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 socio-cultural 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 1930s, this article examines the contribution of such socio-cultural and economic motives to the process while suggesting a third motive, an ideological one. The article concludes by assessing the ways these three motives may still be intertwined in introduction processes in the modern era.

KEYWORDS

Carp, introduction, modernism, Israel, Palestine, ideology

In loving memory of Christine Beatrice Müller, 1961–2008

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INTRODUCTION

On 11 July 1934, a sixty-nine year old man of Scottish origin arrived at Jerusalem, the centre of British colonial administration in Palestine. 'Late Director of Fisheries with the Government of Madras, and Fishery Adviser to the governments of Sierra Leone, Mauritius, the Seychelles, Malta and Baroda', 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 modernising 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 carried a potential hazard to ecological systems; namely, that those species might become alien invasives.

Biological invasions create both direct and indirect problems for humans. Invasive species not only affect individual species, but can also change drastically entire 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 habitats where they are non-native. Such an introduction might take one of 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 burrowed inside raw 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 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.[7] Thorough comprehension of the problem of species invasions requires understanding the phenomenon not only on the causational level, but on the functional and intentional level as well.[8] Various works examined the human perception of introduced, 'alien' or 'exotic' species. Among other things, such works showed the ways new species intertwine in political and economic systems, or demonstrated how people tend to project human phenomena on other species and vice versa.[9]

Kennedy and Lucks have drawn the outlines of the modern global web of commerce and exchange, so complex and omnipresent that it created a system in which one should actually expect the unexpected. The shrinking of our world, they write, 'provides one lesson after another about the Law of Unforeseen Consequences'.[10] Until now, however, outside a selected set of agricultural pests, there has been relatively little research into the socio-cultural and economic causes of specific introductions per se.[11] Furthermore, while considerable research has been done on introduction to regions such as North America and Australia, introductions to areas such as the Middle East are relatively unexamined.[12]

While the modern accepted model for invasion – sometimes summarised as 'Right Plant [or Animal], Right Place, Right Time'[13] – 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 in the future.

Two common assumptions are that the incentives for deliberate species introductions are either economic or socio-cultural. Some scholars[14] emphasise introductions' varied socio-cultural components, namely traditional aesthetic preferences. Other researchers put more weight on the economic aspects of the invasion process,[15] seeing physical needs and expectations for material revenues as an explanatory factor for introductions. And indeed, both assumptions are simple and logical, far from surprising, and supported by clear evidence. This article, however, tries to explore such socio-cultural and economic motives and the interactions between them, while also suggesting a third motive for species' introductions – an ideological one – using the introduction of the common carp to Palestine as a case study.

There were two main reasons for focusing on this specific species and this exact place. First, some forecasts claim that the development of aquaculture is bound to replace fisheries just as animal husbandry replaced hunting on land thousands of years ago.[16] Even if these predictions are a bit exaggerated, it is already clear today that the environmental effects of aquaculture are considerable. The carp, specifically, is a global invasive: it inhabits not only hundreds of freshwater bodies worldwide, but also tops the IUCN's list of 100 worst invasive species.[17] Carp is also considered an invasive in Israel,[18] where invasive species are considered not only a threat to wild biodiversity, but as damaging crucial natural services such as keeping genetic banks of wild forms, pollination and food sources. As awareness of the problem increases, a recent Israeli governmental report recommended exterminating invasives and banning the import of new species.[19] The second reason for choosing carp as a case study is the historical sources. Unlike plants, migratory birds or terrestrial animals, freshwater fish do not often migrate between watersheds without conscious human assistance; they therefore make good case studies for human intervention.[20] Carp's introduction

to Palestine is no exception, and detailed records are available from the archives of 'The Jewish Agency', 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 importation of the carp to Palestine during the 1930s. The second part investigates the *economic* calculations and decision making regarding this introduction endeavour. The third part suggests a third, more theoretical motive, namely aspects of the 'Spirit of the Time': general *ideological* currents which promoted such introduction experiments. The article then concludes with an assessment of these three groups of explanatory factors, and an attempt to estimate their cumulative influence.

SOCIO-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,[21] was also well acquainted with the cultural aspects of human life. Like languages and tools, the use of animals and relations with them are an inherent part of every human culture.[22] As groups of humans migrate from one place to another, they tend to carry their cultural habits and heritage; thus, human migrations were the driving force behind the introduction of species for millennia. When immigrants from overseas colonise a new homeland, the way of life that they establish usually incorporates habits they had practised in their land of origin – a 'cultural capital of knowledge, beliefs, subsistence methods and social organisation accumulated in their homeland', writes Jared Diamond.[23] 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 immigrants – which Crosby calls 'portmanteau' biota – helped immigrants to create some version of their homeland where they too could prosper.[24]

The common carp was no exception to this pattern. Debate persists about the exact time and place in which humans first domesticated and began to raise it, but there is clear evidence of its being held by the ancient Romans.[25] Carp farming expanded during the middle ages, and from the thirteenth century there are records of wealthy men managing carp ponds in England.[26]

While the carp's nutritional value increased after generations of cultivation and breeding in Europe, its glamour dimmed a bit during the centuries to come: from 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 inland as Nebraska in the second half of the nineteenth century, its main markets were located in New York, Boston and Philadelphia, where east European immigrant population was centred.[27]

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 twentieth century likewise carried with it some of its cultural and culinary habits. The introduction of the carp to Palestine was therefore also propelled by the cultural habits of those immigrants, which included some traditional dishes.[28]

As lovers of home-made food 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 carp 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, 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.[29]

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 (1911 to 1925), summoned the committee with the mission to find out about the possibilities of developing fisheries in Palestine.[30] To judge by his title and 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.[31] While their concerns were about local fish supply, the committee members' professional experience was gained in other places: Pevsner had been working for twelve 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 twenty years in the area of the Visla in Poland; Wolkowski ran a fish farm near Kobna, in Lithuania; and Karatkov had 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 were 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: new kinds of fish should be brought to Palestine.[32]

At the committee's next meeting, about three weeks later, a sub-committee was appointed, with the task of suggesting practical means for bringing over new kinds of fish.[33] Diligent and devoted to their mission, the sub-committee members returned a month later, with a recommendation to introduce three new fish species. Unsurprisingly, the first species on the list was the common carp.[34]

Meanwhile, Dizengoff wrote to the directors of PICA (Palestine Jewish Colonization Association; a charity fund established by Edmond James de Rothschild with the aim of encouraging industrialisation 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'.[35] A month later, he sent another letter to the Director of Lands at 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.[36]

Due to either technical or administrative problems, Dizengoff's initiative did not gain momentum. It was not until 1934 that Branco Sitzer, an immigrant from Croatia, established the first fish farm in Palestine, at Kurdani, near Acre.

FIGURE 1. A map of Palestine

Although it was ultimately used primarily to store regular fish deliveries from Europe before their marketing to local retailers (who were mostly concentrated in Tel Abib and Haifa), Sitzer's fish farm produced and delivered significant commercial quantities of fish before going bankrupt about a decade later.[37]

The members of Dizengoff's committee, Schwarz and Siltzer all shared a Central and East European background; a clear East European influence is evident also in the aforementioned letters. Dizengoff was not the only one who connected East European immigrants and freshwater fish: at the beginning of the 1930s, at about the same time of Sitzer's arrival, the initiative for 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 (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, Tischby pointed out that 'the Jew likes fish by his nature, and especially the carp'.[38]

This explanation resonates from other sources as well. In a book published in 1939 surveying the development of fisheries in Israel to date, 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'.[39] Such reflections on the direct connection between immigration from Eastern Europe and the introduction of the carp were common among those who brought it from Europe physically. Šmu'el Şarig, one of the founders of the fish farm in Tel Yamal, also believed that carp were brought because they were eaten in eastern Europe. The other founders of Tel Yamal came from Galicia, and he recalls that before the establishment of the fish farm there, carp were directly imported from Vienna to Tel Abib before the holiday seasons.[40]

The cultural preference for carp becomes even more evident if one remembers that Palestine never lacked fish. While the introduction of terrestrial mammals to Iceland or to some Pacific islands was due to their total absence before human colonisation, Palestine did have an abundant ichthyofauna: not only does the country have a coastline, 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 down to the Mediterranean.[41] It seems that one can summarise the motive for the introduction of the carp in one sentence: 'They just liked to eat *Gefülte Fisch*!'[42]

These aforementioned cultural reasons and motives, deriving from traditional habits and aesthetic preferences of immigrants, indubitably encouraged the introduction of the carp into Palestinian waters during the 1930s. But immigration and culinary heritage alone cannot explain such introductions, largely because of two additional reasons.

One of these reasons is that there were other widespread introductions, which took place without any migration context. At the same time that the carp was doing its first fin-strokes in Palestine, the rainbow trout was transported from the north-western United States to many other parts of the world (including Palestine),

although human immigration from these regions was marginal to non-existent. Other non-immigration-related introductions abound: Chinese palms decorate gardens (and lately also invade forests) in southern Switzerland, grey squirrels jump between trees in Italy, and fluffy mink swim in British rivers. Closer to this article's geographic focus are the eucalyptus (*Eucalyptus globules*, *E. leucoxylon*), imported to Palestine from Australia long before Australian battalions took part in conquering it,[43] or the Common Mynah (*Acridotheres tristis*) brought from India to Tel Abib during the late 1980s, without any immigration wave from the subcontinent.[44] All these examples can prove that human immigration is not a *necessary condition* for species introduction.

Nor does every immigration wave bring its entire biotic entourage with it either. There were species that European immigrants to Palestine in the 1930s did not bring with them. Those aforementioned Australian soldiers brought neither kangaroos nor dingos nor Koala bears. Human immigration itself is not a *sufficient condition* for species introduction.

Why, then, were certain animals brought to Palestine by immigrants, while other species were left behind? And what made people in Palestine – as in many other places – introduce species of which they had no previous experience from faraway lands? Part of the answer lies in the economic realm.

ECONOMIC MOTIVES

We clearly cannot explain the interest of the Tel Abibian fishing committee in freshwater aquaculture solely by its members' east European background. More material factors influenced the carp's introduction to Palestine as well. These economic considerations can be divided into three complementary and mutually supportive categories. On the most immediate level it was the need to *supply 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* anticipated by fish farmers.

The concerns expressed by Dizengoff in the mid-1920s about possible *food shortages* did not disappear. 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.[45] Except on the coast and in the vicinity of the Sea of Galilee, edible fish were rare. Hornell's verdict was clear, claiming that 'there is no dearth of good quality food fishes either in the sea off the Mediterranean coast, or in the Gulf of Aqaba in the south' [46] 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.[47] In a letter of July 1935 to the head of Haifa custom office, Tischby pointed out

that 'Palestine depends very considerably upon most of its essential food stuffs upon foreign countries'.[48]

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.[49] Attempts to introduce freshwater fisheries were a part of a policy whose declared aim was improving 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.[50]

The growing population of Palestine[51] 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,[52] fresh fish were imported mainly from Egypt and 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.[53] 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,[54] Hornell found that fish from Iraq arrive 'in excellent condition, firm and red-gilled'.[55]

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 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 bulk was imported from Egypt, while Iraq was the second exporter and Syria only the third.[56] Those countries, however, were not an integral part of the British mandate regime of Palestine, and had independent economies: Syria had been 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.[57]

The 'Jewish Agency', which was the main implementer of Hornell's advice, 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,[58] in 1935, Palestine imported goods from Iraq to the value of £219,776, while Palestinian export to Iraq was only worth £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.[59]

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, this helped in reducing production costs to levels lower than those in Palestine.[60] 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 government, which apparently hindered Palestinian industrialists and traders from entering it by delaying their entrance visas.[61]

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 *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',[62] contained – along with 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'.[63] 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.[64]

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 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'.[65] 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.[66]

Hornell showed no cultural preference or traditional tendencies; in his eyes the carp was simply the species most likely to acclimatise successfully. His sharp observations and rich experience were right: within less than seven years, fish farming became Palestine's most profitable branch of agriculture per unit of land,[67] and reached a production rate 5 to 6 times the production rate of carp 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.[68] 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.[69]

However, 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 after 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) – a serious sum in those days.[70]

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.[71] 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.[72] 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 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.[73]

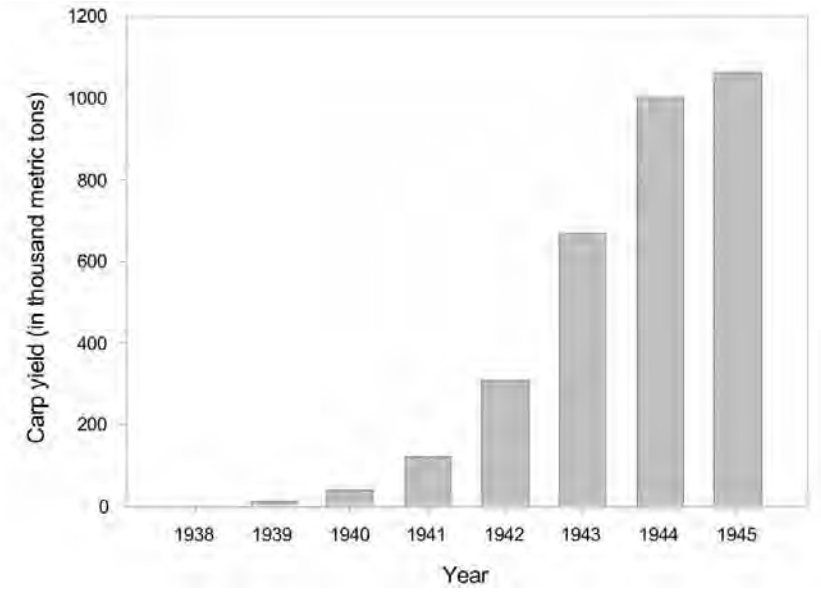

FIGURE 2. Carp production in Palestine, 1938–1945[74]

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-organised 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'.[75]

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 with competition from good quality fish from neighbouring countries 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. This third motive was based on the introducers' ideological milieu; to a certain degree, it reflected the spirit of the time.

IDEOLOGICAL MOTIVES

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

There are two clues, however, that help us reveal ideological tendencies. The first is explicit statements. Such testimonials beginning with 'I think that…' – often self-biased and lacking self-reflection – might serve, under proper scholarly criticism, as evidence of one's thoughts and ideas. The second means is analysis and interpretation of 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.

Therefore, this final 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, 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 combined 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.[76] The second component is the modernist desire to do things '*because they are there*': regarding new experiments and enterprises as a basic feature of human behaviour.

Institutions and individuals can work separately on introductions, oppose each other, or collaborate in the pursuit of the shared aim, working as complementary agents.[77] It seems that in the case of carp's introduction to Palestine, the latter was the case.

Control over the Environment

Human attempts to gain control over natural powers and exploit natural resources are as old as humanity itself. Agriculture, by definition, is a human endeavour aimed at manipulating other organisms 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 to 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'.[78]

Bauman uses this interpretation of modernity mostly to analyse modern ruling methods and global economic systems. His observations, however, may also be valid for modern aquaculture (and agriculture in general). The engineering of large water bodies – rectifying rivers, deepening lakes, drying swamps and fortifying banks – was a common phenomenon in European environmental thinking of the late nineteenth and early twentieth centuries. It was a project clearly identified with progress and modernity, and in most cases viewed positively: changes in the aquatic landscape were regarded as valuable 'improvements'. [79]

Defining what part of the environment needs to be 'improved' is clearly a subjective matter, as the definition of 'improvement' is always in the eye of the beholder. In this case, 'improving' meant bringing water bodies under control, to increase the productivity of a certain resident species. 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 to turn the free-running, shallow brook in Tel Yamal into an industrial carp cultivation plant in 1937.[80] 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'.[81] 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.[82]

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 standardisation; this standardisation of new terrains – both metaphorically, referring to societies and social structures, and literally, with the conquest of new areas – were an integral part of twentieth century colonial rule.[83] Due to the vast scope of rule of colonial superpowers, this state project made a considerable contribution to homogenisation: 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 organisations, 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.[84] These motives, however, address only the institutional, state-organised side of the story. The other side of 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, in January 1923.[85] 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 wanted to climb Mount Everest. 'Because it's there,' said Mallory, in an answer that soon became myth.[86] 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.

This somehow deterministic pattern of 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.[87]

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'.[88] 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.[89]

As a matter of fact, 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 organisation, 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.[90] To a certain extent, the Jewish Agency's agricultural and industrial development in Palestine at the time took the shape of random experimentation:

to try what comes, with the hope it will succeed. Naturally, after a while only the successful survived.

At a first glance, the tendency to break boundaries and challenge existing patterns might be seen as standing in contrast to the modernist imperative to control and standardise environment and society. But these two components have also been complementary, providing another example of the duality inherent in modern human development, termed by Horkheimer and Adorno as the 'Janus face of Modernity'.[91] 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 then 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 histories of biological exchanges, 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 is important to understand the human mechanisms underlying such introduction processes.

Tracing the introduction (and hence the possibility of invasion) of species into Palestine is usually 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 civilisation – agriculture, animal domestication and trade – it is hard to think of a place in the world more influenced and shaped by human activity than this area. 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 socio-cultural (namely, traditional customs, habits and preferences). In the case of the introduction of the common carp to Palestine in the 1930s, both motives were intertwined and played a crucial role. The carp's introduction would not have been possible without them.

The dream of 'remaking the land' was the leitmotif of nineteenth-century European settlement.[92] There is no reason to believe it ceased to be such a leit-

motif with the unfolding of the twentieth century, especially in regions which fell under European rule only then. The former provinces of the Ottoman Empire provide an example for such twentieth-century acquired regions.

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 eating 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 at the time, who also carried with them parts of Europe's 'portmanteau biota'.

The economic incentive for introduction was 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.

The third motive accelerated the first two. The intellectual climate and ideological tendencies prevalent in that era were represented by modernisation-oriented elites, which were eager for innovation and novelties on the one hand, while seeking 'efficiency' and standardisation on the other. As the world's biggest colonial force at the time, the British administration took similar agricultural measures all around the globe: the main British professional advisor who initiated this introduction had previously been doing much the same thing in half a dozen other colonies. No wonder there was widespread biotic homogenisation in these areas. The introduction of species is a quintessential process of globalisation, and the story of the Common Carp is just one more example of it. Globalisation breaks down borders between places, while controlling and standardising them: 'Global law, local orders', as Bauman describes it.[93]

Introductions of exotic species into one's own environment are aimed at improving and ameliorating the human condition. Whether consciously or not, they are accompanied by a certain level of optimism and belief that these deeds are positive and beneficial.[94] With the increasing knowledge of the ways and mechanisms by which ecosystems function, scientists tend to become more pessimistic – or at least cautious – about introducing new species into them. Such a shift from optimism to pessimism might reflect a move from modernism to another ideology. Learning from past experiences, however, is still up to us.

NOTES

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Dani Golani from the Hebrew University and Amnon Loja from Haifa University for their help and assistance.

[1] James Hornell, *Report on the Fisheries of Palestine* (Jerusalem, 21 Nov. 1934. Central Zionist Archives: S8/1978).

[2] William A. Dill, *Inland Fisheries of Europe* (FAO, Rome, 1990), p. 53.

[3] Daniel Simberloff, 'Biological Invasions: How are they affecting us, and what can we do about them?', *Western North American Naturalist* **61** (2001): 308–315.

[4] D. Pimental, L. Lach, R. Zuniga and D. Morrison, 'Environmental and Economic Costs of Nonindigenous Species in the United States', *BioScience* **50** (2000): 53–65.

[5] R.N. Mack, D. Simberloff, W.M. Lonsdale et al., 'Biotic Invasions: Causes, Epidemiology, Global Consequences, and Control', *Ecological Applications* **10** (2000): 689–710.

[6] Marc Hall, 'The Native, Naturalized and Exotic: Plants and Animals in Human History', *Landscape Research* **28** (2003): 5–9.

[7] For a general introduction to the subject and a basic list of books and articles for further reading, see Christopher Bright, 'Invasive Species: Pathogens of Globalization', *Foreign Policy* **116** (1999): 50–64. For a detailed model of invasions specifically by freshwater fish, see Peter B. Moyle and Theo Light, 'Biological Invasions of Fresh Water: Empirical Rules and Assembly Theory', *Biological Conservation* **78** (1996): 149–161.

[8] Timo Myllyntaus, 'Environment in Explaining History: Restoring Humans as Part of Nature', in: Timmo Myllyntaus and Mikko Saikku (eds.), *Encountering the Past in Nature: Essays in Environmental History* (Athens: Ohio University Press, 2000), p. 157.

[9] See Philip J. Pauly, 'The Beauty and Menace of Japanese Cherry Trees: Conflicting Visions of American Ecological Independence', *Isis* **87** (1996): 51–73 and Pauly, 'Fighting the Hessian Fly: American and British Responses to Insect Invasion, 1776–1789', *Environmental History* **7** (2002): 485–505.

[10] Donald Kennedy and Marjorie Lucks, 'Rubber, Blight and Mosquitoes: Biogeography Meets the Global Economy', *Environmental History* **4** (1999): 369–383.

[11] Charles Perrings et al., 'Biological Invasion Risks and the Public Good: an Economic Perspective', *Conservation Ecology* **6** (2002): 1.

[12] For a comprehensive analysis of introduction mechanisms and the forces driving them in Australia and North America, see Thomas R. Dunlap, *Nature and the English Diaspora: Environment and History in the United States, Canada, Australia and New Zealand* (Cambridge: Cambridge University Press, 1999), chapter 2: 'Remaking Worlds: European Models in the New Lands' (pp. 46–70).

[13] Paul Robbins, 'Comparing Invasive Networks: Cultural and Political Biographies of Species Invasion', *The Geographical Review* **94** (2004): 139–156.

[14] Robbins, Ibid.

[15] Perrings, Ibid.

[16] C.M. Duarte, N. Marbá and M. Holmer, 'Rapid Domestication of Marine Species', *Science* **316** (20 April 2007): 382–383.

[17] 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 the influence of common carp (together with other introduced species) on aquatic

habitats around the Mediterranean, see I.D. Leonardos, I. Kagalou, M. Tsoumani and P.S. Economidis, '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),: 165–173.

[18] Daniel Golani and Dan Mires, 'Introduction of Fishes to the Freshwater System in Israel', *Bamidgeh – The Israeli Journal of Aquaculture* **52** (2000): 47–60.

[19] Uriel Safriel (ed.), *Migvan Biologi v-Pitux Bar-Qajma': Sikummej Ybodat Cevet 'Migvan Biologi' b-Misgeret "Estrategja l-Pitux Bar-Qajma' b-Jişra'el'* [Biological Diversity and Sustainable Development: Proceedings of the Biological Diversity Team within the Frame of 'Strategy for a Sustainable Development in Israel'], (Jerusalem: Ministry of the Environment, 2002), pp. 26–28.

[20] Jerry Towle, 'Authored Ecosystems: Livingston Stone and the Transformation of California Fisheries', *Environmental History* **5** (2000): 54–74. Towle emphasises that not every introduction is destructive or even harmful. However, this does not influence the relevance of the act of human introduction.

[21] H.S. Harrison, 'James Hornell, 1865–1949', *Man* **49** (1949): 66–67.

[22] See, for instance: George Perkins Marsh, *Man and Nature* (New York: C. Scribner & Co., 1869); Richard Lee and Irven de Vore (eds.), *Man the Hunter* (Chicago: Aldine, 1968); Edward O. Wilson, *Biophilia* (Cambridge: Harvard University Press, 1986); Stephen R. Kellert and Edward O. Wilson (eds.), *The Biophilia Hypothesis* (Washington, DC: Island Press, 1993).

[23] Jared Diamond, *Collapse: How Societies Choose to Fail or Succeed* (New York: Penguin Books, 2005), p. 187.

[24] 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.

[25] Despite the common belief that the Romans brought carp to Europe from China, it is more likely that they were swimming around the Danube delta much earlier. See Eugene K. Balon, 'About the Oldest Domesticates among Fishes', *Journal of Fish Biology* **65** (2004): 1–27.

[26] Christopher K. Currie, 'The Early History of the Carp and its Economic Significance in England', *Agricultural Historical Review* **39** (1991): 97–107.

[27] Darin Kinsey, '"Seeding the Water as the Earth": The Epicenter and Peripheries of a Western Aquacultural Revolution', *Environmental History* **11** (2006): 527–566.

[28] Anat Helman, 'European Jews in the Levant Heat: Climate and Culture in 1920's and 1930's Tel Aviv', *Journal of Israeli History* **22** (2003): 71–90.

[29] Amnon Loja, 'Branqo Zicer ve-mifyalej ha-daggim be-Kurdani, 1934–1947' [Branco Sitzer and Pisciculture in Kurdani, 1934–1947], *Qatedra* **111** (April 2004): 76–94.

[30] Dizengoff was the first chief of Tel Abib, since 1911. In 1922, when the little town was declared a city, he became its 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. He was the Mayor for eight more years, until his death in 1936.

[31] 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 years. See Arnon Golan, 'Jewish Nationalism, European Colonialism and Modernity: The Origins of the Israeli Public Housing System', *Housing Studies* **13** (1998): 487–505. The actual numbers might have been even higher, as many immigrants – especially from neighbouring countries – were not registered and lacked proper if any documentation. 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* **42** (2006): 625–640. With some fluctuations, this growth tendency continued during the 1930s and 1940s.

[32] 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 on 29 Dec. 1926 (CZA, S8/1329/4). A seventh member of the committee, Mr. Jaffe, was originally from Palestine.

[33] Protocol of the second meeting of the Fishing Committee, 17 Jan. 1927 (CZA, S8/1329/4)

[34] Protocol of the third meeting of the Fishing Committee, 17. Feb. 1927 (CZA, S8/1329/4). 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.

[35] A letter from Dizengoff to the directory board of PICA, 9 Jan. 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 was well understood by the readers of his letter.

[36] A letter from Dizengoff to the Director of Lands, 1 Feb. 1927 (CZA, S8/1329/1). Dizengoff also pointed at the economic interest in his request, adding that building such ponds will need a lot of work, and thus allow many people to earn their living from it.

[37] Loja, 'Branqo Zicer'.

[38] Letter from Tischby to the polish office of the 'Jewish Agency', 22 Jan. 1933 (CZA S8/1329/1), cited by Loja, ibid. The term 'Jew' in the Zionist jargon of those days designated mostly people from Central or Eastern Europe.

[39] Naphtali Wydra, *Ha-Dajig be-'Erec Jişrael* [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.

[40] Interview with Šmu'el Şarig, Nir David, 28 Sep. 2006. Founders of Nir David (in its old name 'Tel Yamal') began breeding carp in 1938. The fish from Vienna referred to are probably those imported by Sitzer.

[41] Menachem Goren and Reuven Ortal. 'Biogeography, Diversity and Conservation of the Inland Water Fish Communities in Israel', *Biological Conservation* **89** (1999): 1–9.

[42] 'Gefülte Fisch' (German for 'Stuffed Fish') is a traditional Central- and Eastern-European delicacy, consisting of a combination of whole freshwater fish, together

with ground fishmeat, spices and vegetables. While Christian families usually eat it at Christmas, Jewish families usually eat it at Jewish Easter (Passover) and New Year (in September–October).

[43] The first attempts to introduce Eucalyptus took place in the 1860s and 1880s, and successful afforestation of Eucalypts between the years 1895–1899. See Gideon Biger and Nili Liphschitz, 'Australian Trees in the Land of Israel, 1865–1950', *Journal of Israeli History* **16** (1995): 235–244.

[44] See C. Holzapfel et al., 'Colonisation of the Middle East by the Invasive Common Myna *Acridotheres tristis* L. with Special Reference to Israel', *Sandgrouse* **28** (2006): 44–51. The mynah, an intelligent and friendly bird, was brought as a pet.

[45] Roza I. M. El-Eini, 'The Implementation of British Agricultural Policy in Palestine in the 1930s', *Middle Eastern Studies* **32** (1996): 211–250. In the political context, El-Eini makes a link between the stress put upon the farmers and the public unrest and ethnic clashes in August 1929.

[46] Hornell, *Report on the Fisheries*, p. 3.

[47] Ibid., pp. 5, 94.

[48] Letter from Tischby to Kingsley William Stead, head of the customs department in Haifa harbour, 23 Jul. 1935 (CZA 1329/1). 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.

[49] Bernard H. Bourdillon, 'Colonial Development and Welfare', *International Affairs* **20** (1944): 369–380. In this short and critical account of the Empire's colonial policy in the 1930s, Bourdillon, who was then the Governor of Nigeria, sharply criticises the British colonial policy; some of his sharp observations can be read today as prophecies about the current failures of 'development' policies in the third world.

[50] 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* **28** (1975): 484–499.

[51] See note 21 above.

[52] Giddul ha-Daggim b-Brejkot [The Husbandry of Fish in Ponds], *Ha-'Arec*, 1 Jul. 1947.

[53] Hornell, *Report on the Fisheries*, p. 96.

[54] B-Šuq ha-Daggim šel Tel Abib [In the Fish Market of Tel Abib], *Ha-'Arec*, 22 Jul. 1936, p. 3. The original weights are 2000–2200 Rotl; one Rotl is approx. 2.56 Kgs.

[55] Hornell, *Report on the Fisheries*.

[56] Ibid., p. 95.

[57] For a detailed account of the British Mandate Government's protection ploicy, see R.I.M. El-Eini, 'Trade Agreements and the Continuation of Tariff Protection Policy in Mandate Palestine in the 1930s', *Middle Eastern Studies* **34** (1998): 164–191.

[58] Memorandum on the Palestine-Iraq Trade written by D. Horowitz to the Economic Research Institute of the 'Jewish Agency', February 1937 (CZA S54/201).

[59] 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.

[60] Letter from Tischby to Rotenstreich, titled 'My Voyage to Egypt', 27 Mar. 1936 (S54/207).

[61] Letter from Tischby to Schartok, 2 Dec. 1937 (CZA S54/207).

[62] Report from the archive of the Urban Colonization Department, no exact date. (CZA S8/2153)

[63] Letter from Tischby to F. H. Kisch, Jerusalem, 8 May 1934 (CZA S8/1329/1)

[64] Letter from Tischby to F. H. Kisch, Jerusalem, 16 May 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.

[65] Hornell, *Report on the Fisheries*, p. 8.

[66] Ibid., p. 9. Gourami (*Osphronemus gorami*) was one of the species suggested by Soloweiczick back in 1927 (see note 24 above). Rainbow trout (*Oncorhynchus mykiss*, another member of the ISSG's 100-list) were actually introduced to some streams in upper Galilee in the mid-1930s and again in 1946; they established an invasive population. See Golani and Mires, 'Introduction of Fishes'.

[67] 'Hitqadmut ha-Dajjig ha-Jehuddi' [Advance of the Jewish Fishery], *Ha-'Arec*, 5 Feb. 1941 (Copy in CZA/1329/2).

[68] 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 Şde Naxum (near Tel Yamal), wrote that the annual production was as much as 10 times higher. Some of the descendants of these rainbow trout also became invasive (Golani and Mires, 'Introduction of Fishes'), while others are regularly grilled and fried in Israel to this very day.

[69] 'Brejkot l-Giddul Dag Jam' [Ponds for Breeding Sea Fish], *Ha-'Arec*, 23 Aug. 1944. (Copy in CZA/1329/2).

[70] A letter from Sitzer to the Jewish Agency (Probably to Wydra), 10 Feb. 1937 (CZA S4/214).

[71] Jakob Katz and Gerhard David, 'Fischerei in Tel Yamal' [Fishery in Tel Yamal], Haifa, 7 Nov. 1937 (CZA S9/1564). Their visit to the fisheries took place one week before.

[72] Letter from Wydra to B. K. Meerovitch, 18 Nov. 1937 (CZA S9/1564/3).

[73] See note 1.

[74] Source: Sklower, 'Fischzucht in Palästina', footnote 62. The yield in 1938 was only 800 kg; the data of 1945 refers only to the first 11 months of the season.

[75] Letter from Wydra to the 'Xaluc Association' in Berlin, 18 Apr. 1938 (CZA S54/Y).

[76] Not only the British, but also the French colonial rule became centres of organised acclimatisation. 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* **15** (2000): 135–151.

[77] Towle, 'Authored Ecosystems'.

[78] Zygmunt Bauman, *Globalization: The Human Consequences* (Cambridge: Polity Press, 1998), p. 33.

[79] Marc Cioc, *The Rhine: an Eco-Biography, 1815–2000* (Seattle: University of Washington Press, 2002), p. 12 onwards.

[80] Letter from Wydra to B.K. Merowitch, 18 Nov. 1937 (CZA, S9/1564/3).

[81] Letter from Craig Bennet to Meerovitch, [exact date unclear, second half of 1937] (CZA, S25/7430).

[82] Letter from Meerovitch to The 'Hakšarat ha-Ješub' Company, 9 May 1938 (CZA, S25/7430)

[83] James C. Scott, *Seeing Like a State: How Certain Schemes to Improve the Human Condition Have Failed* (New Haven: Yale University Press, 1998), pp. 9, 97. Scott uses the term 'High Modernism' to describe this 'improvisation' approach.

[84] See Gideon Biger, 'Ideology and Landscape of British Palestine, 1918–1929', in Alan Baker and Gideon Biger (eds.), *Ideology and Landscape in Historical Perspective* (Cambridge: Cambridge University Press, 1992).

[85] Letter from Prober to Tischby, Jerusalem, 6 Jan. 1923 (CZA, S8/1326), quoted by Loja, 'Branqo Zicer'. 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.

[86] 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. Mallory, alas, died in his attempt.

[87] Letter from Tischby to Kisch, Jerusalem, 16 May 1934 (CZA, S8/1329/1)

[88] For a detailed review of government lead agricultural improvements in Palestine at the time see El-Eini, 'The Implementation of British Agricultural Policy'.

[89] This 'scattergun experimentation' approach was not an innovation here. Livingston Stone, the living spirit behind the introduction of many freshwater species to California who actually became the 'author' of many Californian ecosystems, did the same (see Towle, 'Authored Ecosystems'). What might have been new here was only the extent and the width of the varieties tried and considered.

[90] Letter from Sklower to Wydra, 07 Jul. 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.

[91] Max Horkheimer and Theodor Adorno, *Dialektik der Aufklärung* (Frankfurt am Main: Fischer, 1990).

[92] Dunlap, *Nature and the English Diaspora,* p. 46.

[93] Bauman, *Globalization*, p. 103.

[94] Towle, 'Authored Ecosystems'.

Exploring Australian rainforest, 1840s

Eighth Conference of

The Australian Forest History Society

7–11 June 2010

Lismore, New South Wales

Where?

The conference will be held at Invercauld House, the functions and conference facility of Southern Cross University in Lismore, northern New South Wales. Lismore, a city of about thirty thousand people, is the largest urban centre in the Northern Rivers Region of New South Wales. The region has a rich history of forest logging, forest destruction (mainly for farming), forest conservation, forest activism, and native and exotic afforestation. It also has a great diversity of biological communities, including eucalypt forests, rainforests, forested freshwater wetlands, and mangrove forests.

What?

In keeping with the forest history of the Lismore region, conference participants are encouraged to consider the themes of rainforests and rainforest products, and of landscape-scale forest transitions. Nevertheless, the Australian Forest History Society welcomes papers and presentations on all aspects of Australian and New Zealand forest history.

When?

The conference will run from the evening of Monday 7 June through to the end of Friday 11 June, and will include sessions of paper presentations, short field trips, and a conference dinner. It will be followed by a separate three-day study tour in north-eastern New South Wales and south-eastern Queensland.

Who?

More information about the Society and the latest information about the Lismore conference can be found at:

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