the notion that a closed system (destination: death) will function as an opened one (apparent destination: perpetual life), not subject to the laws of thermodynamics, is as ever being indulged by *style indirect libre* here. Jacques may well believe he is filling a crack by supplying la Lison with grease; he is in fact enlarging one, and refuses to contemplate it rationally, particularly in moments of crisis such as the breakdown in the snow: 'Sans doute qu'elle dépensait trop de graisse. Et puis, après? On la graissait, voilà tout!' (p. 1164).

Similarly, by sealing Séverine's lips, he is deferring her confession and thus ensuring that its effects will be more devastating later than if made straight away. When Séverine does finally 'open up', the identification of sex and death is unequivocal: 'Ils se possédèrent, retrouvant l'amour au fond de la mort, dans la même volupté douloureuse des bêtes qui s'éventrent pendant le rut' (p. 1205). Reason, or attempts at it, no longer enter into the matter. Death, no longer masquerading as a desire for affectionate domination on the part of Séverine (as on the part of la Lison), has passed completely into Jacques, now that death has suddenly become unfixed from sex as far as Séverine is concerned.

The tendency towards Equilibrium in the epic sense has now overtaken the control mechanism allowing maintenance of a 'romantic' equilibrium. From now on the movement of Jacques and of la Lison is as one. Their parallel movement embodies the

Death Instinct, and when the locomotive crashes at the Croix-de-Maufras, there is a certain inevitability, intensified by the *analepsis* inserted at the moment of impact, which renders Flore's agency almost incidental (although highly charged with symbolism, given that it results from sexual jealousy, catalysed by a death). Furthermore, it is made clear that Flore's obstacle is not the sole cause of the crash, and indeed that it could have been avoided had la Lison behaved as her old obedient self. The key ingredients of Zola's symbolism are all present at this point: anthropomorphism, feminisation, sexualisation, bestialisation, respiration, repetition, compulsion:

[L]a Lison n'obéissait pas, allait quand même, à peine ralentie. Elle n'était plus la docile d'autrefois, depuis qu'elle avait perdu dans la neige sa bonne vaporisation, son démarrage si aisé, devenue quinteuse et revêche maintenant, en femme vieillie, dont un coup de froid a détruit la poitrine. Elle soufflait, se cabrait sous le frein, allait, allait toujours, dans l'entêtement alourdi de sa masse. (pp. 1259-1260)

Again, a closure (of the train's path) has resulted in an opening, this time a fatal letting-off of steam:

La Lison, renversée sur les reins, le ventre ouvert, perdait sa vapeur, par les robinets arrachés, les tuyaux crevés, en des souffles qui grondaient, pareils à des râles furieux de géante. (p. 1260)

The urge to movement has become violently defused from the urge to death which it concealed; the Death Instinct has gained the upper hand.¹⁸ This is replayed later at the Croix-de-Maufras, when Jacques's desire to kill overwhelms the sexual urge which has been restraining it, and concealing it. All the energy of his libido is transferred to his desire to kill the latter instinct's previous object, and ultimately instinct itself. Sexual desire is opened up so that the path of least resistance leads beyond it towards death: 'La porte d'épouvante s'ouvrait sur ce gouffre noir du sexe, l'amour jusque dans la mort, détruire pour posséder davantage' (p. 1297). The Death Instinct, aided and abetted by Eros into reaching its ultimate strength, paradoxically and necessarily kills it off. All that is left of the sexual instinct is 'ce gouffre noir du sexe', that is, the *fêlure*, through which the Death Instinct renders all other instincts subordinate to itself, and from which it banishes them.

18. For a discussion of the identification of libido with movement, and indeed for an extensive Freudian analysis of *La Bête humaine*, see Jean Borie, *Zola et les mythes. De la Nausée au salut* (Paris: Seuil, 1971), Ch. 2. See esp. p. 90: '[L]e train est sexualisé de toutes les manières, et d'abord de la façon la plus élémentaire, parce qu'il est mouvement, parce qu'il est vitesse'.

The *fêlure*, is, however, not ultimately to blame; rather than being, as according to Deleuze, the Death Instinct itself, it is merely a means by which the Death Instinct makes its presence felt, both in the *drama* and in the *epos*. It is also, however, a conduit for optimism, even if this optimism is naïve. Like Progress, it is extrahistorical, and it is because Progress, in *La Bête humaine*, as in the wider culture of the nineteenth century, is mistakenly perceived as being historically present and tangible, as being of these times as of no other, and is seen in terms of these times rather than on a grander scale, that its worldly manifestation gives cause for pessimism.

La Bête humaine may come to an overwhelmingly pessimistic conclusion about the human condition, but the grounds for this pessimism are short-term ones, based on the observation of what happens when the extrahistorical is mistaken for the historical, when technological and anthropological vision cannot see past its own immediate environment. Only when thermodynamic motors are perceived as such, and not as machines, with characteristics familiar to the popular sense of the age, can they truly, in an epic sense, go beyond the entropy which will cause them to run down. The epic Death Instinct causes the demise of la Lison in the dramatic sphere.

Equilibrium is reached when the laws of thermodynamics, of the dissipation of energy when movement is produced by gas pressure, are obeyed, as they will be, inevitably. However, significantly, the unanthropomorphised, untamed, 608 is allowed in the final chapter to go beyond the mundane laws of nature, both by Jacques, 'la laissant galoper à sa fantaisie' (p. 1301), and by the implied author, who allows Carnot's Second Law to be flagrantly breached as the locomotive hurtles indifferently towards the future, a physical impossibility given the absence through death of its engineer and fireman, a legal impossibility given the necessary presence of a third party who could override such an *emballage*.¹⁹

A thermodynamic, natural and social impossibility, perhaps, but a narrative inevitability ensuring the indifferent triumph of an epic vision, which, paradoxically, is one which accepts the realities and limitations of modern technology, but which perceives technology in its own, extrahistorical terms and refuses to devalue it by placing it in the template of nineteenth-century complacency.

In this final scene, the *fêlure* provides a passage for the epic Life Instinct, and triumphs in allowing the locomotive, here an embodiment of indifferent Progress (as opposed to Lison's embodiment of progression towards thermal death), to pass beyond the pressure principle, unchecked, through an opening into the twentieth century and

19. See note 2, p. 1790 in the Pléiade edition. Lefèvre informed Zola that there would be a Conductor-in-Chief and a guard who would have access to a safety braking mechanism. However, as M. Wetherill points out, mechanical and topographical inconsistencies, often intentional, are essential to Zola's narrative strategies. See 'Transgressions. Topographie et narration dans *La Bête humaine*', *Les Cahiers Naturalistes*, 70 (1996), 67-82.

beyond. In the words of Deleuze: 'Le train comme symbole épique, avec les instincts qu'il transporte, et l'Instinct de mort qu'il représente, est toujours doué d'un avenir'.²⁰

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