



Engels on Ireland's Dialectics of Nature

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Abstract: This article surveys an unpublished piece in which Engels examined the ecological conditions of Ireland in a chapter, entitled the “Natural Conditions” in his unfinished History of Ireland. This is the only time that either Marx or Engels analysed in detail the specific ecological structure of a particular social formation. In interpreting Engels’ findings, dialectically, we are able to explicate a dialectical framework that gives us a greater insight into how Engels understands how the dialectics of nature enfold in a particular bio-region and crucially those same organic processes of nature provide the necessary ecological conditions for society to engage in agricultural cultivation.

The geological system of Ireland and its particular sieve-like structure moderates the climatic condition of excessive rainfall so that cultivation can continue. The stony soil system plays a similar function to the limestone bedrock, in that it channels water through it. This piece of investigation by Engels can be seen as a concrete case study into the dynamic metabolising relationships between the diverse organic processes of Nature as they are appropriated by society in agricultural production. The conceptual trajectory of this dialectical analysis is to emphasise the inherent fluidity, mutual interaction and ‘universal connection’ of the forces of nature. This particular work of Engels on Ireland is a significant contribution to our understanding of not only of the dialectics of nature but also the methodology of dialectics.

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Marx and Engels make an extraordinary assertion in their *German Ideology* about how history should be written:

In the whole conception of history up to the present this real basis of history has either been totally disregarded or else considered as a minor matter quite irrelevant to the course of history. History must therefore, always be written according to an extraneous standard, the real production of life appears as non-historical, while the historical appears to be separated from ordinary life, something extra-superterrestrial. With this the relation of man to nature is excluded from history and hence the antithesis of nature and history is created (Marx and Engels, CW, vol.5, 1976: 55).

I believe Marx and Engels are proposing is that in order to overcome the ‘antithesis of nature and history’ it is necessary to bring in the co-evolution of the ‘relation of man to nature’. And fortunately, within the same work they suggest how to begin such a conceptual endeavour:

‘The writing of history must always set out from these natural bases and their modifications in the course of history through the action of man’¹. (Marx and Engels, CW, vol.5, 1976: 31)

Consequently, Engels in his attempt to write his *History of Ireland* appears to ground his understanding of Ireland’s history in Ireland’s ecological base: He begins his *History of Ireland* by engaging in an extensive survey of Ireland’s ecological conditions in a twenty-page chapter entitled ‘Natural Conditions’ (Marx, 1971:171-191). This is the only extensive example of Marx or Engels beginning an analysis of ‘real historical’ development of a society by an examination of its ecological conditions. Thus, it provides us with an ideal opportunity to ascertain how Marx and Engels would engage in such a vitally important form of historical analysis.

However, there is a problem with Engel’s lengthy discussion of these natural conditions of Ireland: the dialectic conceptualization of the piece is at a very early stage within the method of dialectical inquiry². It is at the point where a vast array of empirical facts is presented and the dialectical interconnections of concrete reality are only beginning to appear in text, which is the essential and necessary point to be reached in the dialectical method of inquiry as Engels suggests in the following:

‘We all agree that in every field of science, in the natural as in historical science, one must proceed from the given *facts*, in natural science therefore from the various material forms and the various forms of motion of matter; that therefore in theoretical natural science too the interconnections are not to be built into the facts but to be discovered in them, ...’ (Engels, *Dialectics of Nature*:47).

Therefore, in order to ‘discover’ and make explicit these underlying dialectical interconnections of the ecological ‘*facts*’ presented, I have divided Engels’ account into distinct sections that emphasise the inherent processual aspects of the dialectical relations between the

¹ Marx and Engels identify these natural bases in the previous sentence as “geological, oro-hydrographical, and climate and so on”. (Marx and Engels, CW, vol.5, 1976: 31).

² Marx suggested that dialectics involved two stages and both linked. The preliminary stage is the method of inquiry and subsequently followed by a method of presentation.

‘given *fact*’. This allows me to highlight the inherent sense of movement within and between these Irish natural conditions as processes and, it enables me to follow the logical sequence in which these natural conditions are dealt with by Engels – rock structure, soil, climatic conditions, naturally occurring vegetation and finally cultivated crops. This sequence appears to follow a logical hierarchical structure in its’ unfolding. Engel’s indicates this to us where he says:

The earth’s surface, climate, vegetation, fauna, and human beings themselves have definitely changed... (Engels, 1986: 231).

The categorization of these ecological aspects is determined by a logical order where the previous unfolded process provides the necessary preconditions for the emergence of other following on processes which culminate in the final arrival at societal endeavours in the process of cultivation, i.e., ‘human beings themselves’. This is the reason why Engels provided this ecological chapter at the beginning of his book. He did so to explicate the natural (ecological) conditions of the Irish social formation before beginning his analysis of how Irish society and its various social processes metabolize with its organic processes of Nature over time. Accordingly, we begin as Engels did with the natural processes rather than the social processes, specifically, with the physical base of Ireland’s ‘earth surface’ - its geological structure.

Ireland’s geological system

In his chapter entitled ‘Natural Conditions’, Engels adopts an overall conceptual trajectory that is concerned with how these ecological conditions function for agricultural production, including its geological structure. Engels himself was very much aware of the significance of the geological rock structure for soil formation³ and plant growth. Thus, he began his analysis of the Irish ecological conditions by looking at the geological formation of Ireland in which the Carboniferous phase appears to be the determinant period in the geological development of Ireland⁴:

To understand the nature of the soil of present-day Ireland we have to return to the distance epoch when the so-called Carboniferous System was formed (Engels, 1971:172).

In geological terms Ireland is shaped like a saucer with a central plain encircled by a mountain chain which hugs its coastal perimeter. This plain, ‘the foundation of the whole of Ireland consists of the massive bed of limestone’ was formed during the Carboniferous period. Subsequently, it was then covered mostly with drift left behind by the Ice Age. During this Ice Age, most of Ireland was submerged by the sea except for the mountain tops. And, as the

³ Engels in letter to Marx and in discussing Tremaux:

That the geological structure of the soil is closely related to the ‘soil’ in which everything grows is an old idea, likewise that this soil which is able to support vegetation influences the flora and fauna that subsist on it. It is also true that this influence has as yet been scarcely examined at all (Engels to Marx 5th October, 1866 – MECW Vol. 42, 1987: 322).

⁴ Engels stated in a footnote ‘Unless stated all the geological data given here is from J. Beete Jukes, *The Student’s Manual of Geology*, New Edition, Edinburgh, 1862. Jukes was the local superior during the geological survey of Ireland and therefore the prime authority on this territory, which he treats in special detail. (Engels:172).

submersion slowly proceeded, drift was subsequently deposited. This drift was/is a complex combination of diverse rock components as Engels indicates in the following:

Pieces of rock eroded from the mountain islands and fine fragments of rock scraped away by the glaciers as they pushed their way slowly and powerfully through the valleys – earth, sand, gravel, stones, rocks, worn smooth within the ice but sharp-edged above it – all this was carried out to sea and gradually deposited on the sea-bed by icebergs which were detaching themselves from the shore. The layer formed in this way varies according to circumstances and contains loam (originating from argillaceous slate), sand (originating from quartz and granite), limestone gravel (derived from limestone formations), marl (where finely-crumbled limestone mixes with loam) or mixtures of all these components; but it always contains a mass of stones of all sizes, sometimes rounded, sometimes sharp, ranging up to colossal erratic boulders....During the subsequent re-emergence of the land from the sea, this newly-formed surface was given roughly its present structure. (Engels, 1971:175/6).

This enormous accumulation of rock and rock particles is the mineral basis for formation of the soil structure. But the dominant rock remaining within this geological process is limestone:

The variety of rocks, whose decomposition contributed and is still contributing to this soil, provides it with a corresponding variety of the mineral elements required for vegetable life, and if one of these, say lime, is greatly lacking in the soil, plenty of pieces of limestone of all sizes are to be found everywhere-quite apart from the underlying limestone bed-so it can be added quite easily (Engels, 1971:177).

In this, Engels identifies a crucial aspect of the composition of the soil: He clearly states that the minerals which emerge from the underlying varieties of the bedrock subsequently become vital components of the natural fertility of the soil and the ‘vegetable life’ that are dependent on these ‘mineral elements’. However, there is one species of mineral that is missing from the Irish geological strata and that is coal. Engels highlights the significance of this loss of energy resource for Ireland:

It is obvious that Ireland’s misfortune is of ancient origin; it begins directly after the carboniferous strata were deposited. A country whose coals deposits are eroded, placed near a larger country, rich in coal, is condemned by nature to remain for a long time the farming country for the larger country when the latter is industrialised. That sentence, pronounced millions of years ago, was carried out in this century. We shall see later, moreover, how the English assisted nature by crushing almost every seed of Irish industry as soon as it appeared (Engels, 1971:174).

In this dramatic demonstration of the explanatory power of dialectics, Engels proposed that the geological process has metabolised with the colonial process to leave Ireland deindustrialised – a mere agricultural region feeding Britain.

What is interesting about how Engels unfolds his analysis of the geological system is that his conceptual trajectory is concerned with understanding how diverse rock forms are the material and mineral basis of the Irish soil system i.e. he indicates how the geological process is subsumed under the soil system where it provides the essential physical structure and mineral contents of the soil.

The soil system⁵

Engels begins his discussion of the nature of the Irish soil by stating the following:

From an agricultural point of view, Ireland's soil is almost entirely formed from the drift of the Ice Age, which here, thanks to its slate and limestone origin is ...extremely fertile, light loam (Engels, 1971:177).

So, Ireland's soil is formed from the debris of rocks dropped by the moving glaciers over the lowlands of Ireland. But a large proportion of these lowlands are bog: Where the necessary minerals for normal vegetation growth had been leached out of land then peat bog develops instead of soil (Bellamy, 1986). Even when vital mineral elements are perceived to be missing from the soil, they can be 'sourced' near-by and added in 'quite easily'. The implication of this latter human intervention is immense. 'Fertility' – productive fertility - appears to be relative to the type of 'vegetable life' required by society. In this particular case Engels is referring to peat bog – a 'vegetable life' (ecosystem) which has very limited usage for society's agricultural needs, except for turf production and extensive grazing at certain dry periods of the year (Bellamy, 1986). However, this peat bog ecosystem and its deficient 'natural fertility' can be 'repaired' by digging out from its underlying mostly marl (finely-crumbled limestone mixed with loam) base and adding this to the peat to make a soil suitable for agricultural production. But as Engels states, this type of soil reclamation was rarely done under agricultural production in the 1860s:

Yet, the peat bogs of Ireland are by no means hopelessly lost to agriculture; on the contrary, in time we shall see what rich fruits some of these, and the two million hectares of the "indifferent land" contemptuously mentioned by Lavergne, can produce given correct management (Engels, 1871:183).

Here, we uncover why Engels discusses Ireland's 'natural conditions': He apparently does so for the purpose of assessing the potential agricultural capabilities of the soil system and how those capabilities are constrained initially by deficient natural conditions e.g. peat bogs and then crucially by 'the barbaric manner in which the peasants cultivated it' (Engels quoting Arthur Young, 1871:177). The apparent trajectory of Engel's structure of conceptualization is to move the analysis from the physical contents of the natural conditions towards the social form in which these conditions of fertility operate under agricultural production.

With regard to the natural contents of the Irish soil system, they are the foundational components of the overall structure of the Irish ecosystem and are in general considered to offer natural fertility because they produce soil that falls between the infertile extremities of the range of soil composition types:

⁵ In a letter to Marx, Engels stated the following "Similarly, Darwin and others have never failed to appreciate the effect of soil, and if they did not especially emphasise it, this was because they had no notion of *how* the soil exerts its influence – other than that fertility has a favourable and infertility an unfavourable effect" (Engels to Marx 5th October, 1866 – MECW Vol. 42, :322).

We see therefore that all authorities agree that Ireland's soil contains all the elements of fertility to an extraordinary degree. This, not only in its chemical ingredients but also in its structure. The two extremes of heavy impenetrable clay, completely impermeable, and loose sand, completely permeable, do not occur (Engels, 1971:182).

Consequently, the natural fertility of the Irish soil surpasses that of Britain. as Engels quotes from Arthur Young:

Natural fertility, acre for acre over the two kingdoms, is certainly in favour of Ireland' (Young, vol.2, part11, p.3).

And also, Engels quotes the French agronomist de Lavergne on the superior quality of the Irish soil in comparison to the English soil "Even the English admit that Ireland, in point of soil, is superior to England"⁶. But the soil system and the rock substructure are not in themselves the exclusive determinants of the natural and cultivated ecosystems of Ireland. Instead, they interact with climatic conditions to affect outcomes at this level.

The climate system

Engels suggests that the dominant determinant of the climate of Ireland is its position with regard to the Gulf Stream (Engels, 1971:184). The prevailing south-westerly winds coming off the Atlantic Gulf Stream provides warmth in winter, making weather conditions at that time mild and practically frost free, and in summer, the south-westerly winds tend to provide cool temperatures:

... there are seldom more than two or three consecutive dry days in summer; and in late autumn it is fine again. Very dry summers are rare and dearth never occurs because of draught but mostly because of too much rain. It seldom snows on the plains, so cattle remain in the open all of the year-round (Engels, 1971:186).

In summarizing these climatic conditions Engels compares them to those of London:

... the temperatures are more even, the winters milder and the summers cooler than in London, while on the other hand the air is damper. (Engels, 1971: 186).

And it is so damp that salt, sugar or flour left out in an unheated room will soak the dampness out of the air (Engels, 1971:186/7). However, it is not the amount of rain that falls which is important, but "*how and when it falls*" (Engels, 1971:185). The "how and when" of the Irish

⁶ Marx wrote the following to Engels: P.S. In an article in *The Fortnightly Review* (August issue) on "Our Uncultivated Lands", I found the following on the soil in Ireland:

'That her soil is fertile is proved upon the testimony etc. etc. and M. De Laveleye: the latter gentleman says etc. etc (p.204)'

Since the English regard Laveleye as a great authority on agronomy because his books on Belgian and Italian agriculture, the passage may be of use to you (Marx to Engels, 10th August, 1870, MECW, Letters, vol. 44:40).

rainfall is apparently determined by ‘the fresh sea-breezes’ of the Atlantic which creates a condition of volatility in comparison to the drabness of the English weather system. Engels contrasts these volatile tendencies of the Irish climate with the English one:

In spite of this the Irish climate is decidedly pleasanter than the English. The leaden sky which often causes days of continual drizzle in England is mostly replaced in Ireland by a continental April sky; the fresh sea-breezes bring on clouds quickly and unexpectedly, but drive them past equally quickly, if they do not come down immediately in sharp showers. The weather, like the inhabitants, has a more acute character, it moves in sharper, more sudden contrasts; ... (Engels, 1971: 184).

As with his analysis of the soil system, Engels explicitly states that the conceptual trajectory of his examination of the Irish climatic system allows him to assess its impact on agriculture⁷ (Engels, 1871:185). To do this he used many sources, including the Scottish agronomist – James Caird – sent over by Peel to investigate the state of Irish agriculture during the Famine. Engels quotes Caird (1849) on how the excessive humidity of Ireland encourages vegetation growth:

The humidity of the climate causes a very constant vegetation, which has both advantages and disadvantages. It is favourable for grass and green crops but renders it necessary to employ very vigorous and preserving efforts to extirpate weeds’ (Engels, 1971:181).

This identified ‘disadvantage’ is not an aspect of the natural propensity of the climatic dampness to be a catalyst to vegetation growth. Rather, it refers to how that tendency is appropriated for agricultural production. Humidity can impact differently on differing species of plants, including ‘domesticated’ plant ecosystems such as grains. Within the grain ‘family’ itself, Engels uses Wakefield’s research on Irish climate to highlight the difference between its impacts on corn in general and oats in particular:

..., but *nowhere* does he state that it provides a serious obstacle to the cultivation of corn (Engels, 1871:188).

The Irish climate is more suited for the production of oats because ‘oats can take a considerable amount of rain’ (Engels, 1971:189). In general, the excessive humidity of the Irish climate encourages grass growth:

Arthur Young considers that Ireland is considerably damper than England; this is the cause of the amazing grass-bearing qualities of the soil (Engels, 1971:185).

However, the humidity of the climate is just one moment among many that determines the natural fertility of the soil. What appears to be crucial in Engel’s unfolding of Ireland’s natural conditions are how these diverse natural processes combine together to produce the unique fertility conditions of Ireland.

‘Rainy’ climate metabolising with the stony soil and porous bedrock

However, it is not just the presence of a mild climatic system and a good soil system, which creates the conditions of natural fertility, but it is how they are metabolised under specific

⁷ Engels stated that the “climate only concerns us here insofar as it is important for agriculture” (Engels, 1971:185)

Irish conditions. Engels is rightly aware of this crucial metabolising relationship in referring to Young's (Engels, 1971:184) discussion of the relationship between heavy rainfall and the soil structure in Ireland:

At the same time, however, he points out that the soil in Ireland counteracts this dampness of the climate. It is generally stony, and for this reason lets the water through more easily (Engels, 1971:185).

Dampness in this context refers to rainfall and how the physical structure of the soil, determined in part by its stony composition allows the excess water from the heavy rainfall to pass through without water logging. The permeable nature of the soil allows sufficient water to metabolize with the mineral composition of the soil without leaching out the nutrients that maintain natural fertility. Engels uses Young's comparison of this inherent permeable condition of the Irish soil- which creates its conditions of natural fertility - with the impermeable condition of the English clay soil:

If as much rain fell upon the clays of England (a soil very rarely met with in Ireland, and never without much stone) falls upon the rocks of her sister-island, those lands could not be cultivated. But the rocks clothed with verdure; - those of limestone with only a thin covering of mold, have the softest and the most beautiful turf imaginable (Vol.2, Part11: 3-4).

However, it is not just the permeability of the stony soil structure in itself, which allows for the 'growth of this most beautiful turf imaginable' but also the limestone bedrock, which the Irish soil lays upon:

[...] The limestone is known to be full of cracks and fissures which let excess water through quickly (Engels, 1971:185).

As we have already uncovered the Irish climate according to Arthur Young "is the cause of the amazing grass-bearing qualities of the soil" (Engels, 1971: 185), but this is not sufficient in itself as it needs to 'metabolize' with the permeable structures of the soil and its limestone bedrock. Although this particular metabolic relationship appears to intensify the growth of grass, it does not hinder the growth of corn:

..., *nowhere* does he (Wakefield) state that it (climate) provides a serious obstacle to the cultivation of corn. In fact, he finds, as we shall see, that the losses incurred during the wet harvest times are due to entirely different causes, and states so quite explicitly (Engels, 1871:188) (my inclusion in brackets)

Wakefield even identifies three processes that allow Ireland to produce not just a sufficient crop of corn but a yield which he describes as a 'super-abundance':

The soil of Ireland is so fertile, and the *climate so favourable*, under a proper system of agriculture, it will produce not only a *sufficiency* of corn for its own use, but a *superabundance* which may be ready at all times to relieve England when she may stand in need of assistance (vol. 2, p.61) (Engels,1971:188).

Of these three processes that metabolize with each other to produce a corn crop of superabundance, the two natural processes of soil and climate we have unfolded, the one

remaining to be uncovered is the 'system of agriculture'. It should be noted in Wakefield's account that the 'raison d'être' for this Irish superabundance was to feed England.

Engels documents how differing types of natural fertility are more naturally proficient in producing particular agricultural products than others. The typology of the difference in fertility propensities is itself determined by how the diverse natural processes have metabolised with each other within a particular spatial enclave. Thus the 'natural fertility' of a region makes it more or less suited to a particular type of agricultural production. Where an agricultural region has a naturally endowed suitability to produce a particular product, there is less need for human intervention to boost fertility artificially. Engels goes through the regions of Ireland assessing their natural productivity for agricultural production. We have already outlined Engel's extensive discussion of the Irish peat bogs of the central plain and how they are really only suited for rough grazing of sheep and cattle. Beyond the peat bogs Engels continues to assess other regions of Ireland with regard to their natural productivity. For example, he refers to Arthur Young's summation of the natural productiveness of North Cork, Tipperary and Roscommon:

Friable, sandy loams, dry but fertile, are very common, and they form the best soils in the Kingdom, for tillage and sheep (Engels, 1971:178).

It is interesting to note that differing soil compositions can have differing combinations of product mixes. Again, Young on County Limerick:

...., it is the richest soil I ever saw, and such as is applicable to every purpose you can wish; it will fat the largest bullock, and at the same time do equally well for sheep, for tillage, for turnips, for wheat, for beans, and in a word, for every crop.... (Engels, 1871:178).

Here in Limerick, and contrasting with the previously mentioned region where tillage and sheep reigned, the soil is suited for tillage and sheep but, also for cattle production. This has to do with not only differing soil types but also with how they metabolize with the climatic process. Also, the depth of the physical structure of the soil can have a consequence for how the natural productivity can support a particular agricultural activity and not others. In the following account of an area, low soil depth eliminates tillage production, which is generally a feature of loam soil, but here, the conditions determined by the processes of natural fertility allow only for the pasturing of sheep:

If a thinnish layer of heavy loam lies directly on limestone, the land is not suited to tillage and bears only a miserable crop of grain, but it makes excellent sheep-pastures (Engels, 1971:180).

But, it should also be noted that these processes that determine natural fertility can also have a seasonal aspect to them. For example, a turlough can be a lake in winter time and a dry lush pasture location in summer:

Dr Beaufort states that there occur in the west, particularly in Mayo, many turloughs – shallow depressions of different sizes, which fill with water in the winter, although not visibly connected with streams of rivers. In the summer this drains away through underground fissures in the limestone, leaving luxurious firm grazing-ground (Engels, 1971:180).

But all of these ‘natural conditions’ were essentially moments of metabolised natural processes, which today would be known as an ecosystem. This natural ecosystem was in turn embedded in social processes when society intervened in its pursuit of agricultural products.

The thwarting of the natural fertility of the Irish soil by the social process of the British colonial market

Engels summarises the main natural tendencies of the metabolised soil to produce agricultural products:

If one looks at the matter impartially and without being misled by the cries of the interested parties,, one finds that Ireland like all other places, has some parts which because of the soil and climate are more suited to cattle-rearing, and others to tillage, and still others – the vast majority – which are suited for both (Engels, 1971:190).

This quotation succinctly captures the thrust of Engel’s analysis of the metabolised natural processes and how they provide diverse productive conditions for agricultural production. It is crucial that we be aware of the regional diversity of these natural fertility capabilities as their subsumption under particular social forms of production will have a tendency to thwart their natural productive tendencies. For example, an increasing market demand for a particular agricultural product such as cattle, which in the market context would take on the social form of a commodity, would have a tendency to push cattle production beyond its natural productive enclaves into ‘naturally’ endowed tillage areas. Rising prices for cattle products against tillage commodity prices would encourage producers to swing away from tillage production and the natural productive capabilities embedded in that bio-region, so that, these fertility moments would now have to metabolize with the newly imposed product and its necessary ecological requirements. In this situation, the imposed agricultural regime would have more discordant elements within its process of metabolization than the previous regime⁸. But crucially the subsumption of agricultural terrains with diverse natural productive capabilities under a specific commodity regime will have a tendency to ‘homogenize’ the fertility contents of the ecosystems subsumed. Human intervention will attempt to upgrade the naturally endowed fertility system – the natural ecosystem – to a level that is determined by the productive requirements of the commodity been produced⁹. Therefore, in any agricultural region or country, one type of

⁸ As Marx stated:

Finally, fertility is not so natural a quality as might be thought; it is closely bound up with the social relations of the time. A piece of land may be very fertile for corn growing, and yet the market price may induce the cultivator to turn it into an artificial pastureland and thus render it infertile (Marx and Engels, 1975, CW, 6, 204).

⁹ In the following Marx suggests that the capital investment in ‘so-called permanent improvements’ appears to be attempting to construct a uniform condition of fertility by overcoming natural deficiencies (or obstacles) that are present either on the land surface or beneath within the soil structure itself:

.... – nearly all amount to giving a particular piece of land in a certain limited locality such properties as are naturally possessed by some other piece of land elsewhere sometimes quite nearby. One piece of land is naturally level, another has to be levelled, one possesses natural drainage, another requires artificial drainage, one is endowed by Nature with a deep layer of top soil, another needs artificial deepening, one clay soil is naturally mixed with the proper amount of sand, another has to be treated to obtain this

agricultural ecosystem and its appropriate commodity regime will be dominant in land cover dimensions over others as determined by organic sustainability and market forces. But such a position of dominance does not imply that it should spatially invade and metabolically subsume the other agricultural ecosystems that coexist within a particular locality or region. Engels demonstrates his awareness of the dangers in artificially ‘homogenizing’ natural productive capabilities beyond their naturally endowed spatial enclaves in the following:

Compared with England, Ireland is more suited to cattle-rearing on the whole; but if England is compared with France, she too is more suited to cattle-rearing. Are we to conclude that the whole of England should be transformed into cattle pastures, (Engels, 1971:190).

These agroecosystems (the combination of the social forms of agricultural products with the natural contents of the local ecosystems) are not just ecosystems as they also include labour processes in which a class of direct producers produce within. Consequently, a change from one agroecosystem to another would also entail a change in labour input. Engels appears to have this in mind in suggesting that England because of its more natural propensity for grass growth in comparison to France would become a cattle pasture, but for this to happen the resident agricultural population who were employed in tillage operations would have to be cleared off the land:

....and the whole agricultural population be sent into the factory towns of America – except for a few herdsmen – to make room for cattle, which are to be exported to France in exchange for silk and wine? (Engels, 1971:190).

In proposing this strategy of clearing rural England of people for cattle, Engels is not only emphasising the bizarreness of such a proposal but also the idea that it could subsume all the other naturally occurring fertility enclaves that are conducive to producing non-cattle products. But in a dramatic conceptual move, Engels declares that this specific strategy was the one adopted by the Irish landlords and British bourgeois with regard to transforming Ireland into a cattle pasture and he teases out the implications of this proposal for the Irish people – their extermination:

But that is exactly what the Irish landlords who want to put up the rents and the English bourgeois who want to decrease wages demand for Ireland: Goldwin Smith has said so plainly enough. And yet the social revolution inherent in the transformation from tillage to cattle-rearing would be far greater in Ireland than in England. In England, where large scale agriculture and where agricultural labourers have already been replaced by machinery to a large extent, it would mean the transplantation of at most one million; in Ireland, where small and even cottage-farming prevails, it would mean the transplantation of four million: the extermination of the Irish people (Engels, 1971:190).

There is in this ‘social revolution’ many dimensions of the British colonial project in Ireland. But, it also highlights how the elites of both islands could combine their differing trajectories of colonial subsumption under a shared strategy of changing the productive conditions of Ireland.

proportion; one meadow is naturally irrigated or covered with layers of silt, another requires labour to obtain this condition, or, in the language of bourgeois economics, it requires capital (Marx, 1981, 745/6).

Firstly, the demand for a product change in the case of colonial Ireland meant the clearance of surplus Irish direct producers off the land to make room for livestock. Secondly, this colonial strategy of land clearances was conceptualised by Marx as ‘clearing the estate of Ireland’ which he proposed as the dominant relationship of the post-Famine period, where the economy was determined by its colonial form. Finally, the changing product demands by the colonising core constrained Ireland to be a mere supplier of agricultural commodities and thus spatially Ireland became an agricultural region of Great Britain¹⁰.

“Cultivating” Irish Climate as an ideological buttress for the social process of British colonialism

Engels begins the final section of his chapter with a curious assertion:

It can be seen that even the facts of nature become points of national controversy between England and Ireland. It can also be seen, however, how public opinion of the ruling class in England – and it is only this that is generally known (191) on the Continent – changes with the fashion and in its own interests. Today England needs grain quickly and dependably – Ireland is just perfect for wheat-growing. Tomorrow England needs meat – Ireland is only fit for cattle pastures. (Engels, 1971:190/1).

Here Engels appears to be exploring another dimension of Ireland’s natural conditions where the ‘facts of nature’ play a crucial ideological role in the relationship between colonising England and colonised Ireland. The ideological function of these obviously one-sided interpretations of the complex concrete reality of the cultivation practices in Ireland is to convince a public (both domestic and foreign) of the actions that the colonial regime either has taken or is just about to take with regard to guaranteeing that Irish agriculture provides a secure food supply to the core irrespective of the damage that it inflicts on the Irish producers. The changing colonial food requirements of Britain impose market pressures on the Irish peasantry to switch their production from grain to livestock. But this pressure becomes intensified when the initial agroecosystem collapses as its natural contents ruptures. This is discussed by Engels with regard to a case of an outbreak of foot-and-mouth in Cheshire and the potato blight in Ireland. In addition, such a rupture-like occurrence apparently prompts the various ideologues to advocate a necessary product transformation within the agricultural sphere of production whether it is in Cheshire or Ireland:

....; Cheshire carried on mainly cattle-rearing and dairy farming until the last epidemic of cattle-plague, but since most of the cattle perished the climate suddenly became quite admirably suited for wheat-growing. If there had been an epidemic of cattle-plague in Ireland, causing devastation similar to that of Cheshire, instead of preaching that Ireland’s natural occupation is cattle-raising, they would point to the place in Wakefield which says that Ireland is destined to be England’s granary (Engels, 1971:190).

The tragic difference between these two natural ruptures in their respective agroecosystems is that Cheshire lost a food commodity while Ireland lost its immediate food subsistence and two

¹⁰Marx stated it in the following way – “But Ireland is at present only an agricultural district of England, marked off by a wide channel from the country to which it yields corn, wool, cattle, industrial and military recruits.” (Marx, 1971:105).

million producers of that food through death and emigration. But by locating climate as the sole exclusive determinant of what grows ‘naturally’ in Cheshire or in Ireland, the various accounts that use this conceptual strategy are not only ignoring the other moments of the natural process, but even more crucially, they ignore the social process embedded in cultivation. Accordingly, they are ideologically isolating the natural from the social. As a consequence of such conceptual one-sidedness, isolated and independently determined nature does not have a societal input. Instead, the apparent self-regulating form of the climate appears to be immutable, obeying unalterable ‘God-like’ laws whose evolutionary logic can only be accepted. Thus, the product transformation in the cases of Cheshire and Ireland are perceived to be determined by Nature alone. Marx in *Capital* reproduces a similar argument as the one made by Engels in the above:

Having praised the fruitfulness of the Irish soil between 1815 and 1846, and proclaimed it loudly as destined for the cultivation of wheat by nature alone, English agronomists, economists and politicians suddenly discovered that it was good for nothing but to produce forage (grass pasture) (Marx,1976:115).

The ‘social revolution’ of population change inherent in this apparently technical ‘transformation from tillage to pasture’ remains hidden because the conceptual framework of naturalism (which Marx is making fun of) evokes the natural forms of the agroecosystem while simultaneously evading the social determinants of this enforced movement of people off the land. Blaming the natural exonerates the social!

This policy of advocating a switch in agroecosystems and its inherent but hidden social revolution in the necessary decline in peasant population is essentially another aspect of British colonial domination of Ireland as Engels suggests in the following:

From Mela to Goldwin Smith¹¹ and up to the present day, how often has this assertion been repeated – since 1846, especially by a noisy chorus of Irish landowners – that Ireland is condemned by her climate to provide not Irishmen with bread but English men with meat and butter, and that the destiny of the Irish people is, therefore, to be brought over the ocean to make room in Ireland for cows and sheep! (Engels, 1971:185).

Conclusion

The naturalism of the above arguments is, as pointed out by Engels and Marx, a one-sided account of a many-sided reality¹², which should have included an analysis of both the

¹¹ Engels stated the following in footnote: Goldwin Smith, *Irish History and Irish Character*, Oxford and London, 1861. – What is more than amazing in this work, which, under the mask of “objectivity”, justifies English policy in Ireland, the ignorance of the professor of history, or the hypocrisy of the liberal bourgeois? We shall touch on both again later.

¹² In the following quotation from 1842, Marx is suggesting how we attempt to make sense of the world – a world that is an ‘unorganised mass’ whose contents are in a constant state of flux and movement. To this ‘manifold diversity of the world’, we tend to make one-sided interpretations:

...for one-sidedness can extract the particular from the unorganised mass of the whole and give it shape...By confining each of the contents of the world in a stable definiteness and as it were solidifying the fluid essence of

natural and the social processes metabolised. The polemical attack by Marx and Engels against the absurdity of Nature alone determining product cultivation is a critique of the specific colonial apologist's accounts of the Irish situation but it could also be seen as a critique of bourgeois science in general. In the following, Engels highlights this trend within the natural sciences of perceiving the organic processes of Nature as detached and isolated objects:

The analysis of Nature into its individual parts, the grouping of the different natural processes and organic objects in definite classes, the study of the internal anatomy of organic bodies in their manifold forms – these were the fundamental conditions of gigantic strides in our knowledge of Nature which have been made during the last four hundred years. But this method of investigation has also left us with a legacy of the habit of observing natural objects and natural processes in their isolation, detached from the whole vast interconnection of things, and therefore not in motion but in their repose, not as essentially changing, but as fixed constants; not in their life, but in their death (Engels, 2015, Duhring: Introduction) (my emphasis).

The non-dialectical orientation of the natural sciences occurs because they are embedded in understanding of the entities of concrete reality at the level of discrete surface appearances – detached and isolated¹³. Consequently, they have an inherent tendency to eclipse not only the complex interconnections of reality but also, they tend to fail to recognise that these concrete entities are in fact manifest moments of underlying processes¹⁴.

Accordingly, these non-dialectical accounts cannot conceptualise the causal links between differing entities of the real world, even such ones as nature and society. The reason for this fatal flaw is that they perceive concrete reality as being made up as thing-like substances, permanent in their essential structure, and not as Engels maintains that [t]he whole of nature, from the smallest element to the greatest, from the grains of sands to suns.... has its existence in eternal coming into being and passing away, in ceaseless flux, in unresting motion and change' (Engels, 1986: 30/31).

the content, understanding brings out the manifold diversity of the world, for the world would not be many-sided without the many one-sidedness's' (Marx, Debates on the Thefts of Wood, MECW, vol.1, 1975)

This ontological distinction being highlighted here by Marx is that between the 'unorganised mass of the whole' with its 'fluid essence of the content', in short - the real world, and the 'one-sidedness' of our 'understanding' of it, as we 'confine' the 'contents' of the world in our interpretation.

¹³ And according to Marx this includes the so-called 'scientists' of political economy:

Here it will be shown how the philistines' and vulgar economists' *manner of conceiving things* arises, namely, because the only thing that is ever reflected in their minds is the immediate *form of appearances* of relations, and not in their inner connections. Incidentally, if the latter was the case, we surely have no need of *science* at all. (Marx to Engels 27 June 1867, MECW, vol.22, 1985).

¹⁴ Ilyenkov argued that Marx perceived any individual entity as essentially a moment within a process:

That means that any individual object, thing, phenomenon, or fact is given a certain concrete form of its existence by the concrete process in the movement of which it happens to be involved; any individual object owes any concrete form of existence to the concrete historically established system of things within which it emerged and of which it forms a part, rather than to itself, its own self-contained individual nature (Ilyenkov, 1982: 118).

What can be gleaned from our survey of Engel's work on Ireland is that to explore the ecological base of a social formation involves unravelling a maze of metabolising processes, both natural and societal, and how those processes penetrate with each other. With regard to the organic processes of nature, any one of its processes cannot be investigated independently of the others. The excessive rainy Irish climate makes no sense in itself but only how it relates to the other organic processes of nature. It cannot be conceptually grasped separate from the other natural processes within the Irish organic totality. Also, all of these organic processes provide a diverse range of functions simultaneously for the overall reproduction of this earthy organic totality. For example, the geological rock process is not only the physical base of Nature's organic processes but also it is the continuing source of the physical components of the soil, especially the nutrients/minerals. With regard to Ireland, the particular sieve-like structure of its geological base modifies the climatic condition of heavy rainfall so that cultivation can continue. The stony soil plays a similar function to the limestone bedrock, in that it channels water through it. However, the most revealing insight is the crucial dynamic 'engine' of the whole metabolising system is the climate, even the excessive damp climate of Ireland.

It is only when we have completed our analysis of the ecological conditions of a particular social formation and unearthed its complex matrix of metabolising organic processes that we can begin to investigate how the social forms of cultivation impact on the organic processes of the soil. In Engel's presentation of Ireland's ecological conditions of existence, the apparent dominant social form, which dominated the overall structure of Irish organic totality, was that of colonialism. However, Engels only touched upon this subject matter briefly. In fact, Engels fleetingly locates three discrete moments of the colonisation process¹⁵, which he identified as the deindustrialisation of Ireland by British acts of intervention, a constantly manipulated market system geared towards supplying changing British demands for agricultural goods, and finally the enforced emigration of the rural population to make way for livestock production. As a consequence, the dialectical analysis of this article provides us with only an adequate conceptual insight into the 'workings' of the organic world of Nature prior to their appropriation within social forms of cultivation. However, this is a necessary pre-condition for the latter form of investigation.

Unlike the social forms of production, which Marx assessed against the highest and most developed social form in evolutionary terms, i.e. capitalism, the understanding of the development of the natural process appears to be evaluated from its pure unadulterated form – uncontaminated by human contact – an organic ecosystem. Its development is subsequently tracked by how it is increasingly penetrated by social processes. In our survey of Engels' work on the Irish soil system we unfolded the sequential levels in which increasingly more complex social forms 'encase' the natural contents of the Irish ecosystems adapted to agricultural production. In order to highlight the significance of Engel's conceptual procedure I summarise this necessary

¹⁵ But this analysis of the colonial form is very rudimentary in comparison to Marx and Engels work elsewhere, where they suggest that colonialism is a complex social process which penetrates all aspects of the Irish organic totality including crucially the soil structure (Slater and McDonough, 2008, Slater, 2013).

dialectical movement by using the modern concepts of ecosystem and agroecosystem to help the contemporary reader in the following:

Engel's conceptual procedure and its enfolding levels of determination

1. Ecosystem - includes all of the dialectics of nature centred on the soil system and especially climate, which is the dominant determinant of the overall organic process of Nature. These organic processes – the geological structure, the soil process and the climate system constantly metabolise with each other which subsequently become characterised by their dialectical tendencies of inherent fluidity, mutual interaction and ‘universal connection’.



2. Agroecosystem – a simple abstract concept which allows us to express how the organic ecosystems of Nature become embedded in agricultural production, and crucially where the bio-aspects of this metabolised process retain their dominance over society’s cultivation practices. In short, the concept of agroecosystem is an idealised representation of sustainable agricultural production, without a specific social form¹⁶. It is at this level of unfolding that Engels was able to identify the naturally endowed fertility enclaves (bio-regions) through-out Ireland with regard to the production of particular crops or livestock or both without having to account for the impact of the social forms of cultivation.



3. Commoditized agroecosystem – the bio- agroecosystem as expressed in the previous level becomes concretized with the emergence of a metabolizing relationship between an organic producing agroecosystem and the social process of a market economy. As a result, the bio-dominance of the idealized agroecosystem becomes subverted by the social form of commodity production and its inherent changing demands of its market. What is cultivated and how it is cultivated becomes increasingly determined by profit rather than the innate bio-sustainability of the agroecosystem.



4. Colonial Commoditized agroecosystem – the dominant determinant moves from a free market system situation in which agricultural commodities circulates away from their fields of production to a situation, where the colonising core economy uses its power (both economic and political) to distort the operation of the market within the colonised economy. In losing, its market autonomy Ireland accordingly becomes a mere agricultural region of Britain (Marx, 1971: 132).

¹⁶ As part of Marx’s method of exposition, he would isolate a particular level of analysis in order to explicate the determinants within the level chosen to work upon as he did with regard to the labour process:

We shall therefore, in the first place, have to consider the labour process independently of any specific social formation (Marx, 1976 :283).

The above conceptual movement of Engels has only concerned itself with the circulation process, especially at the concrete level of the market. The production process and in particular the cultivation process has been left out, which needs to be tackled in order to take in the full extent of how colonialism penetrates a colonial social formation. However, what we do have from our examination of Engel's exposition of Ireland's 'Natural Conditions' is a methodology – a dialectical methodology, which has emphasized for us how the organic processes are in a constant state of metabolizing with each other. It is only dialectics, the science of inter-connections (Engels, 1986), that can adequately grasp the dialectics of nature of Ireland and beyond:

In nature, nothing takes place in isolation. Everything affects and is affected by every other thing, and it is mostly because this manifold motion and interaction is forgotten that our natural scientists are prevented from gaining a clear insight into the simplest things (Engels, 1986: 178).

Although the natural scientists are unable to see a dialectical world as Marx and Engels did, they – Marx and Engels have left us with a dialectical “method for this investigation” (Engels to Werner Sombart, 1895). Engels work on Ireland in particular is a crucial part of this legacy and especially with regard to explicating the dialectics of Nature. The natural scientist's misinterpretation of reality has cost us dearly and is going to cost us more. In order to turn this about we need to reinterpret the world in order to change it and to do this we need to become scientists of the natural and the social and not just scientists but *dialectical scientists* so that we can finally write the real history of the “relation of man to nature” in order to save both.

What can be taken from this survey is that the significance of Engel's pronouncements on the dialectics of the Irish 'natural conditions' (the metabolizing organic processes of Nature) is that any dialectical or materialist analysis of the relationship between society and nature has to take on board the idea that Nature is a complex matrix of metabolizing processes. The implications of this insight are profound. Firstly, Nature cannot be perceived to be a thing-like entity, nor can it be investigated in isolation from the rest of concrete reality. Secondly, society's engagement with these organic processes of Nature is a 'complex relationship' which operates on many levels and at many diverse points of interaction between these opposing processes of society and nature. Thirdly and finally, any notion of society being dominant over nature has to be qualified by the knowledge that because nature is essentially a process, the concept of dominance can only be maintained where society is conceptualized as effectively manipulating the inherent forces of nature for its own benefit. It does not imply that all of these forces are fully controlled and mastered by society. The inherent complexity of a dynamic process, and even more so when that process is 'the concentration of many determinations, hence unity of the diverse' processes of nature, counteracts any attempt of a total masterful control. Even Capitalism cannot produce Nature in a production process, at most it can only appropriate certain aspects of its organic forces, especially in cultivating agricultural products!

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