

Locust swarms and the spatial techno-politics of the French Resistance in World War II



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ABSTRACT

This article investigates why and how efforts to control Desert Locusts in Northwestern Africa became a strategic concern for the French Resistance during the Second World War. I analyze the record of a 1943 conference convened to discuss on-going locust plagues in Northwestern Africa. The analysis suggests that the “locust problem” provided a field for technocrats to innovate and re-present new modes of government. More specifically, French authorities in exile prioritized organizing against the Desert Locust in part because the spatial extent of the insect’s biophysical specificities provided an ideal field to reinvent and re-present the spatiality and legitimacy of the French Empire as a transnational and constructive federation of techno-scientific benevolence, uniting all its colonies against common enemies. The work provides a different perspective on the questions of ‘fit’ between institutions and ecosystems by highlighting the dynamic relationships between material demands of object(s) of management concerns, scientific knowledge about said object(s), and strategic imperatives of authoritative legitimacy. The paper highlights how the relationships between (1) the selection and stabilization of ecological problems and solutions, (2) their adoption within the logic and imperative of institutions, and (3) the emergence of specific apparatus of rule together bear on why and how given socio-ecological dynamics become “seen” and adopted as mandates by agencies, how they are represented, and what particular technological or institutional arrangement is favored for (and by) their management.

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1. Introduction

Success or failure in environmental management is often attributed to the degree of fit between the ecological processes under management and the spatial logic and capacity of mandated institutions (Dietz et al., 2003; Cash et al., 2006; Folke et al., 2007; Liu et al., 2007). Rather than taking the mismatch between institutions and ecosystems as pre-given, however, work in political ecology and related fields has critically investigated why and how given socio-ecological dynamics become “seen”, adopted as management mandates by agencies, how they are represented, and what particular technological or institutional arrangement is favored by these configurations (Braun, 2002; Robertson, 2006; Alatout, 2009; Biehler, 2009; Goldman, 2009). This body of work highlights how the practices of environmental managers are shaped by interrelations between (1) material demands of the object of management concern, (2) scientific knowledge about the object, and (3) strategic imperatives of authoritative legitimacy (Peet et al., 2011).

In this article I draw on and build upon these two themes by exploring how the spatial demands of statecraft – the practice of conducting state affairs – bears on the relationship between (1)

the adoption, construction, and resolution of environmental problems, and (2) the dynamic “rescaling” of governance that occurs as state actors deal with diverse and spatially differentiated challenges. The focus of the inquiry is on efforts by the French Resistance to organize against swarms of Desert Locusts across Northern and Western Africa during the Second World War. I examine how these efforts relate to the crafting of transnationally networked modes of government as lynchpin of late and post-colonial rule.

Most commonly found as isolated, solitary, individuals in remote desert settings, the Desert Locust periodically changes behavior and appearance as it enters a “gregarious” phase in which individual locusts seek and join one another to form large and highly mobile groups. As swarms travel to agricultural regions, where they consume crops and pastures at extraordinary rates, locust invasions are often disastrous to local and regional agricultural productivity, and consequently, on food security in affected regions. The particularity of its ecology and multiplicity of phases make this insect especially difficult to manage. As with many similar hazards that are emergent and that transcend political boundaries (cf. Robbins et al., 2008), the Desert Locust is, in either of its phases, precisely at odds with the spatial reach of conventional management institutions (Skaf et al., 1990; Lecoq, 2001). The article presents a case where the same behavioral and bio-geographical particularities that make the Desert Locust so problematic in “normal times”

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made it an ideal field of intervention to help resolve unconventional challenges to statecraft.

Examination of the context and content of a meeting on Desert Locusts held by French authorities and Allies in 1943 suggests that authorities turned to the locust problem at least in part because efforts to manage this insect were compatible with the resolution of an especially complex crisis of geopolitical legitimacy in the French colonial Empire. The crisis in question followed from both (1) the capitulation and occupation of Mainland France to and by the Axis and (2) growing concerns that the colonies would seek and achieve independence, thus ending formal colonialism and terminating what was then left of the French Republic. Attention to the locust problem, I argue, allowed the representation and enactment of the French colonial Empire as a transnational and constructive federation of techno-scientific benevolence that united all its colonies against common enemies, both human (Axis) and nonhuman (locusts) in ways that held the promise of bolstering both the legitimacy of this Empire and the claim of it as under the purview of *Free France*.

This article develops a political geographical perspective on the relation between institutions and ecosystems by considering the incidence of the dynamic relationships between (1) the selection and stabilization of ecological problems and solutions (Kull, 2004; Davis, 2007; Goldman, 2009), (2) their adoption within the logic and imperative of institutions (Robertson, 2006; Carter, 2008; Alatout, 2008, 2009; Biehler, 2009), and (3) the emergence of specific apparatus of rule (Foucault, 1980, 2003; Whitehead, 2009; Legg, 2009, 2011). To this end I engage with insights from critical state theory that emphasize how statehood is negotiated through social practices and representations that are themselves shaped by, and in turn shape, the dynamic and non-deterministic assemblages of various material and discursive processes (Hagmann and Péclard, 2010; Passoth and Rowland, 2010). These theoretical perspectives together share much with focus in the social studies of science on the role of techno-scientific expertise in colonial and post-colonial state-making (Anderson, 2002; Jasanoff, 2004a; Carroll, 2006; Alatout, 2008; Tilley, 2011). Together these strands highlight how the spatial extent and resolution of a given socio-technical apparatus is not a pre-existing condition but rather the outcome of negotiation between ideas, representations, and objects.

The case study is divided in two parts. The first part introduces and discusses the content and context of the “Anti-Locust” meeting held in Rabat, Morocco, in 1943. That discussion emphasizes how the geo-political demands and implications of locust control made it an ideal field of intervention for leaders of Free France to articulate, represent, and enact their claims as legitimate authorities of a unified French colonial Empire despite the occupation of its mainland territory by the Axis. In the second part I turn my attention to debates between political leaders and locust experts at the meeting, as well as between French and British entomologists. These debates highlight how strategies, technologies, and organizational configurations chosen for this particular attempt at locust control were selected via negotiations between (1) the imperatives of geopolitical goals, and (2) available technologies and material resources. I conclude by considering the implications of this case study for our understanding of the geopolitical dimensions of techno-scientific practices in shaping environmental management, and on the emergence of modes of government that are predicated on and enacted through transnational expert-power.

2. Critical state theory and science and technology studies

Rejecting the conventional conceptualization of the state as an *a priori* thing or actor, critical theorizations of the state have called

for investigation of the ways in which the “idea” of the state as a unitary entity is produced through socio-technical practices and representations that are often mundane and diffuse, and for the identification of the political effects of these practices (Abrams, 1988; Mitchell, 1999; Painter, 2006; Meehan et al., 2013). These developments have accompanied a view of statehood as not a given fact, but rather a constant negotiation (Hagmann and Péclard, 2010), a contingent and unstable process of governance (Passoth and Rowland, 2010), “constituted in a highly complex matrix of ideas and representations, government and bureaucratic agencies, and land and people” (Carroll, 2000, p. 15, cited in Passoth and Rowland, 2010, p. 823). To understand how the state is made and what it does, then, it is necessary to investigate the practices of ordering the social and the ecological that underpin these specific social formations, and the political effects of these practices (Jasanoff, 2004a; Painter, 2007; Alatout, 2008).

Partly because of its important incidence on these practices of ordering, techno-science has become a key site of modern state-making (Mitchell, 2002; Carroll, 2006). The interdisciplinary field of Science and Technology Studies (STS) provides important insights regarding how knowledge and society are co-produced. As Sheila Jasanoff puts it: “knowledge-making is incorporated into practices of state-making, or of governance more broadly, and conversely how practices of governance influence the making and use of knowledge” (Jasanoff, 2004b, p. 3). Investigations of the practices, techniques, texts, and quotidian activities by which scientific facts are produced and stabilized, as well as of the ways in which techno-scientific practices are adopted and modified as they travel across different settings, and their incidence on social configuration – all key concerns of STS – (Latour and Woolgar, 1979; Bijker, 1997; Latour, 1999; Anderson, 2002; Jasanoff, 2004c) also have serious implications for geographic understandings of state-making, and by extension of the logic and imperative of environmental management institutions (Robbins, 2008; Whitehead, 2008).

The relationship between science and the state has received attention in political ecology in recent years (Whitehead, 2009; Goldman et al., 2011; Lave, 2012). Studies on the relationship between water techno-science and social formation (Swyngedouw, 1999; Alatout, 2009; Bouleau, 2013) and on the political ecology of health (King and Crews, 2013) have been productive in this regard. The latter’s attention to human–insect relations (Carter, 2008; Carter, 2012; Biehler, 2009; Shaw et al., 2010; Robbins and Miller, 2013) has been especially helpful in highlighting the spatial logics of socionatural assemblages.

Interrogations of state-science relations have benefited from, and contributed to, examinations of the specific role of science and technology in colonial and post-colonial forms of statecraft. This sub-field, which Anderson (2002) calls “postcolonial technoscience”, has demonstrated different ways in which science, especially in fields such as health, sanitation, planning, and agriculture, have co-evolved with colonial rule (Vaughan, 1991; Bonneuil, 2000; Hecht, 2002; Carroll, 2006; Tilley, 2011; Carter, 2012). These different ways include (1) the use of technoscientific projects to experiment, perform, and represent forms of social order and subjectivities in colonial settings, (2) the effect of using colonies as laboratories to experiment with modes of government that would later be incorporated in metropolitan governance, and (3) the role of local material, cultural contingencies, and popular agency in shaping the actual outcomes of these projects.

In a similar vein, Mitchell writes of techno-politics as “the kinds of social and political practices that produce simultaneously the powers of science and the power of modern states” (2002, p. 312, note 77). Techno-politics, for Mitchell, is

always a technical body, an alloy that must emerge from a process of manufacture whose ingredients are both human and



Fig. 1. Collection of locust eggs, Algeria, 1889 (Herculais, 1893).

nonhuman, both intentional and not, and in which the intentional or the human is always somewhat overrun by the unintended. But it is a particular form of manufacturing, a certain way of organizing the amalgam of human and nonhuman, things and ideas, so that the human, the intellectual, the real of intentions and ideas seems to come first and to control and organize the nonhuman.” (2002, pp. 42–43).

The concept of techno-politics shares much with Jasanoff’s idiom of co-production, which “calls attention to the social dimensions of cognitive commitments and understanding, while at the same time underscoring the epistemic and material correlates of social formations” (Jasanoff, 2004b, p. 4). Demeritt (1998) groups as “artefactual constructivism” these various approaches concerned with understanding how “the reality of the objects of scientific knowledge is the contingent outcome of social negotiation among heterogeneous human and non-human actors” (p. 176). A particular advantage of such approaches is that they allow, and call for, considerations of the ways discursive and material processes combine, and of how the logic and imperative of technologies and social formations are produced by, and productive of, these combinations.

One key implication of such views is that the “fit” between institutions – such as state agencies – on the one hand, and ecological processes under their management, on the other hand, is not pre-given. Rather, “fit” – or “mismatch” – are produced by the particular relations that link on-going social–ecological processes with the various goals and agendas of managers and agencies at a given time and place. This implication calls for inquiries into why specific institutional arrangements come to be selected, and what political work is done by this selection. The remainder of the article explores these points through the case-study.

3. Governing the Desert Locust

The Desert Locust spends most of its existence in a solitary phase, during which it lives isolated in remote deserts settings in parts of Africa, the Arabian Peninsula, and South Asia. Periodically, aided by the formation of favorable biotope, the insect enters a gregarious phase in which it forms massive swarms that invade agricultural areas, consumes vegetation over vast areas across dozens

of countries, and can cause crop depredations of catastrophic magnitude (Baron, 1972; van Huis et al., 2007).

This bifurcated spatiality makes the Desert Locust particularly adept at overwhelming the scalar capacity of state agencies. The solitary locust is small and diffuse, yet the always-emerging nature of the problem it constitutes is overwhelmingly rapid. This makes the location and timing of outbreaks unpredictable, which complicates monitoring and prevention efforts. The gregarious swarms, on the other hand, are too large and too mobile for any single nation-state, exceeding or crossing territorial boundaries.

As locust–human relations span long historical periods and diverse regions, they have been the object of many different institutional configurations (Arbel, 1989; Baron, 1972; Hsu, 1969). Like much of applied entomology, the history of locust science is closely intertwined with imperialism (Clark, 2009). For example, French settlers tried various methods to control locusts and grasshoppers in 19th century colonial Algeria (Herculais, 1893). Thousands of Algerian laborers were mobilized – more or less coercively – in massive campaigns of collection and destruction of locust egg and larvae (see Fig. 1). Workers also piled up immature (flightless) locust ‘hoppers’ into pits and stomped on them to crush the insects to death¹ (see Fig. 2).

Starting in the early 20th century, chemical insecticides became the favored technology of locust control across the African colonies, replacing mechanical/manual collection campaigns (Baron, 1972; Roy, 2001). Around the same time, in the 1920s and 1930s, public authorities began to recognize that despite efforts by respective colonial governments to contain and control locust swarms within national territories, the insect’s ability to exceed political boundaries required trans-regional organizations that spanned colonial Empires and zones of influence.

To this end, a series of five international meetings on the management of grasshoppers and locusts took place between 1930 and 1938 in Rome, Paris, London, Cairo, and Brussels. At each of these five international meetings on the locust problem, resolutions

¹ Herculais (1893) describes how the bare feet and legs of the laborers doing the stomping would become covered in cuts from the sharp and rigid legs of the locusts, cuts that would be filled with “the juice of crushed insects”, eventually causing severe infections. The combination of these infections with the heat, dust, and severe exhaustion often lead to violent illness, at times fatal.



Fig. 2. Workers stomping locust larvae collected in a ditch, Algeria, May 1888 (Herculais, 1893).

were passed for the creation of a permanent international locust control organization. These resolutions were not followed through, in part because of insufficient lack of political will and momentum (Buj Buj, 1995; Roy, 2001). The Second World War, however, eventually created the conditions that made such an organization not only possible, but a very urgent matter – at least for the French colonial Empire.

4. World War Two, French colonial territoriality, locust control

Protracted locust plagues, or runaway invasions, were widespread and dramatically massive during the Second World War. Waloff (1966) reports that by 1941 swarm infestations had spread across the entire habitat range of the insect, with swarms forming and traveling “in the area extending from Arabia to Pakistan”, Egypt, Ethiopia, Eritrea, Somalia, the Sudan, and on the other side of the continent in, Mali, Niger, Mauritania, Morocco. This “major plague”, Waloff adds, persisted until “its first marked decline” in 1946.

Scientists and colonial government officials were active in developing and implementing locust management techniques in their colonies and protectorates across these regions (Jeannel, 1944; Baron, 1972; Roy, 2001). It is in this context that the first conference devoted specifically to the Desert Locust (as opposed to the preceding ones that were concerned more broadly with all grasshoppers worldwide) was held in Rabat, Morocco, in December 1943 (Fig. 3). It was organized by French authorities. That initiative is in itself not surprising, as the locust swarms presented a threat to agricultural production across such vast territories, including French possessions in Northern and Western Africa.

What is remarkable, however, are the geopolitical dynamics within which these institutional developments occurred. In December 1943, at the very height of the Second World War, the

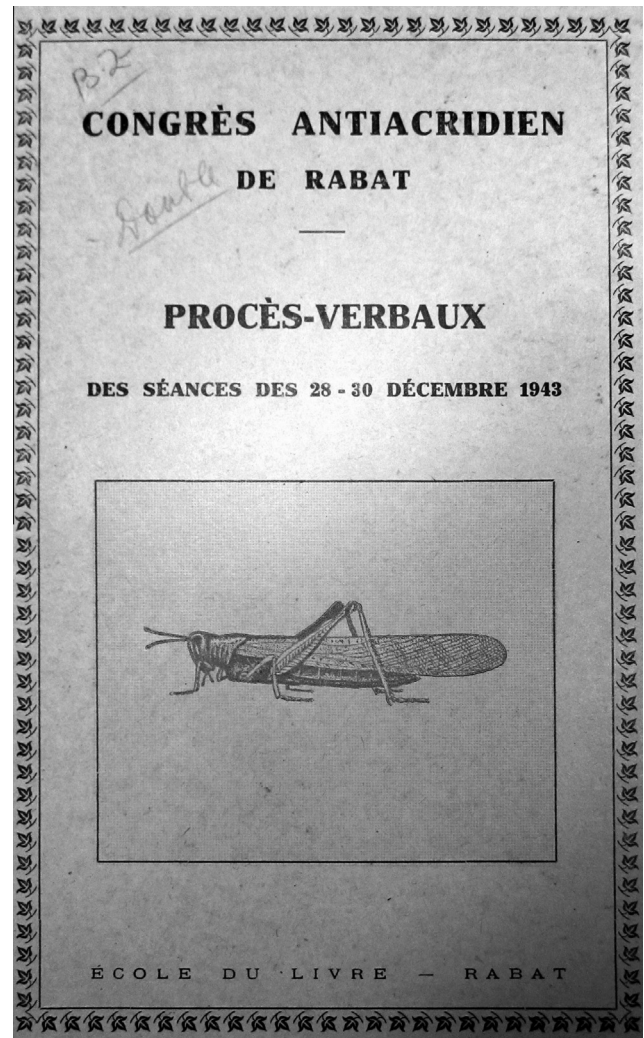


Fig. 3. Cover page of the Proceedings of the Rabat Anti-Locust Conference held in 1943 (Anon, 1944).

question of French Authority, and in fact, the very statehood of France, was in a crisis of epic proportions. The Government of France had capitulated, following military defeat to the German army in July 1940. The French nation-state had become “Vichy France”, named after the town where the capitulated government established itself under the leadership of the Axis collaborator French Marshal Philippe Pétain.

The “French authorities” that organized the Rabat Conference on the Desert Locust were not, however, representatives of the Axis-collaborating French Government of Vichy. They were members of the French Resistance, the *Comité français de libération nationale*² (CFLN). After the capitulation of mainland France, authorities in exile sought to organize resistance from abroad, working with the Allies to vanquish and reclaim territory lost to the Axis. In July 1943, the two authorities of the French Resistance, the London based *France Libre* (*Free France*) and the North Africa-based *Commandement civil et militaire d'Alger*, unified to create the CFLN. That committee was co-presided over by the leaders of both these organizations (Free France's General Charles De Gaulle and the *Commandement's* General Henri Giraud). On the 9th of November of that year the Committee came under the sole presidency of Charles De Gaulle following Giraud's resignation. On December 7, 1943, the CFLN adopted a resolution creating the first permanent, trans-boundary

² “French Committee of National Liberation”.

organization devoted to the control of the Desert Locust: the *Office National Anti-Acridien*³ (ONAA).

The resolution specified that the first mandate of this newly formed anti-locust organization was to organize a meeting of “international scope” (read: Allied countries and their colonial possessions) on the Desert Locust as soon as possible. It took merely 3 weeks for the organization to fulfill that mandate. The said meeting was held from the 28th to the 30th of December, in the meeting room of the Secretariat-General of the French Protectorate, in Rabat, Morocco.

The primary source for this analysis is the *Proceedings* of the conference published in winter 1944 (Anon, 1944). The 44 page document consists of a list of the attendees, summaries of the different sessions of the meeting, and transcripts of presentations and deliberations. Speeches may plausibly have been edited in this official published version. As such the text may not reliably represent the exact wording of the meetings’ presentations, debates or events. Other sources corroborate, at a coarser level, the conditions of the emergence of the ONAA and the importance that French authorities accorded to locust invasions as a field of colonial rule, and how entomologists contributed to that sense of importance (cf. Pasquier, 1942; Bredo, 1944; Bredo, 1945; Jeannel, 1944; Roy, 2001). That said, none of these other sources report on the specifics of the meeting at the same level of detail as the *Proceedings*, which leaves most of the meeting transcripts on which this analysis relies unconfirmed by external sources. The limitations above notwithstanding, the content of the document in question, even if plausibly inaccurate in its representation of the meeting, remains not only compatible with, but also supportive of the claim made in this paper. I understand both the meeting and the *Proceedings* that followed it as discursive performances. In this sense the written text stands in itself as part of the phalanx of discursive formations by which the said techno-political effect was pursued.

The record of the 1943 Rabat conference, and the creation of the ONAA that it accompanied suggests that the locust problem was an urgent field of intervention for Free France because requirements for, and the effects of, successful locust control organizations and campaigns were expected to help overcome multiple challenges to the Resistance’s claims as legitimate authorities of the French Empire. The locust problem was mobilized as a common threat requiring the unity of the French colonies and of the Allies. Such techno-political unity across the empire held the promise of allowing French authorities allied to Free France to continue to perform as legitimate governments in colonies despite being exiled from the occupied mainland France.⁴ In 1943, these colonies were almost all that was left of the Republic of France as a state apparatus, and their unity was paramount to its survival. At that point it was unclear whether mainland France would be recovered from the Axis, or, in the event of an Allied victory, whether it would be considered among the vanquished (the Vichy government being an Axis collaborator). In this context the exiled French authorities could not afford to lose legitimacy in the remnants of their empire. A colonial policy of improvement and intervention would help not only demonstrate that its colonial rule was legitimate but also that it was Free France, rather than Vichy France, that would ensure the welfare of the colonies.

The Rabat 1943 Conference Proceeding lists twenty participants from nine governments representing Allied colonial Empires, French colonies and protectorates, and two other allied nations.

The Republic of France (CLFN) had five delegates; Great Britain and the British Empire, four; the French Protectorate of Morocco, six; the General Government of Algeria, two; the USA, two; and the French Protectorate of Tunisia, the French Mandate for Syria and the Lebanon, the Federation of French West Africa (AOF), and Spain all had one each.

The meeting first began on the morning of Tuesday 28 December, with a preliminary information session among members from French organizations (CFLN, Morocco, Algeria, and Tunisia – the representatives of AOF and Syria had not yet arrived). The preliminary session concentrated on the nature, composition and mandate of the recently created ONAA. Mr. Dulin, director of CFLN’s Agriculture and Supply Department opened that preliminary session by congratulating the director of that new organization, Boris Zolotarevsky, as well as his two technical advisers, Mr. Rungs (Morocco) and Mr. Pasquier (Algeria) for their nomination.

Recalling that the resolution creating the ONAA specified that the organization be operational as early as possible, the CFLN’s Mr. Dulin requested that the date for the next meeting be decided on that day. The director of newly created ONAA, Mr. Zolotarevsky, requested more time, stating that the organization had yet to prepare a budget. Zolotarevsky also inquired about the composition of the Management Board of the ONAA. This dialogue suggests that the ONAA was created hastily. The tone and content of the conversation suggest that the entomologists suddenly summoned by the French Resistance welcomed the new and intense interest in their scientific work, but were not clear about the nature of the organization’s mandate, or about how they were expected to carry it out.

Following that preliminary session, the actual meeting opened with remarks from Gabriel Puaux, the Commissary Resident-General of the French Republic to Morocco. During the French Protectorate (1912–1956), Resident-General was the highest ranking title in that country’s political hierarchy, along with the Moroccan Sultan. The presence of such a high profile politician is indicative of the importance given to the meeting by colonial rulers of Morocco. That said, Mr. Puaux was introduced in the meeting as the “Ambassador of France”, rather than as “Resident-General”. The Ambassador designation, as opposed to Resident-General, has a number of implications. First, it highlights the political importance attributed to the meeting by colonial authorities. Second, this designation underplays the imperial nature of French involvement in Morocco. Finally, by stating that they have the “Ambassador of France” among its ranks, the French resistance could also bolster its claim that they represented the legitimate authority of France. In the participants list that opens the *Proceedings*, however, Mr. Puaux is listed as Commissary Resident-General of the French Republic to Morocco. The wording of the “French Republic” further situates these actors as part of the Resistance: Vichy France referred itself to as the French State (“État Français”), whereas the French Republic was the designation used prior to (and after) Vichy, and by those that contested that collaborator regime, as were Mr. Puaux and the CFLN. It is unclear as to which of these official designations were specifically used in the meeting, or whether they were modified or added in by the editors of its record. Notwithstanding the ambiguity of the historical source, however, the fact that both colonial and “diplomatic” designations for the same political title co-exist in the document suggests that the CFLN is drawn to, or at least cognizant, of the potential effects that the meeting is likely to have on the delicate configuration of political power within the empire.

Mr. Puaux’s opening remarks are also suggestive of the political positionality of these French authorities in exile vis-a-vis the colonial Empire and the Allied war efforts, on how these relate to the locusts. After stating how he insisted in being part of the meeting, the Ambassador/Resident welcomed

³ “National Anti-Locust Board”.

⁴ Borot (2006), drawing on Roy (2001), made a very similar argument based on plausible assumptions about the geo-historical conditions of the meeting. I build on, and expand that argument by engaging with the actual content of the conference proceedings and texts from the historical actors themselves, rather than solely on contemporary hindsight about the course of events.

in the name of the Government of the Protectorate, to this Moroccan land, this *oeuvre* on which the French have worked for thirty years, which they hold dearly, and to which is attached the name of this great creator Marshall Lyautey.^{5,6}

Mr. Puaux expressed nervousness about addressing such prominent entomologists, given how “as most Parisians, he only knows the insect (locust) from the Bible” and is among those who confuse the swarming, “true” locusts (“locustiens”), and other grasshoppers from the same family (“acridiens”), prone to lumping them all as grasshoppers (“sauterelles”). Mr. Puaux went on to describe how, at the beginning of his ‘African career’, in Tunisia in 1907, he first saw locust swarms in action, the extent of the damage they make, and realized how little could be done against them. The Ambassador, “hopefully assuming that much progress has been made in that regard since then”, expressed how pleased he was “to see gathered men from diverse nations, given that the fight undertaken is one that interests all colonizing nations”. The speaker specified being particularly pleased to greet (the British) Professor Boris Uvarov, “whose scientific fame has gone beyond Great-Britain”, stating that “thanks to his science, thanks to his methods, he will help (us) fight this plague”. Turning to the specific socio-political context at hand, the Ambassador pointed out that “circumstances have made it that the nations allied in the war find themselves today allied against the grasshopper”. Humorously referring to the anecdote as “a secret that could be of interest to the controllers of the Axis”, Puaux reported that his daughter spoke of the German occupiers in Romania as “the grasshoppers”, having encountered locusts as a young child in Tunisia. For Mr. Puaux, this analogy is justifiable given “how these insects have the same greenish uniforms, the same absorption capacity than these bands that roam all over Europe”. Building on that comparison, he adds:

just as the Allied nations are successfully fighting the ‘Axis Grasshoppers’, I do not doubt that, thanks to you, we will be able to fight the plague of (real) grasshoppers that constitutes currently for Morocco a rather agonizing reality. And I dare hope that our English and American allies will want to help us effectively in this fight”.

The speech concludes by making a last parallel between the war and locust control:

I do not know if there are secret weapons against the grasshoppers that we can use immediately, but if you want to experiment, it is with the greatest fervor and recognition that we will accept these weapons.

Comparison and metaphorical conflation of animal pests – insect or otherwise – and military enemies are not uncommon (Russell, 1996, 2001). Pests have also been physically mobilized as tools in war (Lockwood, 2008). In some cases, the metaphorical mobilization was accompanied by attempts to transform the very materiality of insects to make them more compatible with warfare (Kosek, 2011). The foregoing adds to this list by presenting a case where the symbolic mobilization of the insect in relation to warfare, I contend, contributed to the institutionalization of expertise and management capacity related to the insect.

The allusions made by the French ambassador to Morocco, Mr. Puaux, highlight commonalities between the locust and Axis threats: both roam across and invade territories, and both, if left unfettered, will destroy the wealth and order built by the French. To some extent, the territorial sovereignty that was lost to and that

continued to be threatened by the Axis was also threatened by the locusts. In turn, locust control was held as closely intertwined with, and reliant on, the alliances, technologies, and resources of the Allied war effort, while depredations by the swarms may undermine the production and supplies of food necessary for the war effort. In other words, the fight against the locust is, or at least strongly overlaps with, the fight against the Axis, and vice-versa.

The second speech, by Mr. Dulin, Director of Agriculture and General Supply further illustrates how the leadership of the French Resistance valued their commitment to an anti-locust organization. After briefly thanking Mr. Puaux for opening the meeting, Mr. Dulin stated how

(by) attributing a national reach to the Office national antiacridien, created by order on 7 December 1943, by placing it under the authority of the Commissary to Supply and Production, which represents central power, and by allowing the participation of the State to the budget of the Office, the French Committee of National Liberation has signified the importance it attaches to the fight against locusts.

The speaker then specified how that concern is not specific to the CFLN, as:

the extent of the locust plague, its repercussions on economic and even political life of the different countries affected by these locust invasions have long been a concern of public powers.

This concern, according to Mr. Dulin, has led to much progress being achieved in that field: “currently, all (the affected) countries have their own locust control organizations” and “much has also been done to coordinate this fight at national and international levels”. Dulin then highlights how France has been an “active and important participant” in these efforts, and how its “international reputation”, its “extensive track record”, and the “lessons learned from experience” made France (meaning *Free France*) best positioned to carry out its mandate. Mr. Dulin continued:

The mandate of the Office is vast. Its attributions, as defined by the order, are limited to the coordination of activities related to the study of locusts for their destruction. But the study of locusts and the organizing of the fight itself are so closely intertwined that the activities of the Office will always be closely linked to the activities of the (national-level) locust control organizations.

At the same time, the attributions of the Office are limited in a way that “preserves the autonomy of local anti-locust services in the organization and operation of anti-locust campaigns on their territories”. This specification has not only practical but also political implications, both of which are highlighted by the speaker:

all these services belong to administrations that are distinct and independent from one another; they operate and rely on dissimilar frames and labor, have different local resources and work in diverse climates. Unification of their organization and (excessive) influence on their function by an extra-territorial organization could only hamper and interfere with the initiative of local leaders, who know the local working conditions in their countries, and would impede the most judicious use of local resources.

In turn, limiting the breadth of ONAA’s mandate “allows it to devote a large part of its activity to studies and on the information and documentation service, which are so crucial to the applied work of the local services”.

While these limitations on the Office’s capacity were seen as justified in normal times, the “exceptional circumstances” of the

⁵ All quotations from the conference were taken from (Anon, 1944), and translated from French by the author.

⁶ Hubert Lyautey, 1854–1934, was the first Resident-General in Morocco and credited as a great contributor to French colonial rule in that country.

time “impose on the Office an activity that will escape it in normal times”. Namely, the ONAA was situating itself, during wartime, as the direct link between the local anti-locust services and the supply organizations of the Allied. The speaker made it clear that the role of the Office is to immerse itself as central node linking the diverse other parts to ensure “the centralization of locust-related documentation and signalization” produced and reported “across all French countries”, and the dissemination of that information to all interested countries”.

What the foregoing suggests is the likelihood that locust control was useful politically and militarily in part because its role as crop protection made it a suitable field of techno-scientific benevolence, justifying colonial rule (Borot, 2006). Crop protection, especially applied entomology, figured prominently among the fields of techno-scientific benevolence that were used to justify colonialism as a legitimate form of rule, especially from the 1920s to the 1960s (Clark, 2009). This was especially critical in Africa from the 1920s to the 1960s, as colonial Empires were facing growing criticisms from not only the colonized populations themselves but also other governments such as the United States and other members of the League of Nations (Cooper, 2002).

Political legitimacy of the French and British Empires were especially crucial during the War. This is because the Liberation effort relied very heavily on not only the Allies for supplies but also on actual military enrollment of colonial subjects in the fight against the Axis (Borot, 2006). Finally, crop protection was also a critical part of the actual war effort, as insect depredations had a direct incidence on the supply of the allied countries.

The geopolitically experimental purpose of this institutionalization of locust expertise as governmental science partly explains the ambiguous oscillation by these historical actors between national and international designations. For example, the nominally “National” ONAA is meant as an international organization, “National” being used to refer to the French Empire, reflecting ambiguity in the relationship between the spatiality of Empire and of the state-form. These designations are themselves, to some degree, tied to the lack of clarity about the emerging hybrid spatiality at the intersection of national and international configurations of power that is being negotiated during late colonial and post-colonial regimes of rule (Cooper, 2002; Tilley, 2011). More than other sub-fields of applied entomology, however, a number of spatial characteristics specific to locust control made it especially relevant as a field of intervention for *Free France* during that crisis of sovereignty. These characteristics were (1) the insect’s ability to form swarms almost anywhere across immense regions, pending appropriate ecological conditions allow, and (2) the large and mobile swarms’ ability to transcend state boundaries. It is because of these, I argue, that of all the problems to which the French Resistance could concentrate in these times of crises, it prioritized the locust.

The solution to the locust problem, i.e. the creation of the ONAA, fostered a techno-scientific field linking the colonies with other colonial governments and organizations. This field was useful for the leadership of *Free France* to imagine, narrate, and perform its role as a federal authority overseeing a network of semi-autonomous colonial entities, in ways that addressed mounting criticisms in the last days of colonialism.

5. Negotiation of locust techno-politics

The adoption of the locust control as a privileged field for the performance and representation of colonial statecraft during the war was not the appropriation of an *a priori* existing applied entomology by a stable and transcendent state power. To avoid such undue simplification, it is helpful to consider the co-evolution of

science and state by returning to Mitchell’s notion of techno-politics as an “alloy” emerging from contingent and often unpredictable encounters between the human and the nonhuman (2002, p. 42). Debates between participants of the 1943 Rabat meeting, as documented in the *Proceedings*, highlight several dimensions of such negotiations between sought-out political effects, representations, and the material conditions of the techno-scientific practices at hand.

A significant portion of the meeting dealt with questions on the types and quantities of materials (e.g. tires, fuel, bags, bran, and chemicals) needed to enable effective locust control. The discussion about which kind of poison should be used for locust baits is especially telling of the balancing act between scarce availability of resources, toxicity, and concerns that risks of livestock poisoning could lead to popular resistance. Mr. Defrance, head of the Crop Protection for the French Protectorate of Morocco made the following statement:

For toxic substances, we planned the use of sodium silicate, because it is less toxic to animals. In 1930, we used sodium arsenite and found a number of poisoning of cattle. In 1942 we used the sodium fluosilicate with no accident. Last year, the supply of fluosilicate being exhausted during the campaign, we had to finish with arsenite. There was a number of poisoning of animals, although they were not of economic importance for Morocco as a whole. For us then, the use of sodium fluosilicate is mainly a psychological issue [with regards to perception by local populations]. It is why Morocco would prefer to receive, if possible, 650 tons of sodium fluosilicate. However, even though we would prefer to use the fluosilicate, if delivery were to prove difficult, we can replace it by 325 tons of sodium arsenite.

Mr. Defrance’s British counterpart, Boris Uvarov responded that, given the scarcity of supplies and the high cost of transportation, requests for the more toxic sodium arsenite are better advised than sodium fluosilicate, as the latter necessitate a double dosage, requiring twice as much tonnage than arsenite. Defrance repeats that Morocco would prefer the less potent fluosilicate, but that it bows in the face of the imperial need to reduce the tonnage: “It would obviously be possible to use sodium arsenic, but we will have to overcome much local resistance”.

Scarcity of documentary evidence makes it impossible to know the extent and severity of local resistance to locust control operations. Mohamed (2002) documented, on the other side of the continent and years later, occurrences of anti-colonial resistance in British Somaliland in 1945 and 1950, that had been aggravated by instances of cattle being poisoned from eating cereals used as insecticidal baits placed to control an incoming locust invasion. Colonial policies in Somaliland, especially their impacts on transhumance combined with additional restrictions on grazing, had already led to overgrazing and soil erosion, with negative consequences on sheep and camel raising, activities central to the local economy. When, in May 1945, the British Locust Control Department responded to the arrival of locust swarms “with an energetic campaign of locust control in which it attempted to distribute and set poisoned baits for young hoppers throughout the country” (Mohammed 2002, p. 190), reports of livestock poisoning were interpreted in the light of suspicions of colonial conspiracies by the British to destroy pastoral livelihoods. This led to violent protests against the poison baits on the “grounds that it is poisoning stock and infecting pastures and water supplies” (G.T. Fischer, Anti-Locust Campaign officer, 5 June 1945, cited in Mohamed, 2002, p. 190). In various parts of the country, protesters burned locust control camps and equipment, and attacked locust control officers; all of which, according to J. Mohamed, was encouraged and channeled by anti-colonial resistance movements.

It is impossible to establish whether the local resistance to locust control that the Moroccan authorities sought to avoid or contain was of a similar scale than the one that later occurred in Somaliland. What is evident from the available text, however, is that the consequences of an elevated risk of livestock poisoning was seen as, at best, undermining locust control's usefulness as a demonstration of the techno-scientific benevolence of colonial rule. This suggests that such concerns made the Moroccan delegate express preference for the less potent – but bulkier and costlier – pesticide.

A recurring theme during the discussions at the meeting was questions on the nature and style of the strategic orientation that should be pursued in locust control, given the especially challenging circumstances imposed by the war. These debates also hinted at criticisms made by British locust experts to the effect that the governments of French Africa had not made sufficient efforts to curtail locust swarms. At one point, Boris Uvarov, representing Great Britain, asked Mr. Risbec of West French Africa's anti-locust service: "Will the effort in 1944 be the same as it was in 1943 in AOF? Can we make a greater effort?"

Risbec: Yes, effort can be greater. The credits proposed are the same as for 1943, but that does not mean we will be limited to that. We are ready to face a given situation.

Uvarov: Last year's effort was certainly very important, but insufficient; we must do much more...

Uvarov then asked Mr. Zolotarevsky (France) whether control can be carried out effectively in Mauritania, to which Zolotarevsky responded: "Yes, in most cases, northern Mauritania is accessible to vehicles, if it is not possible to send trucks, we must not think about it, it's impossible." In these regions:

we must mount expeditions that are completely different from those that are organized in populated areas; we should organize vehicle columns that would bring the personnel, support for toxic substances, water, and supplies.

These difficulties are not specific to Western AOF and Mauritania, but are also the case in the north of the French Sudan [Mali], the north of Niger, Chad, in these regions, the army cannot help, local resources are extremely limited, and labor should be brought in from very far.

Uvarov dismissed these excuses, not believing "that these regions are much more difficult than Saudi Arabia, where Great Britain has successfully carried out control operations. After rhetorically asking whether "this question only relate to AOF, or is it a general question for all French territories", he volunteered that "for (his) part (he does) not believe that it is only a question for AOF", suggesting that the problem lies, rather, with French capacity, broadly speaking.

The debate then turned to questions on the usefulness and desirability of military involvement in locust control. For the French delegate Zolotarevsky, control operations in remote desert areas could only be achieved "with the help of the army", which he deems not useful:

My conclusions about the assistance provided by the military in the fight against locusts are that this help is generally mediocre because of the lack of experience of the military.

These views are not shared by his British counterpart Uvarov: "We have already made the experience in the British colonies. It has shown that we succeed better than with a civilian workforce".

Disagreements between the French and the British representatives also pertain to the location and intensity of the control operations. For the British, a total effort and a generalized fight ("lutte généralisée") everywhere locusts are found, with heavy military

involvement, was imperative. For the French, the consensus was that such total efforts would likely be vain if the swarms were already too large, and that instead the imperative was to find and destroy the source of this swarming through reliance on a specialized civilian workforce. Responding to Uvarov's claim that massive campaigns of swarm suppression by military columns had worked, Zolotarevsky asked: "Have we succeeded in destroying the grasshoppers in the desert? If not, it would better to not try again in Africa." Uvarov:

We will only begin this year, so we do not yet have reliable data. But I think we must plan for a great effort or do nothing. Can we make a *total* effort? Either it is possible, or it is impossible, it is for us to decide.

For my part, I believe it is possible, by consenting to a very important effort. This may not be very economical, but it does not matter. Do not forget that we are at war! This will probably cost a lot, but if the crops are saved, cost is of no importance. My conviction is that a generalized fight is totally possible, and that no difficulty is insurmountable.

Zolotarevsky's position was echoed by the other senior French acridology experts. Roger Pasquier, who also remained skeptical as to whether massive operations can control invasions, and by Mr. Defrance, who argued that an "offensive fight can only give results when it is executed at the beginning of the invasion".

Responding to the argument that a generalized fight cannot be successful, Uvarov asked "If you had the necessary means and personal, would it be possible? Risbec (French West Africa) contended that:

If I told you that we need 50,000 trucks, could you find them? (...) Results depend on the distance from population centers. Never, with the populations as they are presently distributed, could we destroy grasshoppers on a large scale, across the entire Sahara, of which the extent is impossible to monitor. Naturally, if we want to put an army of 100,000 trucks and 300,000 men at the disposition of the fight, we could obtain good results, but with the means currently existing, I repeat that it is impossible to destroy (locusts) and to destroy (them) everywhere. We should find other means than poisoned baits, but in the current circumstances, I do not believe that it is possible.

Despite these disagreements, the French representatives eventually moderated their view, recognizing that even though the type of "total" swarm suppression efforts called for by the British are unlikely to be successful on their own, they would "help more than harm". Zolotarevsky eventually agreed with Uvarov's position that "an offensive fight (lutte offensive) must be led in AOF; adding the precision that this approach "may not give absolute and definite results, but in any case, the relative results obtained may be very helpful for the defensive fight". Risbec also agreed that even though one cannot expect definitive results, it would help in the reduction of the locust masses.

Debates between proponents of early swarm prevention and 'total' swarm suppression strategies of locust control remain on-going to this day (Roy, 2001, pp. 28–29; van Huis et al., 2007; Magor et al., 2008; Symmons, 2009; see Shaw et al., 2010 for a similar dynamic in mosquito management). In this context, however, the debate was temporarily suspended. French entomologists making the case for approaches more akin to preventive strategies came to amend their strategic and conceptual disagreements with, or at least reservations about, British prescriptions for total and offensive efforts of swarm suppression. What the French needed most out of this meeting was support by the British government and Allied committee for their new commitment to locust control across northern and

western Africa. As this support hinged on the approval of their plans by British entomologist Uvarov, this provided significant incentives to agree on technical and strategic issues whenever possible.

Moreover, the scaled up, massive and total efforts of swarm suppression, as argued by Uvarov, were very compatible with the performance of techno-scientific benevolence pursued by the French Resistance in its haste to enact some response to locust invasions. This last point is well illustrated by a closing statement made by Mr. Misse – the representative of the agriculture and supply direction of the (French) CFLN, in which he stressed that:

It is important that the principle proposed by Mr Uvarov, of extreme extension of the fight, be added to the proceedings of our meeting, *because it will open a very large program in the future, regardless of borders, frontiers, and particular administrative authorities.* Moreover, the ONAA will be able to play an important role in these operations (emphasis added).

The French authorities in charge of the meeting, I suggest, were responding to two sets of geo-political concerns as they pushed for the creation of the ONAA and the organizing of the Rabat Conference. First was the issue of recognition and legitimation of the French colonial Empire in the region, which implied good relations with and acceptance by colonial subjects. Techno-scientific benevolence, such as providing expertise and transboundary coordination in locust control was clearly in line with this. Francophone locust experts, however, were cautious and preferred strategies and technologies of locust control that carried less risk of upsetting local power dynamics. This meant (1) calls for civilian-based and contained efforts as opposed to the military “total war effort” preferred by the British representative, and (2) requests for insecticide chemicals of lower toxicity, to avoid local resistance in resulting from cattle poisoning.

The second set of geo-political concerns pertained to recognition by, and cooperation with, the colonial French Empire with Allied governments. This was seen as best achieved by approval of the entomologist representing Great-Britain at this instance, Boris Uvarov. What the *Proceedings* suggest is that French opposition to military action and use of potent insecticides had to be tailored to meet British approval and support. Despite their concerns and reservations about key strategic goals and techniques of locust control on which the British insisted, French spokespeople rapidly rallied themselves to the British perspective, I argue, in part because the scientific prestige and institutional and logistic support of these Allies was paramount, and trumped other professional and technical concerns.

6. Conclusions

By responding to locust invasion, the exiled authorities of *Free France* enacted a form of techno-politics that would, they hoped, bolster the case for a united French colonial Empire. This response shares much with similar instances of “enlisting” of applied entomology for the justification and continuation of imperial rule (Vayssi re, 1980; Clark, 2009). More than other insects, however, the spatiality of the “locust problem” that makes it so intractable and overwhelming to the nation-state in conventional times made locust control a field of intervention through which multiple challenges to colonial statecraft could be overcome. As it transgresses states’ territorial boundaries, the insect is a poor fit with institutions operating on the conventional Westphalian model of state sovereignty. But the solution to this entomological challenge to state spatiality – the creation of an international apparatus of locust control – called for and allowed precisely the kind of techno-political intervention through which the French colonial Empire could be re-invented, re-negotiated, and re-presented in the face of a broader crisis.

More specifically, the war-time institutionalization of locust control via the creation of the ONAA called for precisely the type of transnational, federal, and techno-political apparatus that was necessary to legitimize the role of *Free France* at the head of the remaining French empire, and as the node linking the colonies with the other Allied countries. These features made locust control responses to locust invasions an ideal field for *Free France* to imagine, experiment, and enact its role at the head of the French colonial Empire in spite of and against the occupation of its mainland territory by Axis Troops during the Second World War.

The type of techno-politics that began to crystallize in the 1940s accompanied a changing perception of transnational linkages, calling for and allowing new spatialities of government that would be carried out after independence (Callaghy et al., 2001). The 1940s were the beginning of the end for formal colonialism. In that context, colonial government had, as Frederick Cooper points out, to start thinking about what kind of politics would be “allowed in the ambiguous space between colonial domination and territorial autonomy” (Cooper, 2002, p. 66). This echoes Tilley’s contention that “Science and Empire” were particularly inter-meshed in the “layers of institutions established to meet the needs of the Empire occupied an interstitial space that neither national nor international” (Tilley, 2011, p. 9).

The enlisting of the locust problem for this particular moment of colonial statecraft had to be negotiated with various material and discursive processes, both structural and contingent. The objects of these negotiations not only included the logic and imperative of colonial rule but also an entire array of discourses (development, Allied unity, anti-colonial resistance, etc.), as well as people, insects, chemicals insecticides and vehicles. The co-production of techno-scientific expertise and state-making underlying this particular moment in the genealogy of locust control illustrates the constellation of concerns that shaped managers’ decisions about which strategies should be selected to govern the Desert Locust.

The debates between French and British locust control experts during the Rabat meeting highlight how the stabilization and selection of strategic preferences for locust control were an outcome of the negotiation between (1) the preferred effects and availabilities of select technologies, and (2) ideas and practices underlying given rationalities of rule, as well as their representation. In other words, the political role of the locust was not a given, determined neither by its materiality alone, nor by available technologies, nor by pre-existing transcendent state power. Rather, the particular alignment of all these processes in relation to a given rationality of rule shaped the political work done by locust control at this specific geo-historical juncture. In this context, despite voicing their disagreement with British experts about which strategies and tools ought to be used to control the locust invasion, the French experts and government officials eventually surrendered their position, subsuming it to the more pressing matter of receiving scientific and logistic support from the British.

This article converges on scholarship on the social construction of scale that investigates the political effects of claims about scalar processes (Marston, 2000; Ferguson and Gupta, 2002; Bulkeley, 2005, 2012; Rangan and Kull, 2009). These theoretical strands of political geography and political ecology together point to the importance of investigating which socio-political factors justify the selection and representation of a given spatiality over another, and with what socio-ecological effect. Such investigations allow and call for a less deterministic approach to questions of fit between institutions and ecosystems, asking rather (1) what made the institutional scale in question be selected in the first place, and (2) what are the political ramifications – whether intended or effective – of rescaling the objects and agents of governance (Bulkeley, 2005)? This has implications for our understanding of the political implications of efforts to re-scale environmental

governance. It also carries implications for our understanding of the increasing dominance of transnational networks in modern government. Such inquiries, I argue, direct attention to how the effects of the mechanisms of governance favored by these moves across scales and networks may explain and be explained by the stabilization and selection of mandates and solutions within management organizations.

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