

### **3. Transformative Agroecology: Foundations in agri-cultural practice, agrarian social thought and sociological theory.**

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#### *3.1. Introduction*

Wezel et al. (2009) claim that, from the first scientific use of the term ‘agroecological’ in the late 1920s, agroecology developed through the intersection of agronomy and ecology. Subsequently, following the emergence of the word ‘agroecosystem’ in the 1970s, the focus of research was extended from the field level eventually to encompass entire food systems. By the 1990s, the word agroecology was also being used in reference to agrarian social movements and environmentally friendly agricultural practices. For Wezel et al. this broadening of the scope of agroecology is a source of confusion and a cause for concern. We take issue with their position on two grounds. First, by focusing on ‘agroecology’ and cognate terminology they miss the broader historical context of peasant agri-cultures and agrarian social thought from which the science of agroecology has emerged. Similarly, they take no account of the numerous agrarian countermovements that have accompanied the development of capitalist agriculture and its associated food regimes (McMichael 2009). The restricted focus of their analysis leads to the second problem - flawed conclusions and recommendations. As Eric Wolf noted in his introduction to *Europe and the People Without History*, ‘the world of humankind constitutes a manifold, a totality of interconnected processes, and inquiries that disassemble this totality into bits and then fail to reassemble it falsify reality’ (1982: 3). If we focus on what is signified rather than the signifier, a very different story comes into view where the science emerges from practice and in support of movements for agrarian justice and food sovereignty.

In our contribution to this volume, we do not seek to undermine agroecological science in its efforts to identify and develop more environmentally benign forms of agricultural production but rather to take issue with recent moves to construct and promote an apolitical natural science of agroecology (c.f. Tomich et al. 2011; Wezel et al. 2009). Our intellectual endeavour is to contribute to ‘transformative agroecology’ (c.f. Mendez et al. 2013), which begins with the identification and analysis of situated or place-based agri-cultures and the productive/ecological; socioeconomic and; sociocultural/political milieux that influence what, how, where and by whom food is produced and consumed. Inclusion of the socioeconomic dimension suggests consideration of issues of social and economic equity within agri-food systems, while attention to the sociocultural/political milieu leads us to focus on the cultural and political contexts and agendas associated with the movement towards more sustainable agri-food

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systems and food sovereignty. All three dimensions build from critiques of what McMichael (2009) calls the 'food from nowhere' regime of corporate agriculture and global food security, which we consider to be ecologically, economically and politically bankrupt.

In order to explain the social foundations of transformative agroecology, this chapter is structured into three parts. In the first, we consider some of the basic characteristics of pre-industrial food production and consumption and early concerns over the impacts of the development of capitalism in the countryside. This leads us into a discussion of intellectual engagement with these issues and with the countermovements responding to capitalist development in agriculture. The second part of this chapter reviews some of the more important conceptual contributions that sociology and more recently environmental sociology have made to our understanding of social and socio-environmental relationships that are integral to a transformative agroecological endeavour. To facilitate this enterprise, Table 1 offers a schematic of our view of the historical pathway of social thought and theory that has led to the emergence of contemporary, transformative agroecology. The chapter concludes by illustrating some of the more recent history of solidarity among farmers, scientists and social movements in pursuit of agroecological sustainability and food sovereignty.

[TABLE 1 about here please]

### *3.2. From Local Agri-Cultures to a Global Corporate Food Regime*

The earliest evidence of agriculture has been found in the 'Fertile Crescent', which runs north from the Nile plain in Upper Egypt, along the southern and eastern Mediterranean before following the Tigris and Euphrates on their journey south to the Persian Gulf. It was there that wheat and barley were first developed from wild grasses, and goats, sheep and cattle were domesticated. According to Zeder (2008: 11597), 'initial steps toward plant and animal domestication in the Eastern Mediterranean can now be pushed back to the 12th millennium cal B.P.'. In China there are archaeological indications of millet and pig farming between 7 and 8000 years ago, while in the Indian sub-continent rice, bananas, tea, chickens, pigs and buffalo were domesticated. Animal traction and the first ploughs appear to have been developed by Mediterranean farmers, while millet, sorghum, sesame and coffee are all crops that were domesticated in a region occupied today by Eritrea, Ethiopia and Somalia. The Americas have endowed us with another raft of familiar agricultural crops: maize, climbing beans, squash, cotton, chilli, avocado, cocoa and vanilla were first domesticated in Mesoamerica, while the vast area covered by South America, from the Andes down through the Amazon Basin, offer proof of the early cultivation of potatoes, tomatoes, cotton, sweet potatoes and numerous other roots and tubers, as well as peanuts and pineapples. (Toledo and Barrera-Bassols, 2008). Since the advent of agriculture, the domestication, breeding and production of crops and livestock, and the processing, distribution and consumption of agricultural products have been

accompanied and conditioned by place-based cultural learning and the establishment of a broad range of social institutions.

### 3.2.1. Agroecology as agri-cultural practice

Farmers have always experimented so that the diversity of agroecosystems and agri-cultures that have developed in different parts of the world over the last 10,000 years can best be conceptualised as ‘works in progress’. Yet, for all this diversity, there are some basic characteristics that are central to agricultural sustainability. ‘We had long desired to stand face to face with Chinese and Japanese farmers; to walk through their fields and to learn by seeing some of their methods, appliances and practices which centuries of ... experience have led ... [them] to adopt. We desired to learn how it is possible after twenty and perhaps thirty or even forty centuries, for their soils to be made to produce sufficiently for the maintenance of such dense populations as are now living in these ... countries’ (King, 1911: 2). This short extract from the introduction to F.H. King’s seminal text, ‘Farmers of Forty Centuries’, captures two of the central premises of agroecological practice. First, sustaining agri-cultures have been developed around the world as a result of centuries of experience living in and with nature. Second, the fundamental basis of all such agricultures is a living and healthy soil. Similar observations were made in another foundational volume, Howard’s (1940) ‘An Agricultural Testament’, which resulted from his experiences as Imperial Economic Botanist to the Government of India during the first quarter of the 20<sup>th</sup> Century. Although Howard had been sent to India to introduce Western agricultural practices, he came to the conclusion that he had more to learn from the Indian farmers than he could possibly teach them. Echoing King (1911), Howard (1940) considered a healthy soil to be the basis of healthy crops and livestock, nourishing food and the well-being of human populations. As Barthel *et al.*, (2013: 1142) put it: sustainable agri-cultures have been ‘maintained through a mosaic of management practices that ... co-evolved in relation to local environmental fluctuations, and ... [have been] carried forward by both biophysical and social features ... including: genotypes, artefacts, written accounts, as well as embodied rituals, art, oral traditions and self-organized systems of rules’.

Traditional agri-cultural practices based around soil health and crop and non-crop biodiversity display a number of properties that are central to their long-term viability. First, pre-industrial agricultures, based on human and draught animal power are highly efficient net producers of energy. Manual agriculture can produce as many as 30 calories of energy for each calorie of energy invested (Wilken, 1987) and while the use of animal traction tends to reduce this ratio, farming with draught animals can still produce net outputs of ten or more calories of useful biomass for each calorie of energy input (Martinez-Alier, 2011). These figures compare very favourably with modern industrial agriculture, which typically requires 10–15 calories of fossil fuel energy to produce just one calorie of food (McMichael, 2009). As well as being net producers of energy, pre-industrial polycultural

agroecosystems also outperform industrial input-intensive monocultures in terms of total food productivity per unit area. Mesoamerican corn, beans and squash intercropping can produce almost twice as much food per hectare as industrial maize monocultures and twice as much organic residue for composting and turning back into the soil, obviating the need for synthetic amendments (Altieri and Toledo, 2011).

Another important characteristic of low-input, biodiverse, polycultural systems that integrate annual and perennial crops is that, once established, they tend to be carbon sinks rather than carbon emitters and thus have the potential for climate change mitigation (IAASTD, 2009; UNCTAD, 2013). The industrial food system, on the other hand, is estimated to be responsible for more than 20% of greenhouse gas emissions (McMichael et al. 2007, cited in McMichael, 2009). In addition to climate change mitigation, diversified agroecosystems are more resilient to the increasingly severe and frequent extreme weather events that are associated with global warming. A survey of more than a thousand farms in Central America reported by Holt-Gimenez (2001) demonstrated that following the ravages of Hurricane Mitch in 1998, farms with biodiverse agroecosystems suffered significantly lower economic costs and recovered more rapidly than those where monocropping was prevalent, reflecting the inherent risk mitigating character of agroecological production.

As diversity confers resilience, in combination with traditional, place-based farmers' profound understanding of local ecological and cultural resources and relationships, it also imparts adaptability. Of course the coevolution of distinct agri-cultures has not been a smooth or linear process. Individual farming families, agrarian communities and indeed entire civilisations have disappeared as a result of some irresistible environmental or social force. We will now turn our attention to some of the social and environmental concerns that have accompanied the development of capitalist agriculture.

### *3.2.2. Growing concern over the impacts of the development of capitalism in the countryside*

Various claims have been made about the origins of the political/economic systems we label 'capitalist' although there is no such debate surrounding the centrality of property rights to the functioning of capitalism in whatever form. The tensions imposed by the establishment and (re)structuring of property rights in land have occasioned social critique and action since at least the 16<sup>th</sup> century, when the widespread enclosure of the open fields and commons as private sheep pastures in England denied ordinary people access to land and restricted their ability to feed themselves and their families. One of the earliest critiques of enclosure can be found in Moore's 1516 novel *Utopia*: 'Your sheep ... which are usually so tame and so cheaply fed, begin now ... to be so greedy ... that they devour human beings themselves and devastate and depopulate fields, houses, and towns' (cited in Melville, 1994: vi). In the 17<sup>th</sup> century the problem of access to land became more acute, leading to numerous localised revolts and the coming together of the dispossessed into direct action movements

to level the ditches and fences of the enclosures and invade and cultivate the land. Thus they challenged the most fundamental element of the emerging capitalist economy – private property. “When men take to buying and selling the land . . . they restrain other fellow creatures from seeking nourishment from Mother Earth . . . so that he that had no land was to work for those . . . that called the Land theirs; and thereby some are lifted up into the chair of tyranny and others trod under the footstool of misery, as if the Earth were made for a few and not for all” (Winstanley, 1649, cited in Berens 1906, 70).

At the end of the 18<sup>th</sup> century as industrialisation was beginning to revolutionise production, while it was a commonly held view among Enlightenment thinkers that society was changing for the better and firmly set on a broadly upward and improving trajectory, others were less sanguine about the prospects for ‘perfecting society’. Among them was Thomas Malthus, who questioned the ability of agricultural production to keep up with exponential human population growth. In his *Essay on the Principles of Population* (1998 [1798]) Malthus argued that because ‘population ... increases in a geometrical ratio [while s]ubsistence increases only in an arithmetical ratio ... the power of population is indefinitely greater than the power in the earth to produce subsistence for man’ (4). As Britain’s industrial revolution gathered pace in the 19<sup>th</sup> century, however, agricultural production accelerated and Malthus’s dismal predictions failed to materialise. Nonetheless, the means of achieving such elevated crop yields attracted criticism from a different quarter. In his text on agricultural chemistry, the German chemist, von Leibig, denounced Britain’s success, pointing out that yield increases depended on imported nutrients, while none of the organic residues from food consumed in urban centres was recycled back to the soil (Foster, 2000). Marx, who was particularly critical of Malthus’s thinking, undertook a systematic analysis of von Leibig’s work, leading him to one of the central concepts of his critique of industrial agriculture. As the 19<sup>th</sup> century progressed, agricultural production increasingly incorporated new mechanical, mineral and chemical technologies, protectionist measures aimed at encouraging cereal production were repealed and labour was shed. Thus, as Britain was transformed from agrarian to industrial society, capitalist agriculture provoked ‘an irreparable rift in the interdependent process of *socioecological metabolism*’ (Marx, 1981: 949 emphasis added).

Kautsky’s *Agrarian Question* (1899) employed the notion of ‘metabolic rift’ (c.f. Foster 2000) in an analysis of what he characterised as the exploitation of the countryside by the cities. The agrarian question itself, however, concerned the fate of the Russian peasantry in the face of the development of capitalism and sought to respond to a debate that had been established in the second half of the 19<sup>th</sup> century between the Narodniks and Russian Marxists (see Table 1) following the emancipation of Russian peasants in 1861. Prior to the abolition of serfdom, the organisation of agricultural production in Russia revolved around landed estates. The landlords provided their serfs with access to pasture

and forests for fodder and fuel wood, and two adjacent strips of land: one to be cultivated for their own subsistence needs and one to produce crops for the estate. On their emancipation, the peasants were allowed to retain their subsistence plots and this land formed the basis of village communes. However, the erstwhile landlords retained ownership of the adjacent strips and all of their pastures and forests. Thus the peasants were denied access to vital fodder and fuel resources. The landlords sought to tax the peasants for access to estate pastures and in response some communes turned over some of their agricultural plots to grass but the landlords (or Kulaks) reacted by imposing tolls for each animal that crossed their agricultural strips on their way to the village pastures. In order to pay for access to the forest and acquire vital supplies of firewood, the peasants had no option but to cultivate crops for the Kulaks.

Inspired by the publication of Chernishevsky's novel, *What is to be done?* (1863), the Narodniks viewed the peasants as a revolutionary force capable, with appropriate leadership from the intelligentsia, of overthrowing the Tsars and building a form of socialism based around the village commune and developing cooperative forms of agricultural production utilising the resources of the old feudal estates. In early 1874 rural unrest between the peasants and Kulaks spread to the cities and prompted members of the Narodnik intelligentsia to head for the countryside to galvanise the peasantry and convince them of their revolutionary potential. Hence Narodnik: the Russian term 'narodniki' having the literal meaning of 'going to the people'. Despite the ultimate failure of the Narodnik movement – it met with little enthusiasm among the peasants and was harshly repressed by the Tsarist police – in some important ways Narodnikism prefigures the agroecological approach in its identification of the peasantry as a revolutionary force, its focus on the economics of solidarity, and the importance it attached to 'going to the people'.

The Marxists, however, believed that it was necessary for capitalism to develop before socialism could emerge, and thus claimed that the peasantry would have to disappear. In the same year that Kautsky published his *Agrarian Question*, Lenin published *The Development of Capitalism in Russia*, which begins with a chapter on 'The Theoretical Mistakes of the Narodnik Economists'. The subsequent chapter, entitled 'The Differentiation of the Peasantry' described how the development of capitalism necessitated the polarisation of the peasantry into small-scale capitalist farmers and associated rural proletarian classes. The idea that peasant modes of production were incapable of withstanding the development of capitalism was challenged by another Russian commentator, Alexander Chayanov, who developed what he called 'social agronomy' – a form of natural resource management based on the social institutions and knowledge of peasant households and society. In his theory of the peasant economy, Chayanov (1989) explained how it was possible for peasant modes of production to continue to exist alongside capitalism due to the character of the peasant household as both unit of production and consumption and an alternative economic logic of balancing household

consumption needs with the necessary amount of labour required to achieve them. Thus, in terms of their engagement with the peasantry and support for their role in what we might call the ‘sustainable development of agricultural production’ we might consider both the Narodniks and Chayanov as a proto-agroecologists.

Following the death of Lenin in 1924, Stalin had Chayanov sentenced to the labour camps for his ‘anti-revolutionary’ ideas and set about modernizing Soviet agriculture through forced collectivization: a process met by fierce, but ultimately futile, peasant resistance. Pitirim Sorokin, a fugitive from the Russian Revolution, took up residence in the United States, where together with Carl Zimmerman and Charles Galpin he produced the three-volume *Systematic Source Book in Rural Sociology* (1930–1932). Within the framework of the U.S. Land Grant Colleges, rural sociology was employed to analyse and understand rural life and inform policies of agrarian modernisation (Christy and Williamson 1992; Sevilla Guzmán and Woodgate, 1997). In the second half of the twentieth century, the influence of rural sociology was felt in both the United States and Europe. In the United States, the Farm Population and Rural Life Division was established within the Department of Agriculture and, under the leadership of Galpin, generated sociological understanding of the farm sector in order to influence New Deal policies and partially ameliorate the worst social impacts of industrialization on disadvantaged sectors of the rural economy. In post-War Europe the Common Agricultural Policy, directed chiefly at achieving food self-sufficiency, also included social payments aimed at maintaining vibrant rural communities.

The success of petroleum-based agricultural technologies in the advanced capitalist economies led to international efforts to increase global food production by promoting agricultural modernisation in the South. Of particular relevance to this endeavour were the constituent institutions of the Consultative Group on International Agricultural Research (CGIAR), such as the Centre for the Improvement of Maize and Wheat (CIMMYT) in Mexico and the International Rice Research Institute (IRRI) in the Philippines. In concert with national agricultural development programmes and funding from the Rockefeller Foundation these international institutions drove what became known as the Green Revolution, which extended technological packages of hybrid seeds, synthetic fertilisers and chemical pesticides across the Third World. Under optimum conditions industrial technologies returned remarkable increases in production. The extension of industrial agriculture technologies to Third World nations through the institutions and policies of the Green Revolution during the third quarter of the twentieth century contributed to the reproduction of First World development models of a modern agriculture sector generating surplus capital for industrial development. At the same time, ‘agribusiness elaborated transnational linkages between national farm sectors, which were subdivided into a series of specialised agricultures linked by global supply chains ... [and] ... a “new international

division of labour” in agriculture began to form around transnational commodity complexes’ (McMichael 2009: 141).

The extension of what McMichael (2009) calls the ‘corporate food regime’ has concentrated land ownership through dispossession in the search for economies of scale, marginalising smallholder agriculture and provoking large scale rural to urban migration. It has also transformed food from the most basic of human rights into an homogeneous set of globally traded commodities. Meanwhile, mechanisation and the application of industrial inputs have degraded soils to the point where they function as little more than inert substrates with little or no inherent productive capacity. Furthermore, ‘the rate of biodiversity loss due to ... chemically intensive monocultures is extraordinary. ... Entire habitats and [the] wild species associated with them ... have been lost or are on extinction trajectories ... and it is now well established that the current loss of biodiversity in agro-ecosystems also erodes fundamental ecosystem services that underlie the resilience of production, such as soil fertility, pollination and natural pest control’ (Barthel *et al.*, 2013: 1145).

These great transformations in the socioeconomic and productive/ecological dimensions of agroecosystems reverberate through the sociocultural/political dimension. In order to understand the dynamic interplay of social and ecological factors we need to establish a broad conceptual framework. Thus before moving to our assessment of the emergence and progress of transformative agroecology and its engagement with the politics of the food sovereignty, the next part of this chapter reviews some of the more important conceptual contributions that sociology and more recently environmental sociology have to offer.

### *3.3. From Sociology to Environmental Sociology*

The central lesson that sociology teaches us is that however we conceive of a particular phenomenon our descriptions of it are always social because our perceptions are coloured or filtered by our social context, its culture, its economics and its politics. Social contexts are structured by institutions which carry and instantiate cultural, economic and political rules and resources for social life. What environmental sociology reminds us is that we are all members of a biological population whose institutions and the behaviours they select for impact on nature to such an extent as to change the conditions of our existence. Thus when we observe the world around us, it is like looking into a mirror in two important ways: what we see is what we have constructed from within our social context and its materiality – its ecology – has been impacted by our activities. It is clearly impossible to explicate the entire canon of sociological theory in a few short pages, but in the sections that comprise this part of our chapter we will try to give a flavour of some basic sociological concepts and the key ideas that have contributed to our approach to transformative agroecology.



### 3.3.1. Sociology: competing visions of society

Since Comte first set out his positivist sociology in the 1830s, with its analysis of ‘social dynamics’ and ‘social statics’, two key issues have characterised sociological enquiry: how social change occurs and how social order is maintained. With great simplification, we can say that the answer to the first question is that social change is brought about by social action, which can be understood by focusing on how individuals relate to each other and the world around them. This is the realm of interpretive or constructionist sociology, which provides us with ways into understanding how what people believe and the meanings and values they attach to things have discernible consequences in terms of their attitudes and behaviour. The answer to the second question is that order is maintained by social norms and institutions (structures) that define options for human behaviour. Structuralism thus focuses our attention on social aggregates, such as the family, state, or market. Among his many contributions to sociological thought, Marx pointed out that social structures tended to favour the interests of elite classes – feudal lords or capitalist entrepreneurs, over the interests of the masses – the peasantry or proletariat, and thereby constrain progress toward more egalitarian societies. For Marx, social change required the active intervention of enlightened social actors in the form of ‘class struggle’ and, thus, he adopted a position somewhere in between constructivism and structuralism pointing out that while people make history they do not do so under conditions of their own choosing.

The 20th century witnessed a proliferation of sociological approaches. Some set out largely structural explanations of society, while others proffered constructionist interpretations focused on human agency: the capacity of individuals to act independently of structure. While for much of the 20<sup>th</sup> century most sociology could be characterised by divisions related to the *structure/agency debate*, it is important to note that until the later decades of the century most sociology also shared a common assumption: human society represents an exceptional case in nature because humans have developed culture. According to this view, human culture changes more rapidly than nature’s biology and thus progress can continue unchecked because, ultimately, all social problems can be resolved through cultural adaptation. In other words, human culture exempts societies from the ecological structures that shape the natural world. The agrarian modernisation theories developed by rural sociologists in the second half of the twentieth and the policies that they informed were firmly embedded in this ‘enlightenment’ thinking.

### 3.3.2. Agroecology and development theory: from modernisation and dependency to the rediscovery of peasant studies

What Catton and Dunlap (1978) labelled the ‘*human exemptionist paradigm*’ underlies most theories of development. While modernisation theory cast underdevelopment as an original condition of ‘backward peasant farmers’, in contrast, another broad theoretical orientation, which we can loosely term ‘dependency theory’ (Table 1), claimed that it was an active process generated by structural

inequalities between the advanced capitalist economies of the First World and the peripheral nations of the Third. For the more radical dependency theorists, such as Gunder Frank and Wallerstein, the greatest winners of ‘development’ were the core nations, who enjoyed cheap food supplies imported from the periphery and the rapid growth and eventual transnationalisation of their agricultural input industries and commodity trading corporations, which became key institutions of the corporate food regime.

While Green Revolution programmes and methods increased commercial agricultural production and trade, the industrialisation of agriculture also had the effect of robbing people of their identities and negating local knowledge and institutions. As we have already indicated, industrial agriculture also degraded soil structure and fertility and eroded agrobiodiversity. In short, capitalist agricultural industrialisation represented a new form of colonialism in which modernisation impoverished everything that did not follow the norms and rules that modernity dictated. These exploitative relations operated within as well as between nations as described by González Casanova and Andre Gorz (Table 1) in the concept of ‘internal colonialism’. González Casanova (1965) had used the term to refer to the situation in Mexico in the 1960s. One of the first Southern nations to implement Green Revolution policies, Mexico was also among the first places where peasant technologies and institutions were studied and presented as valid alternatives to industrial agriculture (c.f. Xolocotzi, Table 1).

Some of the most important contributions of peasant studies to contemporary agroecology emanate from the works of Theodor Shanin. These include his research into the history of the agrarian question and the debate among the orthodox Marxists and Narodniki in 19th century Russia, which we have already mentioned. In particular his rediscovery of the works of Chayanov have provided us with profound insight into the multiple levels of analysis that can and should be applied to peasant societies and their management of natural resources (c.f. Ploeg, 2013). In Latin America in the 1970s and 1980s, the agrarian question was reignited by the rediscovery of Chayanov and the body of work developed by peasant studies. A fierce debate ensued between descampesinistas who, like Lenin and Kautsky, foresaw the eventual disappearance of the peasantry (campesinado) and those who concurred with Chayanov that the peasantry could continue to reproduce themselves at the margins of the capitalist economy: the campesinistas.

Despite the negative impacts of modernization on peasant agriculture and social organization, campesinistas such as Angel Palerm held that while peasants might participate in the market economy to generate cash, rather than the simple logic of capitalism, peasant life is organized through membership of kinship groups and participation in the community, by access to land through institutions other than private property, and by reciprocity and solidarity. The relevance of peasant

studies to transformative agroecology is significant and well summarized in the following short quote from Angel Palerm's last book *Anthropology and Marxism* (1980, 197 [our translation]): 'The future of the organization of agricultural production appears to depend on a new technology based on the intelligent management of . . . [natural] resources by means of human labour, utilizing minimal capital, land and fossil energy. This model . . . has its prototype in peasant farming systems.'

As Palerm suggests, and innumerable studies of peasant communities and their use of natural resources confirm, the sustainability of peasant agriculture depends on distinctive social relationships as well as ecological processes and these relationships and processes differ markedly from those associated with capitalist production. The peasant economy is a 'moral economy' and while peasants may interact with commercial markets, as Polanyi (1944) claimed, the negative impacts of economic incorporation foster moral indignation and resistance. While ecology and agronomy may reveal important ecological and agronomic features of agricultural sustainability, in order to understand adequately the socioenvironmental relationships that underpin sound agricultural practice and the agrarian social movements that have arisen in defence of the peasant way of life, we need to make recourse to the field environmental sociology.

### 3.3.3. The 'Crisis of Modernity' and the birth of Environmental Sociology

Since the industrial revolution, labour productivity and economic growth have been enhanced by the extraction and processing of what initially seemed like an inexhaustible supply of fossil hydrocarbons into fuels and industrial chemicals. In the early 1970s, the USA passed peak oil production and oil-rich Arab nations imposing an embargo on supplies to the USA, as a way of registering their protest at US support for Israel during the Yom Kippur War. This led to a quadrupling of the price of crude, bringing an end to the post-War economic boom. Beginning with the Mexican debt crisis in 1982 one country after another moved from inflation to recession and stagflation, and had to turn to the international financial institutions for help. In return for debt relief, the Third World nations had to restructure their economies by selling off national assets and inefficient state enterprises, opening up domestic enterprises to international competition and cutting back severely on public spending. Structural adjustment required funds that had previously been devoted to fostering agricultural modernisation and economic growth, and addressing the social issues associated with capitalist incorporation to be diverted to debt repayments. Thus the 1970s and 1980s brought an end to the era of the 'developmental state' and ushered in neoliberal reforms.

It was not only the failure of state-led development that provided cause for concern in the 1970s and 80s. Since the early 1960s, worrying accounts of the negative environmental and human health impacts of fossil fuel driven industrialisation began to gain public attention. In particular, Rachel Carson's (1962) seminal work 'Silent Spring' brought to light the negative ecological effects of

chemical pesticides in agriculture. The socioeconomic impacts of resource scarcity were also becoming a focus for attention. In the early 1970s, The Club of Rome commissioned an assessment of the future of humanity in the context of varying levels of natural resource availability, industrialisation, agricultural productivity, population control and environmental protection. The report of their computer modelling exercise 'Limits to Growth' (Meadows, *et al.*, 1972), cast serious doubt over the future of humanity, with two of the three scenarios generated raising the spectre of Malthus by predicting that human population growth would outstrip the planet's carrying capacity and lead to the collapse of civilisation before the end of the 21<sup>st</sup> century. If industrial capitalism was to survive Carson's (1962) predictions had to be avoided. Such was Carson's concern about the long term impacts of agricultural toxins that in bringing her book to a close she was moved to compare the contemporary conjuncture with the position described in Frost's 'The Road not Taken':

'We stand now where two roads diverge. ... The road we have long been travelling is deceptively easy, a smooth superhighway on which we progress with great speed, but at its end lies disaster. The other fork of the road – the one less travelled by – offers our last, our only chance to reach a destination that assures the preservation of the earth'.  
(Carson, 1962: 277).

To put it more succinctly, the promise of modernisation had been transformed into the crisis of modernity, the intertwined socioeconomic and productive/ecological dimensions of which provided the context for the birth of environmental sociology.

At the same time as the crisis of modernity was coming to light, the validity of the structure/agency debate in sociology was brought into question. Aware of the limitations imposed by adopting positions that favoured *either* structure *or* agency, social theorists sought to bring them together within an integrated social ontology. For the purposes of our coming discussion of environmental sociology, we shall briefly discuss Giddens' Structuration Theory (1984 *inter alia*), in which the focus falls on 'social practices ordered across space and time' (2). From this starting point, human agency is understood as the capacity of knowledgeable individuals to intervene in situations and change the course of events. Echoing Marx however, Giddens suggests that while people make society, they do not do so under conditions of their own choosing: the daily activities of people in society are enabled and constrained by the rules and resources of social structures (institutions). The intended and unintended consequences of social practice lead to the reproduction or reformulation of social structures and systems over time.

Environmental sociology portrays a growing consensus surrounding what Giddens (1984) termed the duality of structure, with erstwhile structuralists incorporating human agency and social discourse into their analytical frameworks, while scholars from constructivist traditions sought to understand how structures emerge and are changed by agency. Political ecology, for example, while having

structuralist roots, incorporated a constructivist element during the 1990s, and began to investigate the ways in which nature is socially constructed in discourses such as “sustainable development” and “biodiversity conservation,” considering language to be constitutive of reality, rather than simply reflecting it (Escobar 1996). Similarly, while Hannigan’s (1995) foundational text ‘Environmental Sociology’ was subtitled: ‘A Social Constructionist Perspective’, the second edition (2006) dropped the subtitle and proposed that social order and social change can occur simultaneously. Such integrated socioenvironmental theory provides transformative agroecology with ways into understanding both the social processes that maintain peasant agriculture and the emergence of agrarian social movements in opposition to the depredations of the corporate food regime. More importantly, it offers an array of ideas that help us to think about the dynamics of societies’ relationships with nature.

#### 3.3.4. Environmental Sociology: Conceptual Food for Agroecology Thought

Before we can consider more of the conceptual contributions that environmental sociology has on offer, we need to distinguish it from a simple sociology of the environment that focuses on what are perceived as external environmental issues. In 1978 Catton and Dunlap published a paper in *The American Sociologist* claiming that recognition of ecological limits to growth implied that the exceptional characteristics of the human species could no longer be viewed as exempting societies from ecological constraints, as classical social theory had implied. Following their critique of the ‘human exemptionalist paradigm’ of conventional social theory, Catton and Dunlap proposed a ‘new ecological paradigm’ and defined environmental sociology as ‘the study of interactions between the environment and society’ stressing that human beings are biological constituted and ecological embedded as well as culturally constituted and socially embedded.

So how, sociologically, can we get a handle on nature? One way is to examine how it co-evolves with social forms. Norgaard introduced the notion of coevolution and suggested that the coevolutionary worldview could generate the epistemological basis for agroecology (in Altieri, 1987). He explains social and environmental change as the outcome of coevolution between social systems (values, knowledges, technologies and forms of organisation) and environmental systems (climate, soils, biodiversity, etc.). All of the subsystems of society and environment are interrelated. Changes within each sub-system may be deliberate or arise randomly. Whether they survive or fall by the wayside depends on how well they fit with the currently dominant characteristics of the other subsystems and, thus, whether the other systems exert positive or negative feedback pressures on changes as they arise. Norgaard’s coevolutionary model of society-environment interaction is thus neither environmentally nor culturally deterministic (Norgaard in Redclift and Woodgate, 1997).

A more recent contribution in the coevolutionary perspective comes from Carolan (2005), who seeks to understand how nature is ‘co-evolving in accordance with broader sociocultural processes (such as capitalism, globalization etc.)’: that is, to ‘understand what nature is’ and to take the discussion forward by making analytical distinctions between the social and the biophysical, ‘while leaving conceptual space for interaction’ (395). This is facilitated by distinguishing among three natures. Nature (upper case) is used to refer to the physical laws of nature, nature (lower case) denotes the meeting of both biophysical and social phenomena, while ‘nature’ (in inverted commas) is employed to refer to discursive constructions alone. Thus the nature (lower case) of agroecosystems can be understood as the outcome of the interaction of Nature and ‘nature’.

Much environmental sociology has tended to focus on environmental degradation, often involving critiques of capitalist industrialisation and globalisation. Of particular relevance to transformative agroecology, is the idea of ecological debt. Established on the principle of ‘environmental justice’, ecological debt is the debt accumulated by the countries of the North towards the countries of the South through the extraction of more than its fair share of natural resources and the occupation of more than its fair share of environmental space through the dumping of production wastes. Ecological debt is an aggregate measure that brings together: carbon debt, biopiracy, waste export, and environmental liabilities, *inter alia*. The concept acts as a counterbalance to the external financial debt of less industrialized countries, which continues to exert economic pressure towards further exploitation and degradation of environments in the South and the social deprivation of the ‘bottom billion’. While the idea arose in social movement discourse around the time of the first earth Summit in 1992, since then it has engendered academic attention. In 2002 Martinez Alier made ecological debt a central theme in his book, ‘The Environmentalism of the Poor: a study of ecological conflicts and valuation’ and, with publication of the first edition of Andrew Simms’ (2005) book ‘Ecological Debt: Global warming and the Wealth of Nations’, the concept became firmly cemented in the environmental social science lexicon.

Other branches of environmental sociology, especially ecological modernisation (EM) theory, have developed close links with policy makers and focused on the ecological restructuring of modern society rather than its worst environmental excesses. This more optimistic view sees producers responding to market signals and instruments of policy by developing new, green technologies and, more generally, improving the energy and material efficiency of production processes. At the same time, however, Joseph Huber, whom many consider to be the founder of EM theory, has cautioned that industry’s efforts to increase productive ‘efficiency’, even when combined with a shift in consumer behaviour away from excess and towards ‘sufficiency’, are unlikely to form an adequate response to our current environmental and human predicament. For Huber (2000) a third discourse is required, which he calls ‘consistency’, entailing positive action to bring our social metabolism back in

line with nature's metabolism and repair the 'metabolic rift' (Foster 2000) between production and consumption, that Marx had problematized in the 19<sup>th</sup> century (see Section 3.2.2). Socio-ecological metabolic consistency requires moving forward to a situation in which social reproduction is achieved without recourse to fossil hydrocarbons and without further depletion of biodiversity. Long-term sustainability cannot be achieved on the basis of finite resources (petrochemicals and mineral fertilisers) and the liquidation of natural capital (depletion of soil organic matter and deforestation). Ultimately, the entropy produced by socio-ecological catabolism must be balanced by the anabolic potential of solar radiation and biological processes.

Socio-ecological metabolic consistency is a core principle of agroecology, but how do we theorise the transition to consistency? We can begin by returning to structuration theory, with its notion of social practices ordered across time-space and integrating it into the coevolutionary approach proposed by Norgaard. If people are both culturally and biologically constituted, then our actions are better defined as socioecological practices, embedded within socioecological systems, and enabled and constrained by socioecological structures. In a study of agricultural industrialisation in 19th century Europe, Gonzalez de Molina (2010) characterises change as 'socio-ecological transition' driven by complex interactions among factors including: climate fluctuations, pest infestations and disease epidemics, human population growth, social inequality, technological developments, institutional change, and competing ideas about nature. These interactions impact on metabolic processes within a hierarchy of scales from the local to the global.

This characterisation fits within and adds to coevolutionary theory and reflects Freudenberg et al's (1995) concept of 'conjoint constitution' in which all phenomena, whether at first apparently social or natural, are in fact products of both social construction and ecological agency. Understanding nature as an active participant in historical processes of change is a basic tenet of environmental sociology and is central to the agroecological perspective: it is a fact which is now undeniable in the face of accelerated global warming and biodiversity decline. Indeed, globalization studies and work on climate change have begun to add credence to the view that ecological time is being 'compressed'. The pace of industrial developments in the 19<sup>th</sup> and 20<sup>th</sup> centuries created the illusion of a timeless natural world, and the environment as a passive stage for the play of life, the most aesthetically pleasing aspects of which could be preserved for all time. Yet, as the Anthropocene (c.f. Crutzen and Stoermer, 2000) has unfolded in the late 20<sup>th</sup> and early 21<sup>st</sup> centuries it appears that nature's time is accelerating. Ecologists and natural resource managers are revising their views of environmental change, suggesting that it may occur not in small incremental steps, but through major, relatively rapid regime shifts. Our eco-illogical past, it appears, is catching up with our individualised, social present and threatening our collective, future survival.

As agri-cultural practice, transdisciplinary science and agrarian/environmental social movement, transformative agroecology involves diverse responses to the social cum environmental crisis of modernity. In order to understand these responses, a recent contribution to environmental social theory proves helpful: the concept of ‘socioecological agency’. Manuel Navarrete and Buzinde (in Redclift and Woodgate 2010: 141) suggest that overcoming the global environmental crisis requires the mutual co-creation of material and social structures to be mediated by a ‘self-reflexive, or transcendental form of agency enacted by individuals in their interaction not only with society and the environment, but also with themselves: with their inner worlds’. Manuel Navarrete and Buzinde contend that such a transformation is ‘likely to emerge from a radical realization about the reciprocity and double directionality that exists between humanity and the planet as a whole’ (ibidem).

#### *3.4. Agroecology Today and the Road Ahead*

We noted at the beginning of this chapter that the constitution of agroecology as agri-cultural practice, transformative science, and agrarian social movements in pursuit of food sovereignty has led some commentators to claim that ‘these varied meanings ... cause confusion’ (Wezel et al., 2009: 503). In the contemporary knowledge economy, while the legitimacy and importance agrarian/environmental social movements may be grudgingly accepted, a premium is placed on systematising agroecology as the science of sustainable food and fibre production in the context of accelerating environmental change (c.f. Tomich et al. 2011). For the contributors to this volume, however, the assumption that the science of agroecology can be separated from its practice and politics is deeply problematic. For us there are no quick technological fixes to what we conceive of as the interrelated, agrarian, biodiversity, climate, cultural, economic, energy, food and political crises of the present conjuncture. The farmers, researchers and social activists of transformative agroecology demonstrate socioecological agency in practice, through their work together developing institutions and strategies in pursuit of the politics of food sovereignty. Transformative agroecology rejects the so-called ‘post-political’ (Swyngedouw, 2009) consensus of ‘sustainable development’ and ‘global food security’ promoted by the corporate food regime and implicit in the construction of agroecology-as-natural science, and adopts instead more collective, bio- and eco-centric positions.

As McMichael (2007) has argued, the recent return of peasant movements and politics (see also Peréz Vitoria, 2005 and Van der Ploeg, 2009) recasts development in at least four key senses: Drawing on insight from the more radical dependency theories, poverty is viewed as the result of unsustainable development rather than an original condition. Place-based agri-cultures and agroecosystems are constructed as global goods that must be defended from enclosure and incorporation within global commodity markets. Individualisation is challenged, the politics of solidarity are reclaimed, and a plurality of perspectives is adopted, making room for other rationalities beyond the narrow, economic perspective of neoliberalism. Continuing in the tradition of the Narodniks of 19<sup>th</sup> century



Russia, peasant studies scholars in the 1970s and 80s, and post-development protagonists in the 1990s, transformative agroecology engages with peasant struggles. The remainder of this chapter sets out a little of the history of this recent engagement in order to illustrate some of the transformative agroecological institutions that have been built on the foundations of agri-cultural practice, agrarian social thought and sociological theory.

#### 3.4.1. Agroecologists: going to the people

In the mid 1970s, following several years working in commercial enterprises in Costa Rica and Mexico, Stephen Gliessman took up a post as agricultural ecologist at the *Colegio Superior de Agricultura Tropical* (CSAT) in Tobasco, which had been established ‘to train the agronomists and test [Green Revolution] technologies on its experimental fields’ (Gliessman, 2013: 26). During his time in Central America, Gliessman had been intrigued by the agri-cultural practices of his peasant neighbours and, as an ecologist, it became clear to him that rather than trying to override natural processes the local peasant farmers worked with them. He took these insights to Tobasco, where he delivered what was probably the first university course in agroecology: ‘International summer courses in agroecology were offered in 1978–1980, a master’s degree program in agroecology was begun in 1978, and research projects with the agroecosystem as the organizing concept and agroecology as the research process began as early as 1977’ (ibidem). In 1981 Gliessman moved back to the US and a post at the University of California, Santa Cruz where he established the first agroecology program in the USA and set about building a team of colleagues and students that have subsequently established strong and enduring links with agroecological social movements throughout the Americas. More recently, in 2008, Gliessman took on the editorship of the *Journal of Sustainable Agriculture*, engineering its transformation into *Agroecology and Sustainable Food Systems* from the beginning of 2013, the first issue of which (‘Agroecology and the Transformation of Agri-Food Systems: Transdisciplinary and Participatory Perspectives’) provided the inspiration for this book.

During the 1980s a multitude of development NGOs sprang-up throughout Latin America as IMF-imposed structural adjustment programs forced states to close down development programmes and cut back on public spending. Towards the end of the 1980s NGOs from Chile, Brazil, Argentina, Bolivia, Colombia, Ecuador, Paraguay, and Peru, joined forces to form the Latin American Consortium on Agroecology and Development (CLADES). CLADES’s technical advisor was Miguel Altieri, an agroecologist from University of California, Berkeley. Together with the likes of Peter Rossett and Clara Nichols, Altieri developed the Consortium’s relationships with rural social movements and development NGOs, providing them with agroecological advice and training. Since 1991 CLADES has published *Agroecología y Desarrollo*, (a journal dedicated to making agroecological knowledge and experience available to institutions working to promote ecologically and culturally relevant

development practice) and to providing a forum for debating the institutional challenges of sustainability. ([www.clades.cl](http://www.clades.cl)).

Following the 1975 International Working Party for Peasant Studies at the University of Manchester, UK, where he had met and been encouraged by Teodor Shanin, Angel Palerm, Joan Martinez-Alier and Eric Wolf, Eduardo Sevilla-Guzman returned to Spain where, in 1978, he founded the Institute of Sociology and Peasant Studies (ISEC) at the University of Cordoba. ISEC became involved with the Andalusian landless workers movement (SOC), supporting SOC members as they occupied and began to cultivate abandoned haciendas in Andalusia, using agroecological techniques they had learned from the peasant farmers that lived and worked around the old haciendas. The relationship between ISEC and SOC led to further important linkages with Latin American agrarian social movements and these relationships made a significant contribution to the development of the militant perspective that characterises agroecological research and teaching at ISEC to this day (Sevilla Guzmán and Martinez Alier, 2006).

Interactions among UC Santa Cruz, CLADES and ISEC led to the establishment of the first doctoral program in agroecology at ISEC in 1991, followed shortly after by a postgraduate programme at the International University of Andalucia, both of which continue to be offered today. Most of the contributors to this book have lectured or studied on these programs, and the personal and institutional relationships that have developed through this long period of interaction and cooperation have facilitated the training and diffusion of transformative agroecology practitioners, social movement activists, academics, and state functionaries throughout the Americas and beyond. These transformative agroecological actors have contributed to the establishment and work of numerous associations such as the Brazilian Agroecology Association (ABA) and the national umbrella group *Articulação Nacional de Agroecologia* (ANA), as well as the Latin American Agroecology Movement (MAELA), many of which come together in SOCLA, the Agroecology Scientific Society of Latin America. At the same time as it has been institutionalised within academic establishments and associations, agroecology has also become embedded in small-scale farmers' organisations, while the politics of local sovereignty have been adopted and pursued by both producer and consumer-led social movements.

#### 3.4.2. The movement of the people towards agroecology and food sovereignty.

In Brazil, the landless workers movement (MST - [www.mst.org.br](http://www.mst.org.br)) like the Diggers and Levellers of England, came together in protest at the concentration of land in the hands of the few. Since 1984, the MST has led more than 2,500 land occupations, settling at least 350,000 families on somewhere in the region of 10 million hectares of land ([www.mstbrazil.org](http://www.mstbrazil.org)). They promote agroecological methods among their members and in 2006 established the Latin American School of Agroecology on MST

land in the State of Paraná. They also run an agroecological seed network to facilitate food sovereignty. In Europe the Campaign for Seed Sovereignty ([www.seed-sovereignty.org](http://www.seed-sovereignty.org)) represents the interests of more than 30 national and sub-national organisations of small farmers and growers from nations of the European Union, united in their struggle against EU legislation aimed at the standardisation and concentration of the seed market in the hands of a small number of seed industry corporations. Movements to defend traditional agri-cultures and advance food sovereignty include food consumers as well as producers and have the capacity to mobilise vast numbers of people in opposition to the institutions of the corporate food regime. On 25th May 2013, some two million people took part in hundreds of rallies across more than 50 countries in protest against the corporate seed giant Monsanto. ‘March Against Monsanto’ protesters call attention to the dangers posed by corporate control of the food system, genetically modified food and the food giants that produce it.

Many national and regional agrarian organisations, confederations and social movements are members of the peasant and small-farmer International, La Via Campesina ([www.viacampesina.org](http://www.viacampesina.org)). In 20 years LVC has grown to encompass around 150 local and national organizations in 70 countries, representing about 200 million small-scale farmers in their struggle to ‘defend community-based agroecological farming as a cornerstone in the construction of food sovereignty’ ([www.viacampesina.org](http://www.viacampesina.org)). Martínez Torres and Rosset (2010) trace the historical development of La Via Campesina (LVC) from the early coalescence of numerous peasant and small farmer organisations and confederations in Latin America. Established as a global social movement in 1993, during the 1990s the movement’s leaders gained access to international policy fora, rejecting NGO representation and creating space for authentic peasant voices to be heard. In the 21<sup>st</sup> century LVC has taken on a global leadership role for agrarian struggles and positioned itself in opposition to the corporate food regime and its neoliberal discourse of ‘sustainable development’ and ‘food security’. In short, ‘peasants and family farmers have been able to build a structured, representative, and legitimate movement, with a common identity, that links social struggles on five continents’ (op. cit.: 150).

LVC originally defined ‘food sovereignty’ in its Tlaxcala Declaration as “the right of each nation to maintain and develop its own capacity to produce its basic foods respecting cultural and productive diversity” (La Vía Campesina 1996). At the local level LVC works with member organisations to facilitate agroecological knowledge exchange and to share and develop the agroecological approach to food sovereignty. The movement has also established the Paulo Freire Latin American Institute of Agroecology (IALA) in Venezuela and built teams of agroecology trainers that organize continental scale encounters in the Americas, Asia, and Africa. In the face of global capital’s relentless pursuit of profit through land-grabbing, displacement of small-scale producers, and the patenting of seeds, knowledge, and technologies developed over generations of farming practice, the second Americas

continental encounter in 2011 issued a declaration: ‘Agroecology is Ours and is Not For Sale. Peasant agriculture is part of the solution to the current crisis of the system. In this context we reaffirm that indigenous, peasant and family farm agroecology [can] feed the world and cool the planet’ (La Via Campesina 2011).

### *3.5. Conclusion*

Via Campesina’s declaration is an unequivocal statement proclaiming the indivisibility of agroecology as science, movement and practice. Today, agroecologists, whether farmers, scientists or social movement activists (and many individuals operate in all three of these overlapping spheres of activity), are working together to defend rural communities and agroecological cultures against the negative impacts of capitalist industrialization. Reflection and dialogue within the social movements and between university-based agroecologists and peasant movement leaders are of key importance to the vitality and co-evolution of an integrated, transformative agroecology. While their struggle is a global one, human experience of the negative impacts of capitalism in the countryside remains place-based, and the local values, knowledges, institutions, and cultures of socioecologically situated people must be core elements in the construction of ecological sustainability and social justice. If the science of agroecology is separated from the place-based agri-cultural practices and agrarian social thought and movements with which it has grown up, we would argue that its transformative potential will be lost and agroecology will become just another instrumental discipline in the continuing saga of capitalism’s struggle to overcome its own internal contradictions.

**Table 1: From Narodnism to Agroecology**

<b>Marx, Marxism, Narodnism and Anarchism (1850-1900)</b>	
Narodnism ‘The backward march’ ‘Uniting with the people’,	A. Herzen, N. Chernishevski, P. Lavrov, A. Mikailov
Classical Anarchism: ‘mutual support as the motor of history’, ‘the peasantry as revolutionary agents’	P. Kropotkin, N. Bakunin
Capitalism produces an ‘irreparable rift in the interdependent process of socio-ecological metabolism’	K. Marx
Marxism: ‘differentiation of the peasantry’	V.I. Lenin, K. Kautsky
<b>Neo-Narodnism and Heterodox Marxism (1900-1940)</b>	
Vertical cooperation	N. Bukharin
Social agronomy	A. Chayanov
<b>Dependency and Underdevelopment (1940-1980)</b>	
Centre-periphery / World economy	A. Gunder Frank, I. Wallerstein
Internal Colonialism	A. Gorz, P. González Casanova
Ethnodevelopment	G. Bonfil Batalla; R. Stavenhagen
<b>Peasant Studies (1940-1990)</b>	
Moral economy	K. Polanyi;
Cultural ecology	E. Wolf, K. Wittfogel, S. Mintz
Marxist neo-Narodnism	T. Shanin
Peasant technologies	A. Palerm; E. Hernández Xolocotzi
<b>Post-development (1980-present)</b>	
Development and environment as historically produced discourse	Arturo Escobar
Co-motion rather than promotion	Gustavo Esteva
<b>Environmental and agrarian social theory and agroecology (1980 to present)</b>	
Origins of agroecology in Marxist and libertarian social thought.	E. Sevilla Guzmán
Marx’s Ecology (esp. the ‘metabolic rift’).	J.B. Foster
Food regimes	H. Freidmann and P McMichael
Coevolution	R.B. Norgaard
Conjoint constitution	W. Freudenberg et al
Ecological debt	J. Martínez Alier, A. Simm
Food sovereignty	La Vía Campesina
Historical socio-ecological transition	M. González de Molina
Socio-ecological agency	D. Manuel Navarette and C. Buzinde

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