Motives for Introducing Species:
Palestine’s Carp as a Case Study

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Abstract
Species' introductions might lead to biological invasions, which in turn pose a serious threat to global biodiversity. There is a good deal of research about the ecological and physiological aspects of introductions and invasions, but there has been relatively little research into the social and economic motives which initiate such species' introduction. One common assumption relates introductions to ethnic cultural traditions, while another assumption connects them to economic reasons. Taking the introduction of the common carp (Cyprinus carpio) to Palestine's freshwaters in the 1930's, this article examines the contribution of such cultural and economic motives to the process while suggesting a third motive, an intellectual one. The article concludes by assessing the ways these three motives may still be intertwined in introduction processes in the modern era.

Introduction
On the bright summer day of July 11th, 1934, a sixty-nine year old gentleman of Scottish origin arrived at Jerusalem, the center of British colonial administration in Palestine at the time. “Late Director of Fisheries with the Government of Madras, and Fishery Adviser to the governments of Sierra Leone, Mauritius, the Seychelles, Malta and Baroda”, Mr. James Hornell was directed by His Majesty's High Commissioner for
Palestine “to carry out a survey of the fishery resources of the country, with a view to propose measures for their improvement”.¹

Those improvements included modernizing the marine fishing fleet, renovating harbour facilities, regulating fishing work, building curing and canning plants and, last but not least, building fish ponds and stocking them with newly introduced fish species. The introduction of one of those fish species, the common carp (Cyprinus carpio), was so successful that eleven years later Palestine became a carp exporter, as Palestinian fish hatcheries supplied fingerlings for the introduction of this species to Cyprus.² At that time, neither Hornell nor the other people who worked on implementing his recommendations suspected that some of the fish they were introducing bear a potential hazard to ecological systems. Namely, those species were alien invasives.

Biological invasions create both direct and indirect problems to humans. Invasive species not only affect other specific species, but can also change drastically whole ecosystems. Such biological invasions pose a serious threat to global biodiversity, second only to habitat destruction, in bringing species to their extinction.³ Furthermore, invasive species cause damages whose costs are estimated in billions of $ US.⁴ As commonly understood, biological invasions are the result of humans introducing species into their non-native habitats. Such an introduction might take two basic forms, differing not in their possible outcomes but rather in their primary causes: the first form is an unintended, accidental delivery (such as rats boarding a ship, or ants coming inside row wood logs), where humans are nothing more than blind – even if somewhat careless – bearers of the invasive species.⁵ The second is a planned, deliberate introduction of a species, which then goes out of control, and spreads beyond the limits designated for it by its human

³ Daniel Simberloff, Biological Invasions – How Are They Affecting Us, And What Can We Do About Them?, Western North American Naturalist 61(3) 2001, pp. 308-315.
introducers. Although most introduced species do not survive in their new habitat, some of them do, and become invasive.⁶

There is now a vast and deep body of research about the ecological and physiological aspects of biologic invasions caused by intended introduction. Thoroughly understanding the problem of species invasions requires understanding it not only on the causational level, but on the functional and intentional level as well.⁷ Until now, however, there has been relatively little research into the social and economic causes of biological invasions outside a selected set of agricultural pests.⁸ And while the modern accepted model for invasion – sometimes summarized as “Right Plant [or Animal], Right Place, Right Time”⁹ – seems to deal with the physical and biological conditions required for a species to succeed in its invasion, the question still remains as to the incentives for humans to bring it there in the first place. Evaluating those processes and finding possible motives for the introduction of species may help us identify, understand and – should the need arise – avoid and prevent such undesired introductions.

Two common assumptions are that the incentives for deliberate species introductions are either economic or cultural. Some scholars¹⁰ emphasize introductions’ varied cultural components, namely traditional aesthetic preferences. Other researchers put more weight on the economic aspects of the invasion process,¹¹ seeing physical needs and expectations for material revenues as an explanatory factor for introductions. And indeed, both assumptions are simple and logical, far from being surprising, and supported by clear evidence. This article, however, tries to explore such cultural and economic motives and the interactions between them, while also suggesting a third motive for species’

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¹⁰ Ibid.
¹¹ Perrings, Ibid.
introductions, an intellectual one, using the introduction of the common carp to Palestine as a case study.

There were two main reasons for focusing on these specific species and place. First, some forecasts claim that the development of aquaculture is bound to replace fisheries just as animal husbandry replaced hunting on land hundreds of thousands of years ago. Even if these predictions are a little bit exaggerated, it is already clear today that the effects of aquaculture on our environment are considerable. The carp, specifically, is found to be a global invasive: it inhabits not only hundreds of freshwater worldwide bodies but also the top of the IUCN's list of 100 worst invasive species. Carp is considered as an invasive also in Israel, where invasive species are considered not only as a threat to wild biodiversity, but as damaging crucial services such as keeping genetic banks of wild forms, pollination and food sources. As awareness of the problem increases, recent Israeli governmental report recommended exterminating invasives and banning the import of new species. The second reason is the historical sources. Carp's recent introduction to Palestine is quite easy to trace, as there are detailed records available from the archives of "The Jewish Agency", the organization which was the main driving force behind the introduction process.

The first part of this article, therefore, surveys the cultural background and the cultural elements which encouraged the import of the carp to Palestine during the 1930's. The second part investigates the economic calculations and decision making regarding

13 See ISSG list of "World's Worst Invasive Alien Species", available online at http://www.issg.org/database/species/search.asp?st=100ss&fr=1&sts. For a recent evaluation of common carp’s (together with other introduced species) influence on aquatic habitats around the Mediterranean, see Leonardos, I.D., Kagalou, I., Tsoumani, M. & Economidis, P.S., Fish Fauna in a Protected Greek Lake: Biodiversity, Introduced Fish Species over a 80-year Period and their Impacts on the Ecosystem, Ecology of Freshwater Fish, 17 (2008), pp. 165-173.
this introduction endeavor. The third part suggests a third motive, which is less practical and more theoretical, namely aspects of the “Spirit of the Time”: general intellectual currents which promoted such introduction experiments. The article then concludes with an assessment of these three groups of factors, and an attempt to estimate their accumulated influence.

**Cultural Motives**

Although his appointment as an advisor to the High Commissioner was due to his merit as an expert in zoology, one may assume that Hornell, who made a large part of his academic career as an anthropologist, was also quite acquainted with the cultural aspects human life as well. Like languages and instruments, the use of animals and the relations to them are an inherent part of every human culture. As groups of humans migrate from one place to another, they tend to carry with them their cultural habits and heritage; thus, human migrations were the driving force behind the introduction of species for millennia. When immigrants from overseas colonize a new homeland, the lifestyle that they establish usually incorporates features of the lifestyle that they had practiced in their land of origin – a “cultural capital of knowledge, beliefs, subsistence methods and social organization accumulated in their homeland”, writes Jared Diamond. Sheep in Iceland, cows in Minnesota, pigs on the most remote Polynesian islands – all were brought by human immigrants from their respective homelands. When successfully absorbed and propagated in the new place, such groupings of common plants and animals carried by

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immigrants – which Crosby calls “portmanteau” biota – helped immigrants to create some version of their homeland, “Neo Europes” in his words, where they too could prosper.\textsuperscript{19}

The common carp made no exception to this pattern. Although there’s still a certain debate about the exact time and place in which humans first domesticated and began to raise it, there is clear evidence of its being held already by the ancient Romans.\textsuperscript{20} Carp farming expanded during the middle ages, and from the 13\textsuperscript{th} century there are already records of wealthy men managing Carp ponds in England.\textsuperscript{21}

While the carp’s nutritional value increased after generations of cultivation and breeding in Europe, its brilliant social image dimmed a bit during the centuries to come: beginning in the mid-seventeenth century the carp began to lose prestige in Western Europe, in favour of other species, especially the trout. In central and Eastern Europe, however, it remained greatly appreciated. This cultural pattern later reproduced itself in places where European immigrants settled overseas: in North America, for instance, although the common carp was farmed in places as far as Nebraska in the second half of the 19\textsuperscript{th} century, its main markets were located in New York, Boston and Philadelphia, where east European immigrant population was centred.\textsuperscript{22}

The same pattern could also be detected in Palestine. Later and smaller in numbers than the immigration wave from central and eastern Europe to north America, the stream of immigrants who left those regions and travelled to Palestine at the beginning of the 20\textsuperscript{th} century likewise carried with it some of its cultural and culinary habits. It would not be exaggerated to assume, therefore, that the introduction of the carp to Palestine was

\textsuperscript{19} Alfred W. Crosby, Ecological Imperialism: The Biological Expansion of Europe, 900-1900 (Cambridge: Cambridge University Press, 1986), p. 89. Crosby refers in his book specifically to European immigrants – as was the case in the introduction of the carp to Palestine. His observation, however, is relevant to all immigrations.

\textsuperscript{20} Despite of the common belief that carps were brought to Europe from China by the Romans, it’s more likely that they have been swimming around the delta of the Danube much earlier. See Eugene K. Balon, About the Oldest Domesticates among Fishes, Journal of Fish Biology, 65 (2004), pp. 1–27.


propelled by the cultural habits of those immigrants, which included some traditional dishes.\textsuperscript{23} 

As many home-made food lovers know, traditional dishes require traditional ingredients. And so, in 1926, Mordechaj Schwarz, a young student at the Miqve Jisrael agricultural school near Jaffa, asked his schoolmaster for permission to raise some fish at the irrigation pond of the school’s citrus orchard. Gaining permission, Schwarz brought some carps from Vienna, where his family was in the fish marketing business. Schwarz held the fish in the irrigation pool for a while, but when he wanted to dig a new pool where the fish could also lay eggs and reproduce, the head of the regional health department, who was afraid that a new pool might increase the danger of malaria in the region, forbade him to do so. Those fish had no descendants, and were probably consumed by young Schwarz and his fellow students.\textsuperscript{24} 

About a year later, a committee of seven experts was called by Meir Dizengoff, director of the Urban Colonisation Department of the Palestine Zionist Executive. Dizengoff, best known as the charismatic and popular mayor of Tel Abib during its formative years (from 1911 to 1925), summoned the committee with the mission to find out what are the possibilities of developing fisheries in Palestine.\textsuperscript{25} To judge by his title and by his former position, one may presume that Dizengoff’s main concern was the supply of food for the growing urban population of his beloved city.\textsuperscript{26} While their concerns were about local fish supply, the committee members’ professional experience was gained in

\textsuperscript{24} Amnon Loja, Branqo Zicer ve-mifyalej ha-daggim be-Kurdani, 1934-1947 (Branco Sitzer and Pisciculture in Kurdani, 1934-1947), Qatedra 111 (April 2004), pp. 76-94.
\textsuperscript{25} Dizengoff was the first chief of Tel Abib, since 1911. In 1922, when the little town was declared a city, he became the first mayor. He resigned in 1925 in order to become director of the said colonisation department, a position he held for three years. In 1928 he returned to be the mayor of Tel Abib. H ewas the Mayor for eight more years, until his death in 1936.
\textsuperscript{26} At the census of October 1922 the total population of Palestine was 763,600; in the census of November 1931 it was already 1,033,300: a growth of 35% within 9 year. See Amon Golan, Jewish Nationalism, European Colonialism and Modernity: The Origins of the Israeli Public Housing System, Housing Studies, Vol. 13, No. 4 (1998), pp. 487-505. The actual numbers might have been even higher, as many immigrants - especially from neighbouring countries - were not registered and had lacking documentation if at all. The growth of population in the city of Tel Abib was even more rapid: there were 3,600 residents in Tel Abib in 1921; their number reached 42,000 by 1930. At least a very large part of the newcomers were immigrants from Central and Eastern Europe. See Anat Helman, Taking the Bus in 1920s and 1930s Tel Aviv, Middle Eastern Studies, Vol. 42, No. 4 (July 2006), pp. 625-640. With some fluctuations, this growth tendency continued during the 1930’s and 1940’s.
other places: Pevsner had been working for 12 years on the Aral sea, the Caspian sea and the Volga; Ratner and Kudrianski were fish merchants near the Volga, while Wolodarski made his business around the Caspian sea; Soloweiczick worked for 20 years in the area of the Visla in Poland; Włokowski ran a fish farm near Kobna, in Lithuania, and Karatkov already made a career as a fisherman in Ukraine. Although most of their attention in the first meeting was given to marine fisheries and despite the wide agreement that there are still enough fish in the country, the concern was expressed that “if the exploitation of fish from the Sea of Galilee will continue at its current rate for a few more years, we shall undoubtedly be witnessing the dreary vision of a sea void of fish”. A possible preventive measure was suggested by Soloweiczick, one of the committee members: new kinds of fish should be brought to Palestine.  

In the committee’s next meeting, held about three weeks later, a sub-committee was appointed, with the task of suggesting practical means for bringing new kinds of fish to the country. Diligent and devoted to their mission, the members of this sub-committee returned one month later, with a recommendation to introduce three new fish species. Unsurprisingly, the first species on the list was the common carp.

Meanwhile, Mr. Dizengoff wrote to the directors of PICA (Palestine Jewish Colonization Association; a charity fund established by Edmond James de Rothschild with the aim to encourage industrialization and agricultural development in Palestine), asking for their help in finding an adequate place for “raising fish, as is widely common in Russia and in other countries”. A month later, he sent another letter to the Director of Lands at

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27 All details about the members of the committee and about their discussions are taken from the protocol of the first meeting of the Fishing Committee, held at 29.12.1926 (CZA, SB/1329/4). A seventh member of the committee, Mr. Jaffe, was originally from Palestine.
28 Protocol of the second meeting of the Fishing Committee, 17.1.1927 (CZA, SB/1329/4)
29 Protocol of the third meeting of the Fishing Committee, 17.2.1927 (CZA, SB/1329/4). The other fish species suggested were Osphronemus olfax (also known as Osphronemus gorami) and pikes (Esocidae spp.). Soloweiczick had the idea of bringing all these fish from Egypt. All these fish species are alien to Egypt as well: the Esocidae originate from northern Europe and north America, while the Osphronemus olfax comes from SE Asia.
30 A letter from Dizengoff to the directory board of PICA, 9.1.1927 (CZA, J15). It is interesting to notice that next to the Hebrew words “giddul daggim”, which literally mean “raising of fish”, Dizengoff added in his handwriting the German term, Fischzucht. Since there were no fish farms in Israel at the time, he apparently had to coin the Hebrew term himself, and wanted to make sure it is well understood by the readers of his letter.
the Mandate’s government in Jerusalem, in which he wrote that “settling the matter of fisheries in our country might provide cheap food to all its residents; by doing that we shall be able also to reduce the price of meat and other necessities”. He then added that “in the countries of Europe it’s common to use natural lakes or to create artificial ones” for aquaculture, and expressed his department’s interest in leasing governmental lands in the area of Tul-Karm for building fish ponds.31
Due to either technical or administrative problems, Dizengoff’s initiative did not gain momentum. It was only in 1934 that Branco Sitzer, an immigrant from Croatia, established the first fish farm in Palestine, at a place called Kurdani, near Acre. Although it was
ultimately used primarily to store regular fish deliveries arriving from Europe before their marketing to the local retailers (who were mostly concentrated in Tel Abib and Haifa), Sitzer’s fish farm has produced and delivered significant commercial quantities of fish before going bankrupt about a decade later.\(^{32}\)

The fishing committee members, Schwarz and Sitzer all had common central and east European background; a clear east European influence is evident also from the aforementioned letters. Dizengoff was not the only one who saw a connection between east European immigrants and freshwater fish: at the beginning of the 1930s, at about the same time of Sitzer’s arrival, the initiative of building new fish farms in Palestine shifted to the department of trade and commerce within the Zionist executive. In 1933 Nahum Tischby, head of the department (who was himself an immigrant from Germany) asked the “Jewish Agency” in Poland to find some fish experts and send them to Palestine. Next to the economic justifications for it, Tischby pointed out that “the Jew likes fish by his nature, and especially the carp”.\(^{33}\)

This explanation resonates from other sources as well. In a book published in 1939 surveying the development of fisheries in Israel up to that date, Dr. Naphtali Wydra wrote about the introduction of the carp that “Jews are used to it, and they tend to prefer it to other kinds of fish”.\(^{34}\) Such reflections about the direct connection between immigration from Eastern Europe and the introduction of the carp were common among the people who brought it from Europe physically. Šmu’el Šarig, one of the founders of the fish farm in Tel Yamal, also holds the opinion that the carps were brought because they were eaten in eastern Europe. The other founders of Tel Yamal came from Galicia, and he recalls that

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\(^{32}\) Loja, ibid.

\(^{33}\) Letter from Tischby to the polish office of the „Jewish Agency“, 22.1.1933 (CZA S8/1326/1), cited by Loja, ibid. The term “Jew” in the Zionist jargon of those days designated mostly people from central or eastern-Europe.

\(^{34}\) Naphtali Wydra, Ha-Dajig be-‘Erec Jišrael [Fishery in the Land of Israel] (Tel Aviv: The Israeli Marine Sector, 1939), p. 38. Wydra was the head of the Marine Department of the “Jewish Agency” during the 1930s and 1940s, and was in charge of the technical and professional aspects of developing freshwater fisheries as well.
before the establishment of the fish farm there, carps were directly imported from Vienna to Tel Abib before the holidays seasons.\textsuperscript{35}

The cultural preference for carp gains even more stable ground if one remembers that this fish had parallels in other continents. While the introduction of terrestrial mammals to Iceland or to some pacific islands was due to their total absence before human colonization, Palestine did have an abundant ichthyofauna: not only does the country lie on the shore of the sea, but it also had many species of freshwater fish, mainly in the Sea of Galilee and the Hula lake, and even in the streams running to the Mediterranean.\textsuperscript{36} It seems that one can summarize the motive for the introduction of the carp in one sentence: "They just liked to eat \textit{Gefülte Fisch}!"

All these aforementioned cultural reasons and motives, deriving from traditional habits and aesthetic preferences of immigrants, had indubitably encouraged the introduction of the Carp into Palestinian waters during the 1930's, as in many other waves of immigration. But it seems that immigration alone cannot explain such introductions, largely because of two additional reasons.

One such reason is other wide introductions, which took place without any migration context. At the same time when the Carp was doing its first fin-strokes in Palestine, the rainbow trout was taken from the north western US and introduced to many parts of the world, although human immigration from these regions was marginal to non-existent. Other non-immigration-related introductions abound: Palm trees decorate gardens (and lately also invade forests) in southern Switzerland, grey squirrels jump between trees in Italy, and fluffy minks sneak around the British countryside (or sneakied, at least until

\textsuperscript{35} Interview with Šmu'el Şarig, Nir David, 28.9.2006. Founders of Nir David (in its old name "Tel Yamal") began breeding carps in 1938. The mentioned fish from Vienna are probably those imported by Sitzer.

\textsuperscript{36} Menachem Goren & Reuven Ortal: Biogeography, diversity and conservation of the inland water fish communities in Israel, Biological Conservation 89 (1999), pp. 1-9.

\textsuperscript{*} The "Gefülte Fisch" (German for "Stuffed Fish") is a traditional central- and eastern- Europian delicacy, consisting a combination of whole freshwater fish together with grinded fishmeat, spices and vegetables. While christian family usually eat it on Christmas, jewish families use to eat it on Passover (jewish Easter) and New Year (in September-October).
they’ve been effectively eradicated). Closer to this article’s geographic focus one can think of the eucalyptus (Eucalyptus globules, E. leucoxylon) which was imported to Palestine from Australia long before Australian battalions took part in conquering it, or - more recently - about the Common Myna (Acridotheres tristis) brought from India to Tel Aviv during the late 1980’s, without any major immigration wave arriving to Palestine from the subcontinent. All these examples can prove that human immigration is not a necessary condition for species introduction.

Another reason goes in the opposite direction: not every immigration wave brings all its biotic entourage with it. To stick to our current example, there were species that European immigrants to Palestine in the 1930s did not bring with them. Those aforementioned Australian soldiers, to continue that line of argument, brought neither kangaroos nor dingos nor Koala bears. Human immigration itself is therefore not a sufficient condition for species to be introduced.

Why, then, were those animals not brought to Palestine by immigrants, while other species were? And what made people in Palestine - as in many other places around the world - import and introduce species with which they had no previous experience from faraway lands? Part of the answer for these questions lies in the economic realm.

**Economic Motives**

Although it might be tempting to explain the interest of the Tel Abibian fishing committee in freshwater aquaculture solely by its members’ east European background,
such an explanation will be only partial. There is evidence that more concrete factors influenced the carp’s introduction to Palestine. These economic considerations can be divided into three categories which complete and support each other. On the most immediate level it was the need of **supplying food** to Palestine’s growing population; on the macro-economic level it was the **economic independence** of the Palestinian mandate territory from neighbouring countries; and on the micro-economic level, it was the **direct profit** expected by fish farmers.

The concerns expressed by Dizengoff in the mid-1920s about possible **food shortages** did not disappear in the coming years. Between 1926 and 1936 Palestinian farmers experienced a decade of poor harvests brought on by an unfortunate accumulation of droughts, animal diseases, and plagues of locusts.³⁹ Good fish for food were still rare outside towns and villages located directly on the Mediterranean shore or in the vicinity of the Sea of Galilee. Hornell was even harsher in his critique, claiming at the end of his visit that “there is no dearth of good quality food fishes either in the sea off the western or Mediterranean coast, or in the Gulf of Aqaba in the south”.⁴⁰ More alarming than the poor fish harvest at sea was the fact that “regarding lacustrine fisheries, there is definite evidence of most serious depletion”. No wonder, therefore, that the import of fresh fish from neighbouring countries was steadily mounting.⁴¹ In a letter sent in July 1935 to the head of Haifa custom office, Tischby clearly writes that “Palestine depends very considerably upon most of its essential food stuffs upon foreign countries”.⁴²

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⁴⁰ Hornell, ibid., pp. 3.

⁴¹ Ibid., p. 5, 94.

⁴² Letter from Tischby to Kingsley William Stead, head of the customs department in Haifa harbour, 23.7.1935 (CZA 1328/1). The aim of the letter was to assure a custom-exemption for a new delivery of Yugoslavian breeding fish ordered by Sitzer. Tischby argued that the Mandate’s Custom Ordinance guaranteed exemption from duties for “animals of all classes”, fish included.
Food shortages were not a new threat for British colonialism. Confronted with the need to supply food to the growing population in their colonies and mandated territories, British officials resorted to the husbandry of freshwater fish. It had been regarded as an adequate remedy to the shortage in locally produced protein not only in Palestine, but in many other parts of the British Empire as well. Attempts to introduce freshwater fisheries were a part of a policy whose declared aim was improving the grim living conditions in the colonies. As this policy’s major manifestation one may consider The Colonial Development Bill of 1929, which was supposed to provide direct aid to the colonies.

Naturally, nutrition needs and fear of shortage were not confined to the British colonies. Also on the shores of the Mediterranean basin, Palestinian public leaders were not the only ones at the time who were concerned about the proper nourishment of the people. In an interview with an Italian newspaper dating from August 1927, the director of the biological research station near lake Trasimeno said clearly that nourishing the population with fish might solve a considerable part of the nutrition problem. This focus on inland freshwater fisheries is worth mentioning, considering Italy’s long coasts and ancient tradition of seafaring, and the fact that during the 1920s and 1930s its fishing fleet was one of the largest in the Mediterranean.

It seems that the members of the Fishing Committee were well informed about those similar concerns and related innovations in Italy, as a copy of this interview was carefully cut and neatly filed in the archive of the urban colonization department. The person who read it probably did not overlook the passage in the interview stating that

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43 Bernard H Bourdillon, Colonial Development and Welfare, International Affairs, vol. 20, no. 3 (July 1944), pp. 369-388. In this short and critical account on the Empire’s colonial policy in the 1930’s, Bourdillon, who was then the Governor of Nigeria, sharply criticizes the British colonial policy; some of this sharp observations can be read today as prophecies about the current failures of “development” policies in the third world.

44 There are reasonable doubts, however, regarding the Bill’s efficacy. See David Meredith, The British Government and Colonial Economic Policy, 1919-1939, Economic History Review, vol. 28, no. 3 (August 1975), pp. 484-499.

45 As a matter of fact, at least a part of the fishing near the Palestinian coasts at the time was carried out by Italian trawlers; see for instance Saul B. Cohen, Israel’s Fishing Industry, Geographical Review vol. 47 no. 1 (January 1957), pp. 66-85.

46 “L’importanza della pesca d’acqua dolce per la nutrizione e la rivalutazione della lira – intervista con il Prof. Osvaldo Polimanti” [The importance of freshwater fish for the nutrition and the revaluation of the lira – interview with Prof. Osvaldo Polimanti] Il Popolo di Roma, 24.8.1927 (extract kept at CZA, S8/1329/1)
“obtaining the same nutritional value by [the consumption of] beef costs a third more. One may see, therefore, that the issue of freshwater aquaculture is of supreme importance not only in what regards the public’s nutrition, but also regarding the revaluation of the lira”.

This macro-economic observance about the role of food imports (which in turn influenced the exchange rate of the local currency) was also true in Palestine. And here too, not only the supply of nutrition to the people but foreign-trade considerations as well contributed to encouraging local fish production.

The growing population of Palestine\(^{47}\) demanded ever greater food supplies, and these were partially brought from other countries. The fish were no exception: while cured and canned fish were imported from countries as far away as Norway,\(^{48}\) fresh fish were imported mainly from Egypt and from Iraq, and some from Syria. Egyptian fish came mainly from the sea and from estuaries and were imported by train; Iraqi and Syrian fish originated from the freshwater fisheries of the Tigris and Euphrates, and maybe some other lakes as well, and were transported by trucks packed with ice.\(^{49}\) Although their desert journey from their place of origin to the market in Tel Aviv lasted between two and a half to three and a half days,\(^{50}\) Hornell found that fish from Iraq arrive “in excellent condition, firm and red-gilled”\(^{51}\).

The quantities imported from those neighbouring countries were considerable: Hornell calculated that in the first six months of 1934, this import summed up in more than 690,600

\(^{47}\)See footnote 22 above.
\(^{48}\) Giddul ha-Daggim b-Brejkot [The Husbandry of Fish in Ponds], Ha-'Arek, 1.7.1947.
\(^{49}\) Hornell, p. 96.
\(^{50}\) B-Šuq ha-Daggim šel Tel Abib [In the Fish Market of Tel Abib], Ha-'Arek, 22.7.1936, p. 3. The original weights are 2000 – 2200 Rott; one Rott is approx. 2.56 Kgs.
\(^{51}\) Hornell, Ibid.
kilograms, which meant an annual import of about 1,300 tons of fish – quite a lot for a maritime country with a population of a little more than 1 million people at that time. The clear majority of this quantity was imported from Egypt, while Iraq was the second exporter and Syria only the third.\(^{52}\) Those countries, however, were not an integral part of the British mandate regime of Palestine, and had independent economies: Syria was under French mandate rule since 1920, Iraq got its independence from British mandate in October 1932, and Egypt, although still deep in the British sphere of influence, had also its own customs, duties (and visa) system.\(^{53}\)

The “Jewish Agency”, which was the main implementer of Hornell’s advices, was clearly aware of the imbalance in trade between Palestine and its neighbours. According to governmental statistics quoted by one of the Agency’s economic researchers,\(^{54}\) in 1935, Palestine imported goods from Iraq to the value of £ 219,776, while Palestinian export to Iraq was only £ 7,070 (!), what the researcher described as “an extremely adverse trade balance between the countries”. The great difference in production costs made Palestinian farmers call for the institutionalising of a protective tariff, in order to help them compete with cheap Iraqi farm products.\(^{55}\)

The trade relations with Egypt were not much different, and the "Jewish Agency" was well aware of it. With a much larger population and lower per capita foreign investments, wages in Egypt were much lower than in Palestine; combined with the availability of freshwater along the Nile, it helped in reducing production costs to levels lower than those in Palestine.\(^{56}\) The trade rate between Palestine and Egypt in the mid-1930s was 7.3 to 1 in favour of the Egyptians, and was partially due to a protectionist policy of the Egyptian

\(^{52}\) Hornell, p. 95.

\(^{53}\) For a detailed account of the British Mandate Government’s protection policy, see El-Eini, R. I. M., Trade Agreements and the Continuation of Tariff Protection Policy in Mandate Palestine in the 1930s, Middle Eastern Studies, 34 (1998), 1, pp. 164 - 191.

\(^{54}\) Memorandum on the Palestine-Iraq Trade written by D. Horowitz to the Economic Research Institute of the “Jewish Agency”, February 1937 (CZA S54/201).

\(^{55}\) Ibid: the memorandum refers specifically to farmers raising poultry and eggs, but we may assume that the situation was similar in other agricultural branches as well.

\(^{56}\) Letter from Tischby to Rotenstreich, titled "My Voyage to Egypt", 27.3.1936 (S54/207).
government, which apparently hindered Palestinian industrialists and traders from entering it by delaying their entrance visas.\textsuperscript{57}

Last but not least among the economic motives for the introduction of the carp was the expected profitability of fish breeding for farmers in Palestine of that time. This \textit{profitability} was not self evident, especially considering the regional competition mentioned above.

Profitability considerations were taken into account from the very beginning of the attempts to introduce fish farming. The basic report submitted to the Fishing Committee of the Urban Colonization Dept., which was titled “The Possibilities of Growing Pond Fish in Palestine”,\textsuperscript{58} contained – along with a geographical, zoological and nutritional chapters – an estimate of the costs of such an enterprise. Those estimates were quite crude and very optimistic (as proved later by Branko Sitzer's financial difficulties), but nonetheless, financial aspects were seriously considered.

A few months after his first fish fry arrived from Zagreb, Sitzer could proudly report to Tischby that due to the relatively warm water temperatures in Kurdani, the fish were about to reach within one year the same weight they reach in Europe after three years. This was very good news, and Tischby easily calculated that with such outcomes and considering the needed input, the ponds were about to bring revenues of “not less than 10 Palestinian £ per year per dunum”.\textsuperscript{59} A week later, in another letter, Tischby already presented a general plan to introduce carp to Jesud ha-Mayala in the Hula valley, the Fešxa springs on the shore of the Dead Sea and to the Sea of Galilee.\textsuperscript{60}

A few months later, in his report, Hornell was less excited but still showed cautious optimism in this aspect, as he wrote that “no extensive pond-culture seems now to be

\textsuperscript{57} Letter from Tischby to Schartok, 2.12.1937 (CZA S54/207).
\textsuperscript{58} Report from the archive of the Urban Colonization Department, no exact date. (CZA S8/2153)
\textsuperscript{59} Letter from Tischby to F. H. Kisch, Jerusalem, 8.5.1934 (CZA S8/1329/1)
\textsuperscript{60} Letter from Tischby to F. H. Kisch, Jerusalem, 16.5.1934 (CZA S8/1329/1). The letter was probably written after Kisch, another Zionist official at the time, showed willingness to give Sitzer’s farm some financial aid.
possible in Palestine, but there are many large ponds, irrigation reservoirs and small marshes in private hands which can be utilised to considerable profit, if stocked with carp fry in limited numbers". He concluded his observation about the future prospects of freshwater fish farming in writing that he

"...found no streams in Palestine sufficiently cool to induce trout to breed; neither are these waters suitable for the gourami, for this is a fish that flourishes only if it lives in water of continuously high temperature; a fall to 15°C would render its culture economically a failure even if the fishes survived. Of all fishes, the various varieties of Carp as bred in Central Europe are the most suitable for pond culture in this country, and all effort should be concentrated upon these".

Hornell showed no cultural preference or traditional tendencies; in his eyes the carp was simply the species most likely to acclimatize successfully. His sharp observations and rich experience were right: within less than seven years, fish farming became the most profitable branch of agriculture per unit of land, and reached a production rate 5 to 6 times the production rate of carps in central European fish farms. The success of carp led to the introduction of more species: after the first attempts of British officers to develop their angling opportunities failed a few years before, Sklower reported that in May 1946 he received the first eggs of the Rainbow Trout from North America. Moreover: the success of freshwater fish ponds was so great, that a few years later experiments began in breeding sea fish in saltwater ponds built in a similar way.

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61 Hornell, ibid., p. 8.
62 Hornell, ibid., p. 9. Gourami (Osphronemus gorami) was one of the species suggested by Solowewiczick back in 1927 (see footnote 25 above). Rainbow trouts (Oncorhynchus mykiss, another member of the ISSGs 100-list) were actually introduced to some streams in the upper Galilee in the mid 1930s and again in 1946; they established an invasive population since. See Golani, ibid.
63 "Hitqadmut ha-Dajjig ha-Jehuddi" [Advance of the Jewish Fishery], Ha-'Arec, 5.2.1941 (Copy in CZA/1329/2).
64 Dr. Alfred Sklower, "Fischzucht in Palästina in den Jahren 1938 bis 1946" [Fish Farming in Palestine in the Years 1938 to 1946] (CZA S74/103). In another paragraph in his report, Sklower, who was the director of the JA's Fisheries Research Station in Sde Naxum (near Tel Yamil), wrote that the annual production was even 10 times higher. Some of the descendants of the mentioned Rainbow-trouts also became invasive (Golani, ibid.), while other are being regularly grilled and fried in Israel until these very days.
65 "Brejkot l-Giddul Dag Jam" [Ponds for Breeding Sea Fish], Ha-'Arec, 23.8.1944. (Copy in CZA/1329/2).
But as easy as it might be to relate the introduction of the carp directly to economic motives, there is some evidence which shows that economic considerations were not always supportive of the introduction. For example, in February 1937, three years after releasing the first carp in the Kurdani ponds and about four years since the beginning of the work there, Branko Sitzer still had to apply for loans from the “Jewish Agency” in order to keep his fish farm running. This is in spite of the fact that “the fish acclimatized very well, spawned offsprings in April 1934, and already had 4 generations”, as Sitzer proudly wrote. The expenses were huge: building the basic infrastructure cost him £6,300, and the expected wage costs for his workers amounted to more than £530 for 7 months (October 1937 to April 1938) – which were a serious sum in those days.\(^{66}\)

A few months later, two fish experts – Jakob Katz and Gerhard David – were asked by the secretariat of Tel Yamal to examine and evaluate the status and future prospects of the fisheries there.\(^{67}\) Beside a detailed examination of the water, the ground and the food given to the fish, they also included in their report two detailed appendixes calculating the expected costs both of building larger infrastructure and of maintaining and feeding the fish. Their detailed calculations served Dr. Wydra once again in the report he compiled and sent to one of the professionals at the “Jewish Agency”, checking the possibility of breeding fish in Tel Yamal.\(^{68}\) Wydra’s idea was not to build new ponds (an enterprise which would have cost large sums of money, as proven by Sitzer’s farm), but – “with a small investment in improvements and enhancements” – to block a part of an existing stream, the Saxne near Bejt Š’an. The estimated costs here for the first year – £430 – were far lower than those required in Kurdani, not only because of the fact that there was no need to build new ponds, but also because of two more reasons: the land was already leased to

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\(^{66}\) A letter from Sitzer to the Jewish Agency (Probably to Wydra), 10.2.1937 (CZA S4/214).

\(^{67}\) Jakob Katz & Gerhard David, Fischerei in Tel Yamal [Fishery in Tel Yamal], Haifa, 7.11.1937 (CZA S9/1564). Their visit to the fisheries took place one week before.

\(^{68}\) Letter from Wydra to B. K. Meiroovitch, 18.11.1937 (CZA S9/1564/3).
the “Jewish Agency”, and there were no wages for workers and guards, Tel Yamal being a commune village. A few years later, Tel Yamal became the largest fishery in Palestine, and began exporting fish to other fisheries, both at home and abroad.69
Sitzer was a pioneer, and as such he was probably more prone than his followers to all kinds of mishaps – biological, technical, bureaucratic and financial. But the uncertainty about the possible profitability of carp farming did not cease when other fish farms were constructed by better organized entrepreneurs. In a letter sent to a group of people in Berlin who considered the possibility of immigrating to Palestine dated April 1938, Wydra clearly stated that “although we think that with a right investment, proper terrain and a professional manager there is a nice way to make a living [from fisheries, DT], one still cannot say for sure how much profit one could make, and one cannot give any guarantees for it”.

And indeed, there was little basis for predicting a profit in this field: lack of professional experience in breeding fish in Palestine’s climate on the one hand together

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70 Source: Sklower, “Fischzucht in Palästina” (ibid., footnote 62). The yield in 1938 was only 800 Kgs; the data of 1945 refers only to the first 11 months of the season.

71 Letter from Wydra to the "Xaluc Association" in Berlin, 18.4.1938 (CZA 554/Y).
with competition from good quality fish from neighbouring countries – all this did not guarantee economic sustainability of fish farms in Palestine. But there was yet another motive which contributed to the introduction of carp to Palestine. Far less material than the economic motives and even vaguer than the cultural processes, this third motive was based on the introducers’ intellectual milieu; to a certain degree, it reflected the spirit of the time.

**Intellectual Motives**

Estimating and analysing the possible intellectual factors which influenced past human actions is somewhat more complicated than estimating and analysing other more material factors such as economic considerations or even cultural traditions. As cultural customs and traditions usually leave material traces behind them and while economic considerations can usually be detected through financial accounting and inventory lists, all these tend to give us more direct evidence about people’s deeds and actions than about the thoughts which lead them towards such actions in the first place.

There are two clues, however, that help us reveal intellectual tendencies. The first is explicit expressions that people leave about themselves. Such testimonials beginning with “I think that…” – while no doubt being self-biased and many times lacking self-reflection – might serve, under proper scholarly critic, as evidence to one’s thoughts and ideas. The second mean is by analysing and interpreting implicit expressions. The accumulation of such explicit and implicit expressions, put into a historical context, might provide us with the basic notion of ideas, feelings and ways of thought which dominated the life of a certain generation, history’s “depth currents” as Jacob Talmon named it.

Therefore, this last part of the article takes both implicit and explicit expressions from the documentation cited above and examines it in the light of the historical literature
surveying the discussed era, in order to show how the carp’s introducers’ thinking was anchored in the common intellectual paradigms of that time. The intellectual climate in which the carp was introduced can be analyzed as combining two components. The first component is the modern desire to control the environment and subject it to rational rules. This desire was characteristic of European colonial regimes in general, and the British mandate rule in Palestine was no exception. The second component is to a certain extent the opposite of the first: the modernist possibility and desire to do things “because they are there”, going into new experiments and adventures. In the case of carp in Israel, these two components were not contradictory but complementary.

**Control over the Environment**

Human attempts to gain control over natural powers and exploit natural resources are as old as humanity itself, of course. Agriculture, by definition, is a human endeavour aimed at manipulating other organisms in order to extract more goods from them. As Zygmunt Bauman posed it, “the legibility and transparency of space, declared in modern times to be the distinctive mark of rational order, were not, as such, modern inventions; after all, in all times and places they were indispensable conditions of human cohabitation”. But modernity did bring something new into this ancient human action. The modern novelty was “the positing of transparency and legibility as a goal to be systematically pursued – a task; something which still needs to be enforced on recalcitrant reality, having first been carefully designed with the help of specialists’ expertise”.73

Bauman uses this interpretation of modernity mostly in order to analyse modern ruling methods and global economic systems. His observations, however, may be valid for

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72 Not only the British, but the French colonial rule as well became an epicenter of organized acclimatization. For more about the similarities and differences between those two systems see Michael A. Osborne, Acclimatizing the World: A History of the Paradigmatic Colonial Science, Osiris, vol. 15 (2000), pp. 135-151.

modern aquaculture (and agriculture in general) as well. The engineering of large water bodies – rectifying rivers, deepening lakes, drying swamps and fortifying banks – was not a rare phenomenon in the European environmental thinking of the late 19th and early 20th century. It was a project clearly identified with progress and modernity, and viewed positively: changes in the aquatic landscape were regarded as valuable “improvements”.

Defining what part of the environment needs to be “improved” is clearly a subjective matter, as the answer to the question “what is good?” is always in the eye of the beholder. In this case, “improving” meant bringing water bodies under control, in order to increase the productivity of a certain species in them. The main aim was to increase efficiency: the production of more fish, more food, and hence more protein per unit of water. This endeavour demanded the reduction of uncertainty while increasing transparency and legibility. This transparency was pursued literally: the recalcitrant reality of the turbid, uncontrolled lakes and rivers was to be replaced by systematically designed ponds. Specialists’ expertise meant that fishery experts replaced fishermen. The carp met these requirements fully and combined very well in this scheme. Not only did its high reproduction rate and durability make it “efficient”, but its life cycle was also well known and familiar to those specialists.

This modern fashion of “improving” water bodies did not skip the modernisation process in Palestine. Such “small improvements” were needed in order to turn the free-
running, shallow brook in Tel Yamal into an industrial carp cultivation plant. In a similar vein, C. Craig Bennet, the chief officer of fisheries at the government’s department of agriculture and fisheries, assumed the same year that “there are no great difficulties in the way of improving the production” of fish in the Xula lake; this will only require “more intensive fishing”. The same intention of “increasing and improving” the fishery in the lake (through the introduction of new carp species) is mentioned again in a letter written by Meerovitch the following year.

Such “state projects of legibility and simplification” were a must for many modern states in their quest for control. Disposing an unusual degree of power, colonial regimes have been active agents of such simplification and standardization; this standardization of new terrains – both metaphorically, referring to societies and social structures, and literally, with the conquest of new areas – were an integral part of 20th century colonial rule. Due to the vast scope of rule of colonial superpowers, this state project made a considerable contribution to homogenization: in this manner, the same methods and species for “improving” lakes and rivers were used by the British government in India, Central Africa and Palestine.

This modernist approach was by no means the practice of the British government alone; it was also common among the leaders and managers of the Zionist organizations, who came mostly from Central Europe, and to a large extent shared the same modernist ideas about re-shaping the landscape in an efficient, scientific way. These motives, however, address only the institutional, state-organized side of the story. The other side of

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75 Letter from Wydra to B.K. Meerovitch, 18.11.1937 (CZA, S9/1564/3).
76 Letter from Craig Bennet to Meerovitch, [exact date unclear, second half of 1937] (CZA, S25/7430).
77 Letter from Meerovitch to The “Hakšarat ha-Ješub” Company, 09.5.1938 (CZA, S25/7430).
it was the opposite desire: not to dominate and control, but to break boundaries and stretch human achievements as far as possible.

"Because it's there"

The first documentation of an intention to introduce new species of fish to Palestine is from Jerusalem, from January 1923. At the end of that Winter, in March 1923, near the end of a lecture tour to North America, the mountaineer George Mallory was briefly interviewed by a New York Times reporter who wanted to know why Mallory wants to climb mount Everest. "Because it's there," said Mallory, in an answer that soon became myth. Despite (and actually, maybe even because of) the fact that the most famous statement in mountaineering history was probably not more than a remark thrown towards an obstinate reporter, it might reflect some deeper way of thought of that time: the willingness to dare and challenge existing borders and limits.

A generation before, Anton Chekhov was said to phrase a similar argument: “If in Act I you have a pistol hanging on the wall, then it must fire in the last act”. This somehow deterministic pattern of using tools just because they are available, and doing things just because they are possible, can also be traced to the introduction of the Carp. In a letter sent to Fredrick Kisch in May 1934, Naxum Tischby refers to his “plan to develop the cultivation of carp and other fish species”, stating that he knows that

“… your Excellency might see my plan as something imaginary, but I have the proof that very imaginary things about which I wrote 15 years ago have indeed come true”.

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80 Letter from Prober to Tischby, Jerusalem, 6.1.1923 (CZA, S8/1326), quoted by Loja, ibid. The idea was to introduce fish to ponds and reservoirs around Jerusalem; the initiative remained on the paper only. Although the large waves of immigration were still yet to come, this incentive was probably rooted in the memory of partial food shortages which characterised the last years of WWI in Palestine.

81 Like every good myth, this story about Mallory’s phrase has no concrete and documented source. A relatively detailed version of the story is quoted by Mark Jenkins, In the Good Company of the Dead, [http://www.thehardway.com/stories/mallory.htm](http://www.thehardway.com/stories/mallory.htm). Mallory, alas, died in his attempt.


83 Letter from Tischby to Kisch, Jerusalem, 16.05.1934 (CZA, S8/1329/1)
Imaginary or not, he declares with certainty that “there are no technical difficulties in implementing this plan”, and goes further to suggest adding geese and ducks, eucalypts, poplar trees, bananas, oranges, potatoes and “hundreds of species of early vegetables and fruits”. While being quite practical about carrying out the plans once they arrived to the implementation phase, Tischby’s grand tendency was to try whatever was possible, and see what would evolve.84

And indeed, it seems that professionalism was not always the leading line in the work of the Jewish Agency’s Sea and Fisheries department. Lack of scientific order and organization, false research methods, bad facilities, inefficient working systems and turbid work relations – all these are evident from a letter of July 1945, about 8 years after the beginning of the first introduction attempts.85 To a certain extent, agricultural and industrial development in Palestine at the time took the shape of “natural gathering”: to try what comes, with the hope it will succeed. Naturally, after a while only the successful survived. To take Chekhov’s idea to a bit rougher level, one can think of Tuco’s phrase when threatened by a rival gunman: „When you have to shoot, shoot. Don't talk”.86 In our case, the foam bath he has been sitting in was soon swarming with carp.

At a first glance, these two components contradict each other: the tendency to break boundaries and challenge existing patterns seems to stand in contrast to the modernist imperative to control and standardize environment and society. But these two components may also be complementary to each other, providing another example of the duality inherent to modern human development, termed by Horkheimer and Adorno as “Janus

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84 For a detailed review of government lead agricultural improvements in Palestine at the time see El-Eini, The Implementation of British Agricultural Policy, ibid.
85 Letter from Sklower to Wydra, 07.07.1945 (CZA, S74/7). The list of failures begins with stating that “since one and a half years the Agency was not able to find me a desk and a chair”. According to Sklower, conditions were so miserable that he had to do his work at home.
86 Sergio Leone, The Good, the Bad and the Ugly (Italy: United Artists, 1966).
face of Modernity”. In an inherently dialectic fashion, the innovativeness of a certain stage becomes a limiting factor in the next; breaking these limitations requires further innovation and so it goes on. Many times, these “stages” coexist and work simultaneously rather than independently of each other. In the case of Israeli carp, more technical (and soon technocratic) innovative ideas resulted in a more constructed, controlled and constrained environment. In our case, the dual face of Janus were incarnated by two players: a group of British government officials wearing the mask of standardisation and efficiency, and a group of Zionist activists, wearing the mask of challenging and daring. While their drives might have been different and even opposite in a way, the re-shaping of the landscape was the joint outcome of their work.

**Conclusion**

As proven many times before in the history of biological exchange, successful domestication is likely to lead towards the introduction of the domesticated species far beyond their original environment. Considering the potential environmental threats that introduction entails, it’s important to understand the human mechanisms underlying such introduction processes.

Investigating the introduction (and hence the possibility of invasion) of species into Palestine is not an easy task. Sitting on a crossroads between Asia, Africa and Europe and settled by humans for millennia, the environment of the whole Fertile Crescent has been subject to long and deep processes which altered it thoroughly. One of the cradles of human civilization – plant and animal domestication, building and trade – it is hard to think of a place in the world less influenced and shaped by human activity than this area.

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However, the introduction history of some species is well documented, and the common carp is one of them.

Two common assumptions are that the motives for deliberate species introductions are either economic (physical needs and expectations for material revenues) or cultural (namely, traditional aesthetic preferences). In the case of the introduction of the common carp to mandatory Palestine in the 1930's, both motives were intertwined and played a crucial role. It seems that the carp’s introduction would not have been possible lacking either of them; both economic incentive and cultural readiness were necessary conditions for the introduction.

The cultural motive for the carp’s introduction was provided by the considerable number of immigrants from central Europe who were used to the carp and enjoyed it. The main local forces who pushed towards this introduction were local leaders and office holders who came to Palestine some years previously from central Europe. In this aspect, they were not different from central European immigrants in other parts of the world, who also carried with them a “portmanteau biota”.

The economic incentive for introduction came up mostly due to the growing local demand for food and an economic policy aimed at reducing the country’s dependency on imports. It was equally propagated by the local British administration and private investors who saw a possibility for making their living out of fish cultivation.

A third motive accelerated the first two. The intellectual climate and social tendencies common to that era were represented by modernization-oriented elites, which were eager for innovation and novelties on the one hand, while seeking “efficiency” and standardization on the other. As the world’s biggest colonial force at the time, the British administration has taken similar agricultural measures all around the globe: the main British professional advisor who initiated this introduction was previously doing much the
same thing in half a dozen other colonies. No wonder there was widespread biotic homogenization in these areas. Introduction of species is therefore a quintessential process of globalization: it breaks down borders between places, while controlling and standardizing them: “Global law, local orders”, as Bauman describes it.\textsuperscript{88} The Carp is just one example of it.

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