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Years of the Locust – What History Can Tell Us about International Locust Control


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East Africa and Pakistan are currently suffering from the worst invasion of desert locusts in decades. Threatening agricultural production in East Africa, the assault increases the danger of famine in a region where 19 million people already face food insecurity. While these regions experience frequent locust incursions, the scale of this entomological onslaught appears to be much greater than preceding occurrences. As a result, the Food and Agricultural Organization of the United Nations (FAO) has declared the highest disaster level at the end of January 2020 and laid out a six-month emergency action plan. The organization estimated that it would require 70 million USD to keep the situation under control through aerial insecticide spraying and to provide food for the affected population.¹

Not so biblical

When locust invasions such as the current ones occur, journalists like to refer to them as “biblical”² implying that these disasters are analogous to the ones described in the Bible or by classical writers. From God unleashing such a plague upon the Egyptians for enslaving Jews at the times of Moses to Pliny discussing the African origin of a locust swarm in Italy, there is indeed no lack of historical examples from ancient times.³ Even in later times, the source of insect plagues often continued to be attributed to theological causes. In the European Middle Ages, locusts were put on trial by ecclesiastical courts and even excommunicated for the destruction that they caused. The governor of Missouri, USA declared a day of prayer and fasting to support the farmers affected by the Rocky Mountain locust plague of 1875.⁴ After the Russian Revolution, the peasants continued to ask their religious leaders to pray for the prevention of locust disasters – to the dismay of Soviet officials.⁵

However, as this article will illustrate, locust invasions are neither acts of providence nor ancient disasters. In fact, they result from the interplay between natural and human factors and they have been of great concern to western governments in the 19th and 20th centuries, first within the scope of colonial empires, then as a consideration of international development policies.

Biological and manmade factors in insect attacks

The incursions of this enormously destructive migratory pest are primarily of biological origin. The type of desert locust of the 2020 invasion has been around since the Palaeogene - much longer than humans - and they are well-adapted to the environments in which they occur. A single swarm, consisting of up to 150 million individuals per square kilometre, can cover an area of 150 square kilometres and consume the equivalent of food for 35,000 people in a single day.⁶ It was only in the early 1920s, through the ground-breaking work of British Soviet émigré and entomologist Sir Boris Uvarov (1886-1970) that the biology of locusts became better understood. Uvarov, regarded as the founding father of acridology (the study of locusts) and instrumental in creating the FAO's locust control unit in the 1950s, proved that the two seemingly different species that he was studying were actually the same. One was the innocuous *Locusta danica*, which lived in various habitats, including dry grasslands like an inconspicuous grasshopper. The other was the *Locusta migratoria*, which bred in river deltas and would periodically swarm upon fertile farmland. While the latter was well equipped to fly, the former was not, and they were of different colours and sizes. Uvarov determined that under conditions of drought and food shortage the usually solitary *danica* bred abundantly and became the “gregarious” migratory species,



Papiers d'actualité / Current Affairs in Perspective

N°3 | March 2020

migratoria, forming swarms of winged locust, which can travel great distances and consume most of the green vegetation in their way.⁷

In addition to the natural biological origin of locust plagues, human activity can contribute to the emergence of swarms and socioeconomic factors can make people more vulnerable to the locust invasions. Inept or insufficient disaster management strategies on the local, national, or international level can also expose populations to greater risk. The unprecedented nature of the 2020 locust invasion appears to be a result of the region's heavy rainfall and warmer temperatures in recent years, likely the result of anthropogenic climate change.⁸ This combination of warmth and moisture created ideal conditions for the locusts to overbreed. In addition to this food shortage, the region has also been facing other natural calamities such as floods, an epidemic of rift valley fever, and prolonged droughts since 2018.⁹ Locust control measures will be hard to implement in certain countries such as Somalia where the presence of the militant jihadist group, Al Shabaab, makes any activity such as the spraying of insecticides dangerous.¹⁰

History provides several examples where armed conflict and political instability increased a population's vulnerability to locust invasions. A particularly strong plague hit the inhabitants of the Eastern Mediterranean during the First World War. The year 1915 was called by them the "Am al-Jarrad", the year of the locust. Due to the war, communities were already suffering from famine because of price rises, military requisitioning, and an allied military blockade and the locust plague thus came upon an already ravished population, resulting in a "complex emergency" in modern parlance. Although the Ottoman Ministry of War created special battalions to fight the plague, the disaster would lead to half a million additional civilian casualties.¹¹ Locust invasions also occurred in 1943 during the Second World War in countries such as Saudi Arabia, Iran, Yemen, Kuwait, and Oman. However, this time these outbreaks were successfully fought by the Middle East Anti-Locust Unit (MEALU), which was part of the Middle East Supply Center (MESC). This Anglo-American international cooperative coordinated the logistics of supplying the needs of farmers and consumers in the entire Eastern Mediterranean.¹² Although it is difficult to evaluate the exact degree of success of these operations, they nevertheless demonstrated how countries could work together to combat a disaster that had been considered uncontrollable.¹³

Locust outbreaks and colonial agriculture

This last example shows that concerned western governments had acquired the systematic knowledge and techniques to fight locust outbreaks by the mid-20th century. In fact, they had gradually acquired this knowledge though dealing with insects in general, and locust plagues in particular during colonial times. Recent scholarship has hinted at the paradoxical role of insects in colonial enterprises. Domesticated insects such as those that produce lac, silk and cochineal had been central to the global commerce of some regions, yet colonial administrators tended to view insects with revulsion. "It is surprising to my thinking that our asylums are not mainly filled with entomologists driven to dementia by the study of this horrible class," wrote one of them.¹⁴ Indeed, locusts have been particular threats to agricultural exploitation in the Middle East, the Mediterranean, Africa and the South Caucasus, and North America within the scope of imperial expansion in the 19th century. Between 1864 and 1875, French Algeria was especially plagued by locust invasions, with the worst in 1866 triggering a severe humanitarian crisis.¹⁵ In Russia, the fight against locusts coincided with colonial settlement at the outskirts of the empire alongside battles against malaria and phylloxera and struggles with drought. With the creation of the Soviet Union, these policies intensified in the border republics such as Armenia, Azerbaijan, Turkmenistan, and Uzbekistan. They met the dual purpose of demonstrating a capacity of the Soviet Union to subjugate nature and to bring security to regions that were plagued by food shortages and related unrest.¹⁶ In the United States, the Rocky Mountain Locust, which had plagued American settlers in the Midwest, had by then mysteriously become extinct. In the 1870s, however, as two million new people settled on the western prairies in search of free land, work, and new opportunities, the crops were still being ravaged by huge locust swarms. The insects were declared a national enemy, and charities, state governments, and the army were mobilized to get aid to farmers with varying success. In the winter of 1874–75, two million food rations were distributed in the states of Colorado, Dakota, Iowa, Kansas, Minnesota, and Nebraska. A federal scientific commission comprised of entomologists was charged by the US Congress to study the situation and come up with a plan to stop the invasions. In the end, however, it was not an official policy that ended locust disasters in North America, but rather the impact of agriculture on the ecosystem that eradicated the Rocky Mountain locust.¹⁷ These examples – be it in the context of frontier colonialism or of imperialist administration – show that locust invasions posed a serious threat to agricultural exploitation in the 19th century and that governments promoted the study of these insects and the development of ways



Papiers d'actualité / Current Affairs in Perspective

N°3 | March 2020

to control them in order to prevent unrest among colonial peoples. These early control mechanisms varied from the large-scale manual destruction of locust eggs, the burning of infested fields and the use of locust parasites to new methods of diversified agriculture. The early 'acridologist' Jules Kunkel d'Herculès was sent on missions to Algeria by the French ministry of agriculture between 1888 and 1905, where he identified a plant used for textile production that was resistant to locusts (*Stipa tenacissima*). He recommended it for further cultivation.¹⁸ Despite these discoveries in different contexts, international cooperation in the fight against locust plagues only started to emerge after the First World War.

Beginnings of international cooperation

The first organization to instigate a global approach to the issue of locust invasions was FAO's direct predecessor, the International Institute of Agriculture (IIA). The IIA had been created in 1905 in Rome upon the initiative of American businessman and agriculturalist David Lubin (1849-1919), with the support of the Italian king Victor Emmanuel III (1869-1947). Within the context of the locust invasions of the First World War, this new international organization published the first report on the global situation of locust plagues entitled "*La lutte contre les sauterelles dans les divers pays*." The IIA's permanent committee also convoked a vast conference uniting all countries affected by locusts, but this initiative had to be postponed until 1920 due to the war. Twenty-five delegates, ten of which represented French, Italian and British colonies, ultimately participated in the conference.¹⁹ The conference led to the creation through an international convention, of the International Locust Information Bureau headquartered within the IIA.²⁰ Its aim would be to promote the exchange of scientific information and surveillance, and the concluding of agreements between the concerned governments. However, while locust invasions continued to constitute a real problem in the period between the world wars on the entire African continent, and in parts of Spain, France, Asia Minor and Central Asia, the convention did not accomplish its objectives and fell into disfavor. By 1926, only seven states had ratified the convention. One important entomologist, who criticized the state of international cooperation in the field and who lobbied, during the inter-war period, for the creation of a functional international mechanism to deal with the issue was Paul Vayssière (1889-1984), professor at the *Institut National Agronomique* and the *Institut National d'Agronomie Coloniale* in France. He claimed that not enough rigorous scientific studies on the migration and breeding of locusts had been done, and those that were of good quality dealt with national examples. He thus encouraged research collaboration among countries in this field instead of sporadic emergency measures. He denounced the IIA's work in the field as inadequate due to lack of funding. Even though states were regularly providing the IIA with information on locust breeding and migrations, the IIA did not even employ an entomologist able to interpret the results. Vayssière put his hopes on Rome as a hub for international locust control, and Geneva, where he hoped that the League of Nations would lend its authority to assist in solving this problem. The League of Nations was involved in a project to create an international organization to deal with disasters of a general nature, the International Relief Union (IRU). Vayssière worked closely with the IRU and used its journal, *Matériaux pour l'étude des calamités*, to regularly publish a chronology of recent locust activity around the world.²¹ However, the IRU had even less funds at its disposal to help advance Vayssière's cause.²²

Effective international exchanges on locust control and research were not achieved until the early 1930s. Between 1931 and 1932, an estimated 100,000 people perished in what was known as another "year of the locust." This time the Sahel zone was savaged by a mix of locust plagues, drought, and inadequate resources in the colonial administrations. Simultaneously, research on locust had significantly advanced throughout the 1920s leading to the establishment of acridology as a discipline. Twice as many publications on locusts appeared from 1920 to 1929 than between 1910 and 1919, a number that again doubled between 1930 and 1939.²³ Of particular importance was Boris Uvarov's research in the 1920s on the "phasing" from innocuous grasshopper to destructive locust, which opened up new opportunities for preventive control and made Uvarov a key figure in establishing international cooperation in this field.²⁴ The first international anti-locust conference was held in Rome in 1931 at the request of the Italian Colonial Minister and upon the initiative of the British government. It became evident at that conference that international coordination in this field was indispensable.²⁵ Vayssière proposed that Uvarov's Imperial Institute of Entomology in London be recognized as the international centre for anti-locust research. At four subsequent conferences, Paris 1932, London 1934, Cairo 1936, and Brussels 1938, the focus switched from purely defensive strategies to proactive attempts to prevent swarming through better surveillance and a coordinated international study of locust reproduction.²⁶



Papiers d'actualité / Current Affairs in Perspective

N°3 | March 2020

The Second World War put an end to this international cooperation, however, and limited the role of France on the global stage of locust governance. During the war, only regional surveillance and research mechanisms could be put into place in French West Africa, the British territories of East Africa and the Belgian Congo. Although during the war, the French authorities created *l'Office National Anti-Acridien* (ONAA), the office could not exercise any real influence with France and its empire being considerably weakened by the war. London began to establish itself as a centre for locust control, with the creation of the Anti-locust Research Center in the Colonial Office (later Ministry of Overseas Development) in 1945, replacing the older Imperial Institute of Entomology. Uvarov continued as its director until his retirement in 1959.²⁷

International development cooperation and locust control

With the rise of international development after the Second World War, the agendas of governments and international development organizations began to focus on locust control. The sending of aid and establishment of training programs for anti-locust campaigns were part of the first technical cooperation agreements for rural development that the United States concluded with states such as Iran and Ethiopia in the early 1950s.²⁸ By then, the Soviet Union had a tradition going back to the 1920s of providing development aid for locust control to countries such as Iran, Afghanistan, Mongolia and the quasi-autonomous Xinjiang; policies that the Soviet Union would after 1945 expand to more distant countries. This early emergence of development aid in the 1920s was partly a consequence of the new scientific discoveries about the lifecycles and gregarious nature of locusts showing how it made little sense to only go after locusts within one's own borders. With the division of the Middle East between France and Great Britain, anti-acridian policies also disguised anti-imperialist activism in the region.²⁹

Uvarov would again play a decisive role in stimulating the interest of the FAO in anti-locust work. Within the context of the decolonization in the 1950s, the FAO ultimately took over some of the former colonial responsibilities. This became especially important as national and regional protection agencies replaced colonial ones during the process of independence of African states. Regional organizations such as the *Organisation Internationale pour la lutte contre le Criquet Migrateur Africain*, created in 1948, were still colonial products, and one could argue that their structure was not appropriate for the post-colonial era as they had a command rather than a coordinating function. Nevertheless, regional organizations had the advantage of bypassing national and state administrations, which the FAO was not capable of doing as it relied on national information.³⁰ The FAO collaborated with UNESCO and IOM in developing locust control policies and also received a credit of 3.75 million USD from the UN Special Fund to finance its activities. While the war against locusts had ultimately become a global concern, French entomologist Vayssière now remarked that international organizations were not paying enough attention to national and regional sensibilities and that the top-down foreign development work was resented. He called for international organizations to maintain their "apolitical character".³¹ Indeed, France, and Britain continued to retain a certain influence in the regional organizations that were created to replace colonial mechanisms following the independence of several African states such as the *Organisation Commune de Lutte Antiacridienne et de Lutte Anti-Aviaire* (OCLALAV) in 1958 (in which France continued to be part of the administrative council of the organization) and the *Desert Locust Control Organization for Eastern Africa* (DLCO-EA) in 1961 (under British influence).³²

The environmental and health impacts of locust control

These new institutional structures seem to have borne fruit. According to the FAO, in 1962, the number of locust migrations had decreased significantly following the organized use of insecticides.³³ Can this exclusively be seen as a success story? The focus on insecticides hints at an inherent ambiguity in 20th century locust control strategies. On the one hand, entomologists such as Uvarov and Vayssière promoted research to gain a better understanding of acridian species, their natural environment and ecological conditions. On the other hand, they helped to develop insecticides with questionable environmental consequences. Their toxic effects were not restricted to locusts. Insecticidal chemicals often have a counterproductive effect by killing an insect pest's natural enemies and they can be harmful to humans and other animals in the environment. In 1935 the Pan-African Health Conference held in Johannesburg organized by the League of Nations Health Organization and attended by delegates from nineteen African Colonies warned about the devastating health effects of locust poisoning. The conference proceedings reveal a careless disregard for the use of the highly toxic sodium arsenite as an insecticide.³⁴ In 1945, an anti-locust campaign with the use of poisoned bait in the British Somaliland



Papiers d'actualité / Current Affairs in Perspective

N°3 | March 2020

Protectorate was seen as being directed against the land and traditional lifestyles, which led to violent demonstrations and fuelled a rebellion against colonial rule.³⁵ At the start of the civil war in the 1980s, Somalia's large stockpiles of insecticides provided by DLCO-EA were targets for destruction and the release posed a deadly threat by contaminating soil and drinking water.³⁶ These historical examples demonstrate the potentially damaging impact that locust campaigns can have on health and the environment.

Conclusion

This short analysis of the emergence of international locust control, from colonial administration to international organization, demonstrates that locust invasions, while being a biological hazard can be exacerbated by human factors. Whether one considers the impact of anthropogenic climate change on the proliferation of swarms, the coupling of locust invasions with other “natural” or man-made disasters into a “complex emergency,” or populations coping with locust invasions at the same time as armed conflict, locust plagues are far from being “biblical.” Only when control measures are established that take into account these manmade aspects will they become fully efficient. In addition, as locust swarms do not respect national borders, international cooperation in prevention and timely responses are key to keeping migrations from turning into emergencies. This was recognized by governments at the beginning of the interwar period with the first attempt at creating an international organization in 1920 to specifically deal with the locust problem. An unprecedented increase in acridian research in the 1920s and 1930s invigorated these early forms of international cooperation, although colonial interests were still a major driver. Britain, France and Italy became leading actors in international locust research and management largely because the colonial powers saw locust plagues as disrupting colonial agriculture, causing food shortages and having potentially dangerous political consequences. International cooperation in locust research really took off in the 1930s with the organization of five international conferences on locust control and the designation of Uvarov's Imperial Institute of Entomology in London as the centre for anti-locust research. Immediately after the Second World War, international cooperation stalled, but within the context of decolonization and the rise of international development, a British initiative persuaded the FAO to take over some of the former colonial responsibilities. Much of the early international governance of locust outbreaks centred on the emergency use of insecticides, and there were many incidences of harm done to the inhabitants of the target region and their environment. For controlling invasions such as the current ones in East Africa and Pakistan, however, the use of insecticides is unavoidable. In light of history's many examples of the consequences of indiscriminate pesticide application, they need to be used with precision and caution to avoid health and environmental risks. The objective needs to be prevention through further research and not the complete eradication of locusts with insecticides, which would have unpredictable consequences on the ecological balance in their native habitat. This is where funding needs to be targeted and in doing so, countries will come to see that global cooperation benefits everyone.

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Papiers d'actualité / Current Affairs in Perspective

N°3 | March 2020

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Papiers d'actualité / Current Affairs in Perspective

N°3 | March 2020

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