Draining the Marshlands, Disciplining the Masses: The Linth Valley Hydro Engineering Scheme (1807–1823) and the Genesis of Swiss National Unity

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ABSTRACT

The first large-scale hydro technical project of modern Switzerland, the Linth Valley hydro engineering scheme (1807–1823), has been considered to be 'a great moral endeavour'. The paper asks, what historical conditions made it possible to conceive of hydro technical engineering in moral categories? Following the political views of the main promoter of the scheme, Hans Konrad Escher (1767–1823), it shows, that within a specific ideological framework no clear-cut distinctions were drawn between the natural, the technical and the social. Rather, within this early example of environmental management, genuinely technical means of engineering were successfully used to address both urgent political and social problems of the time. The main argument is, that the act of draining marshlands successfully promoted national unity and set important preconditions for the later to be founded liberal nation state.

KEY WORDS

Hydraulic engineering, water control, drainage, mastery of territory, concepts of nature, nation building, enlightenment, liberal political thought, public education, 1800s

This paper focuses on a crucial episode of Swiss environmental history. It will sketch the outlines of a major technical intervention into nature and locate this scheme within the context of the history of political institutions and ideologies. Focus will lie on one part of the Alps, which was turned into a landscape of national importance. In early nineteenth century the Linth River, which flows from the Glarus Mountains into the Lake of Zurich, became the object of the first

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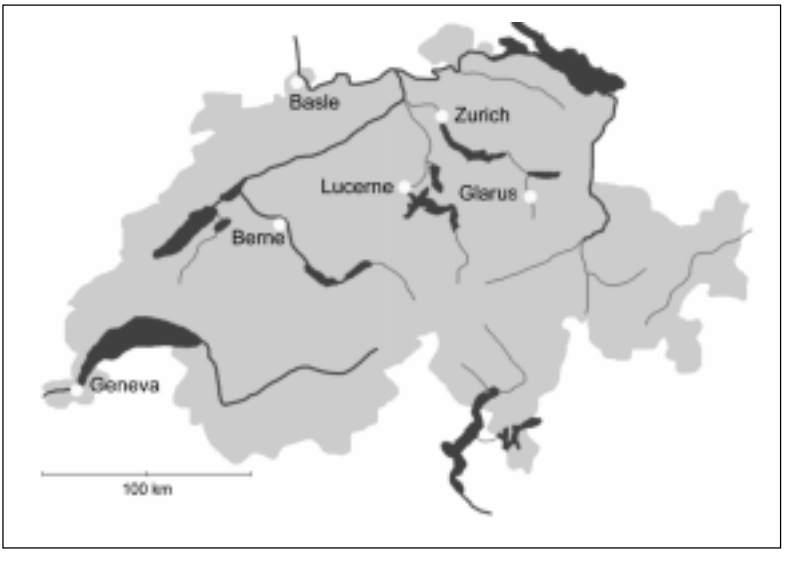
large-scale hydro technical project of modern Switzerland (see map 1). In 1830, shortly after the structure had been completed, the renowned educational reformer Philipp Emmanuel von Fellenberg (1771–1844) called the place 'a classical ground', as it had been the stage of a 'Swiss national enterprise'. In the Valley of the Linth, he added, 'the natural beauties of our country have invited us […] to achieve great moral endeavours'.[1]



MAP 1. Main watercourses of Switzerland. The rivers and lakes of interest are those connecting the cities of Glarus and Zurich. (Map drawn by the author)

The connection of landscape, moral norms and political organisation has been crucial in the formation of many modern nations states. In British and American history as well as in the Swiss case, specific landscapes have been linked to the concept of national identity.[2] The Swiss federal state was founded in 1848, after a brief civil war. However, this union of formerly 22 independent States remained rather fragile. Local authorities kept a high degree of autonomy while the central government was remarkably weak. When it came to promote emotional strings of identification with the new political structure after 1848, geographical features were readily at hand, as hardly any other core concepts existed. Three major languages separated the country, no single religious

denomination prevailed, and economic development had just started to open up wide gaps between industrialised and rural regions. To promote unity, natural landscape and politics were fused in many ways, for example by inventing historical narratives, within which political freedom and democracy were presented as a (natural) consequence of the moral nature of the Swiss and of the physical nature of their environment. One of these narratives was the legend of William Tell which was artistically located in the central part of the Swiss Alps by the German writer Friedrich Schiller and linked to a series of historically real battles against Austrian dukes. The Swiss built monuments at the battlegrounds which soon formed a landscape of national history, called the 'Classical Ground of Switzerland'.[3]

In these narratives, landscapes were the background images of historical events during which they themselves stayed unchanged. But in the case of the Linth scheme, the Linth Valley became a national monument, because its physical appearance had been completely turned over by technical means. The following analysis of this major change of a landscape will show, what historical conditions made it possible to conceive of hydro technical engineering as a 'moral endeavour'. A close look at the notions of nature will clarify that nature was not only referred to as a stable source of norms, values and goods. Instead, an elaborate ideology of improvement of nature gained ground around 1800. True nature, such was the creed, did not present itself without human intervention, but was the result of emancipatory work. By draining marshlands, by 'correcting' rivers, and also by disciplining and educating rural poor, real nature could be unveiled. The main actors in this attempt at improving nature were members of the bourgeois elites of the city-states of Zurich, Basle and Bern who shared characteristics of an aristocracy, but did not own large private estates. Hence, the ideology of improvement materialised in a completely different political framework, as it did, for example, in Britain during the same time.[4] Following the political views of Hans Konrad Escher (1767–1823), who was a member of one of the most powerful families of Zurich and the main promoter of the scheme, it will be shown, that within this ideological framework no clear-cut distinctions were drawn between the natural, the technical and the social. Rather, within this early example of environmental management, genuinely technical means of engineering were successfully used to address urgent political, as well as social problems of the time.

On the shores of the Linth River, a central authority successfully engaged in improving physical nature in order to increase public wealth. And at the same time the moral nature of the rural poor, who inhabited this stretch of land, was thought to have been improved by the feat of hydraulic engineering. The Linth Scheme successfully aimed at unifying the heterogeneous group of political actors and it was an attempt at bridging the emergent gap between social classes. In this respect it considerably strengthened Swiss national cohesion and thus

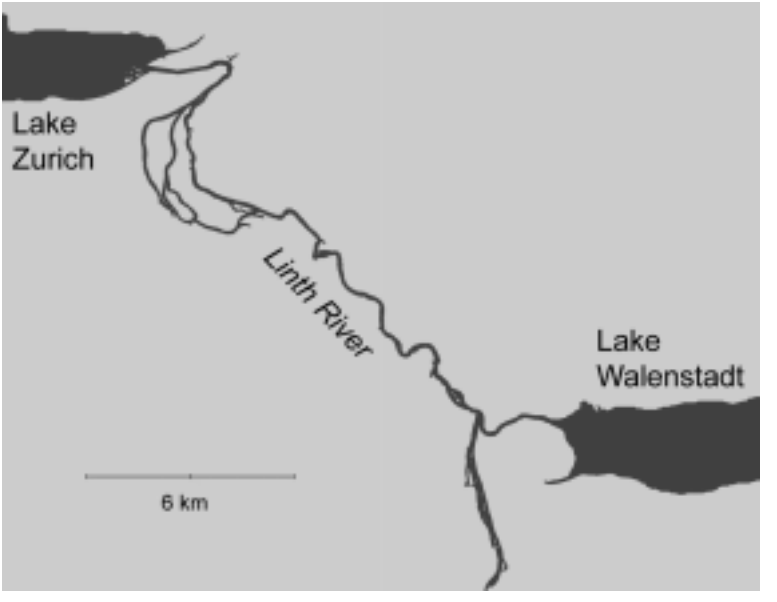
was, indeed, a national enterprise of great importance. In order to make this point, the paper will first draw the outlines of the project. Second, it will explore the revolutionary aspects of hydraulic engineering in the context of late eighteenth century Switzerland. Third, it will show in what ways the Linth scheme was institutionally important for the founding of the federal state of 1848. And finally, the paper presents the hydro technical structure as a 'national classroom', as it were, in which a Swiss body politic was formed.

I. THE PROJECT

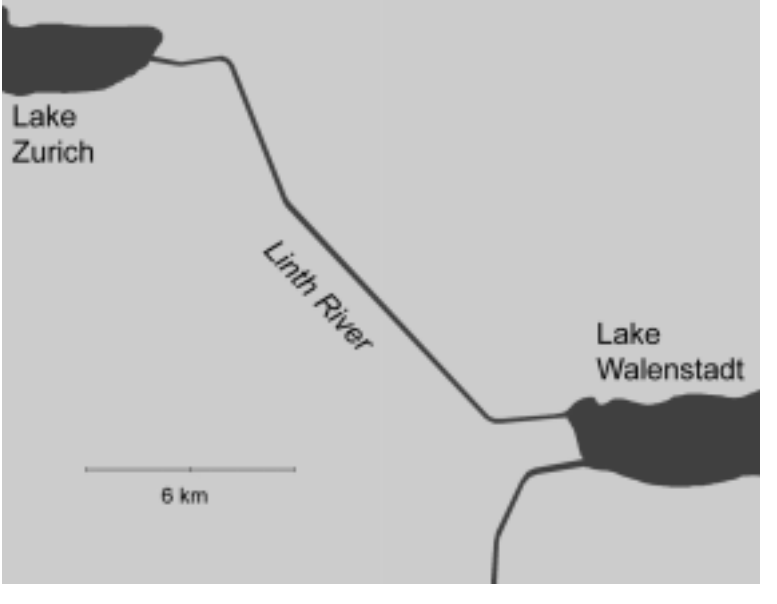
The Linth River originally directed its waters from a large part of the Alps, including several peaks of more than 3000 metres in altitude, directly into the Lake of Zurich, passing near Lake Walenstadt, without touching it. Some three kilometres to the northwest of Lake Walenstadt its outlet joined the Linth River (see map 2 and 3). In the course of the eighteenth century an increasing amount of deposit made the Linth slowly rise to a critical level, and from the 1760s onwards, the regular flood in spring started to obstruct the drainage of Lake Walenstadt. In years of exceptionally high floods, as were seen in 1762 and 1764; it would even redirect the outlet of the lake backwards. Over the years this natural landscape change had dramatic effects on the daily life of local people. An area of roughly 16,000 inhabitants gradually turned into wetlands. Crops deteriorated and settlements had to be abandoned. What was even more important in the mercantilist logic of the time was that the river transportation on one of the major trade routes towards Italy was badly affected, as the main course of the river split up into several small streams, which were not navigable.[5]

In 1784 a first technical plan was developed. Its basic idea was to direct the Linth River from the Glarus Valley directly into Lake Walenstadt, in order to make it deposit its debris in the depth of the lake. In a second step, the outlet of the lake was to be improved by connecting Lake Walenstadt and Lake Zurich through a new river bed. A constant flow of clean water contained by massive dams was thought to allow for hydrological stability in the region. This scheme was eventually carried out – but only 23 years later, after the French Revolution and the Napoleonic Wars had changed political structures all over continental Europe, including Switzerland. Until work started in the year 1807 the situation on the ground was in the process of constant deterioration.

The hydrotechnical basis of the project was designed by the German engineer Johann Gottfried Tulla (1770–1828), who later became well known for his regulation of the Upper Rhine. The expert however only spent a few months in the Linth region, during which he instructed the Swiss who lacked hydrotechnical knowledge. His most willing student was Hans Konrad Escher of the city of Zurich, a trained political economist, philosopher and geologist, who quickly adopted the new techniques and lead the enterprise from 1804 until his death in



MAP 2. Prior to the scheme, the Linth River directed its water directly into Lake Zurich without touching Lake Walenstadt. (Map drawn by the author)



MAP 3. Since 1816 the Linth River directs its water artificially into Lake Walenstadt and leads in a straigth line out of this lake into Lake Zurich. (Map drawn by the author)

1823. Between 1807 and 1816 some 600 labourers constructed the system of two major canals of a total length of 20 kilometres.

The Linth hydro engineering scheme is very well known in Switzerland as its history has been told many times.[6] Most often it is thought of as a project to regain arable land and to increase river transportation. But the delay of 23 years raises some questions. Obviously these economic aspects were not sufficient to trigger action. Rather, social and cultural dimensions necessarily have to be included into the analysis of the scheme. This view is strongly supported by the fact that the goals of improving agriculture and transport were only reached in part. Soon after the completion of the structure, cargo shipping lost in importance, as the new railway lines started to monopolise transport business. And though the level of Lake Walenstadt sunk considerably, the agricultural productivity of the area did not rise as quickly as one might have expected. In fact, to achieve this objective, several additional projects of land drainage had to be carried out, the last of which was not completed until 1964.[7]

But regardless of these circumstances, the project became a model for all the following regulations of Swiss rivers in the second half of the nineteenth century. It was considered a masterpiece of river hydro techniques that could easily stand comparison with much larger projects like the drainage of Prussia's Oderbruch or the regulation of the Upper Rhine in the Grand Dukedom of Baden. The Linth scheme opened up the modern era of hydrological mastery of territory, in the course of which practically all Swiss rivers have been corrected. Ever since the structure was completed in 1823, the landscape of the Linth Valley has been perceived as a monument of human power over nature and even modern environmental critics acknowledge the pioneering spirit by which it was ruled.[8] However, the roots of this strong symbolism do not lie in the technical or economic aspects of the scheme, but rather in the fact that in its course a successful co-operation between the different parts of fragmented Switzerland was possible. In the logic of this interpretation, Hans Konrad Escher became a Swiss national hero who achieved national unity through a concrete task (see figure 1). No history of modern Switzerland misses an account of his fight against the swamp. The political symbolism of the scheme has to be regarded as its main characteristic.

II. HYDRAULIC ENGINEERING IN REVOLUTIONARY TIMES

When in 1784 the first measures of relief for the suffering population of the region were planned, the Linth Valley was administered by eight different cantons, each of them an independent state. One part of the area was directly incorporated into the canton of Glarus, whose male citizens were enjoying a certain degree of political liberty, as they assembled yearly in a democratic convention called 'Landsgemeinde'. Another major part of the Valley was a

district of the canton of Schwyz, which had basically the same political system as Glarus. The remaining areas were divided up into several common dominions of the eight old cantons allied in the Swiss confederation. The abbey of Einsiedeln held manorial rights and so did the abbey of St. Gall. This pre-modern political arrangement was complicated by a special treaty of the cantons of Schwyz, Glarus and Zurich, which had ship transport on the waterway under its monopolised control.[9] Once every year the sovereign states sent delegates to a federal conference, called the federal diet, where from the 1780s onwards, landscape change in the Linth Valley was an annual topic.

But for several reasons no effective steps were taken. First, only a minority of the cantonal governments considered public works of engineering to be a duty of the government authorities at all. In this respect the bourgeois elite of Bern was by far most active. Other cantons, like Zurich, Glarus and Schwyz, were surprisingly passive when it came to constructing proper roads or to hydraulic

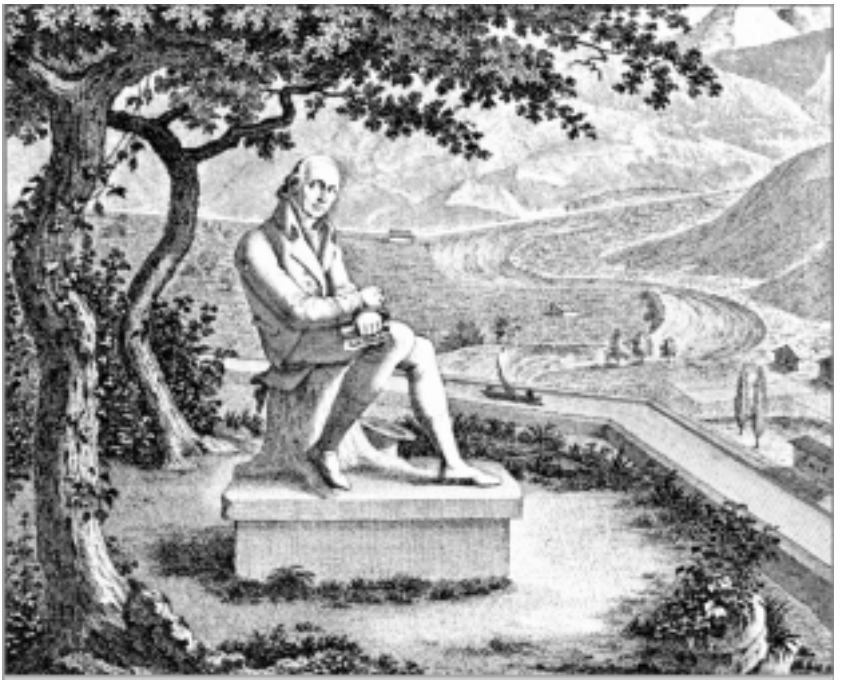


FIGURE 1. Draft of a design for a Monument in honour of Hans Konrad Escher, showing the main promoter of the scheme as a philosopher. Note the curved lines of the old riverbed in the background as opposed to the straight lines of the new structure in the centre of the image. (Source: Frontispiece of the New Year Publication of the Central Library of Zurich, Zurich 1828)

engineering.[10] Second, the existing forms of common disaster relief had always been focused on singular events like exceptional floods, fire disasters, avalanches and the like.[11] But in the case of the Linth Valley, the damage grew slowly, so no spectacular changes triggered collective actions of pity and compassion. Third, the local population lacked the political influence that could have given an adequate weight to their cause. And finally, no single political institution was clearly responsible for the deteriorating situation. Rather, the different actors tried to push responsibility on to the others. This led to a paralysing stalemate as each of them jealously protected their own interests.

At this stage Hans Konrad Escher developed some interest in the miserable state of the people of the Linth Valley. The revenues of the Zurich based trade company run by his father and brother allowed him to travel extensively across Europe, to explore the Swiss Alps with growing geological interest, to study the philosophy of Immanuel Kant and to draft several treatises on good governance. He closely followed the developments of the French Revolution with great sympathy and became a sharp critic of the oligarchic rule by which the city of Zurich dominated its hinterland. However, being a member of the local elite himself, he did not dismiss patriarchal authority as such, and of course, he took great care to keep his political convictions private. One circle of free thought and argument was the 'Helvetic Society', an elitist group of enlightend intellectuals founded in 1762, which Escher joined in 1792. In that year the hydrological problem in the Linth Valley was brought to the attention of the members of the society in a philanthropic presidential address.[12] Shortly after, Escher visited the area and published an account of his impressions. In this, he used the topic to bring forward his political criticism in a rather indirect and disingenuous way. Escher widely shared the general assumption, that the miasma of the swamp and its insidious, debilitating influence had already seriously degraded the moral nature of local women and men. They were considered to have lost their capacity to improve their way of life by themselves, and thus to have lost a good deal of their humanity. But who was to blame? Was it their fault, as many said? Was it the way of nature? Or were government officials to be held responsible?

Escher based his arguments on a brief analysis of the ways of nature that followed the tradition of the philosophy of natural rights. Nature, he argued in decidedly masculinist terms, could turn blooming gardens into wastelands, but it also gave man the capacity of reason, to turn wastelands back into blooming gardens. 'Of course, the marshes on the shores of Lake Walenstadt are caused by nature; but nature also gave us reason enough, to hinder such miseries; it forces us into a social condition, as we have to act united, if one man alone is without help. Finally it forces us into constitutional states, in which we are led by representatives or fatherly rulers in our fight against even greater miseries.'[13] By connecting the forces of nature so closely to polity, Escher put forward a very strong notion of government responsibility. Consequently he had to ask the

question, who was to assume it. At the age of thirty years, the young son of the elite of the state of Zurich concluded self-accusingly: '*We* are these fathers of the people, together with our confederates; *thus it is us*, and not those miserable masses, who have to be accused of making them lose their humanity.'

Statements like these neared high treason in the governmental rationality of the benevolent despotism of the Old Regime. But for the members of the 'Helvetic Society' public criticism of the political authorities was imperative;[14] and the situation in the Linth Valley made them speak up for many reasons. First of all, they followed the contractualist arguments of John Locke and Immanuel Kant, who accepted only one legitimate source of political power: i.e. the natural rights of a bourgeois individual of masculine gender, who was educated well enough, to make proper use of his capacities of reason. This was not the political basis of the Old Confederation, despite its alleged democratic tradition.[15] And neither did 'those miserable masses', who had lost their 'humanity', form an adequate body politic; nor did their male members meet the high profile of reasonable subjects at all.

Second, the stalemate at the federal diet concerning the peculiar hydraulic problem in the Linth Valley showed the general need for a unified political system, including a strong central authority. The Old Confederation as a whole was not able to act united, whenever such action was needed. Third, from a contractualist point of view, the existing powers missed completely their only legitimate fields of action, i.e. to secure the liberties of individual subjects and to promote their common wealth. In accordance with Adam Smith, people like Escher saw one of the fundamental duties of the sovereign power in, 'erecting and maintaining those public institutions and those public works, which, though they may be in the highest degree advantageous to a great society, are, however, of such a nature that the profit could never repay the expense to any individual or small number of individuals.'[16] Among many others, one such task was to improve the intellectual capacities of the population by means of instituting public education. Another task was improving the living conditions of the people by means of public works of engineering.

The time to realise these goals seemed to have come, when local revolutionary movements put up a new liberal constitution in 1798 with a strong back up by Napoleonic France. The political order of the Old Confederation crumbled within weeks, giving way to the unified and indivisible Helvetic Republic. Along with the new freedom of speech, of trade and of movement went a complete reorganisation of the territorial structure of the country.[17] The Linth Valley was now unified within one single canton called 'Canton Linth', and the administrative hierarchy was simplified. The new district commissioners soon received memoranda from locals like the pastor of Niederurnen, Johann Jakob Zwicki (1768–1806), or the Walenstadt based medical doctor Joseph Anton Zugenbühler (1774–1855), who desperately sought for help. In view of the new political

situation the latter addressed the Helvetic government in 1799: 'Repeatedly one thought the [hydro technical] plans would be realised, but a start was never made. This was left to a powerful state; I expect it with certainty.'[18]

The central authority was bound to engage in this effort to increase public wealth, but it lacked the necessary funds. Therefore, the idea of collecting private donations gained ground. An appeal to the patriotic solidarity of the *citoyens* throughout the country was planned to be launched.[19] But before any steps could be taken, the former elites regained power and the Old Regime was restored in 1803. The common dominions of the old cantons, however, were not re-established but turned into independent cantons of their own right. In addition to the old social and economic differences between the separate cantons, now a new divide between liberal and conservative political forces opened up.

III. INSTITUTING A NON-EXISTING STATE

Konrad Escher, who had held executive power during the Helvetic Republic, and who was now asked to join the government of Zurich, rejected any further political office in view of this development. 'I would rather dry up your mires, than govern this country', he wrote to a friend in Glarus.[20] In fact, the old hydro technical project had been brought forward again during the first session of the restored federal diet by two members of the elite of Glarus, Conrad Schindler (1757–1841) and Niklaus Heer (1775–1822).[21] Escher was ready to join forces with them; and in this historical moment of almost complete absence of central authority, the overdue regulation of the Linth River was finally to be realised. In the long run the task of hydraulic engineering would turn out to be yet another way of pursuing the political aim of uniting the Swiss nation.

The technical design of the scheme had largely been clarified before the Revolution. But it remained as unclear as ever how the project could be financed, and how a supervising board could be furnished with the necessary authority to make local governments co-operate. The federal diet had no financial autonomy and it lacked the power to enforce the execution of its decisions on the level of the cantons. But in contrast to its counterpart before the revolution, it had at least the formal competence to supervise public infrastructure throughout the confederation.[22]

Escher, who was appointed to work out a master plan,[23] suggested solving both problems by referring to the evolving public sphere, in which a Swiss civil society was about to be formed. The idea of private finance was reactivated and put under the tutelage of the presidency of the federal diet. In the name of this institution, which held merely representational power, Escher co-authored an appeal to the general public with Johan Samuel Ith (1747–1813), an aristocrat and educational reformer of Bern.[24] The publication set in with a touching description of the suffering of the inhabitants of the Linth Valley and culminated

in the quest for a national enterprise of solidarity. Then the authors offered a way of expressing these compassionate feelings to all 'confederate brothers', by making available shares of an amount of 200 francs each. However, these were not to pay any interest.

The authors of the plan made clever use of the existing state structures. The chancellor of the federal diet signed every single certificate. The cantonal governments were responsible for the distribution of the shares, and the administration of the canton of Zurich took over accountancy. But the power to direct the enterprise lay completely with a technical supervising board presided by Escher, and with a financial commission directed by Hans Georg Stehlin (1760–1832) of Basle. From 1807 onwards they not only reported to the federal diet, but – what was new and unheard of – directly to the general public as well. Detailed accounts of the financial and technical situation of the enterprise were published twice a year, including a constant update of the list of shareholders. Public administration had never been as transparent in Switzerland before. And in 1809 Escher and Stehlin even invited public criticism of the endeavour, to further strengthen their authority.[25] Thus, beyond the existing structure of a highly fragmented political body a new institution arose. It had as its only duty the task of increasing public wealth in the Linth Valley, and it took great care in holding up the idea that it was executing the collectivised free will of individual subjects who originated from many different parts of the Swiss nation. At time of writing, the unique organisational structure still stands beside the federal and the cantonal governments.

The unprecedented combination of private initiative and formal state institution, in which wealthy individuals, cantonal governments, religious congregations and rural corporations could join in, was of considerable success. The necessary funds were raised quickly, work could be started and the financial system proved flexible enough to meet additional demands of money, which came up in the later course of the project. In 1827, well after the main work was done, the issuing of shares was stopped. The enterprise now started to pay back shareholders by selling the improved estates that had been bought at very low prices before the drainage. During 20 years a total capital of 800,000 Swiss francs had been mobilised. This was a substantial sum of money spent in the name of a federal authority, whose regular military expenditure amounted to less than 600,000 Swiss francs over the same two decades.[26]

This success accounts for the considerable symbolic value of the Linth scheme. When in 1848 the constitutional basis for the new federal state was laid out, the now long completed project was of high importance as a precedent. It motivated the founding fathers of modern liberal Switzerland to empower the new government with the right, not only to supervise, but also to erect and maintain public works throughout the confederation.[27] Improving nature had become an unquestioned duty of government authorities. And it had also become a central element within the fabric of Swiss national identity.

Already during the decades of its construction, the Linth scheme had been perceived as a joint achievement of the Swiss, and this was even more relevant in the aftermath. Still today the national interpretation is fairly common,[28] but materially it does not hold. Roughly three quarters of the shares were bought by directly interested parties, such as landowners of the Linth Valley or by cantonal governments and corporations engaged in ship transport. One could say that economic interests motivated the intervention in the first place.[29] However, the national frame of interpretation was absolutely necessary for the project to gain momentum. Governmental organisations and private individuals, who had no material interest in the scheme, bought no less than 25 per cent of the shares. These nationally motivated contributions were sufficient to bring together the conflicting local interests, and thus accounted for the final realisation of the project.

The national frame of interpretation worked so well because the enterprise could be represented as a completely non-political form of disaster relief. The objective of improving nature seemed neutral to all sides. Radical proto-liberals as well as conservative aristocrats could easily agree that improving the living conditions of the suffering people of the region was worth a common effort. Or at least they had no good reasons to argue against the project. Moreover, once the whole enterprise was successfully turned into a question of national cohesion, buying shares became a means of expressing political statements. In this regard the 100 shares that were bought by Geneva in 1815, when the formerly independent republic joined the Swiss confederation, seem to have been a symbolic admission charge. Also, many women and two Jewish communities took the chance of expressing their community spirit, as they otherwise enjoyed no political rights of any kind, until well after the foundation of the Swiss liberal State in 1848.[30]

IV. THE LINTH VALLEY AS A NATIONAL CLASSROOM

When Konrad Escher and Samuel Ith designed the enterprise as a national joint-stock company, as it were, they must have been very much aware that no body politic for Switzerland could be formed by simply uniting wealthy individuals from Zurich, Geneva, Basle and Bern. The Napoleonic Wars and the devastating effects of the British Continental System on the Swiss textile industry had led to high degrees of unemployment and poverty in Eastern Switzerland. Together with the impact of the rising level of Lake Walenstadt an unprecedented situation of misery in the Linth Valley resulted. A class society was about to emerge.

FIGURE 2. A popular phantasy of the wretched people of the Linth Valley and the powerful engineers who were about to restore their humanity. (Source: Oertel, W. *Hans Conrad Escher Von Der Linth. Lebensbild Eines Braven Schweizers, Dargestellt Für Die Jugend Und Das Volk*. Wiesbaden: Julius Niedner, 1871.)

Already in 1797 it had been one of Escher's main objectives, to restore humanity among those 'miserable masses' (see figure 2). Under these politically as well as economically aggravated circumstances, it seemed to be an adequate measure to try to improve the moral nature of the rural poor. At least, this was suggested by the renowned educational reformer Heinrich Pestalozzi (1746–1827) and by his colleague Philipp Emanuel von Fellenberg, who were closely acquainted with Konrad Escher. Both of them focused on improving the moral nature of the poor by teaching them manual skills. To this end, they both designed colonies for poor boys in which the inmates should be trained to gain their own living. Only by becoming independent from charity were they thought to regain their humanity and thus be fit for liberty in the sense of liberal political thought. Girls, on the other hand, were to be trained in housekeeping and in educating their children through the secret ways of motherly love – a diffuse concept which was strongly emphasised by Heinrich Pestalozzi.[31]

In this gender-specific perspective, Fellenberg insisted on a double 'Entsumpfung' – or drainage – on a physical as well as moral improvement, so to say. Agricultural reform, that is, improving physical nature by drainage and fertiliser, was a central element in his scheme of improving the psychological nature of the male inmates of his institutes. And Escher completely agreed on this double approach. While superintending the work in the Linth Valley, he gathered considerable experience of both 'moral and physical' nature, as he told a friend.[32] In his view, local men were not as fit for work as they should have been, but nevertheless, their abilities could be improved. In 1818 he wrote to Fellenberg: 'In the Linth Valley I learned, that also adult men […] can be trained to become good or in fact excellent labourers, even in the most difficult task of hydraulic engineering'.[33] In the practical sense of the new educational theories he turned the construction site into a great classroom. The labour force was split up into teams of 12 to 15 men, and each team was ranked according to the quality of its work. The best teams got the most difficult tasks that were best paid. This resulted in a system of competition in individual effort and eagerness, which proved to be quite 'advantageous' for the enterprise.[34]

When a great famine in 1817 provoked the first wave of mass emigration of rural poor to America, a group of philanthropists from Glarus founded a colony for poor boys on an estate in the drained marshlands of the Linth Valley. The school was run according to the principles of Fellenberg. Escher strongly supported this additional project, which promised to put his own temporary classroom on a regular basis.[35] And Fellenberg also had great hopes for the new institution. This optimism was due to the fact that he expected the physical example of the Linth scheme to have a positive impact on the moral development of its male pupils. And he clearly drew upon the notion of the project as a national enterprise. Fellenberg followed an elaborate plan of national education. In view

of the 'great moral endeavours' which had been achieved on this spot, the boys could be turned into reasonable subjects and active members of the Swiss nation.

CONCLUSION

The technical intervention into the Linth Valley during the early nineteenth century was not only designed as an attempt to master the territory, but it also aimed at building up new political institutions and at educating the Swiss. The two tasks of unifying a heterogeneous group of political actors and of bridging the emergent gap between social classes were key elements within the Linth scheme. However, in the later course of the nineteenth century this broad view upon improving the social as well as the political environment through interventions into nature lost its standing. As the division of labour increased, the spheres of hydraulic engineering, of public education and of policy making drifted apart. Only in the course of this multiplication of contexts did the three respective bodies of knowledge and of expertise gain clear-cut disciplinary borders.

Fellenbergs plan of a closed educational state was not carried out. Public education was only instituted by the next generation of educational reformers, who could draw upon more and more powerful state agencies to back them up institutionally as well as upon a growing body of scientific and technical expertise to teach to their pupils. However, in the new state-run schools of later decades, the Linth scheme, its main character and the landscape of the Linth Valley gained considerable importance. The story of the 'great moral endeavour' was told in classrooms all over the country again and again. The 'classical ground' of the Linth was marked by several monuments and well kept in public memory.

When in the beginning of the twentieth century the first centennial anniversary of the structure was commemorated, one author emphatically appealed: 'All Swiss schools should make a pilgrimage to this place and attend the lessons, which are taught by its Alpine nature and by the interventions into it through human spirit and industry'.[36] By this time, the Linth Valley had indeed become a natural landscape of national importance. The regulated river, its dams and the reworked nature of its environment now represented one of the founding myths of the Swiss federal state: By collective action, free and reasonable Swiss men had turned their hostile nature into a friendly environment. In doing so, they had performed the act of a social contract. And they additionally had attempted to broaden its basis by restoring 'humanity' to the 'miserable masses'. This double intervention into physical and moral nature certainly allowed the landscape of the Linth Valley to stand comparison with the 'classical grounds' of medieval history.

NOTES

The author, Daniel Speich, born in 1969, studied history, philosophy, and anthropology at Zurich University. Since 1998 he has been a research assistant at the chair of the history of technology at the Federal Institute of Technology (ETH) in Zurich Switzerland. His dissertation on the Linth hydro engineering scheme will be published by Chronos, Zurich, in 2003. His recent publications include: David Gugerli and Daniel Speich, *Topografien der Nation. Politik, Kartografische Ordnung Und Landschaft im 19. Jahrhundert* (Zürich: Chronos 2002). An English translation of this monograph on the history of Swiss cartography is planned.

[1] 'Die Naturherrlichkeiten unsers Landes haben uns […] zu hohen sittlichen Bestrebungen aufgefordert.' Philipp Emanuel von Fellenberg, *Beleuchtung Einer Weltgerichtlichen Frage an Unsern Zeitgeist*, Reprint with Introduction by Jeffrey Stern, Classics in Education (Bristol: Thoemmes Press, 1830 (1994)), 243. All quotes have been translated by the author. The original German text of long quotes is given in the endnotes. Emphasis added by the author.

[2] See for example Kenneth Olwig, *Landscape, Nature, and the Body Politic: From Britain's Renaissance to America's New World* (Madison: University of Wisconsin Press, 2002) and David Lowenthal, 'European and English Landscapes as National Symbols,' in *Geography and National Identity*, ed. David Hooson (Oxford UK: Blackwell, 1994). The Swiss case has been analysed by Oliver Zimmer, 'In Search of Natural Identity: Alpine Landscape and the Reconstruction of the Swiss Nation,' *Comparative Studies in Society and History* 40, no. 4 (1998), and David Gugerli and Daniel Speich, *Topografien Der Nation. Politik, Kartografische Ordnung Und Landschaft Im 19. Jahrhundert* (Zürich: Chronos, 2002).

[3] See Fréderic Guillaume Delkeskamp and Eduard Imhof, *Malerisches Relief Des Klassischen Bodens Der Schweiz*, Faksimiledruck der Ausgabe 1830–35 (Frankfurt a. M.: Stocker, 1978). When Switzerland celebrated an alleged 700th anniversary in 1991, this localisation was successfully reified. See as an example http://www.gruxa.ch/weg_schweiz.htm; downloaded on 24 Jul. 2002.

[4] See for the British case Stephen Daniels and Susan Seymour, 'Landscape Design and the Idea of Improvement 1730–1900,' in *An Historical Geography of England and Wales*, ed. R. A. Dodgshon and R. A. Butlin (London: Academic Press, 1990), and Sarah A. H. Wilmot, *'The Business of Improvement'. Agriculture and Scientific Culture in Britain C. 1700–C. 1870*, vol. 24, *Historical Geography Research Series* (Cheltenham, UK: 1990).

[5] See for example Christoph Trümpi, *Neuere Glarner-Chronik. Mit Einer Karte* (Winterthur: 1774).

[6] See for example Fridolin Becker, *Das Linthwerk Und Seine Schöpfer. Jahresbericht Der Geographisch-Ethnographischen Gesellschaft in Zürich* (Zürich: 1911), or Jost Hösli, *Die Linthkorrektion*, (Zürich: Verlag Schweizerischer Lehrerverein, 1968). For institutional aspects see Karl Guggenbühl, 'Das Linthwerk,' *Zeitschrift für schweizerische Statistik* 41 (1905). Technical details have been analysed by Daniel Vischer, 'Die Korrektionen Von Kander, Linth Und Juragewässern,' in *Historische Wasserwirtschaft Im Alpenraum Und an Der Donau*, ed. Deutscher Verband für Wasserwirtschaft und Kulturbau e. V. (Stuttgart: Verlag Konrad Wittwer, 1994).

[7] See 'Final Report on The Amelioration of the Linth Valley' in archives of the federal Linth-Commission C 8.1.

[8] Daniel Vischer, 'Eine Typisch Schweizerische Form Der Wasserwehr,' *Schweizerische Zeitschrift für Forstwesen* 146, no. 8 (1995), and Niklaus Schnitter, *A History of Dams: The Useful Pyramids* (Rotterdam: Balkema, 1994). For environmental criticism see Franco Schlegel, *Naturnahe Neugestaltung Des Linth-Escherkanals. Vorstudie Zur Weiterentwicklung Des Linthwerks* (Mollis: 1986).

[9] For the administrative aspects see Emil Gmür, *Rechtsgeschichte Der Landschaft Gaster* (Bern: Stämpfli, 1905). For cargo shipping see Walter Bodmer, 'Ursachen Der Veränderungen Des Verkehrsvolumens Auf Der Wasserstrasse Walenstadt-Zürich Von 1600–1800,' *Schweizerische Zeitschrift für Geschichte* 27, no. 1/2 (1977).

[10] For the Berne tradition see Paul Zaugg, 'Ingenieur-Hauptmann Andreas Lanz, 1740–1803. Projektverfasser Der Linthkorrektion Und Leiter Der Bernischen Artillerieschule' *Der kleine Bund*, 05.12.1992. For hydraulic engineering in general see Daniel Vischer, *Schweizerische Flusskorrektionen Im 18. Und 19. Jahrhundert, Mitteilungen Der Versuchsanstalt Für Wasserbau, Hydrologie Und Glaziologie Der Eth Zürich Nr. 84* (Zürich: 1986).

[11] Strategies against natural catastrophes have been analysed by several contributors to Pfister, Christian, ed., *Am Tag Danach. Zur Bewältigung Von Naturkatastrophen in Der Schweiz 1500–2000*. Bern: Paul Haupt, 2002.

[12] Escher gave detailed accounts of his many activites in his personal memoirs. Hans Konrad Escher, *Der Persönliche Lebensbericht Von Hans Conrad Escher Von Der Linth. Zwei Bände. Bearbeitet Von Gustav Solar* (Näfels: Linth-Escher-Gesellschaft, 1998). For details on the ‚Helvetic Society' see Ulrich Im Hof and François de Capitani, eds., *Die Helvetische Gesellschaft. Spätaufklärung Und Vorrevolution in Der Schweiz* (Frauenfeld: Huber, 1983).

[13] 'Freylich rühren die Versumpfungen der Gestade des Wallenstadtersees auch von der Natur her, aber diese gab uns Vernunft, ähnliche üble Einflüsse zu hindern; sie zwingt uns zu gesellschaftlichen Verhältnissen, um gemeinschaftlich zu wirken, wo einer allein nicht helfen kann; sie zwingt uns endlich auch in Staatsverhältnisse hinein, um unter der Anführung von Stellvertretern oder Landesvätern gegen grössere Uebel zu wirken. Diese Landesväter sind Wir, mit unsern Bundesgenossen, folglich trifft uns, nicht diese Elenden der gewiss wichtige Vorwurf, dass wir die Menschheit in ihnen allmählig verderben lassen.' Hans Konrad Escher, 'Über Einige Bergtäler Der Östlichen Schweiz,' *Humaniora* 6 (1797), 437f.

[14] Jürgen Habermas, *Strukturwandel Der Öffentlichkeit. Untersuchungen Zu Einer Kategorie Der Bürgerlichen Gesellschaft* (Darmstadt, Neuwied: Luchterhand, 1986), Reinhart Koselleck, *Kritik Und Krise. Eine Studie Zur Pathogenese Der Bürgerlichen Welt* (Frankfurt a. M.: Suhrkamp, 1959). The late Michel Foucault has scrutinised the concept of governmental rationality, on which I draw here. See Graham Burchell, Colin Gordon, and Peter Miller, eds., *The Foucault Effect. Studies in Governmentality* (Chicago: University of Chicago Press, 1991).

[15] Rudolf Braun, *Das Ausgehende Ancien Régime in Der Schweiz. Aufriss Einer Sozial- Und Wirtschaftsgeschichte Des 18. Jahrhunderts* (Göttingen, Zürich: 1984). By the late 18th century the basis of democratic participation was reduced to a small elite in most of the states. For a case study see Hans Rudolf Stauffacher, *Herrschaft Und Landsgemeinde.*

Die Machtelite in Evangelisch-Glarus Vor Und Nach Der Helvetischen Revolution (Glarus: Tschudi, 1989).

[16] Adam Smith, Wealth of Nations, Book Five, Chapter One, Part Three: Of the Expense of Public Works and Public Institutions, http://www.adamsmith.org.uk/smith/won-b5-c1-pt-3.htm; downloaded on 24 Jul. 2002.

[17] Holger Böning, *Der Traum Von Freiheit Und Gleichheit. Helvetische Revolution Und Republik (1798–1803)* (Zürich: Orell Füssli, 1998).

[18] 'Man nahm sich öfters vor, die […] Pläne auszuführen, aber nie fing man an. Dieses war einem kraftvollen Staat vorbehalten; ich erwarthe es mit Gewissheit.' Letter by M. D. Joseph Anton Zugenbühler to the Directoire Exécutif of the Helvetic Republic, 26 Jan. 1799, Swiss Federal Archive Berne (FAB) B 3166, page 27f. Also the touching memorandum by Zwicki can be found here.

[19] FAB B 744, pages 533–536. See also Arrête du Directoire Exécutif, 28 Dec. 1798, FAB B 3144, and Letter by Heinrich Pfenninger, attorney general of the Canton Linth, to the Directoire Exécutif of the Helvetic Republic, 24 Jun.1800, Archive of the State of Zurich (ASZ) L 99.1.

[20] 'Lieber will ich also Eure Sümpfe abgraben, als hier regieren!' Letter by Escher to Johann Rudolf Steimüller, 24 May 1804, cited in Johannes Dierauer, *Der Briefwechsel Zwischen Joh. Rudolf Steinmüller Und Hans Konrad Escher Von Der Linth*, ed. J. Dierauer, *St. Galler Mitteilungen Zur Vaterländischen Geschichte Bd. 23* (St. Gallen: Huber, 1888), 217.

[21] Protocol of the federal diet, 04 Aug. 1803, cited in Jakob Kaiser, ed., *Repertorium Der Abschiede Der Eidgenössischen Tagsatzungen Aus Den Jahren 1803 Bis 1813, Amtliche Sammlung Der Neuern Eidgenössischen Abschiede* (Bern: R. J. Wyss, 1886), 305.

[22] Paragraph 23 of the Act of Mediation of 1803. Kaiser, *Repertorium*, 495 and 478. Napoleon had instituted this new competence as a mediator of the new constitution, to make sure that the Swiss roads would always allow him quick transportation of military material and staff.

[23] Kaiser, *Repertorium*, 306.

[24] Hans Konrad Escher and Johann Samuel Ith, *Aufruf an Die Schweizerische Nation Zur Rettung Der Durch Versumpfungen Ins Elend Gestürzten Bewohner Der Gestade Des Wallen-Sees Und Des Untern Linth-Thales* (Zürich: 1807).

[25] Report by the supervising board to the shareholders, 06 Jun. 1809, cited in Hans Konrad Escher, *Offizielles Notizenblatt, Die Linthunternehmung Betreffend.* (Zürich: 1807–1824) Vol. 1, 391.

[26] Wilhelm Fetscherin, ed., *Repertorium Der Abschiede Der Eidgenössischen Tagsatzungen Aus Den Jahren 1814–1848, Amtliche Sammlung Der Neuern Eidgenössischen Abschiede* (Bern: R. J. Wyss, 1876), Vol. 2, 460ff. See also G.H. Legler, *Über Das Linthunternehmen*, vol. 4, *Jahrbuch Des Historischen Vereins Des Kantons Glarus* (Glarus: Friedrich Schmid, 1868).

[27] Paragraph 21 of the Federal Constitution of 1848. The connections to the Linth scheme have been highlighted by Josef Mooser, 'Eine Neue Ordnung Für Die Schweiz. Die Bundesverfassung Von 1848,' in *Etappen Des Bundesstaates. Staats- Und Nationsbildung Der Schweiz, 1848–1998*, ed. Brigitte Studer (Zürich: Chronos, 1998), 55. See also Guggenbühl, 'Das Linthwerk', 310.

[28] Linth-Escher-Gesellschaft, ed., *Das Linthwerk – Ein Stück Schweiz. Idee Und Zusammenstellung Von Réné Brandenberger* (Mollis: Linth-Escher-Gesellschaft, 1993).

[29] See Josef Ballmann, 'Das Linthwerk. Gründe Zu Seiner Ausführung' (Unpublished Thesis, Universität Zürich, 1988).
[30] Figures according to Escher, *Offizielles Notizenblatt*, passim. The political emancipation of Jews became a reality in 1867, female suffrage was not introduced until 1971.
[31] Kurt Guggisberg, *Philipp Emanuel Von Fellenberg Und Sein Erziehungsstaat* (Bern: Herbert Lang, 1953), and Peter Stadler, *Pestalozzi. Von Der Umwälzung Zur Restauration, Ruhm Und Rückschläge (1798–1827)*, vol. 2, *Geschichtliche Biographie* (Zürich: Verlag Neue Zürcher Zeitung, 1993).
[32] Letter by Escher to Rengger, 05 Jan. 1809, cited in Ferdinand Wydler, *Leben Und Briefwechsel Von Albrecht Rengger, Minister Des Innern Der Helvetischen Republik* (Zürich: Friedrich Schulthess, 1847), Vol. 1, 288f.
[33] 'Ich habe an der Linth die Erfahrung gemacht, dass auch erwachsene Männer […] zu guten und selbst zu ausgezeichneten Arbeitern, sogar beim schwierigsten Wasserbau, umgeschaffen werden können.' Letter by Escher to Fellenberg, 29 Mar. 1818, cited in Fellenberg, *Beleuchtung Einer Weltgerichtlichen Frage an Unsern Zeitgeist*, 236–238.
[34] Report by the supervising board to the shareholders, 01 Oct.1808, Escher, *Offizielles Notizenblatt*, Vol. 1, 261.
[35] Jost Wichser, *Geschichte Der Evangelischen Hülfsgesellschaft Des Kantons Glarus Und Ihrer Armen-Erziehungs-Anstalten Linthkolonie Und Bilten* (Glarus: 1891).
[36] 'Alle Schulen der Schweiz sollten an jene Stätte pilgern und den Unterricht geniessen, den die Bergnatur und der in sie eingreifende Menschengeist und Menschenfleiss erteilen.' Fridolin Becker, *Zur Erinnerung an Hans Konrad Escher Von Der Linth Und Sein Lebenswerk. Sonderabdruck Aus Die Schweiz 15* (Zürich: Polygraphisches Institut, 1911).

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