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In the last stages of my studies in Global History, the subject "Insular Studies" and the research on this topic unfold fascinating insights and new perspectives on global historical and geopolitical aspects and thematic interrelationships, which also contributed to see the term of globalization historically in a new light. Complex interdependencies of interests and powers with numerous other subject areas such as international development, environment, agriculture, natural sciences, technology, industry, economy and trade relations, but also law, labour, and human rights make this topic a highly exciting cross-sectional matter and at the same time a difficult and equally fascinating research field in which being critical of the source is just as important as taking a step back again and again to keep the overview for the big picture and to recognize the connections that are visible far outside the box. For this reason, I would like to thank Professor Friedrich Edelmayer for awakening my curiosity in this multifaceted topic and for giving me the opportunity to open this field as the starting point of my research.

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ABSTRACT

This master's thesis examines the role of the Guano Islands Act of 1856 on the territorial history of the United States in the 19th century up to the effects on today. The passing of the law is seen as the starting shot for American Imperialism, whereby under the guise of economic raw material extraction through extractivism, the actual intention of military-strategic expansion remained hidden. The fact that the quality of the guano does not justify the effort made, confirms the hypothesis that the Guano Islands Act represented geopolitical interests and its vague formulation made it possible to circumvent the later prohibition of slavery, which promoted economic interests before people. As a further argument for the U.S.'s motivation for expansion, this work describes the attempts of colonialist occupation of the islands of Howland, Baker and Jarvis, which continued, like some of the other over 100 occupied islands, to be claimed and used as islands of military strategic importance, even after the total depletion of their guano deposits. In the last chapter, this master's thesis examines the effects of the Guano Islands Act on the present day using the example of the highly radioactively and chemically contaminated Johnston Atoll. Nuclear weapons tests were carried out there and toxic waste such as Agent Orange was stored and disposed of. Officially, the Guano Islands, some of which are still occupied under the pretext of nature and marine protection, are no longer used for military purposes, but are still part of the U.S. territory.

1 INTRODUCTION

Talking about guano today often provokes blank looks and inquiring faces. Given its importance for world history, this is surprising. Nowadays the optically inconspicuous, crumbly substance, which ultimately consists of bird or bat droppings, most likely remains in the mind of those who encountered it through its acrid stench. But the caustic material once played a major role on the global commodity markets for a considerable amount of time, primarily as an irreplaceable fertilizer for extensive agriculture. Guano was once so important that there emerged a veritable guano rush. The substance was mined unscrupulously in vast quantity, regardless of human loss or environmental damage. There exists even an own guano-based U.S. federal law from 1856, the Guano Islands Act, which is still in effect. It aimed at safeguarding supply of the scarce material that mainly occurs on islands caves and coastal regions that are difficult to access.¹

In contrast to the gold rush and the oil fever, the guano rush in the 19th century is virtually mysterious today. It is not only this aspect that ensures the malodorous substance an extraordinary significance in global history. Guano holds further surprises. Who will dare to associate bird dung with food supply, forced labourers, gunpowder,

¹ Jimmy M. Skaggs, *The Great Guano Rush. Entrepreneurs and American Overseas Expansion* (New York 1994).

or the settlement of Hawaiians on the most remote islands in the South Pacific?²

It is interesting and at the same time incomprehensible that a substance which is so neglected in historical documentation, and still largely unknown today, has such far-reaching effects on today's world. The search for guano outside the known mainland borders of the United States of America was presumably not just about guano itself, but also about new territories in strategically relevant areas. This is the only way to explain the pursuit for islands in the most remote regions of the South Pacific. Some of these islands are still strategic U.S. military bases today. This is where the Guano Islands Act comes into play again. With this background, guano, together with its specifically designed law, is considered the initial spark for American Imperialism and aspired Colonialism, which the United States tended to hide and to tackle with geopolitical calculus.³

This work follows the traces of guano and its role on U.S. territorial policy from that time until the present and aims to light up new aspects and implications in this matter.

² Gregory T. *Cushman*, *Guano and the Opening of the Pacific World. A Global Ecological History* (Cambridge 2013).

³ Daniel *Immerwahr*, *How to Hide an Empire. A History of the Greater United States* (New York 2019).

1.1 RESEARCH QUESTIONS AND HYPOTHESES

The major idea of this master's thesis is to find out how the discovery of the material of guano and the resulting law specifically tailored to it, the Guano Islands Act of 1856, has influenced the territorial policy of the United States of America. Following the call of the guano age as an "age of shit", as the author Gregory T. Cushman states in his book "Guano and the Opening of the Pacific World"⁴ (that implies, inter alia, that guano mining did not only come along with positive impacts based on an obvious intention of supply guarantee), this master's thesis also tries to answer the following main research question by approximation from different perspectives:

A. What was the role of guano and the Guano Islands Act of 1865 in American Imperialism?

All further questions and hypotheses are derived from this initial research question. It tries to get to the bottom of the (1st) hypothesis that guano can be seen as the basis of U.S. Imperialism. This hypothesis is supported by the fact that the United States of America were not only interested in a stable supply of the population with agricultural products and food or in environmental protection, but also pursued geopolitical and defence industry interests. In particular, the mining commitment in the comparatively distant Pacific region

⁴ *Cushman, Guano and the Opening of the Pacific World*, 74.

suggests that it was not just a matter of simply procuring a raw material. A comparison of the share of transport costs in relation to the actual raw material value for primary use as fertilizer underpins this hypothesis.

Another question emerges about the political decision-makers and, thus, the profiteers, especially since the time around the Guano Islands Act coincides with the beginning of industrialization and the American Civil War that began shortly thereafter. Specifically, the question (B.) comes up as to which actors and profiteers of that time still benefit today from the guano policy. This leads to the (2nd) hypothesis that some of the beneficiaries from back then are nowadays big players in politics and economy, whose success today is based on the model of corporate capitalism, an economic model that was not only important for the implementation of the Guano Islands Act of 1856, but which is also typical for the principles of today's U.S.-American economy.

This work also investigates the question (C.) why the United States continued to claim some islands even after the end of the guano boom. This leads to the question of which of the Guano Islands still belong to the U.S. territory today and what function they have.

Preceding considerations have led to the free-standing (3rd) hypothesis that the USA have avoided their responsibility to comply with basic

rights and laws with the special form of territorial expansion triggered by the Guano Islands Act and the associated special legal status of the Guano Islands. The fact that slavery was banned in the United States at the time while people were being exploited on the Guano Islands under slave-like conditions supports this assumption.

This work also deals with the end of the guano age when guano lost its importance as an irreplaceable raw material with the invention of the ammonia synthesis by the so-called Haber-Bosch process. At this point, the widely rumored (4th) hypothesis that the Haber-Bosch process wiped out the entire guano industry virtually overnight is to be checked. Was Haber-Bosch really the turning point in the very form as assumed?

1.2 METHODOLOGY AND THEORY

This work is conducted as a literary research work, with access to both primary and secondary sources. The research attempts to gain access to online and original versions of documents and sources regarding the Guano Islands Act, but also the reactions to this act, both nationally and internationally. Since this thesis is now being written under the difficult conditions in the times of Covid-19, access to written sources of a physical nature is becoming more difficult. Up to now, however, online sources have mostly been available. Where appropriate and possible, this work contrasts the research status of that time with

today's scientific knowledge. The subject of guano, although completely unknown to most people nowadays, has been professionally researched, but does not find as much attention as it deserves in the general historical context. An interdisciplinary approach should at this point serve to depict an entire view on the multifaceted aspects and effects of guano on world events. The contents of this work are, whenever possible, sorted chronologically within the various topics by their occurrence. The examination and the discussion of the research questions with the aid of relevant economic and system theories should help to accomplish a holistic perspective of the entire complex of themes. In addition, due to the predominantly insular occurrence of guano, a particular focus is put on the immanent characteristics of islands.

1.2.1 ECONOMIC AND SYSTEMIC THEORIES

For a better understanding of complex backgrounds, this work also tries to explore various aspects with the aid of thematically relevant theories and (economic) models, with Extractivism⁵ leading the way as a big part of the influence on a World System Theory. Playing a major role in the imperialistic and colonial world, following the

⁵ Naomi Klein, Die Entscheidung: Kapitalismus vs. Klima (Frankfurt am Main 2015) s.p. (e-book): *„Der Extraktivismus ist eine einseitige, herrschaftsbasierte Beziehung zur Erde, bei der es nur ums Nehmen geht.“* („Extractivism is a one-sided, rulership-based relationship with Earth that is only about taking. “)

principle of the extraction of raw materials and commodities, overexploitation, and the profit-oriented market economy, Extractivism frames this work theoretically, since the mining of guano was subject to unprecedented predatory exploitation.⁶

According to researcher and sociologist Maristrella Svampa, Extractivism began on the American continents with the genocide of the indigenous population by European invaders 500 years ago, that has led to the rise of Europe, achieved through the accumulation of capital based on looting by the so-called conquerors. Extractivism is considered a structural feature of Capitalism, which serves as the basis of economic advantages for the global commodity trade.⁷

Likewise, Karl Marx already mentioned in his work "Das Kapital" in 1867 the effects of guano on the global economy in the agricultural sector and the environment, as well as on the differences between the resulting classes by the maximization of profits in industry as a main interest of Capitalism. Marx also referred to the destructive side effects of the guano trade with regards to mining and further processing carried out by slave-like employment.⁸

⁶ Moritz C. *Urban*, Die Trilogie der Krisen: Wasser-, Land- und Geldwirtschaft (Hamburg 2018) 81.

⁷ Maristella *Svampa*, Die Grenzen der Rohstoffausbeutung - Umweltkonflikte und ökoterritoriale Wende in Lateinamerika (Bielefeld 2020) 12 – 13.

⁸ Karl *Marx*, Das Kapital. Kritik der politischen Oekonomie, Erster Band, Buch 1 (Hamburg 1867) 214.

The author, philosopher and civil rights campaigner Rosa Luxemburg describes in her work "The Accumulation of Capital" in 1913 the necessity of imperialistic politics to maintain the structure of Capitalism and to generate guaranteed growth. In her opinion Capitalism is based on capital and territorial expansion. If this is not possible anymore due to worldwide industrialization, this would set, according to Rosa Luxemburg, an expiration date for the capitalistic world.⁹

The title of this thesis contains the expression "American Imperialism", which differs from the actual, general term of Imperialism. The term of Imperialism frames the epoch between 1880 and 1914, which was characterized by the race of the great powers for the last remaining areas that can be occupied, as well as the form of concept of how Imperialism influenced foreign policy.¹⁰

Imperialism differs from Colonialism by the exertion of power over the territories it has won. Robert J. C. Young claims that in Colonialism, for example, state control is exercised from centers on the periphery of the colonized areas and pursues the goal of settlement, whereas Imperialism exercised its ideology from the centers of the

⁹ Rosa Luxemburg, *Die Akkumulation des Kapitals – Ein Beitrag zur ökonomischen Erklärung des Kapitalismus* (Berlin 1913) 338 – 340.

¹⁰ Margrit Pernau, *Transnationale Geschichte* (Göttingen 2011) 25.

metropolises itself, where the driving force is characterized by power-political interests.¹¹

The peculiarity of American Imperialism is subject to the priority positioning of economic interests, especially agriculture, which were also given legal security by the Guano Islands Act. In his explanation of the Guano Islands Act, Markus Gatschnegg describes the expansionist approach of individual companies, the so-called Movements of Filibusters, which started amongst others a campaign in Nicaragua with their own funds before the Guano Islands Act and therefore emphasized economic interests. Thus, the Filibusterer Movement is a symbolic characteristic of American Imperialism. It shows the urge to expand the state's sphere of influence is primarily based on the demands of the economic representatives.¹²

The historical events surrounding guano should therefore also be compared with the principles of Economic Liberalism, since this free play of market interest was presumably of particular importance for the rapidly increasing position of guano for the USA. Another theory that looks at the economic context in a global aspect is Wallerstein's

¹¹ Robert J.C. *Young*, *Postcolonialism: An Historical Introduction* (West Sussex 2016) 16 – 17.

¹² Markus *Gatschnegg*, *Der Guano Islands Act von 1856*. In: Friedrich *Edelmayer* (Ed.), Gerhard *Pfeisinger* (Ed.), *Ozeane. Mythen, Interaktionen und Konflikte. Studien zur Geschichte und Kultur der iberischen und iberoamerikanischen Länder*, Vol. 16 (Münster 2017) 268 – 269.

World System Theory, which illustrates the principles of Globalization as an interdependent system and understands the need for economic exploitation as the basis for unlimited growth, which is another feature of Capitalism and one reason for the motivation to expand into areas with possible raw material deposits like guano.¹³

In the overall context of these theories and the applied methodology, the research for this work aims to show new cross-connections and interdependencies that have not yet been pointed out in this form, by use of an interdisciplinary approach in correlation regarding specific insular topics.

1.2.2 INTERDISCIPLINARY THEMATIC AREAS

An aspect of utmost importance for this work is of interdisciplinary nature. Only this approach enables a holistic view of things. The understanding of guano as cross-sectional matter that goes beyond Global History is the key to answering the predominant questions on its role both in history and the present-day world. When researching the question of the role of guano in a global historical context, one inevitably comes across other, sometimes supposedly distant subject areas. Topics such as international development, geopolitics, territorial conflicts, agriculture, economics and economic history,

¹³ Immanuel Wallerstein, *The Capitalist World-Economy* (Cambridge 1979) 17 et seqq.

trade relations, industrialization, technological progress, and globalization play an important role for this work.

Scientific fundamentals such as chemistry, sediment and mineral science, environmental protection and ecosystems are necessary for a profound understanding of the substance guano itself. In addition, legal issues such as human rights, labour law, international law, state law or maritime law also come into play when thoroughly dealing with this topic.

1.2.3 INSULAR STUDIES AND CHARACTERISTICS OF ISLANDS

Curiously, Hollywood was probably partially responsible for the emergence of Insular Studies as an interesting field of research at the University of Vienna, which is in Austria, and which is considered a classic European landlocked country. Inspired by pirate films, the thematic focus on the area of the islands had found its way to the students. The conditions around and on the islands began to be viewed from a global historical perspective. In 2008 the first lectures at the University of Vienna began, when Professor Friedrich Edelmayr already prophesied:

“Thus, insular studies not only have become a field of vivid research and study at the University of Vienna but are also on a good way to be installed in a global institutional context. The

trans-regional and truly interdisciplinary nature of insular studies ensures that this field will be of interest for global studies scholars in the future.”¹⁴

Subsequent participations in international congresses in Hong Kong (2016, 2017), Beijing (2017), and Taiwan (2018) in the context of Insular Studies testified the influence in the field of Global History.¹⁵

Due to the predominant insular occurrence of guano, research on this topic also deals with the specific characteristics of islands. This is also about the question of why islands play such a big role in this research field. After all, a corresponding law, which represents one of the core research subjects of this work, bears the name “Guano Islands Act”. To get to the bottom of the geopolitical meaning of islands in relation to territorial expansion and the conditions required for this, a precise definition of the word island is required. According to Article 121 (1) of the United Nations Convention on the Law of the Sea in 1982 (UNCLOS), an island is defined as follows:

¹⁴ Friedrich Edelmayer. Margarete Grandner, Insular Studies at the University of Vienna. In: Toward Colonizing Cold War Knowledge: Facing Contemporary Border Politics (Hsinchu, Taiwan 2018) 56 – 63.

¹⁵ *Ibid.*

*"An island is a naturally formed area of land, surrounded by water, which is above water at high tide."*¹⁶

The United Nations Convention on the Law of the Sea (UNCLOS) was signed in 1982 and, like the Guano Island Act, the definition leaves a lot of leeway and will be examined in this work.¹⁷

The territorial discussions about dominion over the oceans have been going on for many centuries and thus UNCLOS can be viewed as a milestone in the history of the law of the sea, even if the interpretation of the respective law can still not be unexceptionally defined. Before the first international agreement, the League of Nations of 1919, the law of Freedom of the Seas applied to the seas and oceans of the world, which - put simply - said that everyone was allowed to sail around anywhere. Thus, the oceans were not tied to nation states and there were yet no legally valid international agreements. The Dutch philosopher and lawyer Hugo Grotius, also termed the father of international law, refers to Roman law when he put forward arguments for the general freedom of the seas in the chapter "Mare Liberum" in a legal opinion written by him in 1609. In his legal assessment, which was widely recognized at the time, Grotius came to

¹⁶ United Nations, Division for Ocean Affairs and Law of the Sea, Office of Legal Affairs, United Nations Convention on the Law of the Sea (UNCLOS), Part VIII – Regime of Islands, Article 121 (s.l. 1982) 63.

¹⁷ Carmen Pölsler, The Legal Classification of Marine Rocks (Vienna 2019) 9 – 11.

the opinion that the open sea, by virtue of its nature, is incapable of ownership, since property is always viewed as controllable and limitable, but the open sea is by its nature not submissive. His opponent John Selden, on the other hand, viewed the seas as a counterpart to the mainland, which meant that these were also controllable and, with his considerations, corresponded more to the zeitgeist of the conquerors and state interests.¹⁸

From now on, the coastal waters fell under the predominance of the respective coastal states and the limits of the zone corresponded to the striking distance of cannonballs. The resulting 3-nautical-mile rule arose from technical progress in terms of its range and later went up to 12 nautical-miles as border of the territorial waters. The sovereign powers of the coastal states or in this case of the occupied islands were measured from the baseline, i.e., the low water mark and, according to UNCLOS in 1982, extended to 200 nautical miles in international open waters. This zone is known as the Exclusive Economic Zone (EEZ), bounded by the maritime continental margin and allows the exploration and use of the maritime resources within. The fact that

¹⁸ Eike Blitza, *Die Auswirkungen des Meeresspiegelanstiegs auf maritime Grenzen* (Heidelberg 2019) 39 – 41.

more raw materials and minerals could be found in these areas has led to disputes between the respective sovereign states to this day.¹⁹

At the time of the rise of the Guano Islands Act, these extensions of the sovereign territory were not related to state power, then only related to the jurisdiction in the occasion of criminal events, as Markus Gatschnegg explains, and thus only extends the legal status like that under the U.S. flag guided ships that are on the high seas.²⁰

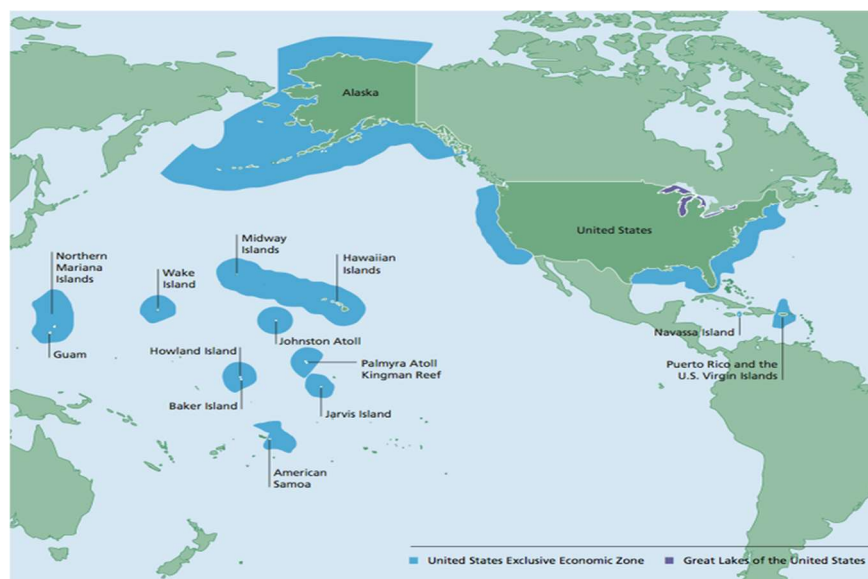


Image 1: Economic Exclusion Zones (EEZ) of the United States²¹

¹⁹ Blitz, Die Auswirkungen des Meeresspiegelanstiegs auf maritime Grenzen. 43 – 46.

²⁰ Gatschnegg, Der Guano Islands Act von 1856, 267.

²¹ National Oceanic and Atmospheric Administration (NOAA), U.S. Department of Commerce, Exclusive Economic Zone (EEZ). In: U.S. Geological Survey (online). <https://www.usgs.gov/media/images/exclusive-economic-zone-eez>.

1.3 STRUCTURE OF THE THESIS

Following the hypothesis that guano can be seen as an ingredient for the beginning of U.S. Imperialism, this work deals initially with the material guano as such, starting from its origin and history, its chemical properties, sorts, and areas of application around the globe up to its discovery for the Western world, which resulted in a real guano mania. It illustrates the role of guano in the 19th century, which could be compared to that of mineral oil nowadays in terms of economic impact, power, and growth. In order to adequately take account of the Guano Islands Act of 1856 as a specific law of historical scope and as one of the core research aspects, this work deals in depth with its background, contents and objectives and explores the question of its profiteers and losers. Introducing and discussing the Guano Islands Act will provide a deeper understanding of the arbitrariness of the U.S. government to legitimate companies to excavate guano from every non-inhabited island. Building on that, a chapter of this thesis deals with thematically relevant questions in the field of the imperial expansion of the United States, related to activities in the scope of their initial guano politics.

All these considerations should help to answer the question about the motives of how the United States justified the occupation of over 100 islands and what empowered them to do so. Following on from this, the work deals with the change in strategy of the Americans after

guano became insignificant as a raw material due to the synthesis of nitrogen.

There are numerous interesting aspects to be investigated here, which are dealt with in the corresponding chapter “Strategic Shift”. In the last part, this work deals with the implications of historical events for the present time.

2 GUANO: HIDDEN TREASURE OF THE 19TH CENTURY

Guano is largely unknown to many people today, with all its facets including its historical background. But this has not always been like this. There was a time when guano was the only raw material to produce fertilizers for large-scale commercial agriculture.²²

After its discovery by the Western world, the highly effective plant fertilizer generated enormous demand on the world market. It went to a veritable guano mania.²³

An interesting fact is that the legendary American gold rush took place around the same time, in the second half of the 19th century.²⁴

²² Erin Stewart *Mauldin*, *Unredeemed Land. An Environmental History of Civil War and Emancipation in the Cotton South* (New York 2018) 39.

²³ Charles C. *Mann*, 1493. *Uncovering the New World Columbus Created* (Toronto 2011) 215.

²⁴ Paul *Lucier*, *Scientists and Swindlers: Consulting on Coal and Oil in America, 1820 – 1890* (Baltimore 2008) 245.

In addition, the oil boom, also known as oil fever, emerged just then.²⁵ There may be different reasons why the run for guano is so little-known today, in contrast to the gold rush and the oil fever. In this context, gold delivers an obvious explanation for this. On the one hand, virtually anyone could participate in the search for gold. Digging tools were cheap and easily available, and the gold deposits were easily accessible by land. In addition, gold can be poured and stored in compact forms and is therefore well suited as a space-saving currency which was stable in value. The Californian gold deposits were even a decisive factor in the founding of the U.S. State of California.²⁶

On the contrary, Guano is far from compact. Guano deposits are also more likely to be found in places difficult of access. And ultimately, guano was one day replaced by artificial compounds.²⁷

As it is well known, this was also not the case with gold, even if alchemists had supposedly always tried to do so.²⁸

While oil was also difficult to extract and transport, investments in U.S. rail infrastructure and the importance of oil to a wide range of

²⁵ Douglas *Fetherling*, *The Gold Crusades: A History of Gold Rushes, 1840-1929*, Revised Edition (Toronto/Buffalo/London 1997).

²⁶ Linda *Thompson*, *California Gold Rush* (Vero Beach 2005) 36 – 43.

²⁷ *Cushman*, *Guano and the Opening of the Pacific World*, 155.

²⁸ Jost *Weyer*, *Geschichte der Chemie, Band 2: 19. und 20. Jahrhundert* (Hamburg 2018) 332.

industrial applications favored the role of oil as commodity and economic factor. All these reasons probably played a role why the rise and fall of guano took place in the shadow of gold and oil.²⁹

But also guano provided further fields of use. The caustic and smelly substance was additionally suitable for the manufacture of other products besides fertilizer, above all colors, explosives, and gunpowder.³⁰

When taking a closer look at the chemical properties of guano, it quickly becomes apparent that the exact nature and origin are of paramount importance for its possible uses. For example, the production of explosives or gunpowder requires nitrate, which cannot be found in all types of guano.³¹

Thus, guano is an umbrella term, not a name for specific chemical compounds, as for instance saltpeter.³²

In order to understand essential historical aspects of guano, it is very worthwhile to briefly dive into the world of chemistry and mineralogy at this point to gain a more detailed overview.

²⁹ Brian C. *Black*, *Crude Reality: Petroleum in World History* (Plymouth 2012) 27 – 29.

³⁰ Gotthilf *Hempel* (Ed.), Kai *Bischof*, Wilhelm *Hagen*. *Faszination Meeresforschung. Ein ökologisches Lesebuch*, Vol. 2 (Bremen 2016) 78.

³¹ Georg *Fuchs* (Ed.), *Allgemeine Mikrobiologie*, Vol. 8 (Stuttgart/New York 2007) 329.

³² Pauline J. *Fischer*, Fritz E. *Kühn*, *Brot aus der Luft und andere chemische Beiträge zur Welternährung*. In: *Chemie in unserer Zeit*, 2019-04, Vol. 53 (2), 112 – 124.

2.1 CONDENSED POWER IN TANGIBLE FORM

In his reference work for the chemical industry, Blücher describes guano as collective term for conglomerations of excrements and cadavers of various birds, bats, fishes, and seals.³³

With a similar approach Schmidt-French and Butler describe guano as “droppings (faeces) of birds or bats”.³⁴

More precisely, following Niggli, the term guano stands for sedimentary deposits from the long-time pile of excrements, feathers, bones, and carcass remains of (marine) birds, in some cases combined with other animal residuals. Due to the ability of a single bird to produce ten to twenty-five kilograms of guano during an average breeding season of two and a half months, insular collections of guano up to dozens of meters in thickness are not uncommon. In the end, guano is known as a naturally established solid material of animal-organic origin in different chemical compositions with phosphorous and/or nitrogenous compounds as main components. Closer analyses of guano detected in addition different shares of potassium, calcium phosphate, ammonium and calcium oxalate, uric acid, urea derivatives, acidic ammonium sulphates, alkali sulphates, ammonium chloride

³³ Hans Blücher, A. Ernst (Ed.), L. Neumann (Ed.), *Auskunftsbuch für die chemische Industrie*, Vol. 18 (Berlin 1954) 424.

³⁴ Barbara Schmidt-French, Carol A. Butler, *Do Bats Drink Blood? Fascinating Answers to Questions about Bats* (New Brunswick/New Jersey/London 2009) 47.

and sodium chloride. Brushite, Whitlockite, Struvite, Monetite³⁵ and gypsum are so called guano minerals which consist of compounds of the before enumerated chemical substances. Since guano is a natural product, the shares of components vary, depending on the places and animals of origin. All things considered, the high concentration of fertilizing substances and elements, with phosphorous and/or nitrogenous compounds leading the way, in combination with its specific material density, endow the constituents of guano vibrant and high potential fertilizing qualities.³⁶

2.2 SUPREMACY OF ELEMENTS: TYPES OF GUANO

Depending on its origin and its producing animals, natural guano deposits can be found all over the globe, mainly in maritime, coastal, and insular areas, but also in smaller quantities in inland regions. This is naturally due to the habitats of its producers, so to speak. While marine guano (sea bird guano) naturally emerges in the habitats of sea

³⁵ The nomenclature of these minerals follows a common system, naming scientific discoveries after their discoverers, in this case, George J. *Brush*, Herbert P. *Whitlock* and Heinrich v. *Struve*. The mineral Monetite, on the other hand, is named after its place of discovery, the Caribbean Island of Moneta, on which guano deposits were found. (Carl *Hintze*, *Handbuch der Mineralogie*. Erster Band, Vierte Abteilung, Erste Hälfte, 1. Teil (Leipzig and Berlin 1933) 200 et seqq.)

³⁶ Paul *Niggli*, *Gesteine und Minerallagerstätten*. Exogene Gesteine und Minerallagerstätten (Basel 1952) 454 – 455.

birds, which are mainly maritime, coastal, and insular areas, bat guano can mostly be found in caves onshore.³⁷

Bat guano has good properties as a plant fertilizer, and, contrary to marine guano, a neutral smell, resulting from the fact that bats feed on insects and not on fish.³⁸

It can be found in certain noteworthy deposits around the globe. However, the mining of its deposit sites, which only emerge in caves populated by bat colonies, are problematic. On the one hand, careless mining contributed to the wipe out of entire colonies of bats. On the other hand, deposits in caves are smaller and therefore less productive. In addition, due to the low expansion of the single deposit sites of bat guano and the relatively small hauling potential, bat guano has always played a minor role on the global guano market and serves rather as a niche product for non-industrial application and for private use.³⁹

The following map visualizes that those guano deposits found on the Pacific Islands entirely consist of phosphorus guano, while nitrogen guano can be found predominantly in the coastal regions along Peru

³⁷ Kirsten Stöven, Frank Jacobs, Ewald Schnug, Guano. Ein historisches Düngemittel. In: *Journal für Kulturpflanzen* 68/7 (Stuttgart 2016) 197 – 207.

³⁸ G. Wichern, W. Wöhlbier, Die organischen Dünger natürlichen Ursprungs. In: F. Honcamp (Ed.), *Handbuch der Pflanzenernährung und Düngerlehre, Düngemittel und Düngung*, Vol. 2 (Berlin 1931) 612.

³⁹ Gerald Kerth, *Heimlich, still und leise: Die faszinierende Welt der Fledertiere* (München 2016) 217.

and north of Chile, as well as along the coastal areas of Namibia and South Africa.



Image 2: Major deposits of guano
*Phosphate guano (A-G), nitrate guano (H-K) and bat guano (L)*⁴⁰

At this point, a second decisive distinction must be made between two different main sorts of sea bird guano in terms of its chemical compositions and places of origin. In this context, the overarching differentiation distinguishes nitrogen guano from phosphorus guano. This stems from two main types of formation processes influenced by two different location clusters linked to two different kinds of climates which are decisive for the formation of nitrogen guano on one hand and phosphorus guano on the other. Nitrogen guano emerges under

⁴⁰ Stöven et al., Guano, 200.

very dry climatic conditions in areas with low precipitation in conjunction with cold, nutritious waters rich in fish and plankton. Low rainfalls in combination with low humidity prevent the elution of the nitrogen out of the matter. As a result, nitrogen guano contains both nitrogen and phosphorus (with a lower share of the latter in comparison to phosphorus guano). Significant deposits of nitrogen guano can be found along South America's west coast, predominantly along the Peruvian coast and its offshore islands, as well as in the coastal regions of Chile and Bolivia, where the cold Humboldt Current, rich in fish and plankton, nourishes vast colonies of marine birds.⁴¹

The best known and most important guano deposits in this region are the Chincha Islands, a group of three small islands with rough terrain, some twenty kilometres off the Peruvian coast. The Chincha Islands are eponymous for a type of guano (Chincha-guano) which was the guano type of best quality with the highest content of nitrogen.⁴²

A counterpart of the region along the South American coast is the area off Namibia's and South Africa's coast fed by the Benguela Current. The small island of Ichaboe (on the territory of today's Namibia) with significant nitrogen guano deposits is to be mentioned here. The fact that nitrogen guano contains both phosphorus and nitrogen, while

⁴¹ Stöven et al., *Guano*, 197 – 207.

⁴² Ludwig Meyn, *Die richtige Würdigung des Peru-Guano in der Landwirtschaft für den Rest des Jahrhunderts* (Halle 1872) 18.

phosphorus guano only contains small traces of nitrogen or even no nitrogen at all, makes nitrogen guano the better fertilizer with the ability to be applied directly to the fields (in ideal quality, without any further chemical processing). In contrast, phosphorus guano emerges under the influence of rain and ocean breeze aerosols on grounds rich in calcium carbonate, for instance limestone, chalk rocks or coral cliffs. Extraction processes of the contained phosphorus of the animal components (mainly bird's excrements) lead to the leaching-out of phosphorous sediments and to a reaction of those with the underlying stone layers. As a result, compact, often rock-like structures (also referred to as "rock guano") occur. Phosphorus guano is mainly found in equatorial Pacific and Caribbean regions. Only at these tropical-subtropical places, those climatic conditions and water temperatures prevail, which are necessary for the growth of coral reefs as calcareous subsoil for phosphate guano.⁴³

Well-known representatives of phosphorus guano were found on the coral islands in the Pacific and the Caribbean region, which are eponymous for these varieties of guano, such as for example Baker-guano, Howland-guano, Jarvis-guano, and Nauru-guano (Pacific) or, in the Caribbean, for instance Sombrero-guano, Aves-guano or Curaçao-guano. Further noteworthy deposits of phosphorus guano are found on the Christmas Islands in the Indian Ocean south of Java

⁴³ Stöven et al., Guano, 197 – 207.

and on the Chilean peninsula of Mejillones⁴⁴ (Mejillones-guano). The fact that phosphorus guano contains a high share of phosphorus, but a low or in some cases inexistent share of nitrogen makes phosphorus guano not ready for an instant use as a fertilizer without sulfuric acidulation. Thus, contrary to most kinds of nitrogen guano, phosphorus guano is not useable without further steps of chemical processing at all. Therefore, phosphorus guano served primarily as a raw material for further industrial processing, mainly for the superphosphates industry to produce phosphorus for agricultural fertilizers.⁴⁵

Furthermore, phosphorus serves as raw material to produce phosphoric acid and phosphate salts for further applications in the chemical industry.⁴⁶

Phosphorus, an exhaustible resource which cannot be produced artificially, is not only found in guano. The largest phosphorus deposits in the soil are located in Morocco and Algeria. But also, the

⁴⁴ Mejillones is the Spanish name for blue mussels, which feed a range of sea birds. (cf. Simon *Jennings*, Michael J. *Kaiser*, John D. *Reynolds*, *Marine Fisheries Ecology* (Oxford/Melbourne/Berlin 2003) 301 – 302.)

⁴⁵ *Stöven* et al., *Guano*, 198.

⁴⁶ Martin *Okrusch*, Siegfried *Matthes*, *Mineralogie. Eine Einführung in die spezielle Mineralogie, Petrologie und Lagerstättenkunde*, Vol. 8 (Berlin/Heidelberg/New York 2010) 373.

United States, China, Syria, Jordan, South Africa, and Russia dispose of large phosphorus reserves.⁴⁷

At this point, saltpeter comes into play as a very notable substance. While guano serves as a subordinate term for sedimentary bird droppings in different compositions, the term saltpeter functions as a trivial name for the chemical compounds of sodium nitrate, calcium nitrate and ammonium nitrate. Both nitrate guano and saltpeter are naturally occurring nitrate deposits. The most important natural occurrences of saltpeter exist in the form of sodium nitrate in Chile (hence it is also referred to as "Chile-saltpeter"). Sodium nitrate (saltpeter) can also be recovered from nitrogen-rich guano (nitrogen guano). Saltpeter and nitrogen guano have quite similar properties and are suitable both as fertilizer and to produce explosives and gunpowder.⁴⁸

The historian David Cressy even calls saltpeter the "mother of gunpowder".⁴⁹

Compared to nitrogen guano (with a high degree of purity), saltpeter has an economic disadvantage: Saltpeter has to be processed before

⁴⁷ Franziska Killiches, *Phosphat. Mineralischer Rohstoff und unverzichtbarer Nährstoff für die Ernährungssicherheit weltweit* (Bonn/Berlin 2013) 8 – 9.

⁴⁸ Pauline J. Fischer, Fritz E. Kühn, *Brot aus der Luft und andere chemische Beiträge zur Welternährung*. In: *Chemie in unserer Zeit*, 2019-04, Vol. 53 (2), 112 – 124.

⁴⁹ David Cressy, *Saltpeter: The Mother of Gunpowder* (Oxford 2013).

use. Its extraction is therefore more expensive and knowledge-intensive than high-quality nitrogen guano.⁵⁰

Coming back to guano as a fertilizer, as an alternative to sea bird or bat guano, also other animal waste was processed to apply it to the fields and to satisfy the demand for nutrients for agriculture. As early as 1853, a process to produce artificial guano made from fish was patented in England. The resulting product showed a quality as agricultural fertilizer which was found to be good at that time. A few years later, this process was also applied in Norway, with an artificial guano product that disposed of even better fertilizer properties than its predecessor.⁵¹

Also, in the United States artificial guano was produced. For instance, the Gloucester Isinglass & Glue Company based in Massachusetts produced a fertilizer solely from fish waste. With a relatively high share of phosphate and rather low nitrogen content, this fertilizer showed similar characteristics to phosphorus guano.⁵²

⁵⁰ Robert G. *Greenhill*, Rory M. *Miller*, The Peruvian Government and the Nitrate Trade, 1873-1879. In: *Journal of Latin American Studies*, Vol. 5, No. 1 (May 1973) 111.

⁵¹ Emil M. *Dingler* (Ed.), *Polytechnisches Journal*. Hunderachtundsechzigster Band (Augsburg 1863) 388 – 391.

⁵² *Department of the Interior*, Descriptive Catalogues of the Collections Sent from the United States to the International Fisheries Exhibition, London, 1883: Constituting a Report Upon the American Section. In: 33rd Bulletin of the United States National Museum, No. 27 (Washington 1884) 48.

Fertilizers were also produced by the reprocessing of various animal cadavers. A scientific journal reports in detail about the mid-scale production (400 tons per year) of fertilizers from horse cadavers by a French company. Indeed, the end product was described as a “very powerful fertilizer”, but however, with a nitrogen share of 7.9 percent and a phosphoric acid content of 3.5 percent, this did not come close to fertilizing values of any guano variety.⁵³

Similar approaches of artificial guano production came to effect in Great Britain, where fertilizer was produced from farm animal waste (including bones and bone ash), fish, chalk, and sulfuric acid, with the difference that additional imported phosphate was added. Since “manufactured fertilizers” (which are, confusingly, in historic literature often referred to as “artificial” or “synthetic” fertilizers⁵⁴) existed already before the invention of the ammonia synthesis in the first years of the 20th century, the production of artificial guano can be seen as a historical production form of artificial (manufactured) fertilizers.⁵⁵

⁵³ *Dingler*, Polytechnisches Journal. Hunderachtundsechzigster Band, 387 – 388.

⁵⁴ A. *Stutzer*, Stallmist und Kunstdünger: Kurze Anleitung über die richtige Behandlung des Stallmistes und über die rentabelste Verwendung der Kunstdünger (Bonn 1892).

⁵⁵ Robert *Colls*, Richard *Rodger* (Ed.), *Cities of Ideas. Civil Society and Urban Governance in Britain 1800-2000* (London/New York 2018) 72.

Prior to the availability of artificial nitrogen, entirely natural sources were necessary to obtain all fertilizer components.⁵⁶

Regardless of whether it is about real or artificial guano, the weighting of the elements is always decisive for the quality of fertilizers with phosphorus and nitrogen as the most important raw materials.⁵⁷

At this point it is important to mention that manufactured fertilizer products of the 19th century are not necessarily referred to as “manufactured” or “artificial” or “fertilizer” and are, thus, not consistently listed as such in literature and statistics.

2.3 THE DISCOVERY OF GUANO BY THE WESTERN WORLD

The human desire to improve the agricultural yield of soil is as old as agriculture itself.⁵⁸ Ancient indigenous civilizations already used the bird manure to fertilize their crops. Under the government of the Inca, guano was an important factor of the overall economy. In large parts along the coast of the Inca Empire guano was the prevailing fertilizer. The fact that it was – under penalty of death – strictly forbidden to harm any sea birds on the empire’s guano islands illustrates the tremendous importance of guano as a crucial economic factor of these

⁵⁶ David B. *Rutledge*, *Energy: Supply and Demand* (Cambridge 2020) 225 et seqq.

⁵⁷ Charles G. *Warnford Lock*, *Spons' Encyclopædia of the Industrial Arts, Manufactures, and Raw Commercial Products*, Vol. II (London/New York 1882) 1256 – 1276.

⁵⁸ F. *Honcamp* (Ed.), *Handbuch der Pflanzenernährung und Düngerlehre* (Berlin 1931) 1 – 2.

times. Every guano island along the coast of the Inca Empire had an own ward who was responsible for its surveillance and the reporting of any infringements.⁵⁹

The etymology of the word “guano” traces back to the languages of the peoples of the Quechua and Inca, who used the term “wanu” (Quechua)⁶⁰ and “huanu” (Inca) for “fertilizer” or “dung”; the word “guano” is presumably the European form of this word or origin regarding its pronunciation and notation, tracing back to the German explorer Alexander von Humboldt. More by coincidence than intentionally, Humboldt was the first discoverer who documented the finding of guano for the Western world.⁶¹

Originally in search of a rare planetary constellation from which he hoped to receive closer findings about the precise longitude of the “City of Kings”⁶², Humboldt observed, while he was waiting for the celestial event, local sailors transporting a yellowish-brown substance

⁵⁹ J. C. *Poggendorf* (Ed.), *Annalen der Physik und Chemie*. Einundzwanzigster Band. Der ganzen Folge Siebenundneunzigster (Leipzig 1831) 606.

⁶⁰ *Cushman*, *Guano and the Opening of the Pacific World*, 25.

⁶¹ Carl *Vogel*, *Der Guano*. Seine Entstehung, Fundorte, Geschichte; seine chemischen Bestandteile und Sorten; seine Prüfung und Werthbestimmung; seine Bedeutung, Anwendung und Wirkung; seine Ersatzmittel etc. (Berlin 1860) 1.

⁶² The Peruvian capital Lima is also referred to as the “City of Kings”. This designation traces back to the foundation of Lima in 1535 by the Spanish conquistador Francisco Pizarro on January 6, the day of Epiphany, which is also known as the church festival of the “Three Kings”. (E. George *Squier*, *Peru. Incidents of Travel and Exploration in the Land of the Incas* (New York 1877) 34 – 35.)

from the Chincha islands near the Peruvian coast to the port of Callao. After his return from his expeditions in Peru in 1804 and initial doubts about the reports from the locals that bird manure can for one thing pile up to such high formations and, on the other hand, serve as highly effective fertilizer, Humboldt was finally convinced that he had found a new substance with high potential. Humboldt initiated material analyses and studies of guano samples with the aid of renowned scientists of that time from France and England, with astonishingly good results.⁶³

This led after all to the official discovery of guano in the Western world and marked the commencement of the global guano age.⁶⁴

Indeed, guano first came to Europe already around 1700 via the Spanish seaport of Cadiz⁶⁵ by the Spanish colonialists. But the enormous value as a raw material and fertilizer was not recognized at

⁶³ Dave Hollett, *More Precious Than Gold: The Story of the Peruvian Guano Trade* (Cranbury 2010) 82.

⁶⁴ *Cushman*, *Guano and the Opening of the Pacific World*, 24 – 26.

⁶⁵ The city of Cadiz, founded by the Phoenicians, has been the main hub of overseas trade for silver, gold and other goods from the New World since the discovery of America. This explains why the addressed guano samples also came to Europe via this location. (Moritz Willkomm, *Die Halbinsel der Pyrenäen: Eine geographische-statistische Monographie, nach den neuesten Quellen und nach eigener Anschauung* (Leipzig 1855) 435.)

that time. It was initially only brought in small quantities and without the recognition of its value for high-potential fertilization.⁶⁶

Instead, the Spanish conquerors used the guano to produce gunpowder.⁶⁷

Thus, it was presumably Humboldt's findings which led to the rise of awareness of guano. At that time, at the beginning of the 19th century, there was probably nobody who could have even remotely imagined what guano was supposed to elicit, neither the predatory exploitation of guano deposits and workers, nor the lure of small, barren islands spread over the Pacific.⁶⁸

In the first instance, after its discovery by Humboldt, guano remained undiscovered by the Western world for a quite some time and did not immediately play a noteworthy role on the world market. One of the reasons for this was that the Spanish conquerors, which indeed had in the meantime recognized the fertilizing qualities of guano, were more interested in enriching themselves with Peruvian gold.⁶⁹

While the Industrial Revolution forged ahead in Europe and North America with ground-breaking technologies, advanced agricultural technology was at the same time a foreign word. Indeed, it was known

⁶⁶ Stöven et al., *Guano*, 202.

⁶⁷ Hempel et al., *Faszination Meeresforschung*, 77 – 78.

⁶⁸ Douglas L. Oliver, *The Pacific Islands* (Honolulu 1989) 212.

⁶⁹ Skaggs, *The Great Guano Rush*, 4 – 5.

that the soil, depleted by the cultivation of plants, required fertilizer. Farmers applied numerous fertilizing substances (human and animal faeces, plant and vegetable waste, ash, minerals, etc.) to the fields, but until the beginning of the 1830s there existed no significant studies or scientific findings on the effectiveness of the individual elements, which were good for the different soils and their yield. The use of fertilizers was rather based on the principle of trial and error.⁷⁰

In fact, agricultural production output fell sharply, and the fertilizers used at the time could not counteract the decline in agricultural productivity.⁷¹

But this was due to change soon. Three Peruvian and two English businessmen together with a French company as investment partner finally set the decisive ball rolling. In 1840 they acquired cheap, exclusive mining rights for six years from the Peruvian government for 2,400 British pounds, which were equivalent to 12,000 U.S. dollars (today this sum would be roughly worth 359,000 U.S. dollars⁷²). The investment paid off: within a good year, the sale of Peruvian guano in England brought a net profit of half a million U.S. dollars (which

⁷⁰ In 1840, the German chemist Justus von Liebig established the knowledge of modern mineral fertilization through his research (Justus *Liebig*, Lyon *Playfair* (Ed.), *Organic Chemistry in its Applications to Agriculture and Physiology* (London 1840).)

⁷¹ Bill *Bryson*, *At Home: A Short History of Private Life* (London 2010) 400 – 401.

⁷² Ian *Webster*, *Inflation Calculator* (online). <https://www.officialdata.org>.

would be equal to almost 15 million U.S. dollars today⁷³). With results that increased crop yields up to three times, guano from Peru became an absolute bestseller, initially in Great Britain and Europe, and later in the United States of America. There, too, a British company was in charge. It is remarkable that the first large commercial guano markets initially had monopoly-like structures, each of which was based on resourceful businessmen under British leadership. The fact that guano reached the U.S. market with a delay of some years is partly due to this circumstance. British businessmen controlled with their exclusive mining rights the global trade in guano largely alone and initially shipped their guano primarily to Great Britain to sell it there at quasi-monopoly prices.⁷⁴

Historical export statistics of Peruvian guano illustrate vividly the significant rise in importance of guano. Whilst guano contributed to approximately three percent of the total financial export volume of Peru at the beginning of the guano rush in 1841, the share of guano contributed to almost 74 percent of the entire Peruvian exports in 1854.⁷⁵

On the other hand, African guano came onto the market from the island of Ichaboe, off the coast of what is today Namibia, also through

⁷³ *Ibid.*

⁷⁴ Skaggs, *The Great Guano Rush*, 5 et seqq.

⁷⁵ Paul Eliot Gootenberg, *Between Silver and Guano. Commercial Policy and the State in Postindependence Peru* (Princeton 1989) 161.

British companies. Ichaboe-guano was not quite as good in quality as the market leading Peruvian Chinch-guano, but it was available in large quantities and sold considerably cheaper. Within just a year the British mined about 300,000 tons of guano on Ichaboe. This high supply of cheap guano lowered retail prices immensely. Attempts by the traders of Chinch-guano to counteract this with larger import quantities to save their profit failed. Their measures only pushed prices down further. With a view to new, stable markets of worthwhile size and purchasing power, British traders sold their first large shiploads of guano in the United States of America in 1844. The international guano trade developed into a downright economic thriller, nourished by power tensions, speculation, disputes, price jumps and even fraud. For example, counterfeit guano appeared. Fraudsters sold guano-like matter or guano of very low quality to unsuspecting farmers as a high-quality product.⁷⁶

Hence, guano had turned from an unknown material to one of the most important and most demanded raw materials and commodity products in the world. In this context, a German poem illustrates the importance of guano at that time (see appendix, 9.3).⁷⁷

⁷⁶ Skaggs, *The Great Guano Rush*, 5 et seqq.

⁷⁷ Joseph Victor *von Scheffel*, *Gaudeamus! Lieder aus dem Engeren und Weiteren* (Stuttgart 1877) 25 – 26. (This poem has been freely translated from German into English for illustrative purpose.)

But also, other nations, as will be dealt with later in this work, appreciated guano in the second half of the 19th century, which is considered the time of guano.⁷⁸

3 GUANO ISLANDS ACT OF 1856

The second half of the 19th century was a time of upheaval, characterized by great competitions between the great powers. In the context of the age of industrialization it was also the time of the beginning of the world exhibitions, at which the world powers presented their achievements ("colonies and commodities") in the world's most glittering metropolises.⁷⁹

In Europe, with Great Britain, France and Germany leading the way, highly competitive industrial structures emerged, fuelled by significant investments at this time. New technologies, for instance in the chemical or the electrical industry emerged with an increasing orientation towards the outside world and towards an economic Imperialism, merged with colonial power politics and armament race ambitions.⁸⁰

⁷⁸ Akitoshi *Hiraoka*, *Japanese Advance into the Pacific Ocean – The Albatross and the Great Bird Rush* (Singapore 2018) 69 – 72.

⁷⁹ Christian Olaf *Christiansen*, Steven L. B. *Jensen*, *Histories of Global Inequality: New Perspectives* (Cham 2019) 307.

⁸⁰ Manfred *Görtemaker*, *Deutschland im 19. Jahrhundert: Entwicklungslinien* (Leverkusen 1983) 345.

Tracing back to the beginning of the 17th century, Europe disposed of a highly productive arms industry sector in the mid-19th century.⁸¹

At this point in time, the United States were on the verge of the American Civil War. They had made use of the European know-how in arms production which was brought to America just after the founding of the United States. Less officially but in fact there was not only an armament race, but also an overall competition in terms of economic and military power between America and Europe at that time. As a result, after a catching-up process, the United States had successfully lifted, among others, their domestic arms manufacturing sector into the industrial age.⁸²

The well-developed arms industry of the United States, however, reflected a fundamental structural issue at that time: Although the interior U.S. economy including its weapon industry was well developed, the United States disposed only of moderate outward military impact in those days. In other words, although the American economy and mainland military was in good shape, the United States

⁸¹ Jörg Echternkamp, Hans-Hubertus Mack, *Geschichte ohne Grenzen? Europäische Dimensionen der Militärgeschichte vom 19. Jahrhundert bis heute* (Berlin/Boston 2017) 113 – 114.

⁸² Barton C. Hacker, Margaret Vining, *American Military Technology: The Life Story of a Technology* (Baltimore 2006) 2 – 22.

were in the middle of the 19th century not yet firmly established in the club of world powers.⁸³

But America was not content with a place in the second row on the world stage. In the U.S., which had been looking towards Europe with a suspicious eye since their foundation, the striving for a shift of power arose. The nationalistic ideology of Manifest Destiny was leading the way when it came to a new self-conception and self-confidence of America as a great nation, not only in terms of spatial expansion across the North American continent (American Continentalism) or of internal economy, but also as a moral power including all American values and virtues to be spread beyond the borders of the U.S.⁸⁴

An important aspect of the ideology of Manifest Destiny is its legitimacy by God's will. According to Herring's interpretation, "the phrase meant, simply defined, that God had willed the expansion of the United States to the Pacific – or beyond." Thus, America was firmly decided to expand its territory and to spread its ideology.⁸⁵

⁸³ John Lowe, *The Great Powers, Imperialism, and the German Problem, 1865-1925* (London/New York 1994) 21 – 23.

⁸⁴ William Earl Weeks, *Building the Continental Empire: American Expansion From the Revolution to the Civil War* (Chicago 1996) 59 – 63.

⁸⁵ George C. Herring, *From Colony to Superpower: U.S. Foreign Relations since 1776* (New York 2008) 180.

But the 19th century was also the time of agricultural industrialization and of the unintended side-effects of monocultural agriculture. Industrialization indeed had an impact on the technical possibilities of agriculture. But, however, neither newly developed agricultural machines, nor state loan or soil conservation programmes could counteract declining agricultural output which was owed to soil depletion.⁸⁶

For many decades the main aim of industrial farming was focused on an increasing outcome, regardless of the consequences for the exhausted environment and soil. Declining agricultural production quantities could no longer be ignored, and so politics had to reach out for better ways of supply of any kind of fertilizers. After it became known that guano was able to brilliantly compensate for this nutritional requirement, the demand for guano naturally increased. Since the global trade in guano was firmly in British hands at the time and Europe was largely supplied with guano from Peru and Namibia through mining licenses and trade agreements via Great Britain and Spain, the Americans had no such cheap sources of guano. One way to supply the U.S. market with affordable guano could have been the development of good trade relationships with the ruling guano powers of that time, primarily Great Britain, Venezuela, Spain, or

⁸⁶ R. Douglas *Hurt*, *American Agriculture. A Brief History*, Revised Edition (Lafayette 2002) 287 – 295.

Peru, and to buy the required quantities of guano from them on favourable terms. But such dependencies did not at all fit in with the efforts of the Americans to expand their territory and to rise to world power. As a “latecomer to exploration and colonization”, as Mathew Johnshoy states, the U.S. wanted more. Aroused by the discoveries in those days of guano deposits by seafarers in the Pacific area, the U.S. government got something remarkable off the ground. The adoption of an own federal law, the Guano Islands Act of 1856, which formally enables any U.S. citizen, who discovers deposits of guano on any unclaimed island (anywhere in the world) with its peaceful occupation, underpins the strong intention of the United States to achieve further influence on a global perspective. The Guano Islands Act further entitles the U.S. government to execute and to defend such claims with the use of military force. Besides these facts, numerous unique properties of this legal act make the Guano Islands Act more than just a simple law at the intersection between economic interests and imperialistic ambitions.⁸⁷

⁸⁷ Matthew Johnshoy, The final frontier and a Guano Islands Act for the twenty-first century. Reaching for the stars without reaching for the stars. In: The Journal of Corporation Law, Spring 2012, Vol. 37 (3) 718 – 738.

3.1 A SINGLE LAW AS FERTILE SOIL FOR STATE EXPANSION

The Guano Islands Act came into force during the 34th Congress of the United States, precisely on 18th August 1856 as:

“Act to authorize protection to be given to citizens of the United States who may discover deposits of guano.”⁸⁸

This U.S. federal law is remarkable in several ways. In fact, it was the first time that a law in connection with U.S. territorial expansion was not debated publicly in the media.⁸⁹

This lack of public debate was apparently due to a vague formulation of the legislative wording of the law, which was previously very unusual for federal U.S. laws. For example, the arcane word "appertaining" was used to describe the territorial affiliation of islands with guano deposits, occupied by U.S. citizens. This formulation was probably not entirely accidental, as some congressmen had concerns that the law could go beyond the mere procurement of guano as a raw material. William H. Seward, a senator who had strongly supported

⁸⁸ *The Library of Congress, Statutes at Large, 34th Congress, 1st Session* (online) 119 – 120. In: *American Memory: Remaining Collections, A Century of Lawmaking for a New Nation, U. S. Congressional Documents and Debates, 1774 – 1875.*

⁸⁹ In the 19th century in the absence of radio, TV, and internet, print media were the most important public sources of information. Political issues were of great importance in newspapers, which went in the 19th century through a process of commercialization and politicization. (Gerald J. Baldasty, *The Commercialization of News in the Nineteenth Century* (Madison 1992) 11 – 12.)

the law, was able to dispel the concerns of his colleagues by arguing that the law only aimed at a few rocks with guano deposits in the sea, and not at establishing colonies. His involvement was presumably justified by the ambitions of the same guano investors who had just before formed the financially powerful American Guano Company and who approached the acting President of that time, Franklin Pierce, by adjuring him to protect their activities on islands with guano deposits from foreign rivals. Both President Pierce and Senator Seward (amongst others) strongly supported the stated far-reaching law.⁹⁰

There was also lively debate among the congressmen about the prices per ton of guano the state should pay to guano companies. The end of the debate on the draft law resulted in another price increase to the advantage of the guano companies.⁹¹

Another remarkable detail of the vote to pass the Guano Islands Act itself is the fact that in the "Congressional Globe", the journal in which all debates and all requests spoken in the U.S. congress were published in writing, contrary to publications on other laws (as it can be seen in

⁹⁰ *Immerwahr*, *How to Hide an Empire*, 51 – 52.

⁹¹ John C. *Rives*, *The Congressional Globe, Containing the Debates, Proceedings, Laws, etc. of the First and Second Sessions, Thirty-fourth Congress, Band 3* (Washington 1856) 1743.

the directly successive law decision), no information was given about which delegates voted for and which against the Guano Islands Act.⁹²

One can only speculate about the reasons for this unusual approach. Another fact that can be described as remarkable is the fact that the Guano Islands Act is still in force to this day. It can be found today in Chapter 8 of Title 48 of the actual United States Code (USC), the official collection of U.S. federal laws. It has survived all legislative consolidations since it was passed in the year 1856, and it deals with several modalities of possession of guano islands, including privileges and protection of their discoverers, trade regulations, criminal jurisdiction or the right to abandon the islands. Although the content of the Guano Islands Act⁹³ was revised several times, the first paragraph remained almost unchanged since its commencement and reads nowadays as follows:

“Whenever any citizen of the United States discovers a deposit of guano on any island, rock, or key, not within the lawful jurisdiction of any other government, and not occupied by the citizens of any other government, and takes peaceable possession thereof, and occupies the same, such island, rock, or key may, at

⁹² Rives, The Congressional Globe, 1743.

⁹³ For the original legal text of 1856, see appendix 9.4

the discretion of the President, be considered as appertaining to the United States."⁹⁴

Hence, the Guano Islands Act can be viewed as a free pass for the arbitrary occupation of areas since a global maritime law was only created with the Charter of the United Nations long after the Second World War.⁹⁵

The questionable ruthlessness of the Guano Islands Act regarding international law needs and the unrestricted power to act for civilians and companies gives room for further alleged motives of the U.S. government, whereby the role of the U.S. was more suggesting the positioning in the direction of imperial great powers. Questioning the imperial intentions to which expansion and imperialism are usually linked to, the author Christina Duffy Burnett describes the Guano Islands Act linked to imperialism, more as an expansionism that insists on sovereignty. The territorial claim was never meant to fully include the guano islands to the U.S. in terms of national territory, so the government did not have to take full responsibility. Also, companies began to lobby the Congress by blaming the lack of support from the U.S. government by providing affordable fertilizer and

⁹⁴ *United States Government Printing Office*, United States Code, Title 48, Chapter 8, § 1411 (Washington 2014) 1221 – 1222.

⁹⁵ *United Nations*, Division for Ocean Affairs and Law of the Sea, United Nations Convention on the Law of the Sea (UNCLOS), Part VIII – Regime of Islands, Article 121 (s.l. 1982) 63.

defeating international competitors in this field like Peru or Venezuela.⁹⁶

In this context of different interests and protagonists, the following chapter deals with the question of who benefitted most from the Guano Islands Act and, on the other side, who were the losers of this venture.

3.2 WINNERS AND LOSERS

As in countless cases in history, also this venture with the Guano Islands Act as legal basis generated profiteers on the one hand and sufferers on the other. Providing food for the people to build a strong and powerful society is an ancient endeavour and, at the same time, has ever since been an important instrument of national politics, now and then. Following up on this, the driving forces of food politics can certainly be socially motivated, but food politics has at the same time always been at least as much about economic interests, such as tax income, financial subventions, or industry interests. In short, food safety can be seen politically motivated and is inseparably linked to political activity.⁹⁷

⁹⁶ Christina Duffy *Burnett*, *The Edges of Empire and the Limits of Sovereignty: American Guano Islands*. In: *American Quarterly*, Vol. 57 (3), (2005) 780 – 781.

⁹⁷ Robert *Paarlberg*, *Food Politics. What Everyone Needs to Know*, Second Edition (New York 2013) 1 – 4.

What is certain is that mining guano turned out to be a big business for some few, who became extremely rich with the coveted raw material in a very short time. The price for their bonanza was often paid by the workers who mined the guano often under inhumane conditions.⁹⁸

But the emergence of guano had also impact on other professions at the time. Little is known, for example, that guano completely erased an entire branch at the edge of society.⁹⁹

Also, the environment suffered in many places from the mostly ruthless mining of guano, which was often carried out without any mercy for flora and fauna in previously untouched ecosystems.¹⁰⁰

Since the Guano Islands Act is a U.S. federal law, there is urgent reason to assume that the proportion of Americans is higher among the winners of the consequences of this legal act than among the sufferers. For this reason, when conducting research on the beneficiaries of this matter, particular attention was paid in the first instance to American decision-makers and beneficiaries around this law, including related interest groups, industries, and enterprises. Therefore, the investigations at this point begin with the question of who was behind the political venture to adopt this law.

⁹⁸ *Skaggs*, *The Great Guano Rush*, 139 – 158; 159 – 170.

⁹⁹ *Bryson*, *At Home*, 400 – 401.

¹⁰⁰ *Stöven et al.*, *Guano*, 203 – 206.



*Image 3: Sacking guano for export*¹⁰¹

3.2.1 BONANZA, GUNPOWDER AND OTHER BACKGROUND NOISES

Who were the people with so much interest in the enforcement of such an act? Indeed, the most evident approach to reveal interrelationships in the form of a comparison between America's richest family names in this age¹⁰² and the names of the politicians in Congress in 1865 does not reveal any significant correspondence. But however, the revision of the areas of professional activity of the congress members of those

¹⁰¹ John Bellamy *Foster*, Brett *Clark*, The Expropriation of Nature. In: Monthly Review – An Independent Socialist Magazine, Volume 69, Number 10, March 2018 (online edition). <https://monthlyreview.org/2018/03/01/the-expropriation-of-nature/#lightbox/0/>.

¹⁰² Kerry A. *Dolan*, Billion-Dollar Clans: America's 25 Richest Families 2016. In: Forbes (online edition). <https://www.forbes.com/sites/kerryadolan/2016/06/29/billion-dollar-clans- americas-25-richest-families-2016/?sh=22c1517b32f5>.

times provides more remarkable findings, as it reveals a significant share of congressmen with professional proximity to military, navy, or warfare. Also, plantation owners and slave owners were amongst the congressmen. In total approximately every eighth delegate belonged at least to one of the groups mentioned.¹⁰³

However, it must be said that the majority of the congressmen consisted of high officials or lawyers, also including civil rights activists, opponents of slavery (abolitionists), craftsmen, (university) teachers and entrepreneurs. Unsurprisingly, and as it was common at that time, all delegates were wealthy white men.¹⁰⁴

Although for example Senator and former U.S. finance minister William P. Fessenden (an abolitionist) was extremely ambitious in advocating higher guano prices that the state should pay to the guano companies, none of the congressmen at the time can be proven beyond doubt financial benefits by supporting the Guano Islands Act - especially since, mysteriously, as mentioned before, it was not even published who voted for this law and who against.¹⁰⁵

Even if one can assume that some congressmen have benefited from their vote to pass the Guano Islands Act, a proof of this conjecture

¹⁰³ G. S. *Gideon*, Congressional Directory for the First Session of the Thirty-Fourth Congress of the United States of America (Washington 1856).

¹⁰⁴ *United States Congress*, Biographical Directory of the United States Congress. 1774 – 1996 (Alexandria 2005) 30 – 34.

¹⁰⁵ *Rives*, The Congressional Globe, 1743.

seems to be unfeasible at this point. Though, it can be claimed with certainty that the U.S. guano companies, whose business model consisted of mining guano (mostly on remote islands or areas) and transporting it to the USA, were in the first row among the big winners of the Guano Islands Act. For them the emergence of guano as a valuable new raw material was more a real stroke of luck, a true bonanza. The pioneer, so to speak, was the American Guano Company. It was the first large merger of companies (which had their origin and their interest representation, the Farmer's Club, in the agricultural sector¹⁰⁶) that mined guano far away from the U.S. mainland and shipped it in great quantities to harbours in the United States.¹⁰⁷

To what extent there exists a connection with widespread investments in U.S. port facilities at that time is questionable. It is a fact, however, that investments in dozens of ports were also decided within the framework of the 34th U.S. Congress, the same Congress, within the scope of which the Guano Islands Act has been adopted.¹⁰⁸

Coming back to the guano companies, the founder of the American Guano Company, Alfred G. Benson, an entrepreneur with a good standing on the high political arena who obtained guano mining rights

¹⁰⁶ *American Institute of the City of New York*, Transactions of the American Institute of the City of New York for the Year 1858 (Albany 1859) 179.

¹⁰⁷ *Immerwahr*, *How to Hide an Empire*, 51.

¹⁰⁸ *Rives*, *The Congressional Globe*, IV et seqq.

in the course of the Guano Islands Act for the remote islands Howland, Baker and Jarvis in the equatorial Pacific area, was among the most prominent winners of the first race for guano on islands in the Pacific region. His American Guano Company achieved huge wins with the mining and shipping of guano, predominantly from the before mentioned islands.¹⁰⁹

Winged by the success of the American Guano Company, other larger companies with the business content of guano mining emerged, such as the U.S. Guano Company, the Pacific Guano of California Company, the Pacific Guano of Massachusetts Company or the Phoenix Guano Company (which were later also referred to as the “Yankee phosphate firms”¹¹⁰). The bone of contention was the fact that all newly founded guano companies acted as rivals to the American Guano Company.¹¹¹

Driven by this rivalry, it was after all Alfred G. Benson who called for legal protection of his activities with the American Guano Company in the equatorial Pacific area. Thus, it is among other things, the rivalry

¹⁰⁹ Skaggs, *The Great Guano Rush*, 71 – 79.

¹¹⁰ The word „phosphate“ implies already at this point, that the guano found on the remote islands the Americans headed for, consisted mainly of phosphor, and had, contrary to the prevailing Peruvian Guano at that time, only low or even no shares of nitrogen.

¹¹¹ Adam Burns, *American Imperialism: The Territorial Expansion of the United States, 1783 – 2013* (Edinburgh 2017) 56.

between companies of the U.S. guano industry over these small islands that fuelled the adoption of the Guano Islands Act.¹¹²

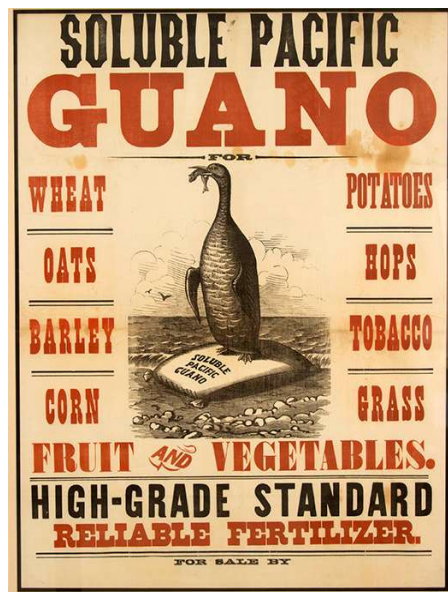


Image 4: Advertisement for Pacific Guano (19th century)¹¹³

A remarkable side effect of the ambitious efforts to find essential fertilizer in the form of guano was the discovery of the fact that its constituents could also be used to produce gunpowder and explosives. The name Du Pont, a family with French roots, well known in the corporate world, is probably one of the richest families around the globe and owns one of many companies that benefited from the

¹¹² Skaggs, *The Great Guano Rush*, 71; 165.

¹¹³ *World History Facts* (online). <https://worldhistoryfacts.com/post/181692817468/advertisement-for-guano-aka-the-excrement-of-sea>.

new bill. In the American Civil War, the DuPont [sic]¹¹⁴ company ensured the victory of the north with sufficient gunpowder, in the First World War DuPont's ammunition thwarted Germany's victory and the atomic bomb from Hiroshima also came from the enterprise DuPont.¹¹⁵

Whether a coincidence or not, immediately after the Guano Islands Act came into force, DuPont patented a new formula for the manufacturing of nitrate-based explosives. The supply of the required raw material, guano rich in nitrogen compounds, came via an intermediary from Peru.¹¹⁶

Also, word about the resounding effect of the relatively new substance of nitro-glycerine, a relatively new invention made by an Italian chemist, had got around in the chemical industry. High-quality nitrogen guano would have perfectly served as a raw material for its production. The outlook on the production of a substance with by far higher explosive power than black powder may well also have fuelled the hopes for new sources of guano.¹¹⁷

¹¹⁴ The spelling of the name DuPont is no coincidence at this point: While the family name is written apart (Du Pont), the company name is written together (DuPont).

¹¹⁵ *Anonymous*, Du Pont. In: DER SPIEGEL, No. 6 (1966) 80 – 83.

¹¹⁶ C. Alexander G. *de Secada*, Arms, Guano and Shipping. The W. R. Grace Interests in Peru, 1865 – 1885. *The Business History Review*, Winter 1985, Vol. 59, No. 4, *Business in Latin America* (1985) 607.

¹¹⁷ *Cushman*, Guano and the Opening of the Pacific World, 65.

However, aspirations that the American guano from the islands in the new areas in the Pacific should be of the same quality and composition as Peruvian guano have not been fulfilled. The guano from the distant Pacific islands had been washed out by the heavy rainfalls there, so that it consisted primarily of phosphorus and had only little or even no shares in nitrogen. That made it unsuitable to produce explosives or gunpowder. In addition, it had to be chemically processed before being used as a fertilizer. Much like DuPont, many companies had speculated on more nitrate-rich guano from the remote Pacific islands, even if not for the manufacture of explosives, but rather to produce fertilizers. This led to the situation that in many cases blended sorts between phosphate guano and imported nitrogen guano, or even with artificial guano (for example from fish waste or bone ash) were sold. For customers it was in any case difficult to evaluate the quality. Those who could not afford a chemist had to believe what they were promised.¹¹⁸

There emerged a number of companies that generated good profits from processing and trading guano from the “new” islands in the central Pacific. Among them were also enterprises which allegedly made false claims about its effectiveness and profitability.¹¹⁹

¹¹⁸ Skaggs, *The Great Guano Rush*, 139 et seqq.

¹¹⁹ William H. Bruckner, James Bennett Chynoweth, *American Manures, and Farmers and Planters Guide* (Philadelphia 1872) 212 – 217.

The derived assumption that the American chemical industry was one of the big beneficiaries of the Guano Islands Act through the processing of Pacific guano into fertilizers and other products, cannot be clearly substantiated at this point, since it is not possible to determine to what extent the guano processed by U.S. companies was guano from those islands covered by the Guano Islands Act, as American companies also processed guano from other regions, for example from South America. The reason for this was that the quantities of guano from the new sources on distant islands were simply not sufficient to significantly counteract the impoverishment of the soil.¹²⁰

Although the main use of guano as a fertilizer and, thus, the demand by voters for replenishment would have been decisive, the Guano Islands Act can presumably also be seen as an attempt to prepare for the civil war that only began a short time later. If the company DuPont (which had applied for a patent on gunpowder made of nitrate-based chemical substances, shortly after the adoption of the Guano Islands Act) hoped to find cheap material supply from the new territories in the Pacific to produce ammunition for the American Civil War, remains mere speculation. The economic localization of companies such as DuPont in the northern part of the USA is at any rate

¹²⁰ *Immerwahr*, *How to Hide an Empire*, 56.

interesting. It can, however, be stated for certain that the name DuPont appears in succession repeatedly in connection with war expenditures of the United States.¹²¹

3.2.2 DIRT, BLACKBIRDING AND AMPHIBIOUS FELLOWS

Whenever economic interests are supported and promoted by the state with all its might, not only winners remain, but also people or things which are sacrificed to the capitalist system. Reckless exploitation and violations of human rights have accompanied the history of the United States from the very beginning, and, although slavery in the United States was finally abolished in December 1865, there was still disagreement about its actual implementation. This situation led, among other things, to the subsequent American Civil War, which made the split conditions in the United States visible. As discussed by the author Christina Duffy Burnett, the difference between an actual territorial takeover (and thus also the complete connection and integration into the American legal system) and the formal affiliation to American areas of use, offers the legal grey area within which hidden slave labour took place in connection with the Guano Islands, or at least could not be prosecuted under American

¹²¹ *House of Representatives, Hearings Before Subcommittee No. 5 (Ordnance) of the Select Committee on Expenditures in the War Department, Sixty-Sixth Congress, Second Session on War Expenditures, Volume 3, Serial 6 - Parts 50 to 59 and 64 to 66, with index (Washington 1920) 2646.*

law. This fact could have been another reason for the changes in the Guano Islands Act to change terms such as territorial takeover by belonging, as it avoided the approaching adoption of slavery.¹²²

As often in history, ordinary workers and poor people were among the biggest losers in many cases, also in the guano economy. Working on the Guano Islands was indescribably inhumane and hard. The acrid ammonia vapor from the bird droppings burned the respiratory tract and the eyes. Many workers died from internal bleeding or went blind.¹²³

Under the pretext of a supposedly dreamlike South Sea Island, surrounded by palm trees and beautiful women, to find their happiness and make good money away from home, several workers were lured and found themselves stranded and abandoned in unreal places far away from home instead of paradise. The scorching sun burned down on the workers and there was no escape, the men were sometimes even charged for the passage and further meals, if they were not kidnapped by so-called "blackbirders" anyway. "Blackbirding" was practiced throughout the Pacific and the seamen were often disguised as missionaries and tricked unsuspecting people onto their ship, mostly under the threat of gun violence. The related

¹²² *Burnett*, *The Edges of Empire and the Limits of Sovereignty*, 781 – 782.

¹²³ *Skaggs*, *The great Guano Rush*, 160.

term "shanghaied" also goes back to the kidnapping of Asian workers, the so-called "coolies", who were enslaved to work at far off places.¹²⁴

Slavery was officially prohibited shortly after the Guano Islands Act was enacted in 1856, but a small legal loophole in the law allowed the workers to be exploited with impunity.¹²⁵

Due to the low costs of the workers, the participating companies as well as the state were able to achieve extraordinary profits.¹²⁶

Even if not kidnapped, guano workers were often socially stigmatized due to the stench of the guano they mined. Similar to the Indian caste of the "untouchables", they were pushed to the edge of society. Education and life path of children of guano workers was often predefined right from the start. They had no other option but to drudge in guano quarries.¹²⁷

The British, who are also known to be involved in the guano business on a large scale, passed a law in 1872 that forbade slavery for the

¹²⁴ Donald B. *Freeman*, *The Pacific* (London/New York 2013) 140 – 143.

¹²⁵ At this point, the exact formulation of the Guano Islands Act plays an important role: It states that islands that are taken into peaceful "possession" on the basis of the Guano Islands Act shall (...) be considered "appertaining to the United States" (cf. hereto the original legislative text of the Guano Islands Act of 1856 in the appendix 9.4). This implies an unequal status compared to the main territory. Thus, no civil rights based on the U.S. Constitution can be derived.

¹²⁶ Roger *Haden*, *Food Culture in the Pacific Islands* (Santa Barbara 2009) 23 – 25.

¹²⁷ Jennifer C. *James*, *Buried in Guano. Race, Labor, and Sustainability*. In: *American Literary History*, Vol. 24, Issue 1, Spring (2012) 116.

purpose of guano mining, but not the Americans. Slavery continued to exist on remote islands, partly with the help of legal nuances (for example, by officially contracting the slave laborers) until the Second World War - both by the British and the Americans, but also by the Germans and the Japanese. Particularly perfidious episodes are reported from the dealing with guano workers, who toiled for the "Yankee phosphate firms" on the so-called American appurtenances on distant islands. For example, Polynesian workers acted as swimming messengers with bottles around their necks to carry messages across the water between representatives of the Yankee companies who were on different parts of the island. The swimming couriers were by them ironically referred to as "amphibious fellows". On some islands the workers had to struggle with plagues of rats or swarms of crabs. Heat, dust, water, and food shortages, meager or no wages and social isolation were the daily bread of the workers, some of whom were simply left behind on the islands after the guano deposits had been exhausted.¹²⁸

But the workers on remote Islands in the Pacific were not the only losers of the guano age. Also, the environment suffered from the ruthless mining of guano. The insatiable need for the raw material also claimed its victims within various ecosystems. On the one hand, relentless overexploitation was taken without any regard for the

¹²⁸ *Skaggs, The Great Guano Rush*, 159 – 169.

environment. Entire islands with guano deposits were razed to the ground (or abraded to the waterline). The dismantling work also caused serious damage to the breeding grounds of the local seabirds by destroying breeding sites and thus partially led to a significant decimation of bird populations. This was later responsible in many places for the depletion of the guano stocks.¹²⁹

In addition, invasive species, both animals and plants, were introduced. Thus, individual fragile ecosystems got out of balance.¹³⁰

Magoc and Bernstein dare to take overall stock of the Guano Island Act in terms of its significance for the United States by stating:

*“The Guano Islands Act of August 18, 1856, represented a departure in American imperialism”.*¹³¹

In summary, the new law legitimated the already previously ongoing activities of companies in the Pacific Ocean and the Caribbean Sea. According to this fact, the Guano Islands Act hence “signalled one of the earliest attempts of the government to officially expand overseas beyond the North American continent”, which resulted in the claim of

¹²⁹ Stöven et al., Guano, 203 – 206.

¹³⁰ Sophie Hardach, The Rats Invicted From Paradise. In: BBC Future Planet, Ecology (online edition). <https://www.bbc.com/future/article/20201008-palmyra-how-tropical-islands-got-rid-of-their-rats>.

¹³¹ Chris J. Magoc, David Bernstein, Imperialism and Expansionism in American History - A Social, Political, and Cultural Encyclopedia and Document Collection (St. Barbara 2016) 265.

more than 100 islands, some of which have been kept into the 21st century. The activities taken in the course of the Guano Islands Act with the aim to exploit guano as a valuable commodity did also evoke conflicts. As example of the latter, the Guano Islands Act has been used to claim and to occupy the small Island of Navassa, off the coast of Haiti. When some of the Afro-American workers, who were lured there under false promises, revolted against the slave-like treatment by foremen of their employer, the Navassa Phosphate Company, an American company, the conflict escalated, in which five associates of the company were killed.¹³²

Also, entire wars were fought over guano. Although not solely influenced by the Guano Islands Act, but still more than just worth mentioning is the Chincha Islands War (also referred to as Spanish-South American War), where Spain on the one side and Peru on the other fought between 1864 and 1866 for the high-quality guano deposits on the Chincha Islands off the Peruvian coast. At that time, the crew of a Spanish fleet of ships raided the Chincha Islands and confiscated the guano deposits there. Bolivia, Chile, and Ecuador provided military support to Peru in this conflict.¹³³

¹³² *Immerwahr*, How to Hide an Empire, 53.

¹³³ Richard J. *King*, The Devil's Cormorant. A Natural History (Lebanon 2013) 213.

Among similar opponents raged the War of the Pacific (also referred to as Saltpeter War) between 1879 and 1884, in which Chile secured the global monopoly of natural saltpeter by conquering the Bolivian and Peruvian saltpeter provinces.¹³⁴ The author William F. Sater draws a gloomy picture of the War of the Pacific and describes it as a “Dirty War” that left numerous dead and wounded on both sides at numerous battlefields.¹³⁵

Outside the direct influence of the Guano Islands Act, the aftermath of the guano economy and the sudden emergence of guano on the markets were as well noticeable in sectors on the fringes of society. Little is known, for example, that guano completely put an end to the feces trade, which had been common until then. The emergence of guano made an entire industry go down, and thus, the livelihood of many impoverished people who were previously already among the poorest in society.¹³⁶

Also in this context, a reflective look at winners and losers of events in world history makes it clear that the view of winners and losers is often relative, as it is the case with regard to the effects of the Guano

¹³⁴ Detlef Wienecke-Janz, *Die Große Chronik: Weltgeschichte. Das Imperiale Zeitalter, 1871 – 1914* (Gütersloh/München 2008) 93.

¹³⁵ William F. Sater, *Andean Tragedy: Fighting the War of the Pacific, 1879-1884* (Lincoln/London 2007) 301; 348 – 349.

¹³⁶ Bryson, *At Home*, 400 – 401.

Islands Act. In sum, Daniel Immerwahr enunciates in his research work the following legacies of the Guano Islands Act: On the one hand, a short-term, slight cushioning of the decline in agricultural yields (which was, though, not possible with guano from the new territories only). On the other hand, Immerwahr associates with it not less than the “foundation for the United States’ overseas empire.” He hereby highlights interests of the U.S. that go beyond the procurement of guano, and notes in this connection that some islands that were occupied under the Guano Islands Act were later converted to military bases.¹³⁷

This makes the Guano Islands Act a military-strategic and territorial-political issue. A synopsis of the most important facts (the fact that the guano from the new areas in the Pacific was less valuable than hoped, the fact that the guano islands were later also used for military purposes, and the fact that in the run-up to the adoption of the Guano Islands Act already critical voices among the delegates were raised in precisely this direction), strongly supports the hypothesis that the Guano Islands Act was in the end not only about guano, but also about the strategic importance of the guano islands for the U.S. territorial policy.

¹³⁷ *Immerwahr*, *How to Hide an Empire*, 56.

4 AMERICAN IMPERIALISM: EXPANSION OF THE UNITED STATES

When researching the history of the United States activities of territorial expansion, the question arises as to which areas, outside the existing sovereign territory of the U.S. since its formation, were first acquired as outer areas by the United States. The information that there were islands occupied (“possessed”) under the Guano Islands Act may appear unsurprisingly at this point. A list of the United States Department of Treasury from 1886 provides information on which islands were at which time “possessed” and declared “appertaining to the United States” under the Guano Islands Act. The first four were, in this very order, the islands Baker, Jarvis, Navassa and Howland.¹³⁸

Indeed, those islands do not play a very famous role, but they nevertheless depict an important part in the history of the United States of America, especially regarding its territorial policy.¹³⁹

These islands also have some other characteristics that only become apparent at second glance. They were not just the first islands to be occupied by the United States as part of its outer territory expansion,

¹³⁸ *United States Department of the Treasury, Synopsis of the Decisions of the Treasury Department on the Construction of the Tariff, Navigation, and Other Laws for the Year Ending December 31, 1885* (Washington 1886) 525 – 526.

¹³⁹ Scott W. Wrighton, *The Pacific Guano Rush* (Honolulu 1983) 41 et seqq.

they are also among those few islands (out of a total of about 100 islands originally¹⁴⁰) that still apply as U.S. territory today.¹⁴¹

This chapter examines the background of the occupation of these islands and shows the global political framework conditions in this context.

4.1 FIRST POSSESSIONS

The year is 1856, more precisely Tuesday, October 28th. This day is indeed not very famous, but it is nevertheless a remarkable day in the history of the United States of America. On this very day, the first two islands were officially declared as "appertaining to the United States" by the State Department of The Treasury on the legal basis of the Guano Islands Act. The talk is of the little-known islands Baker and Jarvis, just a few kilometers north of the equator, in the middle of the Pacific Ocean, about halfway between America and East Asia, respectively Australia.¹⁴²

„Few people have ever heard of the flyspecks of land enveloped by the marine monuments. Who knows about Howland Island, the

¹⁴⁰ Brij V. Lal (Ed.), Kate Fortune (Ed.), The Pacific Islands. An Encyclopedia (Honolulu 2000) 239.

¹⁴¹ Skaggs, The Great Guano Rush, 230 – 236.

¹⁴² United States Department of the Treasury, Synopsis of the Decisions of the Treasury Department on the Construction of the Tariff, Navigation, and Other Laws for the Year Ending December 31, 1885 (Washington 1886) 525.

*“ratoll” where Amelia Earhart was headed; or Baker Island, where germ warfare testing took place; or Jarvis Island, the “catoll” on the equator?”*¹⁴³

Thinking now of the scene of the moon landing, where American astronauts euphorically took their first steps on the new terrain to ram the flag of the USA into the ground, may be not as wrong as one might assume. In fact, similar scenes are likely to have taken place on these islands, albeit in a different environment and without space suits. However, these activities had no official character, particularly because there is a temporal deferral, since the flags were already waving on these islands before October 28th, 1856, and, thereby, before they were declared as U.S. property. In addition, the flags were set up by private individuals or company representatives. These companies, mostly trading, expedition or whaling companies, had already swarmed out in droves to explore the Pacific in previous years, in many cases with government support. Even before the 1830s, the Americans were busy catching up knowledge of the oceans, just as their counterparties, some European colonial powers, had.¹⁴⁴

¹⁴³ Mark J. Rauzon, *Isles of Amnesia. The History, Geography, and Restoration of America's Forgotten Pacific Islands* (Honolulu 2016) 1.

¹⁴⁴ Skaggs, *The Great Guano Rush*, 67 – 72.

The global interplay of forces and nations that prevailed in the 19th century also affected, among others, the most remote regions in the Pacific. At this time also the Japanese came into play, since those were highly active in snapping up islands in the Pacific, especially in the second half of the 19th century.¹⁴⁵

At that time, the Americans were also busy occupying islands in the Pacific. It can be assumed that the Americans were not indifferent to these activities by the Japanese, who have in the end also combined territorial interests with the outlook for guano.¹⁴⁶

In the light of this geopolitical situation, the list of islands that have been occupied by the United States under the Guano Islands Act reads a little differently. If you look closely to the data, it seems clear that the Americans were in a hurry to declare as many islands as possible to be “appertaining to the United States”, particularly from 1860 onwards.¹⁴⁷

And then there was the Hawaii question. The group of islands in the Pacific had aroused the interest of the Americans already in the 18th

¹⁴⁵ *Hiraoka*, Japanese Advance into the Pacific Ocean, 69 – 72.

¹⁴⁶ Paul *Kreitman*, Feathers, Fertilizers and States of Nature: Uses of Albatrosses in the U.S.-Japan Borderlands (Princeton 2015) i – ii.

¹⁴⁷ *United States Department of the Treasury*, Synopsis of the Decisions of the Treasury Department on the Construction of the Tariff, Navigation, and Other Laws for the Year Ending December 31, 1885 (Washington 1886) 525.

century. First entered by a representative of the Western world in the person of the British seafarer and explorer James Cook in 1778, the strategic location of Hawaii in the Pacific became very interesting for the United States, especially as a gateway to trade with China.¹⁴⁸

At the beginning of the 19th century, Hawaii was first used by American fur traders as a stopover during the winter. Thereafter they dealt in Hawaiian sandalwood, which had been discovered as an excellent barter commodity in China. In addition, the Hawaiians turned out to be very hardworking, technically skilled, loyal, and cheap workers, who also showed skills as cultural bridge builders in dealing with other indigenous peoples. For this reason, more and more American merchant ships hired Hawaiians as part of their crews in the 19th century. In the context of the story, it is hardly surprising that the Westerners never regarded the Hawaiians as equals, and that they exploited and suppressed them. The same applies to the expansion of American power and control over Hawaii, which ultimately took on a new dimension with the annexation of Hawaii by the United States in 1898. 1898 was also the very year in which the United States, after having achieved its goals of establishing trade with China and establishing a strong navy, had instigated the Spanish-

¹⁴⁸ Gregory *Rosenthal*, *Life and Labor in a Seabird Colony. Hawaiian Guano Workers* (Oakland 2018) 17.

American War to annex island territories in the Pacific and the Caribbean.¹⁴⁹

Here the ideology of Manifest Destiny emerges again, which says that it is God's will that the Americans should have supremacy over the North American continent, expand their territory and spread their ideology.¹⁵⁰

In the Spanish-American War, the USA asserted its claim to supremacy against Spain, under whose control Cuba and Puerto Rico were among others, but also the remote Pacific Island of Guam and the Philippines.¹⁵¹ In Guam, today the U.S. operates a military base.¹⁵²

In consideration of all these facts, it is safe to say that strategic territorial interests have consistently been one of the main driving forces of the United States of America, as it is illustrated on the following map:

¹⁴⁹ Davianna Pomaika'i McGregor, Engaging Hawaiians in the Expansion of the U.S. Empire. In: *Journal of Asian American Studies* (Oct. 2004) 209 – 222.

¹⁵⁰ Herring, *From Colony to Superpower*, 180.

¹⁵¹ Kenneth E. Hendrickson Jr., *The Spanish-American War* (London 2003) 1 – 16; 173.

¹⁵² Harald Kleinschmidt, *Der Kontext der Europäischen Union: Eine Globalgeschichte der regionalen Integration vor und außerhalb der EU und ihrer Vorgängerinstitutionen* (Hildesheim 2020) 311.

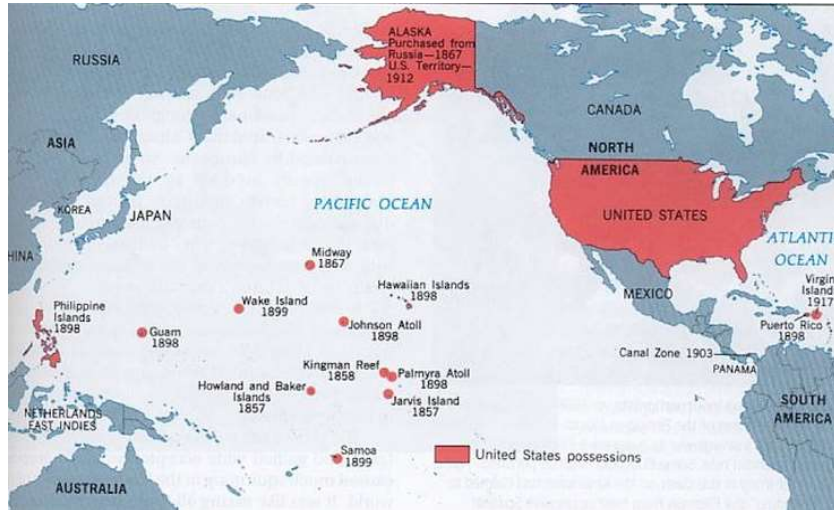


Image 5: Manifest Destiny Moves into the Pacific ¹⁵³

4.2 AMBITIOUS MISSIONS

Taking a closer look, some of the insular possessions of the United States turned out to be highly ambitious missions on an exceptional level of effort. What has happened so far, in a nutshell: The USA has passed a law, the Guano Islands Act, with which it has legitimized the annexation of islands in the Central Pacific and the Caribbean, and officially justified this undertaking with the search for raw material for much needed fertilizer. At the same time, there was a political race for strategic islands in these areas going on, especially in the Central Pacific and the Caribbean. At this point the question emerges whether

¹⁵³ Gayle Olson-Raymer, Manifest Destiny Moves into the Pacific (online). <http://gorhistory.com/hist420/Pacific.html>.

the effort put into annexing (some of the remotest) islands was solely justified by the search for guano.

Wrighton's research comes to the clear conclusion that this is, at least regarding the said islands in the Pacific, not the case. The guano deposits on these islands were too small in structure, too fragmented, too remote, and insufficiently productive. And the British had long since established themselves too much in the global guano business that was, in addition, slowly coming to an end in the late 19th century. What remained, however, were in part strategically located islands, for which at first sight unprofitable expenditures seemed worthwhile over the long term.¹⁵⁴

The excesses to which some of those ambitious U.S. missions to annex islands have led, becomes visible in the following instances. Beginning with an area, where the distance to the mainland of the USA, from a purely economic point of view, would at least offer some reasons for taking the effort to haul guano: The Caribbean Sea. The small, uninhabited island Navassa protrudes there from the water some 55 kilometers off the Haitian coast, flanked by Haiti in the east, Jamaica in the west and Cuba in the north. As mentioned before, there was a conflict between the USA and Haiti over the island of Navassa, only a few square kilometers in size. Navassa is very difficult to access, with

¹⁵⁴ *Wrighton, The Pacific Guano Rush*, 1 – 3.

meter-high, steep cliffs jutting out of the sea and sharp-edged rocks, with no shallow access. The terrain consists in parts of such sharp-edged coral rocks that almost any footwear is a risk to be slashed.¹⁵⁵

On Navassa existed considerable amounts of sedimentary rock, which were initially mistaken for guano. In fact, it was natural deposits of tricalcium phosphate, a marine sedimentary that, like phosphor guano, was suitable for the production of fertilizers. American companies mined this mineral over a longer period, widely unnoticed by the general public. When it came to the said workers' uprising in 1889, the situation changed: The incident became public and the insurgents were brought to a U.S. court in Maryland, where their employer company was registered. The defense of the insurgents, who had killed several of their foremen out of anger over inhumane treatment, argued that the case would not apply to U.S. law since Navassa was no part of U.S. territory. The justification: The lack of government officials on-site. In addition, the point was raised that Haiti was also claiming Navassa. The U.S. Supreme Court ruled, unsurprisingly, that Navassa was legally part of the U.S. territory.¹⁵⁶

¹⁵⁵ Skaggs, *The Great Guano Rush*, 171 – 172.

¹⁵⁶ Immerwahr, *How to Hide an Empire*, 54 – 56. The defendants were by order of the then U.S. President not sentenced to death after reports of a U.S. warship he had sent to Navassa for an on-site inspection had confirmed the bad conditions on site. His motivation becomes clear in his subsequent annual speech. In this he said literally: „*It is inexcusable that American laborers should be left within our own jurisdiction without access to any Government officer or tribunal for their protection.*”

But this did not change the circumstance that Haiti continued to claim the island for itself. Officially, this conflict has not been solved to this day.¹⁵⁷

The Navassa project had thus developed into a rather complex undertaking, but it also brought great territorial and political benefit to the Americans. Immerwahr describes the precedent Navassa as nothing less than the "foundation for the American overseas empire".¹⁵⁸

Considerably further distant from the U.S. mainland than Navassa are those lonely islands in the Equatorial region of the Pacific that the Americans were also heading for in order to take possession of them. As mentioned before, the islands of Baker, Jarvis and Howland are of particular importance in this context. Together with Navassa, these were among the first islands that were declared by the U.S. government to be "appertaining to the United States."¹⁵⁹

While Jarvis Island belongs to the so-called Line Islands, the islands of Baker and Howland, located northwest of Jarvis, are not part of any named island group.¹⁶⁰

¹⁵⁷ Pierre Michalle, *Haiti's Claim over Navassa Island* (Malmö 2014) 15 – 21.

¹⁵⁸ Immerwahr, *How to Hide an Empire*, 56.

¹⁵⁹ *United States Department of the Treasury, Synopsis of the Decisions of the Treasury Department on the Construction of the Tariff, Navigation, and Other Laws for the Year Ending December 31, 1885* (Washington 1886) 525 – 526.

¹⁶⁰ Hertha Arnberger, Erik Arnberger, *The Tropical Islands of the Indian and Pacific Oceans* (Vienna 2001) 240 – 241; 287.

Different actors and companies competed for these remote islands in the Pacific. Each of them wanted to be the first.¹⁶¹

The example of the Pacific Guano Company (which was also active on the nearby Phoenix Islands) shows what curiosities this race led to. It came about, that the Pacific Guano Company did not only apply the practice of occupying islands (in true and loyal accordance with the Guano Islands Act), but also designated them as their property.¹⁶²

But also, non-Americans were active in the area amidst those islands which should later turn out to be of particular importance for the United States. The British for instance maintained insular radio stations in this area.¹⁶³ And, as said before, also the Japanese were feisty on course towards the Central Pacific.¹⁶⁴

To summarize the facts at this point, there were islands in the Pacific, remote, far away from the USA, with guano deposits, which, however, were not sufficient on their own to make the barren soil fertile again at home on the American mainland. The islands were small and not exactly a livable environment, quite apart from their accessibility. But they were of strategic relevance.¹⁶⁵

¹⁶¹ Skaggs, *The Great Guano Rush*, 139 – 157.

¹⁶² *Pacific Guano Company*, *The Pacific Guano Company: Its History; Its Products and Trade; Its Relation to Agriculture. Exhausted Guano Islands of the Pacific Ocean; Howland's Island, Chiacha Islands, Etc.* (Cambridge, 1876) 7 – 8.

¹⁶³ *Immerwahr*, *How to Hide an Empire*, 341 – 342.

¹⁶⁴ *Hiraoka*, *Japanese Advance into the Pacific Ocean*, 72.

¹⁶⁵ Skaggs, *The Great Guano Rush*, 159 – 169.

Also, other world power nations seemed to be interested in the region at the time, above all the Japanese¹⁶⁶ and the British.¹⁶⁷ In the end, not all those Pacific islands, that were hastily annexed with the Guano Islands Act, actually contained guano.¹⁶⁸

What was perhaps already foreseeable at this point, if not yet occurred: The guano age was slowly drawing to a close. After the American Civil War, not only the soil was depleted, but so was the agricultural sector by itself as well.¹⁶⁹

In addition, with the end of the American Civil War, slavery was banned in the United States. As brutal as this may sound, slavery was an important value-adding factor in American agricultural economy that abruptly ceased with the end of slavery.¹⁷⁰

All of this resulted in a decrease in U.S. domestic fertilizer demand. The American fertilizer industry suddenly had to rely on Europe as a

¹⁶⁶ *Hiraoka*, Japanese Advance into the Pacific Ocean, 72.

¹⁶⁷ *Immerwahr*, How to Hide an Empire, 56.

¹⁶⁸ *United States General Accounting Office*, Report to the Chairman, Committee on Resources, House of Representatives: U.S. Insular Areas: Application of the U.S. Constitution (Washington 1997) 39.

¹⁶⁹ *Skaggs*, The Great Guano Rush, 116 – 117.

¹⁷⁰ Richard K. *Fleischman*, David *Oldroyd*, Thomas N. *Tyson*, Plantation Accounting and Management Practices in the US and the British West Indies at the End of Their Slavery Eras. In: *The Economic History Review*, Vol. 64, No. 3 (August 2011) 765 – 797.

sales market. In this context, "island guano"¹⁷¹ had a significant legal disadvantage: The Guano Islands Act had stipulated that it shall be used only by U.S. citizens. In contrast, phosphate producers on the American mainland were not subject to these restrictions. They were allowed to directly sell their products wherever and to whomever they wanted, for example to customers in Europe. By these circumstances, mining and retail of island guano became increasingly unattractive.¹⁷²

But also, from a global perspective the guano business, hitherto led by Peru, should soon get into trouble.¹⁷³

Inebriated by its victory in the saltpeter war, Chile monopolized almost all of the guano deposits of Peru and Bolivia in 1884 and, thus, gained control of the world's largest guano and saltpeter deposits. But the triumph was not unclouded since the Chilean economy was still highly dependent on exports of exhaustible natural resources. The main customers were, on the one hand, the USA, whose economy was weakened after the Civil War. And on the other side Europe.¹⁷⁴

Just there, groundbreaking things were soon to happen that hardly anyone had expected.

¹⁷¹ This means guano mined in those areas (islands) on the legal basis of the Guano Islands Act.

¹⁷² Skaggs, *The Great Guano Rush*, 116 – 117.

¹⁷³ John Peter Olinger, *The Guano Age in Peru*. In: *History Today*, Vol. 30, Iss. 6, (June 1, 1980) 13 – 18.

¹⁷⁴ Cushman, *Guano and the Opening of the Pacific World*, 71 – 75.

5 STRATEGIC SHIFT

At the end of the 19th century, the largest clustered guano deposits in the world, most of which in South America, formerly under Peruvian and meanwhile under Chilean control, were slowly running out. Guano deposits elsewhere, which contained, on an average, rather low shares in nitrogen, could not keep up with the quality of the natural nitrate deposits in South America and, apart from that, those were also about to shrink. In short, the guano age was drawing towards an ending. Natural saltpeter as it was found in Chile and in smaller depots also in other places scattered around the globe, replaced nitrogen guano to a certain extent, but could not quite keep up with guano from an economic point of view. Because in contrast to high-quality nitrogen guano as it was mined for decades in Peru, saltpeter needed to be extensively purified before it was ready to use for further application or processing. Thus, natural saltpeter was not an ideal alternative to guano. And the artificial production of saltpeter had not yet been invented.¹⁷⁵

At the same time world population was about to increase rapidly. In this context, in 1898, the British scientist William Crookes delivered a warning in a famous speech, in which he literally said:

¹⁷⁵ *Greenhill et al., The Peruvian Government and the Nitrate Trade, 1873-1879, 107 – 131.*

„The fixation of nitrogen is a question of the not-far-distant future. Unless we can class it among certainties to come, the great Caucasian race [sic!] will cease to be foremost in the world, and will be squeezed out of existence [sic!] by races to whom wheaten bread is not the staff of life.”¹⁷⁶

Under the new guiding principle with the aim to “turn air into bread”, researchers in Europe were already about to search for a process to bind atmospheric nitrogen in a chemical product that can be absorbed by plants. It was the scientific question that dominated chemical research at that time.¹⁷⁷

Leaving aside the very questionable formulations of Crookes in his speech, the fact remained that the only significant sources of natural nitrogen existed, besides the remaining depots of guano and natural saltpeter, in the form of ammonium sulfate as a waste product from the gas works and coking plants. At least, Crookes did not only draw a gloomy picture in his speech, but he also provided - at least in theory - the solution: Science would have had to manage to extract the nitrogen from the air and fixate it. Coincidence or not, at that time the

¹⁷⁶ William Crookes, Address of the President Before the British Association for the Advancement of Science, Bristol, 1898. In: Science. New Series, Vol. 8, No. 200 (Oct. 28, 1898) 561 - 575.

¹⁷⁷ A. Hermann, Haber und Bosch: Brot aus Luft - Die Ammoniaksynthese. In: Physikalische Blätter, Vol. 21, Issue 4 (April 1965) 168 – 171.

technical innovation that Crookes referred to in his speech was already ongoing, albeit in an early stage of development. Initially, the implementation of the first attempts failed due to insufficient energy balances of the developed processes. But this was due to change soon.¹⁷⁸

5.1 HABER-BOSCH: A POLITICAL WATERSHED

In 1908, the German chemist Fritz Haber achieved a scientific breakthrough: With a new process, in which high temperature and high pressure were applied, he succeeded in the artificial production of ammonia.¹⁷⁹

But the process technology was not yet suitable for a large-scale production. That changed shortly thereafter when the chemist Carl Bosch and his assistant Paul Alwin Mittasch joined in and lifted, together with Fritz Haber, the process in the German chemical company BASF to an industrial level. A few years later, the new Haber-Bosch process enabled the artificial production of ammonia in large industrial quantities. This made it possible for the first time in

¹⁷⁸ Weyer, *Geschichte der Chemie*, 213 – 214.

¹⁷⁹ With ammonia, the nitrogen in the air could be fixed and was available synthetically. At the same time, nitric acid could be obtained through the oxidation of ammonia, which also made the coveted nitrates (which ultimately mattered) accessible. (Martin Bertau, Armin Müller, Peter Fröhlich, Michael Katzberg, *Industrielle Anorganische Chemie*, (Vol. 4, (Weinheim 2013) 32.)

history to produce nitrogen fertilizers on a large industrial scale. The invention of the Haber-Bosch process resulted in not less than a tremendous increase in global agricultural yields.¹⁸⁰

But both the Haber-Bosch process and the person Fritz Haber himself are linked to very controversial, much-discussed and particularly tragic aspects.¹⁸¹

Historically, the science of chemistry is an integral part of human progress, with all aspects associated with it. The profession of chemist has not only been an important activity since chemistry as a recognized science broke away from nebulous, wicked, and

¹⁸⁰ Estimates from 2015 showed that the current world population would only be about half as large without the Haber-Bosch method. But apart from the groundbreaking innovation in food security through large-scale industrial production of artificial fertilizers, ammonia was also used in the manufacture of explosives. (*Fischer, Kühn, Brot aus der Luft und andere chemische Beiträge zur Welternährung*. In: *Chemie in unserer Zeit*, 2019-04, Vol. 53 (2), 112 – 124.)

¹⁸¹ Haber, shooting star and researcher in renowned research institutes of the German Empire, became the first scientist to lead the Central Office for Chemistry in the German War Ministry in 1915, shortly after the start of the First World War. In this role, Haber and BASF signed a contract with the military command that included the guarantee of large quantities of sodium nitrate obtained from ammonia for military purposes. Meanwhile, Haber's institute worked on military projects only. These included the production of poison gas weapons, but also the development of an insecticide made from hydrocyanic acid, on the basis of which Zyklon B was developed in 1922, which gained sad notoriety through its use in the gassing of Jews in the Third Reich. This morally questionable amalgamation of science in the service of war plunged Haber's private life into a severe crisis: His wife Clara, née Immerwahr who was, like Haber, of Jewish descent, committed in protest against Haber's activities suicide in May 1915. After the Nazis came to power in 1933, Haber bitterly left Germany and died shortly thereafter. (*Dieter Wöhrle, Lernen aus der Geschichte: Fritz Haber und Claudia Immerwahr*. In: *Chemie in unserer Zeit*, 2010-02, Vol. 44 (1), 30 – 39.)

disreputable alchemy, both in terms of achievements in the development of civilization and in destruction. When the chemical revolution began in the middle of the 18th century, a chemical industry slowly began to develop in Europe. During the 19th century, France and Great Britain became the leading nations in this field.¹⁸²

Especially in the second half of the 19th century, in the age of Imperialism and Colonialism, in which the great powers were outbidding each other with world exhibitions and progress competitions, but also in the period from the turn of the century to the First World War, chemical research and industry were of great importance. They had become an important economic factor, and, in addition, they were politically valuable. Nations that produced the best scientists were also respected in the club of the world's elite. But chemical research and industry also became a strategic tool, not least because of its potential military applications.¹⁸³

Since the dawn of modern chemistry most of the groundbreaking innovations in this field originated in Europe. Paracelsus, Lavoisier, Pasteur, Liebig, Davy, Faraday, Nobel, to name a few, were all Europeans. By 1850, chemical research and industry was firmly in

¹⁸² Fred Aftalion, *A History of the International Chemical Industry: From the Early Days to 2000*, Second Edition (Philadelphia 2001) 1 – 16.

¹⁸³ Weyer, *Geschichte der Chemie*, Band 2, 19 – 23.

British and French hands. But also, in other European countries ambitious scientists pushed their way to the top, often with government support. Soda was one of the first raw materials in Europe that was manufactured in large quantities by the chemical industry. In the USA, sulfuric acid was the first product to be manufactured in a larger chemical production facility from 1779 on, using imported raw materials and know-how from Europe. But it was not the production sulfuric acid, but rather of black powder that motivated the Americans to establish an independent chemical industry. This is where the name Du Pont (see also chapter 3.2.1) appears for the first time on American soil. In 1799, Eleuthère Irénée du Pont de Nemours, who had immigrated from France, founded the first gunpowder factory with start-up capital from his father, factory plans and machines from France. His company became the leading ammunition supplier in the United States. Du Pont initially obtained the main ingredient nitrate in the form of saltpeter from natural deposits located in Kentucky.¹⁸⁴

About 100 years later, the access to own nitrate sources and thus independence from imported guano and saltpeter were also Europe's motives to establish a process to artificially produce nitrate.¹⁸⁵

¹⁸⁴ *Aftalion*, A History of the International Chemical Industry, 1 – 16.

¹⁸⁵ *Wöhrle*, Lernen aus der Geschichte. 30 – 39.

Indeed, the Haber-Bosch process brought the long-awaited solution, but not overnight. It was rather a longer-term process¹⁸⁶, as it could be observed in history at the transition between technologies, for example with the diesel engine, which had several time-consuming intermediate steps between its invention and its technical implementation.¹⁸⁷

Nevertheless, the effect of the Haber-Bosch process was striking and made guano and natural nitrate as raw materials replaceable. After the invention and introduction of the Haber-Bosch process for the synthesis of ammonia in the early 20th century, guano, and nitrate deposits, such as saltpetre, began to lose importance.¹⁸⁸

The impact of the new Haber-Bosch process on the global guano industry raises the question of why the USA continued to claim the former Guano Islands as territorial property, although in some cases guano could no longer be extracted and, almost even more important, although guano had become obsolete. With which strategies could the USA justify or continue to legitimize the ongoing occupation of Guano islands? All of this could only be explained with a strategic

¹⁸⁶ *Weyer*, *Geschichte der Chemie*, Band 2, 214.

¹⁸⁷ *P. Meyer*, *Beiträge zur Geschichte des Dieselmotors* (Berlin/Heidelberg 1913).

¹⁸⁸ *Cushman*, *Guano and the Opening of the Pacific World*, 155.

turnaround. In consideration of these framework conditions, an American project in the Pacific puts the entire topic of the Guano Islands in a completely new light. This much can be revealed: It is about nothing less than the strategic turn in the U.S. territorial policy in the 20th century.

5.2 HUI PANALA'AU PROJECT

After guano had lost more and more of its importance at the beginning of the 20th century, due to the decreasing outcome of the already completely abraded guano islands and the newly discovered ways to generate chemical fertilizer and further products, the islands were partly abandoned. But not all the occupied islands and small islets were left behind by the United States and the American Guano Companies. In 1935, under President Franklin D. Roosevelt, the U.S. Department of Commerce and Interior embarked on a secret mission as part of the American Equatorial Islands Colonization Project, to use the former Guano Islands as a new, strategically located estate.¹⁸⁹

The islands of Baker, Howland, and Jarvis (and further, partly even smaller islands) were the scenes of a widely unknown mission with the aim to populate the islands by sending approximately 130 mostly

¹⁸⁹ Ty P *Kawika Tengan*, Re-memembering Panalā'au: Masculinities, Nation, an Empire in Hawaii and the Pacific. In: *The Contemporary Pacific*, Vol. 20 (1) (Honolulu 2008), 27 – 34.

Hawaiian pupils from the Kamehameha School, within the time span from 1935 until 1942, who were chosen by the U.S. command in charge for this project.¹⁹⁰

The military background of their mission was withheld from them. Instead, research by means of a weather station and the maintenance of an emergency runway for aircrafts in distress were stated as the reason for the alleged mission. The truth about the occupation of the islands was never given to the Hawaiians. Hawaii itself, as it is well known, got annexed by the Americans in 1898. The reason was again of a strategic nature: to serve as a military stopover for military aircrafts. Due to the geographical location as a strategic steppingstone between Hawaii and New Guinea, the United States considered particularly Howland Island as an interim base for supply and airmail flights. The U.S. military commander in charge even supported the American flight pioneer and feminist Amelia Earhardt with her attempt to be the first person and, for Amelia Earhardt as a well-known feminist and prominent fighter for women's rights from the

¹⁹⁰ Heidi *Hirsh*, The Hui Panalā'au Story of the Equatorial Pacific Islands of Howland, Baker, and Jarvis: 1935–1942. In: Oceanexplorer (online). <https://oceanexplorer.noaa.gov/oceanos/explorations/ex1705/background/jarvis/welcome.html>.

United States important to say, the first woman in history to circumvent the equator with an airplane.¹⁹¹

The young men earned three dollars a day for collecting meteorological data, building the campsite and the government house, hunting rats, and trying to distract themselves with swimming, fishing, keeping themselves fit and maintaining a good health. Now the question arises why the USA made this effort to colonize an inhospitable island with the Hui Panala'au project and to even build a government house on it. One of the reasons for this form of territorial expansion away from Imperialism and towards Colonialism would be the creation of facts and state structures, since the island has now been administered by the USA for several years and, thus, the legal protection laid down in the Guano Islands Act reads:

"[...] not under a lawful jurisdiction of any other government and not occupied by the citizens of any other government [...]".¹⁹²

On the other hand, the settlement on the islands of Howland, Baker and Jarvis serves to create a standard that would perform as the basis

¹⁹¹ Thomas F. King, Randall S. Jacobson, Karen R. Burns, Kenton Spading, Amelia Earhart's Shoes: Is the Mystery Solved? (Walnut Creek 2001) 25 – 26. (Tragically, Amelia Earhardt disappeared without a trace on her flight from New Guinea to Howland Island. To date, numerous myths and conspiracy theories have grown up around her disappearance, the circumstances of which have never been fully clarified.)

¹⁹² Skaggs, The Great Guano Rush, 227.

for the later adopted Article 121 (3) laid down in the United Nations Convention on the Law of the Sea (UNCLOS), which states:

*“Rocks which cannot sustain human habitation or economic life of their own shall have no exclusive economic zone or continental shelf.”*¹⁹³

Even though it can't be said that it was the primary intention of the United States to set a standard that they would later give a legislative character as UN-law, it had the ability to serve as a template for future standards (in terms of later UN-laws) in relation to imperialist acquisition of islands. Another reason for the colonization efforts of the islands could also be the results of the Imperial Conference under the auspices and solitary presence of the British Kingdom. The term of usable or habitable, chosen in 1923 at the so-called colonial conferences, speaks in favor of the occupation of the Guano Islands in the style of colonization to create a territorial basis for the striving of further island areas.¹⁹⁴

Since both U.S. and British guano companies searched the islands in the Pacific for guano and were equally interested in the islands as important flight routes, the U.S. department for Commerce and

¹⁹³ *United Nations*, Division for Ocean Affairs and Law of the Sea, United Nations Convention on the Law of the Sea (UNCLOS), Part VIII – Regime of Islands, Article 121 (s.l. 1982) 63.

¹⁹⁴ *Pölsler*, *The Legal Classification of Marine Rocks*, 7 – 8.

Interior initiated the occupation of the equatorial islands by means of colonization projects. This ensured supremacy due to several years of administrative management in form of a peaceful possession and thus supremacy in the sense of lawful jurisdiction as stated in the Guano Islands Act. Also, the British showed great interest in securing points in the form of islands in the central Pacific. Specifically, their interests were aimed at the Line Islands, a group of islands in the very region in the Central Pacific the Americans also were heading for.¹⁹⁵

In this context, there is even a documented incident with the British related to the colonization project with the Hawaiian students: In 1935 a group of Hawaiian students was brought to the small Island of Canton¹⁹⁶ with the order to colonize it. However, there was a British radio station there. Although the British signalman on-site had politely pointed out that the Island was British territory and complained about the raising of the American flag, the students were nevertheless dropped off on the island and the flag remained hoisted.¹⁹⁷

The Americans had obviously learned their lessons from the Navassa cause. It should not happen a second time to them, when in doubt or

¹⁹⁵ *Kawika Tengan*, Re-membering Panalā'au, 34.

¹⁹⁶ Part of today's territory of Kiribati (*The Library of Congress*, Subject Headings, 26th Edition, Volume III, I – M, 3463.)

¹⁹⁷ *Immerwahr*, How to Hide an Empire, 341 – 342.

in a dispute about island territories, to be confronted with the counterargument of missing settlement or state administrative structures.¹⁹⁸

So, it was a matter of colonizing the islands and equipping them with the appropriate state structures of whatever kind. A people for the colonization project were quickly found: the Hawaiians. These were popular with the Americans as hardworking and robust workers.¹⁹⁹



*Image 6: Government House on Howland Island
during the American Equatorial Islands Colonization Project (picture taken on January 23rd, 1937)²⁰⁰*

¹⁹⁸ Immerwahr, *How to Hide an Empire*, 54.

¹⁹⁹ McGregor, *Engaging Hawaiians in the Expansion of the U.S. Empire*, 209 – 222.

²⁰⁰ L.A.B. *Pearl Harbor*, National Archives, FOIA request (Record Group 80, Series CF), In: Wikimedia Commons (online). [https://commons.wikimedia.org/wiki/File:Government_House_on_Howland_Island_\(80-CF-79868-11\).jpg](https://commons.wikimedia.org/wiki/File:Government_House_on_Howland_Island_(80-CF-79868-11).jpg).

When the young Hawaiian students were dropped off on the islands Howland, Baker and Jarvis with canned food, drinking water and instructions to ward off intruders, of course, the raising of the U.S. flag was a must, but it could not distract from the terrible conditions on the former Guano Island. As on many other Guano Islands, the Hui Panala'au fought with an out-of-control plague of rats, which found their way as stowaways on the ships of the Guano Companies.²⁰¹

The author Daniel Immerwahr describes the scenario as follows:

*"The resulting scenario was surreal, half Heart of Darkness, half Salvador Dalí. At the very least, it would make a striking diorama: four Hawaiians eating out of crates, waiting for a famous aviator who would never arrive on a tiny, poisoned island that was littered with guano, crab vomit and dead rats. And the Stars and Stripes flapping crisply in the breeze."*²⁰²

The situation on the islands was characterized by dirt, heat and the overpopulation of rats and mice. However, after the illegal overthrow of the Hawaiian government by the U.S. Army after 1883, living conditions on the home island of the mostly Hawaiian colonizers were marked by a sharp decimation of the population due to imported diseases and excessive immigration of Asian workers, causing the

²⁰¹ Immerwahr, *How to Hide an Empire*, 341.

²⁰² Immerwahr, *How to Hide an Empire*, 342.

unemployment rate to rise to 40 percent. Driven by the hopelessness in their homeland and the promises of the U.S. government, many Hawaiians took the opportunity to participate in the supposed research project. Due to the Hawaiians' alleged adaptability to the prevailing conditions and their ability to support themselves based on their local origin, they appeared to be suitable candidates for colonization. The mission at the equator took place for almost seven years in the shadow of the gradually threatening conflict between the Kingdom of Japan and the USA. Already the search of the great powers for islands to be conquered as well as the search for raw materials such as guano led to territorial tensions and the effects of this also felt the men on the former guano islands.²⁰³

The secret mission ended abruptly on December 8, 1942, when Japanese bombers attacked Howland, Jarvis, and Baker islands, just one day after the attack on Pearl Harbor. The airstrip built by the Hui Panala'au and the lighthouse were destroyed, and two men were killed. The rest of the island's crew was evacuated a little later. In memory of the pilot Amelia Earhardt, the light tower was rebuilt after the end of the Second World War.²⁰⁴

²⁰³ *Kawika Tengan*, Re-membering Panala'au, 29 – 30.

²⁰⁴ *Kawika Tengan*, Re-membering Panala'au, 27.

Due to the advancing wave of worldwide decolonization in the late 20th century and the anti-imperialist current associated with it, many colonial powers lost their territories. The USA und President Harry Truman, promised not to pursue any more colonial intentions, but only to continue to maintain the most necessary military bases in a completely selfless manner in the interests of security and world peace.²⁰⁵

6 IMPLICATIONS ON CURRENT TIMES

This chapter treats the consequences of the Guano Island Act on the present day and what justifications validate the continued occupation of the Guano Islands, which had now been widely excavated. Of the about 100 taken islands, based on the Guano Islands Act, the following Islands are still parts of today's U.S. Territory: Howland, Baker, Jarvis, Navassa, Petrel, Kingman Reef, Johnston Atoll, Palmyra Atoll and Seranilla Banks.²⁰⁶

Among other things, it deals with the question of what has become of the many Guano Islands and what function they play today. In a number of cases, it is likely that these will perform strategic tasks

²⁰⁵ *Immerwahr*, How to Hide an Empire, 343 – 344.

²⁰⁶ U.S. Department of the Interior, Office of Insular Affairs, Acquisition Process of Insular Areas (online). <https://www.doi.gov/oia/islands/acquisitionprocess>.

under the guise of other uses. In addition to the legacy of the Guano Islands Act and the American guano policy from the 19th century, this chapter also fulfils a holistic point of view in order to open the findings that came to light during the research to the readers of this thesis. At the very beginning when researching the question of what role guano plays today, one comes across surprising images: Believing to first look at historical images from the 19th century, it becomes clear only at second glance that these are current photos. Even if guano is no longer a global economic factor, it is still mined today, with methods that have apparently not changed in the last 150 years. With the simplest tools workers, without any protective equipment, covered with guano dust and surrounded by thousands of seabirds, scrape guano, shovel it into sacks and drag them under the scorching sun onto a meter-high sieve tower.²⁰⁷

²⁰⁷ Nell *Durfee*, Holy Crap! A Trip to the World's Largest Guano-Producing Islands. In: Audubon, April 27, 2018 (online edition). <https://www.audubon.org/news/holy-crap-trip-worlds-largest-guano-producing-islands>.



Image 7: A picture like 150 years ago: Workers in the year 2018 on a Peruvian guano island

Photo: Ernesto Benavides, National Audubon Society²⁰⁷

The picture comes from the Chincha Islands off the coast of Peru, precisely those islands that were once the center of the global guano business of the 19th century, for which people even fought and which served as a main source of income for the entire Peruvian state. The guano mountains which were over 60 meters high at the time, exist no longer today, but there are still considerable guano deposits on the islands, which are now being mined again for several years. Rising costs for synthetic fertilizers combined with the trend towards organic farming have stimulated demand for guano again. Still, nobody is anticipating a resurgence of a guano boom. Not least because of overfishing has resulted in the severe depletion of the seabird population (and thus in the reproduction of the guano layers). The state of Peru, to which these islands belong, is now paying attention

to the environment and is taking action against poachers. And after all, the workers on site earn a few hundred dollars a month, much more the wage of a simple worker on the mainland, albeit under working conditions from the 19th century.²⁰⁸

In this context, the consequences of the guano age and the associated disputes over guano and saltpeter in Peru and Chile at the end of the 19th century have to be seen. The most important mining sites had come into the possession of private British companies at that time. Since guano in Peru and saltpeter in Chile were central economic factors, British companies controlled a large part of the guano economy in this region. This led to a downright sell-off and external control of these countries by British corporations.²⁰⁹

These effects are still visible today, where the wealth of resources of countries hardly reaches the population (with Peru and Chile being just two of many countries where this applies to).²¹⁰

²⁰⁸ *Durfee*, Holy Crap! A Trip to the World's Largest Guano-Producing Islands, s.p.

²⁰⁹ *Wienecke-Janzen*, Die Große Chronik: Weltgeschichte, 93.

²¹⁰ Markus *Porsche-Ludwig*, Wolfgang *Gieler*, Jürgen *Bellers*, (Ed.), Sozialpolitik in Entwicklungsländern: Asien, Afrika, Lateinamerika - Ein Handbuch (Berlin 2013) 49 – 51.

6.1 DOUBTFUL LEGACY

Elsewhere, in the age of the guano mania of the 19th century, under the title of the Guano Islands Act, entire islands with guano deposits were exhausted and eroded. Through this, entire ecosystems were left behind destroyed.²¹¹

In addition, guano miners introduced, with their vessels, invasive species in some places. As a result of guano mining the release of environmental toxins caused damage to ecosystems.²¹²

Some islands have been used as testing grounds for secret military weapons tests. For example, biological and chemical weapons tests were carried out on Baker Island in 1965. At least that is what official congress documents show. On the contrary, the national U.S. authority in charge, the U.S. Fish & Wildlife Service, reports, also in an official document about Baker Island, that although military nuclear tests were planned there in 1963, that these were never carried out on Baker Island and had been moved to Johnston Atoll instead.²¹³

²¹¹ Stöven et al., Guano, 203 – 206.

²¹² Hardach, The Rats Invicted From Paradise, s.p.

²¹³ U.S. Fish & Wildlife Service, *Pacific Remote Islands National Wildlife Refuge Complex, Baker Island National Wildlife Refuge, Draft Comprehensive Conservation Plan and Environmental Assessment* (Honolulu 2007) 3-18.

There is more to report about the Johnston Atoll, which is located further north, roughly 1,400 kilometers southwest of Hawaii in the Pacific. In the northern part of the ring-shaped atoll, which was occupied by the Americans in 1859 under the title of the Guano Islands Act, lies Johnston Island, whose present appearance on the satellite image rather reminds of an aircraft carrier than an island. Just before the Second World War, the Americans began to transform the island into a military base. It is a place where the United States have hardly left out anything in terms of military experiments: Chemical weapons tests, storage, and disposal of (radioactive and chemically contaminated) toxic waste, hydrogen bomb tests, nuclear missile tests. Particularly in the 1960s numerous nuclear weapon tests²¹⁴ followed, several which failed and thereby seriously contaminated the area.²¹⁵

In addition to numerous tests with nuclear weapons, the topography of the atoll was significantly changed by the extensive filling of

²¹⁴ In 1962 alone, under the code name "Operation Dominic", a total of 36 tests with nuclear explosives were carried out on Johnston Island and (U.S.) Christmas Island (now Kiritimati, an island of the Republic of Kiribati), 11 of them on Johnston Island (Gary *Sublette*, Operation Dominic, In: The Nuclear Weapon Archive (online). <https://nuclearweaponarchive.org/Usa/Tests/Dominic.html>).

²¹⁵ The military operations "Starfish Prime", "Bluefish Prime" or "Bluegill Double Prime", for example, should be mentioned here, all of which failed due to the premature detonation of the nuclear warheads and thereby massively contaminated the entire area. (Eckart *Garbe*, Johnston – Die traurige Geschichte eines Geheim-Atolls. In: TAZ, 21 July 1990 (online edition). <https://taz.de/!1758944/>).

artificial land masses with coral rubble. Even two artificial islands were banked up, which increased the total land area twelve-fold in relation to the original land mass of Johnston Atoll. After the information about an incident in 1969 in a U.S. chemical weapons depot on the Japanese Pacific Island of Okinawa became public, all chemical weapons stored there were hastily moved to Johnston Island.²¹⁶

The originally planned transport from Johnston Island to a depot in the U.S. state of Oregon failed due to a U.S. law prohibiting the return of chemical weapons in U.S. federal states. Thereby, Johnston Island as a part of the Johnston Atoll with the status of a U.S. outer area became a permanent poison gas depot.²¹⁷

In 1972, U.S. forces also brought huge amounts of the highly toxic defoliant "Agent Orange" from the Vietnam War to Johnston Island, which was devastated by a severe storm shortly afterwards, causing the poison barrels stored there to partially leak. When the rusty Agent Orange barrels threatened to become an insoluble problem, the U.S.

²¹⁶ The transportation of the chemical weapons stocks from Okinawa to Johnston Island went under the code name "Operation Red Hat". The operation was named after the peculiar custom of the soldiers of the military guards unit of Johnston Island, who used to wear red hats on duty. (*Garbe, Johnston, s.p.*)

²¹⁷ *Garbe, Johnston, s.p.*

military secretly carried them onto a chartered civilian ship and burned the chemicals on the open sea. When the U.S. decided to destroy all old chemical weapons stocks, Johnston became the central location for this mission. This is how the Johnston Atoll Chemical Agent Disposal System (JACADS) was created in 1983, a chemical weapons destruction facility with an industrial incinerator as a core element. JACADS was originally only planned as a pilot project to develop chemical weapons destruction facilities that would later be used at the eight other chemical weapons storage locations in the United States. On Johnston Island itself the U.S. initially only wanted to destroy the stocks of chemical weapons from Okinawa. But it turned out differently. In the absence of alternatives, old stocks of chemical weapons from European²¹⁸ chemical storage facilities of the U.S. Army, including the highly toxic nerve gases Sarin and VX, were brought to Johnston to be destroyed in the JACADS facility. However, the term “destruction” should not be confused with rendering harmless, because the highly toxic hazardous waste that resulted from the destruction of these chemical weapons still had to be disposed of. A simple solution was found for the highly toxic exhaust gases: They were blown into the air. There is no reliable information on how the

²¹⁸ The removal of the US chemical weapons stocks in Germany took place under the code name “Operation Lindwurm” in September 1990 (Helmut R. Hammerich, Dieter H. Kollmer, Martin Rink, Rudolf J. Schlaffer, *Das Heer 1950 bis 1970: Konzeption, Organisation und Aufstellung* (München 2006) 776.)

rest, including highly toxic broth and ash, was ultimately disposed. In the past, these had always been dumped into the sea. In 1988 a U.S. law officially prohibited "ocean dumping" in the USA.²¹⁹

Reliable information on the disposal of toxic waste from this point on until the closure of JACADS could not be determined at this point. After the completion of the JACADS program in the year 2000 and the official end of the program one year later, the plant was dismantled in 2003. Most of the 150 buildings (including desalination and power plants, barracks, and residential buildings, but also leisure facilities such as a bowling alley, an open-air theater, an exhibition hall, a gym, a library, and a post office) were demolished.²²⁰

Out of the high number of large above-ground buildings, only the former Joint Operations Center, a hurricane-proof construction, remains today in addition to underground bunkers.²²¹

²¹⁹ Garbe, Johnston, s.p.

²²⁰ Gregg K. *Kakesako*, Johnston Atoll: The end of an era. In: Honolulu Star-Bulletin, 6 Nov. 2003 (online edition). <http://archives.starbulletin.com/2003/11/06/news/story3.html>.

²²¹ Alisa *Opar*, One Remote Island's Battle Against Acid-Spewing Ants. In: Audubon, July – August 2015 (online edition). <https://www.audubon.org/magazine/july-august-2015/one-remote-islands-battle-against-acid>.

6.2 GREENWASHING

The Johnston Atoll and most of the islands that were occupied by the USA under the Guano Islands Act and which still belong to the USA²²² are today listed as “National Wildlife Refuges”. The islands and their surrounding areas are under regulatory control of the U.S. federal agency Fish & Wildlife Service. Its public website suggests the impression of entirely intact ecosystems.²²³

Interestingly, most of these places had already been declared as nature reserves in the 1920s, thus, prior to any nuclear testing activities. The U.S. Navy was entrusted with the guarding of these nature reserves after the Second World War.²²⁴

This fact can be seen as evidence for the connection between environmental and territorial policy and the legitimacy of continuation of ownership claims. The author Mark J. Rauzon offers in his book “Isles of Amnesia” an interesting history of the former guano islands, being exploited, and used for many years until today’s existence as a Marine National Monument and National Wildlife

²²² U.S. Department of the Interior, Office of Insular Affairs, Acquisition Process of Insular Areas (online). <https://www.doi.gov/oia/islands/acquisitionprocess>.

²²³ U.S. Fish & Wildlife Service, National Wildlife Refuge, U.S. Minor Outlying Islands, Johnston Atoll (online). https://www.fws.gov/refuge/Johnston_Atoll/about.html.

²²⁴ United States General Accounting Office, Report to the Chairman, Committee on Resources, House of Representatives: U.S. Insular Areas: Application of the U.S. Constitution (Washington 1997).

Refuges. This book might be used as a good overview of the island history, though the content of the book must be seen quite critical as well, amongst other things due to his statement:

*“Because the United States have some of the strongest environmental regulations in the world [...]”*²²⁵

Due to the doubtful position of the author in terms of the United States’ environmental protection standards, this source is to be seen with reserve.

On the other side of the U.S. mainland, in the Caribbean Sea the island of Navassa, which has already been discussed earlier (see Chapter 3.2.2) is also managed as a Natural Wildlife Refuge. The U.S. declares the Navassa Refuge to belong to the U.S. outer area of Puerto Rico. In fact, to this day Haiti and the USA both claim the island, which is strictly guarded by the USA as a restricted area.²²⁶

But the Americans have also transferred numerous guano islands that they apparently no longer needed. So, it came to assignments of islands among others to Mexico, Venezuela or the Dominican Republic, but most of the former Guano Islands, precisely 17, were

²²⁵ Rauzon, *Isles of Amnesia*, 3.

²²⁶ U.S. Fish & Wildlife Service, *National Wildlife Refuge, U.S. Minor Outlying Islands*, Navassa (online). https://www.fws.gov/refuge/navassa_island/.

transferred to the Republic of Kiribati in the Central Pacific in 1979, its founding year.²²⁷

About two decades later, Kiribati applied to the USA for fishing rights in the Exclusive Economic Zone (EEZ) of Baker Island, a guano island that is still owned by the USA and, according to the USA, is now subject of "no current economic uses". The United States rejected the request of the Republic of Kiribati.²²⁸

A similar case represents Runit Island, a part of the Enewetak Atoll on what is now the Marshall Islands, even if Runit did not come into possession of the United States by way of the Guano Islands Act.²²⁹

6.3 DEEP HOPES

From the examples mentioned above, it can be guessed that the return of former Guano Islands by the USA depended on the extent to which

²²⁷ Skaggs, *The Great Guano Rush*, 230 – 236.

²²⁸ U.S. Fish & Wildlife Service, *Pacific Remote Islands National Wildlife Refuge Complex*, Baker Island National Wildlife Refuge, 3-18.

²²⁹ Runit, like many other islands in the region, was severely contaminated in the course of a large series of nuclear and biological weapons tests by the U.S. in Enewetak and Bikini Atoll between 1946 and 1958. The USA returned them to the government of the Marshall Islands as "decontaminated" in the late 1970s, with a makeshift nuclear waste storage facility on Runit. The USA has since shirked all responsibility. What the USA did, however, was to clear the sarcophagus of anti-American graffiti with the call to the USA to take responsibility. (*Max-Planck-Institut für chemische Energiekonversion*, US-Atommüll-Deponie im Pazifik droht aufzubrechen (9 Dec. 2019) s.p.)

they could still be of use. Since raw materials have always had an influence on political decisions, the idea of keeping certain islands in part because raw materials such as oil or gas could still be found in the vicinity cannot be dismissed out of hand. In any case, the USA had started to setup strategic storage facilities in 1939 and continued to expand them after the Second World War and the Korean War.²³⁰

As far as the mineral oil resource is concerned, the U.S. Geological Survey has developed a resource extraction principle that, in simple terms, justifies the exploitation of harder-to-reach deposits with increasing prices with the aid of better technology. In any case, the global, decentralized, concentrated pattern of oil deposits does not rule out oil deposits in remote locations (e.g. in the central Pacific). In line with this, deep-water extraction possibilities have technically improved in the last few decades.²³¹

There are also generous research grants for the development of deep-water mining projects. The EU for instance invested more than 65 million euros in research and development projects in the field of deep-water mining between 2002 and 2016.²³²

²³⁰ Werner Gocht, *Wirtschaftsgeologie und Rohstoffpolitik: Untersuchung, Erschließung, Bewertung, Verteilung und Nutzung mineralischer Rohstoffe* (Berlin/Heidelberg/New York/Tokyo 1983) 156 – 158; 179.

²³¹ Steffen Bukold, *Öl im 21. Jahrhundert - Band I: Grundlagen und Kernprobleme* (München 2009) 70 – 75.

²³² *Seas at Risk*, Deep Sea mining: Exploring the unknowns (Brussels 2016), 3.

Information on the exact location of oil and gas drilling rigs in the seas is scarce, but there was an increase in oil and gas drilling rigs in the Asia-Pacific region between 1990 and 2019.²³³

In 2020 Russia found abundant oil and gas reserves off the island of Sakhalin in the Sea of Okhotsk, north of Japan.²³⁴

The US maritime strategy in the 21st century, which involves a shift towards the Pacific and Asia, is to "guarantee access to resources and markets in peacetime as in war". Increased importance is attached to the navy and the control of the marine areas, also in order to secure any claims to resources.²³⁵

In any case, all these facts suggest that the possession of islands in the Central Pacific can at least be an area of hope in terms of raw materials policy.

²³³ Mathias Brandt, Öl und Gas vom Meeresgrund. In: Statista, 13 March 2020, (online). <https://de.statista.com/infografik/21115/anzahl-der-offshore-oel-und-gasbohrinseln-weltweit/>.

²³⁴ WWF, Energiehunger gefährdet die Letzten ihrer Art, 9 June 2020 (online). <https://www.wwf.de/themen-projekte/bedrohte-tier-und-pflanzenarten/wale-und-delfine/bartenwale/westpazifische-grauwale>.

²³⁵ Michael Paul, Kriegsgefahr im Pazifik? Die maritime Bedeutung der sino-amerikanischen Rivalität (Baden-Baden 2017) 158; 175.

7 SUMMARY AND CONCLUSION

Unknown for a long time, discovered by accident, triggering a rush and, as quickly as it came, it disappeared both physically and from people's minds. This might briefly summarize the history of guano for the Western world. But that was by far not all. Surprisingly, many facts about the stone-like, powdery material, which was already used as fertilizer by the Inca, and which is subject to a turbulent history, are largely unknown today. As in many cases in history, its discovery was rather unintentional. Even if the German researcher Alexander von Humboldt was not the first to hold the unsightly material consisting of sedimented bird manure in his hands, Humboldt is still considered by many to be the discoverer of guano for the Western world. At that time, Humboldt was probably not aware of what he had found and that the malodorous and caustic substance he discovered should not only activate enormous demand, but also tremendous human suffering, wars, and relentless overexploitation of nature.

However, it was not only the properties as a fertilizer that made guano interesting, but also the contained nitrates, which made guano irreplaceable as an important source of nitrogen, a chemical element that is also used to produce gunpowder and explosives. These characteristics were presumably not of sole relevance for the United States of America. With high probability, guano also served to

legitimize their pursuit of territorial expansion leading to entering the game of the Club of the Great Powers, which was previously only reserved for European nations.

The United States laid the foundation for their extension with the aid of a specific law based on guano, the Guano Islands Act. This specific law adopted in 1865 allows any American citizen to haul guano deposits on any uninhabited stateless island on the globe (theoretically until today, because the law is still in force). About 100 islands in the Caribbean and the Pacific were hereby declared to belong to the USA.

This is where the beneficiaries of the Guano Islands Act then and now come into play. Contrary to what was assumed in the initial hypothesis, there are today only a few prominent names left by the decision-makers and key players of the time, such as Du Pont. Most of the names of the companies that were the first to benefit from the new raw material guano, and that were on the winning side of a new raw material industry, are hardly known today. But the structures created at that time are still deeply anchored in the economic and social structure of the USA. The history of guano is thus also a history of corporate Capitalism, which is prototypical for the USA.

On the losing side of the Guano Islands Act, there are, in addition to the environment, which was ruthlessly overexploited to mine guano, countless people who toiled for this system under inhumane

conditions and whose names mostly did not make it into the history books. On the subject of inhumanity, the term slavery needs to be addressed here, which the USA knew how to interpret skillfully in the context of the Guano Island Act. Due to the vague formulation of the term "appertaining", the Guano Islands did not belong directly to U.S. territory, which meant that civil rights were not applied there.

This supports the hypothesis that the USA have avoided their responsibility to comply with basic rights and laws with the special form of territorial expansion triggered by the Guano Islands Act and the associated special legal status of the Guano Islands. The fact that slavery was banned in the United States at the time while people were being exploited on the Guano Islands under slave-like conditions supports this assumption.

Undeterred by this and fired by a new self-confidence that saw the expansion of the United States as a divine order under the name Manifest Destiny and with the help of the Guano Islands Act, the United States developed from the previously prevailing Continentalism to Imperialism.

A race for supremacy in the Pacific area in terms of global power structure also played a role here. Likewise, the Japanese showed great interest in the strategically important steppingstones between the American and Asian continents, without looking for guano. The

Americans were therefore in a particular hurry to secure as many islands as possible in the Pacific area to lead the competition. Mostly unknown islands in the Central and South Pacific were hastily annexed, but also Hawaii, which was of strategic importance for the U.S. for trade with China. But also taking a liking to the strong, skilled, and hardworking Hawaiian workers. Probably for this reason too, it was Hawaiians who were used by the Americans for a colonization experiment on previously uninhabited remote Pacific Island.

The fact that the United States continued their commitment to the islands in the Central and South Pacific even after it became clear that the guano from this region, due to its low nitrogen content, could not be used as fertilizer without chemical processing and was therefore inconvenient for both as a ready-to use fertilizer and for other industrial applications, such as ammunition or explosives production, underpins the hypothesis that these islands were mainly of strategic importance. In addition, the United States continued to hold onto the islands in the Pacific, despite the high transportation costs from the South Pacific (which made guano there unattractive on the domestic market), declining deposits of guano and beyond the invention of the ammonia synthesis.

However, not as originally assumed as a hypothesis of this work, the Haber-Bosch process did not make guano obsolete overnight.

Although it was a revolutionary invention, it first had to be industrially established). Nevertheless, preceding facts are rather indicative for territorial-political interests than for environmental protection, food security or serving the needs for industrial raw material. The latter reasons seemed to serve as a domestic political legitimacy for U.S.-American territorial-political ambitions.

All these indications only became apparent during the research on this topic and support the hypothesis that guano and the Guano Islands Act served as the initial spark for American Imperialism.

The current legacy of the Guano Islands is doubtful: of the about 100 islands that were hurriedly sought out under the title of the Guano Islands Act, a total of nine islands, atolls and archipelagos remain today. Most of them are used for military purposes today. Interestingly, these are used by the U.S. National Park Administration. Fish & Wildlife Service administered as nature reserves. Whereby there can be no question of nature conservation, as the Johnston Atoll shows in a sad way. Numerous nuclear tests were carried out here between the 1960s and the early 2000s, and nuclear and chemical waste was disposed of.

Even in the global race for raw materials, there are still hopes that fossil raw materials will occur in remote areas, as current research

activities of practically all major powers in the field of deep-water mining show.

The story of guano is thus not only the story of a raw material, but also the story of capitalistic Extractivism. The Guano Islands Act with its sphere of influence laid the foundation for American Expansionism and Imperialism. The effects of the Guano Islands Act have probably far exceeded the original intentions of the founders.

The Guano Islands Act symbolizes many aspects of humanity: the striving of people for progress and expansion, for security and food, for power and wealth. And it also stands for how people tend to misuse things and instrumentalize them. In this way, virtuous goals and visions can turn into horror scenarios many years later. In the history of mankind, it becomes visible again and again how man tends to misuse and exploit things and thereby lie to himself.

There are always two sides to this. For example, research and destruction are often closely related (see Haber-Bosch, but also Johnston Island). All those thugs who blindly implement immoral ideas have a very limited picture.

Changing things always starts with showing them. Make education, information, and connections visible. To show connections that -

mostly consciously - were not written in the history books by the respective rulers. That is the strength of Global History.

As a result, the chapter of the Guano Islands Act of 1856 will probably not be closed in the future and will still offer a basis for a wide variety of research areas many times over.

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9 APPENDIX

9.1 REGISTER OF IMAGES

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9.2 ABSTRAKT (DEUTSCH)

Diese Masterarbeit untersucht die Rolle des Guano Islands Act von 1856 auf die territorialpolitische Geschichte der USA im 19. Jahrhundert bis zu den Auswirkungen auf die heutige Zeit. Die Verabschiedung des Gesetzes wurde als Startschuss für den amerikanischen Imperialismus und dessen außerkontinentale Expansion betrachtet, wodurch unter dem Deckmantel des wirtschaftlichen Rohstoffabbaus durch Extraktivismus die eigentliche Intention der militärstrategischen Erweiterung verborgen blieb. Die Tatsache, dass die Qualität des Guanos nicht den betriebenen Aufwand rechtfertigte, bestätigt die Hypothese, dass der Guano Islands Act von Anbeginn geopolitische Interessen vertrat. Auch durch dessen vage Formulierung konnte das spätere Sklaverei-Verbot umgangen werden, wodurch man mit dieser Politik die Interessen der Wirtschaft vor die Interessen der Bevölkerung stellte. Als weiteres Argument für den Expansionswillen der USA beschreibt diese Arbeit die Versuche der kolonialistischen Okkupation der Inseln Howland, Baker und Jarvis, welche, wie einige andere der über 100 besetzten Inseln, auch nach dem totalen Raubbau des Guanos weiterhin als militärstrategisch relevante Inseln besetzt und genutzt wurden. Im letzten Kapitel untersucht diese Masterarbeit am Beispiel des hochgradig atomar und chemisch verseuchten Johnston Atolls die Auswirkungen des Guano Islands Act auf die heutige Zeit. Dort wurden Atomwaffentests durchgeführt und Giftmüll wie Agent Orange gelagert und entsorgt. Offiziell werden die unter dem Vorwand des Natur- und Meeresschutzes weiterhin besetzten Guano Inseln nicht mehr militärisch genutzt, zählen jedoch immer noch zum U.S.-Staatsgebiet.

9.3 POEM ABOUT GUANO

Lob des Guano

Ich weiß eine friedliche Stelle
Im schweigenden Ocean;
Krystallklar schäumt die Welle
Am Felsengestade hinan.

Im Hafen erblickst Du kein Segel,
Keines Menschen Fußtritt am Strand,
Viel tausend reinliche Vögel
Behüten das einsame Land.

Die Vögel sind all' Philosophen;
Ihr oberster Grundsatz gebeut:
Den Leib halt allezeit offen,
Und alles Andre gedeiht.

Sie sitzen in frommer Beschauung,
Kein Einz'ger versäumt seine Pflicht;
Gesegnet ist ihre Verdauung
Und flüssig als wie ein Gedicht.

Was die Väter geräuschlos begonnen,
Die Enkel vollenden das Werk,
Geläutert von tropischen Sonnen;
Schon thürmt es empor sich zum Berg.

Sie schauen im rosigsten Lichte
Die Zukunft und sprechen in Ruh:
Wir bauen im Lauf der Geschichte
Noch den ganzen Ocean zu.

Und die Anerkennung der Besten
Fehlt ihren Bestrebungen nicht;
Denn fern im schwäbischen Westen
Der Böblinger Rapsbauer spricht:

Gott segn' euch, ihr trefflichen Vögel,
An der fernen Guanoküst',
Trotz meinem Landsmann, dem Hegel,
Gebt ihr den gediegensten Mist.

Praise of the guano

*I know a peaceful place
In the silent ocean;
Crystal clear the wave foams up
On the rocky outcrop.*

*In the harbour you do not see a sail,
No one's footstep on the beach,
Thousands of neat birds
Guard the lonely land.*

*The birds are all philosophers;
Their supreme principle demands:
Always hold open the womb,
And everything else thrives.*

*They sit in pious contemplation,
Not one of them neglects his duty;
Blessed is their digestion
And fluent as a poem.*

*What the fathers began silently,
The grandchildren complete the work,
Purified by tropical suns;
It piles up to a mountain.*

*They see in the rosiest light
The future and speak in silence:
We fill up in the course of history
The entire ocean.*

*And the recognition of the best
Do not miss their efforts;
Since far away in the Swabian West
The rapeseed farmer from Böblingen speaks:*

*God bless you excellent birds,
At the far guano coast,
In spite of my compatriot Hegel,
You give the most solid muck.*

9.4 ORIGINAL TEXT OF THE GUANO ISLANDS ACT OF 1856²³⁶

CHAP. CLXIV.—An Act to authorize Protection to be given to Citizens of the United States who may discover Deposites of Guano. Aug 18, 1856.

Be it enacted by the Senate and House of Representatives of the United States of America in Congress assembled, That when any citizen or citizens of the United States may have discovered, or shall hereafter discover, a deposit of guano on any island, rock, or key not within the lawful jurisdiction of any other government, and not occupied by the citizens of any other government, and shall take peaceable possession thereof, and occupy the same, said island, rock, or key may, at the discretion of the President of the United States, be considered as appertaining to the United States: *Provided, however,* That notice be given by such discoverer or discoverers, as soon as practicable, to the State Department of the United States, of such discovery, occupation, and possession, verified by affidavit, describing said island, rock, or key, and the latitude and longitude thereof, as near as may be, and showing that such possession was taken in the name of the United States, and that satisfactory evidence be furnished to the State Department that such island, rock, or key was not, at the time of the discovery thereof, or of the taking possession and occupation thereof by the claimants, in the possession or occupation of any other government or of the citizens of any other government.

Guano islands discovered by citizens and not belonging to other countries, may be considered as appertaining to the United States.

Proviso.

SEC. 2. *And be it further enacted,* That the said discoverer or discoverers, or his or their assigns, being citizens of the United States, may be allowed, at the pleasure of Congress, the exclusive right of occupying said island, rocks, or keys, for the purpose of obtaining said guano, and of selling and delivering the same to citizens of the United States, for the purpose of being used therein, and may be allowed to charge and receive for every ton thereof delivered alongside a vessel, in proper tubs, within reach of ship's tackle, a sum not exceeding eight dollars per ton for the best quality, or four dollars per ton in its native place of deposit: *Provided, however,* That no guano shall be taken from said island, rock, or key, except for the use of the citizens of the United States, or of persons resident therein, as aforesaid. *And provided, also,* That said discoverer or discoverers, or his or their assigns, shall first enter into bonds, with such penalties or securities as may be required by the President, to deliver the said guano to citizens of the United States, for the purpose of being used therein, and to none others, and at the price aforesaid, and to provide all necessary facilities for that purpose within a time to be fixed

Rights of discoverers in such cases.

Provisos.

in said bond. And any breach of the provisions thereof shall be taken and deemed a forfeiture of all rights accruing under and by virtue of this act.

SEC. 3. *And be it further enacted,* That the introduction of guano from such islands, rocks, or keys, shall be regulated as in the coasting trade between different parts of the United States, and the same laws shall govern the vessels concerned therein.

SEC. 4. *And be it further enacted,* That nothing in this act contained shall be construed obligatory on the United States to retain possession of the islands, rocks, or keys, as aforesaid, after the guano shall have been removed from the same.

SEC. 5. *And be it further enacted,* That the President of the United States is hereby authorized, at his discretion, to employ the land and naval forces of the United States to protect the rights of the said discoverer or discoverers or their assigns, as aforesaid.

SEC. 6. *And be it further enacted,* That until otherwise provided by law, all acts done, and offences or crimes committed, on every such island, rocks, or keys, by persons who may land thereon, or in the waters adjacent thereto, shall be held and deemed to have been done or committed on the high seas, on board a merchant ship or vessel belonging to the United States, and be punished according to the laws of the United States relating to such ships or vessels and offences on the high seas; which laws, for the purposes aforesaid, are hereby extended to and over such islands, rocks, or keys.

APPROVED, August 18, 1856.

Transportation of such guano, how regulated.

United States not bound to retain such islands.

Land and naval forces may be employed to enforce said rights.

Provision against crimes on such islands.

²³⁶ The Library of Congress, Statutes at Large, 34th Congress, 1st Session (online) 119 – 120. (Extracted by the author)