Terraced Hillside Housing Architectures

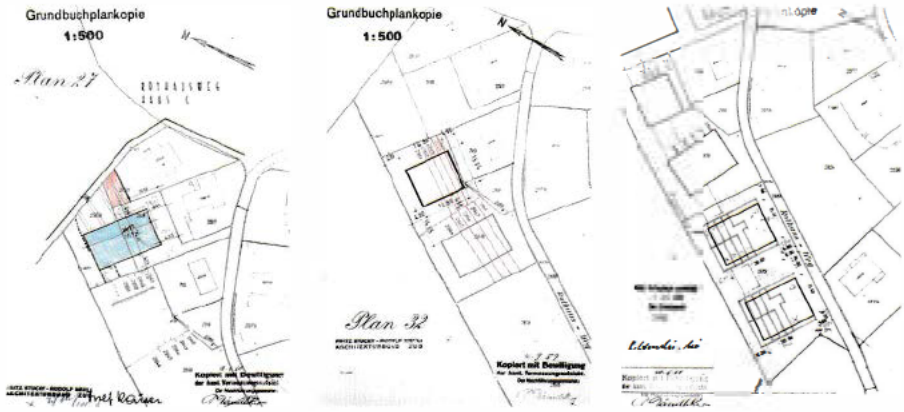
When Vineyards Gave Way to Swiss Families

Lorenzo Stieger

> 'The architects are saying to themselves one should make a virtue of a necessity, and it appears that Switzerland will become a country of terraced hillside housing estates.'[1]

The hectic pace of building activity after the Second World War led, within a few years, to widespread urban sprawl in the Swiss Mittelland. From the 1950s onwards the sun kissed, undeveloped southern slopes of the Jura region were thought to represent an attractive alternative. The advantages of the steep topography had been recognised by planners since the turn of the century, but it was only by resorting to a legal loophole that it first became possible to also exploit the region for housing. Since the introduction of the modern Civil Code in 1912, Switzerland's citizens had been legally prohibited from acquiring flats in most parts of the country. Concerned about the legal structural problems that inheritance laws had caused in the past with the part division of houses, individual housing ownership had been conditional upon simultaneous land ownership. This legal stipulation made it obligatory that house ownership had to demonstrate a physical connection to the land as property. On the one hand this guaranteed the ownership of single family homes, and on the other it prevented the sale of individual flats in multiple family dwellings to interested buyers. In essence, hillside terraced housing owes its early success in Switzerland to this legal obstacle. In 1957 the ingenious architects Fritz Stucky and Rudolf Meuli spotted steep hillside slopes as an opportunity to overcome this legal hurdle.[2] By virtue of a diagonal stacking of the apartments parallel to the slope each unit stood on a minimal plot of land. With this sleight of hand, the subdivision of the building land into narrow strips allowed each apartment to be assigned the status of a single family house in the land registry, each with their separate entrances (fig. 1).

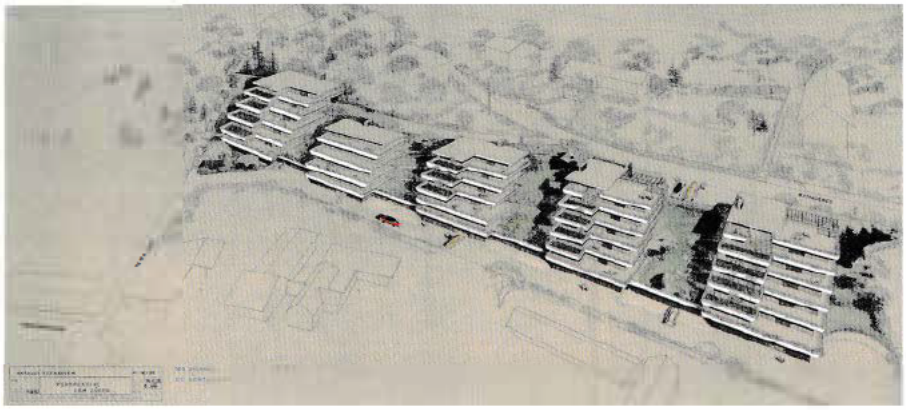
A further legal manoeuvre involved contractually regulated building authorisations between the individual house owners that constituted the legal basis for the overlapping of the residential units of terraced housing projects. This meant that the first housing estate by the Stucky Meuli architectural office on the symbolically christened *Terrassenweg* (i.e., terrace lane) in the city of Zug was not only erected on relatively cheap land, which until then had been considered



1. Fritz Stucky and Rudolf Meuli, Terrassenweg project, Zug, 1957–60. Subdivision of the escarpment, plan and drawing.

almost undevelopable, but also that potential buyers could be wooed with the argument that their future hillside home required a land purchase that was merely a third of the size of the actual living space. Once tried and tested in Zug, this model of property sub allocation quickly advanced to become a com mon practice amongst architects, aimed at obtaining official permission for this hitherto largely unfamiliar building design (fig. 2). At the same time the various building authorities lacked uniform guidelines to evaluate the terraced housing developments, which due to their elongated architectural dimensions along the dip of the slopes obliged the granting of exemption permits.

The approval procedure for a stepped multi family house by the architect Claude Paillard in Witikon, in Zurich, clearly shows that in 1959 there was still a lack of clarity about the criteria by which such a building type set on sloping land should be measured. According to the cantonal building laws, the num ber of floors facing downhill was to be counted from the juncture where the first residential storey emerged above the building plot, whereas the munici pal building regulations considered the street level facing uphill to be decisive. These opposing interpretations resulted in the new development requiring the issuing of two special permits that could hardly have been more contradictory. On the one hand an exception was granted to construct a high rise block with seven storeys, and on the other to erect a two storey house with four additional basement levels (fig. 3). However, this combination of a deficit in professional experience amongst the building authorities and the absence of a vocabulary for terraced construction approaches in the building laws also opened up consider able freedoms in design scope, as is strikingly evinced in the projects by archi tectural offices such as Team 2000 and Atelier 5. This tandem of topography and multi occupancy dwellings was seized as an opportunity to test out new forms of housing projects focused on inner scheme community living. The vagueness of prevailing building laws coupled with the unfamiliar building design constituted an energy field that provided dedicated architects with a chance to realise just such approaches using a new plastically shaped physical presence. In this sense the steep slope became a locus of planning uncertainty and a source of architec tural innovation in equal measure.



2. Fritz Stucky and Rudolf Meuli Terrassenweg project, Zug, 1957–60. Sub division of the escarpment, perspective drawing.

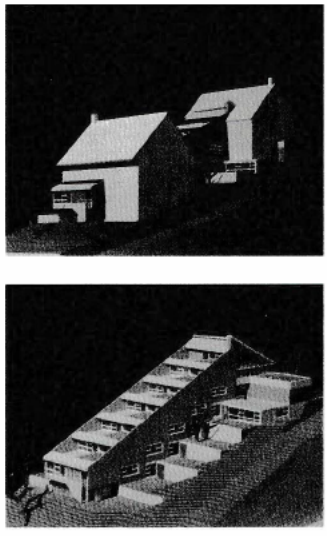
Keeping the Flatlands Free: Hillside Terraced Housing as a Spatial Planning Instrument

> 'How delightfully the three co joining little houses are staggered on the steep escarpment, each a little higher than the next, perfectly aligned to the slope [...] three houses and yet nonetheless only one!'[3]

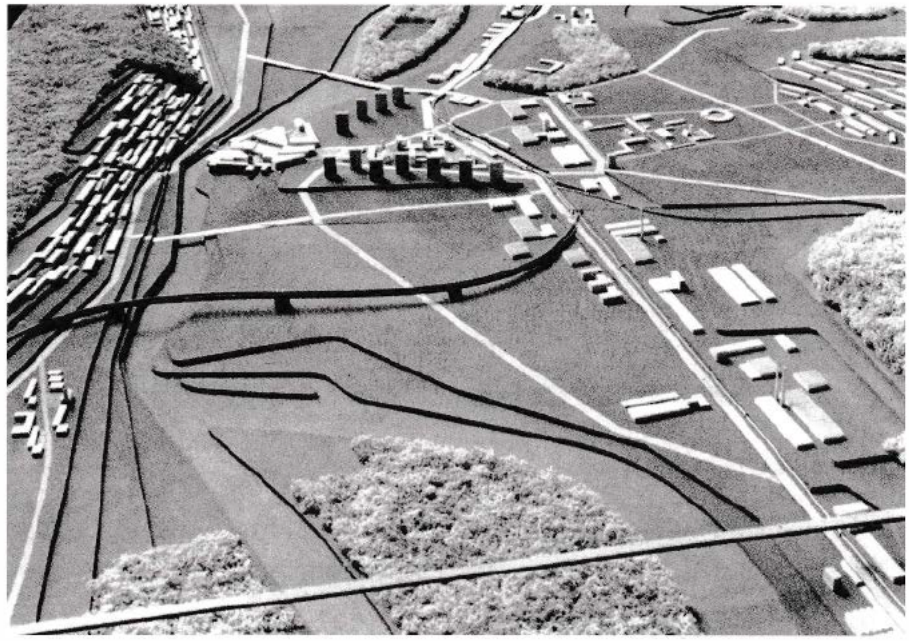
In the issue 'Junge Form' of the cultural magazine *DU* in 1963, the author Silvia Kugler highlighted the special status given to urban development in numerous projects by a new generation of Swiss architects.[4] Featured as a prominent exam ple was a double rowed terraced housing project erected in the canton of Aargau in front of the fortified walls of the small town of Klingnau, between the vines on an until then largely pristine site.

The Burghalde (lit. castle escarpment) housing estate was the initial realisa tion of what the young architect Hans Ulrich Scherer would later describe as the built fragment of a real *Haldenstadt* (lit. escarpment town). The idea of a modern city on a hillside was based on his urbanistic vision to build a continuous linear city in the form of terraced hillside housing along the entire length of the Jura Mountains, stretching all the way from Geneva to Brugg.[5] Scherer was first able to concretise this leitmotiv in the regional model Brugg 2000 in 1958, demon strating that in Scherer's thinking the idea of terraced hillside housing encom passed both architectural constructional and spatial planning aspects. Team 2000

Scherer's team together with befriended architects, construction engineers and sculptors presented their radical planning proposal to residents and municipal representatives from the building authority in an exhibition in Brugg, specifically put together for this purpose (fig. 4). By the symbolically laden year 2000, the his torical core of the town was to be expanded by a modern commercial district and eleven flanking residential towers. The up and coming municipality was to be equipped with an extensive industrial zone running along the railway lines, while families with children were to be provided with desirable housing in the form of a terraced *Teppichsiedlungen*[6] on the sun drenched Bruggerberg adjacent to the countryside. Accompanying this highly densified urbanisation of the hillside



3. Claude Paillard, terraced housing in Eierbrecht, Zurich, 1960. Illustrative model contrasting a standard construction procedure conforming to the building regulations with a sloped terraced house as a permitted exemption. Photograph P. Grünert.



4. Visionary regional model Brugg 2000 The new style of living at the turn of the century in the Haldenstadt on the Bruggerberg.

areas, the authors formulated an urgent demand that the lowlands be protected against the forces of further sprawl and be preserved as a vital natural and agricul tural space for the population a landscape conservation agenda *avant la lettre.*

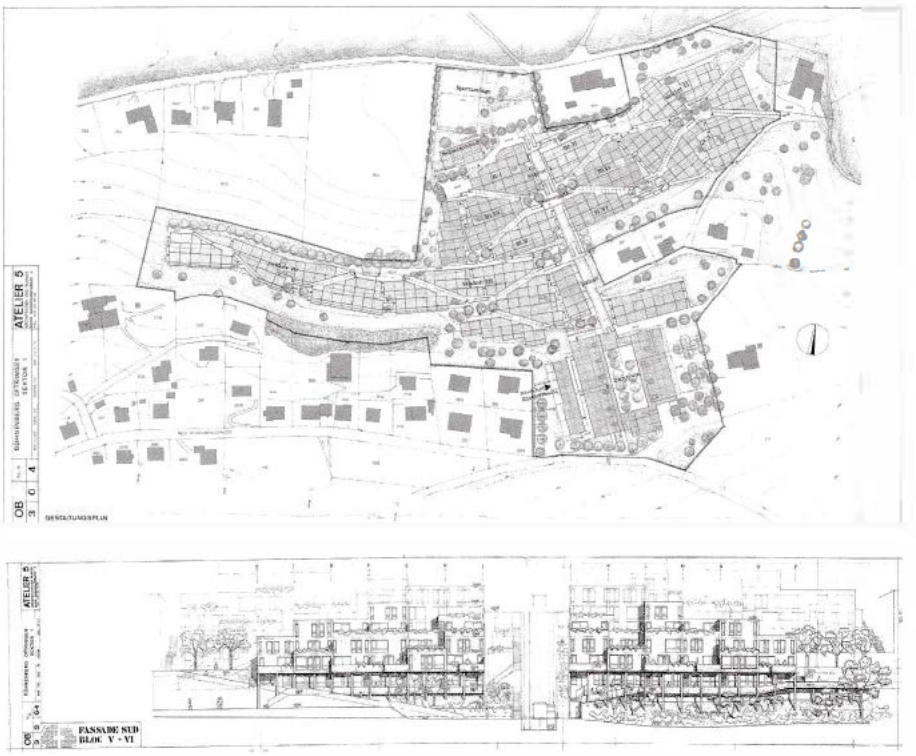
There were two key factors that encouraged these young architects in their aspiration to combine modern architectural practices with a root and branch urban and regional planning perspective. One aspect was that futurologists had predicted rapid economic and demographic growth rates for the region in the coming years. This would present small municipalities with new challenges, the meeting of which would require the coordinated collaboration of interdisci plinary teams. The first omens of these prognoses were already to be seen in the arrival of global-player industries, the imminent linkage to the national motorway network or the projected construction of a new generation nuclear power plant.[7] The other aspect was that these young architects were swayed by the thinking of prominent personalities demanding a new planning approach for tackling pressing future settlement issues. In their pamphlet *Achtung: Die Schweiz*, authors Max Frisch, Lucius Burckhard, and Markus Kutter called for nothing less than the construction of a whole city from scratch. Built to accom modate 10,000 inhabitants, it was envisioned to provide an urban model whose features would exclusively conform to the most modern planning principles.[8] Although this idea was fundamentally anchored in the functional separation of living, working, industry, and recreation as propagated in Le Corbusier's *La Charte d'Athènes* (1943), in the meantime the theoretical discourse in mod ern urban planning had undergone a paradigm shift. The new objective was to respond to these growth projections with a housing strategy based on qualitative and social guiding principles. The discussions concerning a more humane 'habi tat' were marked by a resumed search for a densified urban atmosphere and new

collective forms of living. Traditional and vernacular settlement structures, such as the Arab kasbah or the historical Zähringen town layout, were adopted as paradigm archetypes for new planning impulses in the conception of contempo rary settlements. A younger generation was considered to be under an obligation to harness architecture to serve the community again. In addition, by virtue of their 'social imagination'[9] architects were ideally positioned to deliberately shape a complex living environment that could once more act as a wellspring of iden tity and meaning for the modern individual.

Under these circumstances it was hardly surprising that the canton of Aargau's small medieval towns should possess a real model character for Scherer in terms of the spatial organisation and architectural articulation of terraced hillside hous ing. A transfer of ideas with conventional forms of urbanisation was not yet explicitly expressed in the radical regional model for Brugg, which excited both a favourable curiosity and deep antipathy amongst the visitors to the exhibition. The model presentations were too large scale and the building plans too schematic to derive a spatial impression of what community existence on the Bruggerberg might look like. However, in the following years this discursive spirit fused with technical solutions that made large scale terraced housing projects on steep slopes realisable. The Mühlehalde housing estate, built between 1964 and 1971 in three stages, would emerge as the most fully developed manifesto of the new hillside town. In addition to the shared facilities and varied layout configurations, its dis tinguishing characteristics were above all an ingenious network of paths and the world first mechanically driven inclined lift system in a housing scheme. The dif ferentiated prioritisation of the individual circulation and access forms resulted in a multi faceted arrangement of narrow byways, widely configured stairways and expansive open spaces between the layered architectural volumes. This structured the housing project, distinguishing between private and public areas, which in turn served the residents either as individual havens or places to pause collectively. As the most prominent voice and early pioneer of the Swiss terraced hillside housing, Hans Ulrich Scherer happily referred to what he called 'a spider's web of new urban forms of living!'[10] However, the accolade of energising terraced hillside housing with a renewed impulse, and thereby demonstrating a ground breaking spatial and programmatic virtuosity, lies with the architects of Atelier 5. In their unrealised Bühnenberg project they successfully coupled two principles: the resurrection of the idea of diagonal circulation, harking back to a traditional Italian hilltop town, and united with a rigid yet organic topographically embedded structure (fig. 5).

Buttressing the Slope and Shaping Living: Concrete between Statics and Structural Freedom

> 'We don't believe it right that a person has to conform to the apartment a supposition dictated by official regulations, by the profit margins of real estate developers or by the ideologies of architects. [...] The problem thereby con cerns... both furnishing possibilities in a limited volume and the opportuni ties to expand or reduce in conformity with the cycle of human lifespans.'[11]

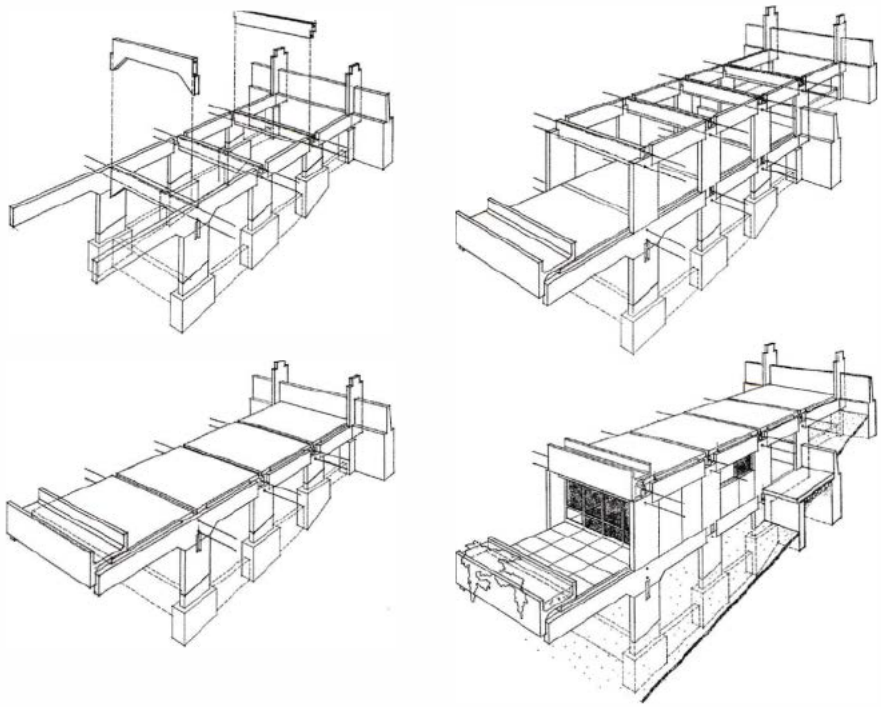


5. Atelier 5, Buhlenberg project, Oftringen, 1973 onwards, unrealised. A dynamic hillside housing development between traditional urban morphology and technical progress.

In the 1950s, at the same time as the first of these housing projects was being completed in Switzerland, the question of the appropriate construction material no longer revolved around whether terraced hillside housing should be built in concrete, but instead focused on which foundation techniques and construction methods could be most efficiently applied on sloping terrain. Land treatment and slope stabilisation were inevitably compelling cost factors, pushing architects and structural engineers to reduce excavation work to an absolute minimum and to test out new foundation methods wherever possible.[12] Moreover, the deployment of the technical advantages of the composite material was due to the fact that inclined stepped building entailed a swivelling from the vertical to the horizontal of the classic order of base structure, central structure and roof. While the rear part of the building was submerged beneath the ground, the terraces jutted out towards the sky, so that both the construction and the material were equally weathered by ground damp and the changing seasons. The architects of the first terraced hillside housing development in Zug tried to elegantly sidestep this problem by using an experimental method. Due to the fact that the overall concept was based on two different building approaches, in terms of construction engineering the apartments could be divorced from the bedrock. The foundations were built in the form of parallel set strings, which essentially simply rested on the inclined terrain, supported by a massive retaining wall at the base of the slope. In keeping with the spirit of industrial prefabrication, the apartments were conceived as autonomous spatial modules that – simply placed on the concrete steps would settle diagonally one above the other. Theories aside, realities

showed that local building contractors had yet to convert to industrial construction techniques. Instead of stacking one spatial cell above the next using cranes, and contrary to the architectural vision, each storey had to be successively built level by level while the walls were executed using traditional bricklaying.

Despite this setback the new technical capabilities in concrete construction and the advance of industrial assembly led to a closer collaboration between architects and civil engineers in developing new building approaches to frame construction and with prefabricated modular design systems. The ambitions went as far as to liberate terraced hillside housing from a rigid floor plan by deploying frame systems and pre stressed tension cables, as in bridge engineering. Because the rear of the terraced building had to simultaneously perform a slope supporting function and the inner walls had to bear the accumulated weight of the levels above, resulting in massive configurations, the apartment floor plans allowed no scope for structural alterations whatsoever. On the other hand, the advantages of frame construction in terms of statics lay in the point focal load transfer in the form of a three dimensional spatial grid, which from then on enabled both horizontal and vertical spatial configurations over multiple storeys. Thanks to the standardisation of the building elements and a flexible arrangement of the apartments, the architects believed that the inhabitants could be already included as participants in the design phase of the planning process. Moreover, the adaptability of the apart ments could anticipate future use scenarios, which could be implemented internally, without interfering with the load bearing structure, due to the lightweight construction method. The architect Erwin Mühlestein was one such protagonist who over a period of many years successively pursued the implementation of modular and adaptive module based systems in his terraced housing designs (fig. 6).



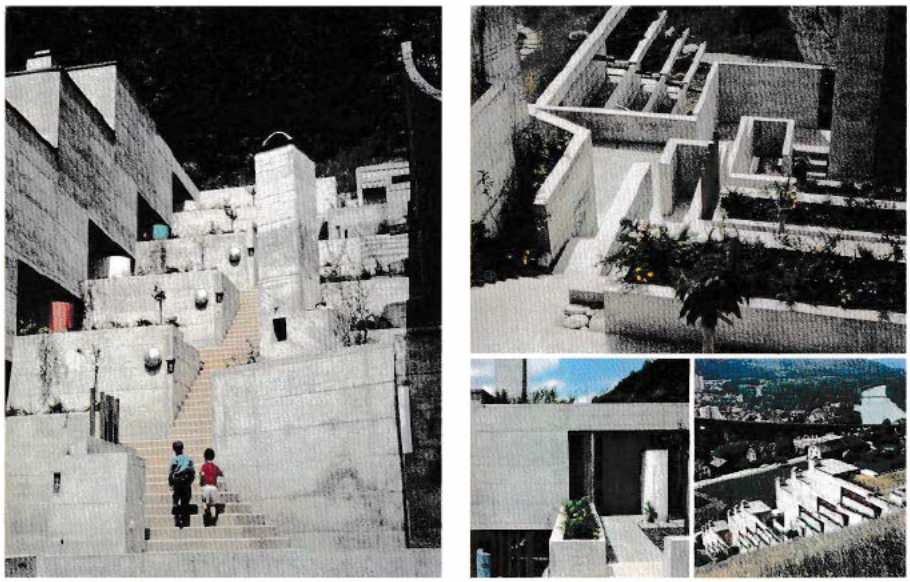
6. Erwin Mühlestein, the variable terraced hillside housing construction system imbued by the spirit of participation and adaptation.

Despite the strong desire of the engineers and architects involved to experiment with modular principles, the inherent inconveniences of hillside building plots including, for instance, cumbersome access to the building site, structural project complexities, the high production costs of the building elements, and lengthy transport distances meant that prefabricated based construction processes never became an established practice. The on-site realisation of terraced housing developments additionally took advantage of a cheap labour pool of migrant workers, whose manual skills were limited to traditional building. The upshot was a large discrepancy between the theory, concerning what was technologically achievable with concrete in mass-housing developments at the time, and the practice, in terms of the extent to which such building methods were basically implementable on steep topographies in the first place.[13] One of the architectural leitmotifs propagated in the 1950s and 1960s was architectural and social renewal, but terraced housing developments offered little scope in realising these aims, not least because the living form was closely tied to the idea of being a surrogate for house ownership and thus remained reserved to a small segment of the general population who could afford to purchase property. Discussing a particular terraced housing development built based on a flexible 4D construction-element system (Kamm and Kündig), the architectural critic Benedikt Loderer came to the conclusion in the 1990s that: 'The idea of a democratisation of planning via residents' participation proved to be a democracy for those who could afford to pay for it. Therefore, flexible structures do not automatically lead to more fairness they can merely assimilate it.'[14]

Expressive Sculptural Force and Fragmentation as Distinguishing Characteristics – a Verdict on the Quintessence of Swiss Architecture?

> 'The sensation of exiting the apartment and entering the sheltering cellar space across a single level undoubtedly satisfies the primal soul of the mountain dweller in the same way as a dovecote like projecting or overhanging panoramic window does.'[15]

The fact that the majority of such buildings had to be realised in situ could be taken as proof that some of the architects involved focused above all on the aesthetic potential of concrete as a monolithic building material and less on its technical properties. Especially in the first terraced hillside housing projects, the choice of stylistic means and material appearance were more often than not closely interlinked with the personal biographies of their authors, their education, and the principles of the architectural discourse. The works of Frank Lloyd Wright and Alvar Aalto were held in considerable awe, both of them exercising a marked sway over Swiss architectural creativity after the Second World War. Thus the clear formal design of the terraced hillside housing in Eierbrecht and its material execution in red exposed brick can be explained by Claude Paillard's affinity for Aalto's architecture. Fritz Stucky, on the other hand, chose to train



7. Team 2000. Mühlehalde terraced hillside housing development, Umiken, 1966. Expressive plasticity and Mediterranean bulkiness in the aesthetic tradition of Le Corbusier's *béton brut*.

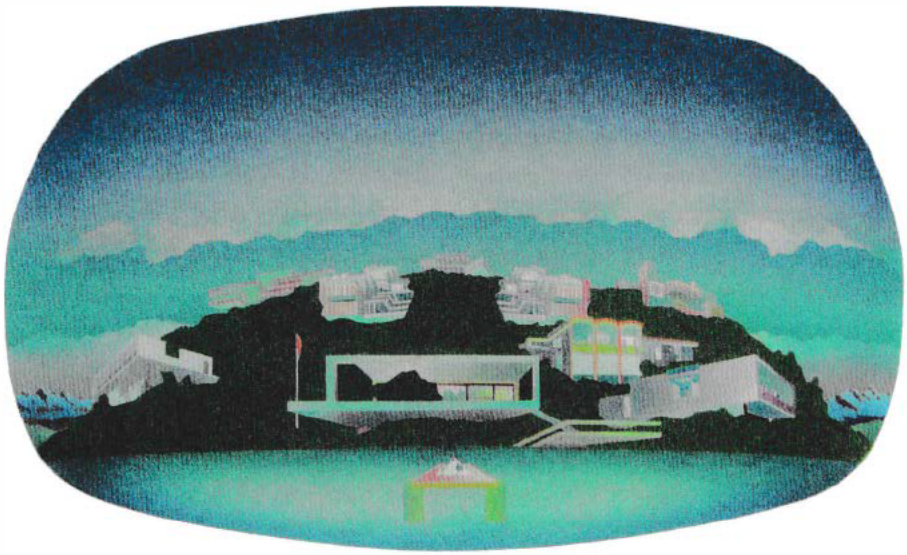
in Taliesin under Frank Lloyd Wright instead of learning architecture at the Swiss Federal Institute of Technology in Zurich, which can inevitably be read in his recital of various aesthetic design elements in his numerous hillside housing projects. Thus the particular emphasis given to the horizontal and the massiveness of concrete deployed again and again in Stucky's work refers to specific projects by the American master and his former mentor.[16] Nevertheless, the deliberate use of concrete to articulate a new plasticity in modern architecture was undoubtedly above all the hallmark of Le Corbusier's late works, which certainly attracted the most admirers amongst Swiss architects. The members of Atelier 5, the sculptor architect and 'facade renegade'[17] Walter Maria Förderer, as well as Hans Ulrich Scherer were amongst the closest adherents of a *béton brut* architecture. In his Mühlehalde housing project the latter consciously relied on a material aesthetic, form design, and colour elements that were prominently found in Le Corbusier's buildings (fig. 7).

This architectural idiom, as defined by the plasticity of concrete, was discussed by architectural critics such as the Austrian Friedrich Achleitner or the British Reyner Banham either as a short style episode in Swiss architecture or as part of the wider aesthetic tradition of international Brutalism. Against the backdrop of these savants' speculations, the local population often perceived this sculptural concrete architecture woven into the landscape as positive, because, according to Christoph Allenspach, building in concrete in the Alpine region was often combined with an association of 'progress and prosperity' both factors that were embodied in infrastructure edifices, for instance dams, which, 'as the work of fathers, brothers and sons', were 'the pride of the whole population'.[18]

However, it was the sociologist Lucius Burckhardt, as the editor-in-chief of the journal *Werk*, who proved to be particularly persuasive in increasingly equating dwelling in hillside terraced housing with a Swiss self-image, as associated with the ways of living of the country's mountain inhabitants. Such a perception

was also coupled with a political dimension that represented the core features of terraced housing as a democratic architectural form. The dissolving of facades and proportions Burckhardt juxtaposed the 'contemporary terraced hillside house' with the "'facade front house" of the past'[19] and the penchant for tran quil spatial divisions echoed supposedly typical Helvetic traits, at the same time underscoring the dismantlement of the totalitarian claims to power abusively embraced during the Second World War in the two official tendencies of Nazi Classicism and Stalinist Folklore.[20] In Switzerland a moderateness of spatial order was felt to correspond with the repeatedly stressed sovereignty of the people, with hillside complexes and the layout of their individual spatial units considered to be ideal expressions of this marriage, in particular in terms of an oft cited human scale. The architectural critic Friedrich Achleitner considered this small scale segmentation, produced by manipulations of 'stepping, stacking or swivelling', as 'a new widespread notion of the spatial' that had become a 'kind of common denominator' in Switzerland and was 'possibly an expression of an altered social situation, a democratic form of living'.[21] The prominence given to the individual within a larger community seemed to correspond to the socio political structure of federalist Switzerland, and the revision of sin gle storey owner occupancy rights in 1965 was similarly imbued with the 'basic democratic spirit'[22] that each and every citizen should possess their own home and thus financial security.[23]

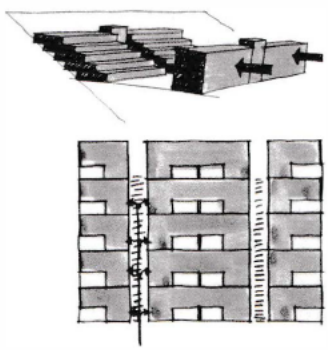
In a special issue of the architectural journal *Werk* in 1966 dedicated to terraced hillside projects, the architect Hans Ulrich Scherer emphasised that Switzerland could by no means claim a monopoly on the building type, naming numerous examples of terraced projects in England.[24] Indeed, thanks to the promotional programmes of their respective national tourism ministries, numerous terraced holiday complexes had sprung up along the French and Italian Riviera since the 1950s.[25] Nevertheless, in terms of the history of the idea, the terraced hillside housing development as a typical Swiss architectural form remained, intimately tied to the argument of the country's distinct national topography and the dwin dling space for settlement development. In comparison to its German speaking neighbours Austria and Germany, where the first projects had been realised from 1965 and 1970 onwards, respectively, the rapid spread of the type had already begun relatively early along the foot of southern slopes of the Jura Mountains. Moreover, this Swiss centric image was further fostered via a coordinated media campaign about national building endeavours in numerous foreign professional journals, propelled at the time by a small circle of enthusiastic architects. To take one prominent example, it was the efforts of Lucius Burckhard, Hans Ulrich Scherer, Erwin Mühlestein, Walter Maria Förderer, and others that led to the French architectural journal *Architecture d'Aujourd'hui* prominently featuring hillside terraced housing in a number of articles in 1965.[26] The title page of the special issue about current architectural activities in Switzerland was illustrated with two high profile terraced hillside developments executed in exposed con crete, prominently embedded, as an unmistakable message of the neighbouring country's new identity, in the emblem of the Swiss cross.



8. Max Matter's work from the series Uberbauung from 1969. Painting as an architectural and planning critique of hillside developments

According to the announcements by developers and investors in the 1960s, the clientele most attracted by this individual hillside living style included young, open minded people who did not lead traditional middle class lives and who had intellectually challenging jobs.[27] And so it was: the general interest in apart ment properties with their own private seating areas and pristine panoramas was great enough to slowly but surely inscribe terraced hillside housing into the image of Swiss housing. The resulting creeping but steadily encroaching trans formation of the Swiss national landscape was registered not only by experts but also increasingly among the public at large.[28] Within the context of confronting the force of everyday phenomena, the artist Max Matter, for instance, unerringly sensed the extent to which this persistent urge to build more and more had now colonised the hillside slopes to its own ends under the disguise of a postulated modernism in architecture (fig. 8).[29]

It did not take long before it became a common proverb that the majority of terraced housing complexes were little more than tenement blocks tilted onto the hillside (fig. 9).[30] Tax competition between municipalities, rising hillside property prices, speculative practices by construction companies and investors, newly issued hillside zoning plans, but also building regulations with rigid design parameters, collectively acted to ossify the form of terraced housing as a build ing typology. On the one hand this provided planning security, but on the other meant that the design parameters became successively suffocated in an ever tighter corset. As an 'anthology' of advertising texts and prospectuses for terraced hillside apartments in *Werk* already showed in 1966, the outcome of these grow ing trends was often schematic developments with minimal architectural origi nality.[31] New zoning plans incorporating hillside slopes and yet reserving them for housing resulted in programmatic impoverishment and stymied planning proposals advocating a functional mix on slope sites.[32] Amongst both the pop ulation and architects, the opinion eventually prevailed that the construction of terraced hillside housing entailed a marring of the country's visual appearance.[33]



9. Atelier 5, sketch showing a rigid structure for a Siedlung, as if a tenement block had been pushed against the hillside.

For Switzerland, the circumstances at the time, coupled with a curiosity on the part of the architects involved, could have perhaps acted as nothing less than a beacon for the formulation of a pioneering planning ideology, bridging the gap between control and laissez faire. Instead, ultimately all we are left with are a few built examples and project sketches fragments pointing to the fact that this unique interplay between the new, the unknown, and a healthy portion of insecurity inherent to terrace hillside housing architecture could have perhaps truly been a rich seam for the architecture of the country.

Notes

[1] 'Man soll aus der Not eine Tugend machen, sagen sich die Architekten, und es sieht so aus, als werde die Schweiz das Land der Terrassensiedlungen' ('Terrassensiedlung – Bauform der Zukunft?', *Wohnen* 42, no. 4, 1967, 103–4, here 103).

[2] Fritz Stucky pointed out in the journal *Werk* that as a type, steep building plots stimulated them as architects to examine new hillside housing forms that offered a suitable solution in terms of construction, laws, and economics. The architecture duo had already experimented with a legal hybrid form with their 1955 Bohlgutsch House, consisting of a single-family house and two attached rental apartments. The insights into ownership rights in hillside multi-apartment dwellings were applied from 1957 onwards in the design of their first terraced housing development. See Fritz Stucky, 'Terrassenhäuser in Zug: 1957/60, Architekten Frütz Stucky und Rudolf Meuli, Zug', *Werk* 48, no. 2 (1961), 58–60; Fritz Stucky, 'Haus mit 3 Wohnungen in Zug', *Bauen + Wohnen* 11, no. 1 (1957), 14–17.

[3] 'Wie entzückend die drei aneinandergebauten Häuslein sich an der steilen Berghalde staffeln, jedes ein wenig höher als das andere, ganz dem Hang folgend [...] drei Häuser und doch nur eins' (Wolfgang Müller, 'Der Kindergarten "Munothalde" in Schaffhausen', *Der Schweizerische Kindergarten: Monatsschrift für Erziehung im Vorschulalter* XXVI, no. 1, 1936, 8–11, here 8, 9).

[4] See Silvia Kugler, 'Städtebau ist wichtig!', *Du* 23, no. 11 (1963), 11–25.

[5] See 'Terrassensiedlung Burghalde in Klingnau', *Werk* 51, no. 10 (1964), 370–3; Hans Ulrich Scherer, 'Terrassenbauten', *Werk* 53, no. 6 (1966), 201–7.

[6] Hans Ulrich Scherer, 'In ein paar Jahrzehnten', *Brugger Neujahrsblätter* 69 (1959), 49–62, here 56. *Teppichsiedlungen*: lit. a carpet housing development, that is, an intricate varied housing pattern based on interlocking low-rise units and courtyards or gardens (TN).

[7] The architect summarised the local development in the region in the *Brugger Neujahresblätter* of 1959, mentioning the 'prognosis of a statistician' ('Prognose eines Statistikers') who predicted that the canton's population would double to reach 600,000. By 2000 three-quarters of the newcomers were anticipated to settle in the areas around Baden and Brugg. Ibid., 49–50.

[8] See Lucius Burckhardt, Max Frisch, and Markus Kutter, *Achtung: Die Schweiz. Ein Gespräch über unsere Lage und ein Vorschlag zur Tat*. Basler politische Schriften vol. 2 (Basel: Verlag Karl Werner, 1955).

[9] 'Sozialen Imagination' (Sigfried Giedion, *Architektur und Gemeinschaft: Tagebuch einer Entwicklung*, Hamburg: Rowohlt, 1956, 96).

[10] 'Spinnweb neuer urbaner Lebensform!' ('Terrassensiedlung Brüggliacher in Rohrdorf AG', *Werk* 51, no. 10, 1964, 375).

[11] 'Wir halten es nicht für richtig, daß sich der Mensch der Wohnung anzupassen hat - einer Vorgegebenheit, die durch behördliche Bestimmungen, durch Renditegesichtspunkte von Baugesellschaften oder durch Ideologien von Architekten fixiert ist [...] Dabei geht es [...] sowohl um Einrichtungsmöglichkeiten in einem begrenzten Volumen - als auch um Expansions- und Reduzierungsmöglichkeiten, die dem Zyklus menschlichen Lebens entsprechen' (Harald Deilmann, 'Zu diesem Heft [Die Wohnung: Variabilität – Flexibilität]', *Bauen + Wohnen* 24, no. 3, 1970, 76).

[12] Based on the premises of Neues Bauen, the minimisation of excavation costs by staggering the architectural volumes on inclined terrain had already been an important criterion in housing development prior to the Second World War. Thus, for example, the Neubühl housing estate (Haefeli, Moser, Steiger, Roth, Artaria) or the GWAD housing estate (Fischli) both of them built during economic crises (the Great Depression and the Second World War, respectively) – were executed as stepped ribbon developments on hillsides with the aim of keeping excavation costs as low as possible.

[13] Erwin Mühlestein's plans for a terraced housing development in Orselina based on standardised building elements were featured in the journal *Bauen + Wohnen* in 1964. The architect referred to the fact that 'the whole architectural complex can be constructed for significantly less than traditionally built houses' ('die ganze Baugruppe wesentlich billiger zu stehen kommen wird als Häuser in traditioneller Bauweise.' Erwin Mühlestein, 'Terrassensiedlung in Orselina ob Locarno', *Bauen + Wohnen* 18, no. 4, 1964, 155–8, here 158). Nevertheless, photographs of the building site in the journal *L'Architecture d'Aujourd'hui* from around

1965 document the construction work being executed in cast-in-situ concrete. André Bloc, 'Suisse', *L'Architecture d'Aujourd'hui* 35, no. 121 (June-July 1965), 20. As late as 1977 Mühlestein was obliged to admit in the journal *Werk Archithese* that participatory and adaptable terraced developments did '(not) yet' exist, and concluded: 'They exist, at best, on paper, as theoretical entities ... whose realisation today is stymied by factors other than technical capability' ('Sie existieren bestenfalls als papierene, theoretische Gebilde [...], deren Verwirklichung heute andere als technische Hindernisse im Wege stehen.' Erwin Mühlestein, 'Partizipative Siedlungsstrukturen', *Werk-Archithese* 64, no. 11/12, 1977, 52–4, here 52).

[14] 'Die Idee der Demokratisierung der Planung durch Bewohnermitsprache erweist sich als Demokratie für diejenigen, die sie zahlen können. Flexible Strukturen schaffen also nicht automatisch mehr Gerechtigkeit, sie können sie nur aufnehmen' (Benedikt Loderer, 'Alte Wahrheiten in neuer Lage', *Hochparterre* 5, no. 10, 1992, 61–3, here 63).

[15] 'Die Sensation, von der Wohnung ebenerdig in einen bergenden Kellerraum zu gelangen, ist sicher eine ebensolche Befriedigung eines Urgefühls des Bergbewohners wie etwa ein vorspringendes oder überhängendes, taubenschlagähnliches Aussichtsfenster.' (Lucius Burckhardt and Urs Beutler, *Terrassenhäuser*. Werk-Buch vol. 3, Winterthur: Werk, 1968, 3).

[16] A horizontal alignment was germane to all of Wright's works but was expressed in its most spectacular form in Fallingwater. The concrete parapets in Stucky's terraced housing projects are inspired both aesthetically and materially by the rooftop terraces of the Suntop Homes.

[17] 'Fassadenrenegate' (Scherer, 'Terrassenbauten', see note 5, 205).

[18] 'Fortschritt und Wohlstand' 'als Werk von Väter, Brüder und Söhne der Stolz der gesamten Bevölkerung' (Christoph Allenspach, *Architektur in der Schweiz: Bauen im 19. und 20. Jahrhundert*, 2nd updated ed., Zürich: Pro Helvetia, 2002, 99).

[19] 'Terrassenhaus der Gegenwart' "'Fassadenhaus" der Vergangenheit' (Lucius Burckhardt, 'Das Terrassenhaus – Eine Hausform für die Schweiz?', in Burckhardt and Beutler, *Terrassenhäuser*, see note 15, 7).

[20] See Adolf Max Vogt, Ulrike Jehle-Schulte Strathaus, and Bruno Reichlin, *Architektur 1940–1980* (Frankfurt: Ullstein, 1980), 27–34.

[21] 'Stufung, Stapelung oder Drehung' 'eine weitverbreitete, neue Auffassung des Räumlichen' 'Art Gemeingut'; 'möglicherweise ein Ausdruck der veränderten gesellschaftlichen Situation ist, einer demokratisierten Lebensform...' (Friedrich Achleitner, 'Extreme, Moden, Tabus', in *Die Architekturabteilung der Eidgenössischen Technischen Hochschule Zürich, 1957 1968*, Zürich: ETH Architekturabteilung, 1970, 8–10, here 8).

[22] 'Demokratischen Grundgedanken' (Romano Diem, 'Stockwerkeigentum – pragmatisch, aber nicht immer frei von Problemen', *Wohnwirtschaft HEV Aargau*, no. 10, 2006, 10–11, here 10).

[23] The reintroduction of single-storey owner occupancies was prompted by rising land prices and shrinking investment opportunities in the real estate market, intended to also offer private individuals new perspectives in planning their pension arrangements.

[24] See Hans Ulrich Scherer, 'Beispiel England', *Werk* 53, no. 6 (1966), 210–11.

[25] Early examples are the terraced holiday housing complex Pineta di Arenzano (1958–1965) by Ignazio Gardella in Arenzano to the west of Genoa and the holiday home complex Torre del Mare (1957) by Mario Galvagni and his Swiss colleague Carlo Fellenberg in Bergeggi. Further residential developments appeared along the coast in places such as Spotorno or Varazze. The undoubtedly most famous French example of a free-standing terraced housing project are the pyramid-shaped buildings by architect Jean Balladur, erected from 1963 onwards (until 1984) in the tourist spot La Grande-Motte. See, for example, Martin Feiersinger and Werner Feiersinger, *Italo Modern: Architektur in Oberitalien 1946 1976* (Wien: Springer, 2012), 124; Benedikt Huber, 'Architektur des Zufalls', *Werk* 50, no. 7 (1963), 264–71, here 269.

[26] See Bloc, 'Suisse' (see note 13). The national Swiss report in the German journal *Neue Heimat* emphasised the dominance of this building typology, whereby geographical and topographical shortcomings were identified as the supposed driving forces behind this development. See Hansdietmar Klug, 'Schweizer Terrassenhäuser – Architekten auf neuen Wegen', *Neue Heimat: Monatszeitschrift für neuzeitlichen Wohnungsbau* 14, (1967), 28–41. At the beginning of the 1960s, numerous interested foreign parties (such as the Constance municipal council, student groups from

Stuttgart, Darmstadt and Delft, but also architects and sociologists such as Egon Eiermann or Ulrich Conrads) took part in so-called 'information tours' to visit the projects, including those by Fritz Stucky, Claude Paillard, or Hans Ulrich Scherer. The mediating role of promoting these Swiss artefacts abroad was assumed not only by the Federation of Swiss Architects (BSA/FAS), the Swiss Society of Engineers and Architects (SIA) or Pro Helvetia Foundation, but also the ETH Professor Werner Max Moser. See Werner Luz, 'Endgültiges Reiseprogramm der Besichtigungsreise des Konstanzer Gemeinderates', 9 June 1965; BSA/Bund Schweizer Architekten, 'Studentengruppe Prof. E. Neufert', 13 February 1962; Werner Max Moser, 'Besuch der Stuttgarter Studenten', 13 February 1962 (gta Archiv Zurich ETH, Nachlass Claude Paillard, Sig. 181-091.2/2).

[27] Asked in an interview in the journal *Modernes Bauen* what kind of people chose 'to live in terraced hillside housing', a Park Immobilien AG representative responded: 'They are people from intellectually challenging professions who are less rooted in "plain middle-class" traditions and who are open-minded about architectural innovations' ('Es sind Leute mit geistig anspruchsvollen Berufen, die wenig der "gutbürgerlichen" Tradition verwurzelt sind und Neuerungen in der Architektur aufgeschlossen gegenüberstehen.' 'Terrassensiedlung Brüggliacher in Oberrohrdorf', *Modernes Bauen* 14, no. 1, 1969, 7–10, here 7). Roman Brunner from the Historic Building Conservation Office Zug was similarly quoted in a property development magazine as follows: 'Back then the futuristic construction type was considered unusual. Terraced hillside housing targeted open-minded people who were searching for novel densified housing forms beyond the model of the single-family house' ('Damals galt die futuristisch wirkende Bauweise als ungewohnt. Die Terrassenhäuser hätten sich an aufgeschlossene Menschen gerichtet, die nach neuartigen verdichteten Wohnformen jenseits des Einfamilienhauses gesucht hätten.' David Strohm, 'Die Familienbühne', *Residence: Das Magazin für Wohnen und Immobilien*, 2015, 20). The sales brochures of the time deliberately advertised the attractiveness of terraced hillside housing by drawing attention to the tax reductions in the respective municipalities. See Uto Wohnbau AG, 'Uto baut Terrassenhäuser Chilacher II Uitikon a/Albis' (1969) (ETH Bibliothek, ORL-Archiv, Conv. 661); Park Immobilien AG, 'Terrassensiedlung Brüggliacher Oberrohrdorf/Baden' (1967) (gta Archiv Zurich ETH, Nachlass Hans Ulrich Scherer).

[28] In the early 1970s two books appeared that focused on the transformation of the Swiss landscape, albeit from completely different perspectives. In his children's book Jörg Müller presented the various stages of developments over a period of many years, subtly criticising the loss of identity that the country had been subjected to through the breakneck pace of building activity. Jörg Müller, *Alle Jahre wieder saust der Presslufthammer nieder, oder Die Veränderung der Landschaft* (Aarau: Sauerländer AG, 1973). Peter Keller explained the existing state of the landscape, encapsulated in numerous photographs of buildings and urban vignettes, as evidence of the environmental destruction caused by building. Rolf Keller, *Bauen als Umweltzerstörung: Alarmbilder einer Un-Architektur der Gegenwart* (Zürich: Artemis, 1973).

[29] Matter offered a 'special perspective on things' ('besondere Sicht auf die Dinge') in the architectural journals of his flatmate in which the artist confronted 'what is being newly developed in building' ('was im Bauen neu entwickelt wurde'. Stephan Kunz, ed., *Ziegelrain '67 '75*, Aarau: Aargauer Kunsthaus, 2006, 15). The works, which revealed his critical stance 'vis-à-vis contemporary architecture and urban sprawl' ('gegenüber zeitgenössischer Architektur und Zersiedelung'. Annelise Zwez, 'Max Matter', 1998/2017, in *SIKART Lexikon zur Kunst in der Schweiz* http://www.sikart.ch/KuenstlerInnen.aspx?id=4001293&lng=xx, accessed 19 May 2021), were exhibited in December 1969 in the ETH Zurich's Globus-Provisorium (a repurposed temporary department store building) under the title 'Malerei als Architekturkritik' – a criticism that was 'in Max Matter's case always a social critique' ('bei Max Matter immer auch Gesellschaftskritik'. Gruppe Agitation, 'Uitikon: Eine Oase der oberen Zehntausend', *Agitation: Aktions Zeitschrift der fortschrittlichen Arbeiter, Schüler und Studenten FASS* 2, no. 9, 1970, 4–7, here 7).

[30] Lucius Burckhard noted in the 1968 book *Terrassenhäuser*: 'But unfortunately reality shows that the majority of these objects

will simply be tenement blocks tilted onto the hillside, because the speculators have eagerly recognised their chance' ('Aber leider zeigt die Wirklichkeit, daß die Mehrzahl dieser Gebilde lediglich gegen den Hang gekippte Mietskasernen sein werden. Denn die Spekulation hat rasch ihre Chance begriffen') (Burckhardt and Beutler, *Terrassenhäuser*, see note 15, 7). This statement originated in an article about Swiss terraced hillside housing first published in French in 1965. See Lucius Burckhardt, 'Les habitations en terrasse', *L'Architecture d'Aujourd'hui* 35, no. 121 (June-July 1965), 14. The architectural office Atelier 5 revived Burckhardt's analogy in the context of readdressing this housing typology in the 1970s and 1980s. See Atelier 5, 'Oftringen und Dahlerau (D): Projekte für Hangbebauungen', *Werk* 60, no. 11 (1973), 1383–4; A[natole] d[u] F[resne] and R[alph] G[ent ner], 'Gruppenhokuspokus', *Werk, Bauen + Wohnen* 67, no. 7/8 (1980), 26–7.

[31] See Scherer, 'Terrassenbauten' (see note 5), 202. Three years later Erwin Mühlestein likewise complained that a lot of planning applications that 'failed' to match 'the model' were being rejected by building authorities and rarely received bank financing, making the building projects rich pickings for the speculative business practices of 'finance companies' whose main purpose was to develop the increasingly scarce hillside building land 'at a profit'. Erwin Mühlestein, 'Zur Entwicklung des terrassierten Bauens', *Modernes Bauen* 14, no. 1 (1969), 5–6, here 6.

[32] See Willi Strickler et al., 'Wohnbebauung in Hanglagen: Forschungsbericht im Auftrag des ORL-Institutes ETH Zürich' (1969); Heinrich Huber et al., 'Empfehlungen für die Beurteilung, Zonung und Überbauung von Hanglagen, Berichte zur Orts-, Regional- und Landesplanung no. 34' (Zürich: Institut für Orts-, Regional- und Landesplanung, 1976).

[33] Numerous newspaper reports commented on the 'bad reputation' ('schlechten Ruf') of hillside developments, which were considered to be 'ugly and unfavourable in terms of energy consumption' ('als hässlich und energetisch ungünstig'). Larger-scale building projects were thought to be 'massive intrusions into the vineyards' ('massiver Eingriff in den Reb berg'), whereby complaints were loud not only about stylistic 'gimmickries' ('Spielereien') but repeatedly about the 'stereotypical' ('stereotyp wirkende') appearance of the realisation, 'lacking any allure' ('ohne Ausstrahlung') and 'lacking any attention to detail' ('ohne grosses Engagement fürs Detail'). A 2017 initiative to legally ban terraced hillside housing in the municipality of Ennetbaden was welcomed, amongst others, by 'star architect' Mario Botta. See Benjamin Gygax, 'Ganz oben auf dem Sonnendeck', *Sonntagszeitung*, 23 February 2013, business section, 59; Ulrich Scheibler, 'Nicht immer glücklich am Hang gebaut', *Der Landbote: Tagblatt von Winterthur und Umgebung*, 20 January 2007; Pirmin Kramer, 'Stararchitekt Mario Botta befürwortet das Verbot für Terrassenhäuser', *Aargauer Zeitung*, 26 March 2017, local Ennetbaden section.