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STONE, STYLE AND TRUTH

THE VOGUE FOR NATURAL STONE IN NORDIC ARCHITECTURE 1880—1910

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PREFACE

It is now more than a decade since I first began the research leading to the present study. In 1979 a one-year scholarship from the Academy of Finland enabled me to work full-time and to visit sites, buildings and archives in Norway, Sweden and Finland. This sabbatical year thus provided the groundwork for my subsequent research which had to be carried out at a slower pace in the intervals between other commitments.

Over the years I have received grants towards the cost of travel and photographic material from the Åbo Akademi, the Research Institute of the Åbo Academy Foundation, the Finnish Society of Sciences, the Finnish—Norwegian Fund and the Letterstedtska Föreningen (Sweden). For this support I would like to express my sincerest thanks.

Numerous individuals have helped me by locating documentary and visual evidence. Others have volunteered information and bibliographical references. Others still have suggested fresh ways of looking at the phenomena under discussion. Some have helped me in more than one respect. For this invaluable assistance I am indebted to Tuula Airola (Vaasa), Hans Andersson (Gothenburg), Tuula Anttila (Helsinki), Berndt C. Aminoff (Helsingfors), M. Äyräpää (Helsinki), Bengt Blom (Vasa), Marion Boström (Växjö), Rolf Danielsson (Uddevalla), Brita Degerth (Helsingfors), Jens Christian Eldal (Oslo), Gunnar Floman (Salo), Tarmo Friman (Helsinki), Kari Hakli (Helsinki), Aulikki Helle (Virolahti), Olav Høydal (Ålesund), Tor Kindingsland (Oslo), Jorma Kolmijoki (Helsinki), Sirkka Kopisto (Helsinki), Pekka Korvenmaa (Helsinki), Jahn M. Lillebo (Oslo), Krister Malmström (Stockholm), Dag Myklebust (Oslo), Kerstin Gjesdahl Noach (Trondheim), Anna-Lisa Nordgren (Stockholm), Rolf Nummelin (Åbo), Hilding Nyström (Helsingfors), Bjørn Sverre Pedersen (Oslo), Åsa Ringbom (Åbo), Karl-Erik Rinman (Gothenburg), Jan Rosvall (Gothenburg), Lasse Saha (Vehmaa), Stig Schubert (Helsingfors), Arne Skivenes (Bergen), Bengt Svensson (Örebro), Kristian Syltke (Kristiansund), Kari Tarkiainen (Stockholm), Leif Tengström (Stockholm), Oiva Turpeinen (Helsinki), and P. O. Welin (Åbo). I am indebted to Göran Torrkulla for his work with the Index.

Leena Ahtola-Moorhouse and Jonathan Moorhouse have revised the language of my manuscript and also suggested improvements in other respects; I would especially like to thank them for their patience and care, and I hope that possible blemishes due to my own, last-minute »editing» will not reflect on their contribution.

I am conscious of the honour of having my essay included in the series published by the Finnish Antiquarian Society, and I wish to thank the editor of the series, Lars Pettersson, for his kind services in bringing the book through the press.

The manuscript was prepared for the press during my stay as a Fellow-in-Residence at NIAS — Netherlands Institute for Advanced Study in the Humanities and Social Sciences during the academic year 1986/87, which was also my first year as a Research Professor at the Academy of Finland.

The material was finally sent to the press in March, 1987, and publications which became known to me after this date could no longer be incorporated in the discussion.

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1. INTRODUCTION

During the last few decades there has been a tendency among architectural historians to regard an inordinate interest in façades as a mark of amateurism. The relevant qualities of architecture, we have been given to understand, concern the structuring of space and the articulation of the environment. Other aspects, too, have been represented as being more important than façades: the analysis of architecture according to function or building types, for instance.

Yet the current rating of façade design as being of secondary importance rests on values which were formulated in the twentieth century and which ultimately derive from the manifestoes of the modern movement and its immediate precursors. To apply modern standards to the architecture of the past may be legitimate as long as we bear in mind what we are doing; on the whole, however, such an approach will say more about ourselves and our attitude to the works in question than about the works themselves. An alternative way of approaching nineteenth-century architecture would be to consider it in its own context of values and priorities. This does not, of course, mean that we have to share the values embraced by the architects and decision makers of the period under discussion. It is sufficient that we are aware of their premisses and try to consider their accomplishments in the light of this insight.

While there is no textual documentation to prove that during the period under discussion architects, critics or members of the public ever saw architecture in terms of "spatial structure", there is ample documentation for the nineteenth-century preoccupation with façades. Not only that; well into the present century even progressive critics, including the Finnish rationalist architect Sigurd Frosterus, judged architecture mainly in terms of façade design.[1]

In the late nineteenth-century urban context the art of "architecture" could be almost synonymous with the art of composing façades. The typical city building stood shoulder to shoulder with its neighbours; what distinctive features it presented to the beholder were for the most part concentrated on its façade. The narrowness of the site and the necessity of adhering to the street line rarely permitted any experiments in the "distribution of the masses" (to use the then current term that comes closest to modern conceptions of spatial articulation). In the case of bank buildings and insurance companies care was taken to articulate the interior, too, but these attempts were seldom noted with the same interest as the more conspicuous façade. Only in the case of monumental, detached buildings could architects and patrons indulge in the creation of striking contours, the interplay of volumes and the elaboration of interiors. But even here more attention was paid to façade design than to other features. Vast complexes were sometimes planned to be completed in successive stages, and the first wing (in some cases the only part actually to be built) was equipped with a screen façade planned to have a continuation when the complex of buildings was completed.

The external appearance of buildings was a topic that appealed to the specialist and layman alike. New façades were discussed with avid interest in daily papers, in pamphlets, travel accounts, even in fiction. In the small but growing capitals of Norway, Sweden and Finland the completion of single buildings was proudly registered by the press. Almost invariably it was the exterior appearance that interested the commentators. Now and then writers in the technical journals complained about the superficiality of public taste in architecture; however, some members of the architectural profession noted a little sadly that they were also dependent for their living on the very system they criticized.

The primacy of the façade was manifested in many ways. Façades were what architects recorded on their tours of the centres of European architecture, and exteriors were what the graceful travel sketches published in the technical journals showed to the readers.[2] Several of the most important competitions during the period concerned façades, and façades only; for the building itself there existed designs which the competitors were expected to comply with in their elevations. This was the case with the Bünsow House in Stockholm (Fig. 63). The same procedure was also employed in connection with the Finnish National Theatre (Fig. 161-163), the Railway Station (Fig. 294-295) and the Suomi Insurance Company in Helsinki (Fig. 300). Even where the competition concerned the building as a whole, the winning entry could be combined with façades designed by another competitor, as was the case with the Regjeringsbygningen in Oslo (Fig. 147-149) and the Pohjola Building in Helsinki (Fig. 187-193).

Although the quality of the elevation was not, of course, the sole criterion used by competition juries, it was in many cases decisive for the final verdict. A successful exterior could make up for shortcomings in other respects, whereas a weak façade was never condoned. For this reason prudent competitors devoted much care to the polychrome finish of their elevations and their perspective drawings visualizing the exterior of their projects.

In the case of commissioned works or when an architect solicited his services, enticing elevations and perspectives would be included among the first sketches,

sometimes even before the specifications for the building had been definitely laid down. The same basic attitude is reflected in some of the architectural publications serving as pattern books for practising architects. *Academy Architecture and Architectural Review*, a publication much studied by Scandinavian architects, deals first and foremost with exteriors. Despite its title the German series *Grundrissvorbilder* featured both elevations and perspectives of the buildings described. As late as 1901 E.A. Seemann & Co of Leipzig sponsored a competition for ''modern façade projects;'' the contributors competed in three different classes defined according to the width of the façade and the number of storeys. In the same year Seemann published the entries in handsomely produced portfolios.[3]

The habit of seeing architecture in terms of façades was so deeply rooted that even architectural reformers found it difficult to free themselves from it. In its initial stage the reaction against historicism therefore assumed the form of assaults on the excessive use of historical ornament in the façades of building. Even the ''New Style'' that was envisaged to supersede historicism was, for a beginning, expected to appear on the façades. The primacy of the façade was ultimately challenged only with the advent of the modern movement.

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The developments to be discussed below represent the last significant attempt to bring about a renewal of architecture within the restricted scope of the exterior, that is, façade design and the employment of façade materials. The scene is made up by three Nordic countries, none of them then possessing a distinctive or stable tradition of urban architecture answering the needs of the growing city centres. Around 1880 the dependence on continental models was felt as overwhelming in all three countries, and the search for alternatives seemed urgent. In the pictorial arts realism and naturalism had swept away many traditional, academic recipes, and architects were preparing for a corresponding show-down in their field. Architectural traditions hitherto unnoticed began to attract attention. At the same time the flow of ideas from the Continent began to contain novel elements: reform and renewal in the crafts as well as in architecture became a persistent, often repeated theme. What in the middle of the century began as a trickle of translated excerpts from foreign periodicals, often reprinted as a mere space filling in the early technical journals of Scandinavia, had grown into a lively debate by the end of the century.

A recurring theme in this chorus of voices demanding reform and renewal was the insistence on the truth of material and the truth of style. Techniques such as sgraffito on plaster, brick *rohbau* and masonry of natural stone were recognized as ''true.'' During a brief period c. 1890-1910 the term ''true material'' came to be almost synonymous with natural stone. The truth of style represented an ideal which, it was hoped, could be approximated through an honest use of materials. In Norway and Finland, in particular, the attempts to utilize domestic materials assumed strong national overtones.

A typical aspect of the Nordic stone movement was the interaction between architects, geologists and engineers, an interaction which seems to have been extremely fruitful from the artistic point of view. The flowering of the movement was short and transient, but it has left us with a number of original and impressive works of architecture.

In terms of quantity Nordic stone architecture cannot, of course, be compared with corresponding developments in the metropoles of Europe, not to mention the United States. The Nordic architects and engineers were well aware of this fact. In 1896 the Norwegian engineer Henrik Lund pointed out that one American building alone could require 30,000 cubic feet of stone facing, an amount equalling the annual output of the entire Norwegian marble industry.[4] But in this context relative size is more important than absolute numbers: for about three decades the use of natural stone remained an overwhelmingly important issue which dominated the architectural debate in Norway, Sweden and Finland. The use of stone was a question that occupied the minds of most of the leading architects, it influenced the outcome of architectural competitions, and it formed a topic of discussion among laymen.

This relative importance of the stone movement in the architecture of the respective countries also accounts for the geographical definition of the present study. Thus Denmark, traditionally regarded as one of the Nordic countries, has been left outside this account (although a few Danish examples are mentioned in passing). In Danish architecture the vogue for natural stone never assumed the proportions it reached in the three countries dealt with. Nor did the material there ever become charged with the national meanings it had in Norway and Finland, partly also in Sweden.

The chronological limits of the present study are set at 1880 and 1910, but important precedents in architecture as well as in architectural writing are included to form a background to the subject proper. The increasing interest in stone construction and stone coating was reflected in the technical handbooks, and for each new edition of many standard manuals the section on stone materials became more detailed, until finally the interest again subsided in the second decade of the twentieth century. In the Swedish textbook *Handledning i Allmänna byggnadsläran* by E.E. von Rothstein the stone materials and stone working methods are treated with increasing detail in the various editions from 1856 to 1890.[5] The same also applies to foreign standard works used as textbooks and manuals in Scandinavia. In the first edition of the *Handbuch der Architektur* natural stone was dismissed on less than

four pages, in the second edition it was given twice this space and in the third edition thirty pages.[6] Even in Britain, where stone construction had a strong and unbroken tradition since the Middle Ages, the heyday of stone construction in the 1890's is reflected in technical publications (see below p. 65).

The main topic of the present study is not, however, building techniques. Within the limits indicated I have aimed at giving an account of the history of an idea, the notion of stone construction as the answer to the demand for truth in architecture, its ramifications in contemporary applied geology, and its manifestations in the façade architecture of the period. In addition, I have also tried to apply what has been called the ''iconology of materials''.[7]

A final remark on method: in what follows I have become convinced of the wisdom of A.L Kroeber's idea of ''stimulus diffusion'' or ''idea diffusion'', although I have made no attempt to apply the concept with systematic rigour.[8] This model for the spread of cultural material was first proposed half a century ago. It has since been employed by historians of science and technology, as well as by the anthropologists for whom it was devised. But it seems not to have been used by art historians, who perhaps prefer their favourite concepts of ''influence'' and ''visual source''.

The mechanism described by Kroeber occurs in ''situations where there are difficulties in regard to the transmission of the concrete content of the system.'' ''In this case it is the idea of the complex or system which is accepted, but it remains for the receiving culture to develop a new content.''[9] Stimulus diffusion occupies a place between the two extremes of independent invention (''parallel'') and direct influence. It contains an element of independent invention, but it is prompted by a stimulus provided by an earlier solution. Thus it also contains an element of influence although the connection does not consist of simply adopting an existing model or procedure. Kroeber remarked that positive proof of stimulus diffusion may be ''difficult to secure long after the act, or wherever the record is not quite full.''[10]

Kroeber gave some historic examples of stimulus or idea diffusion. Thus the introduction of porcelain in Europe in 1708—1709 was neither an independent invention nor a technology taken over directly from the Chinese; it was an original invention prompted by the existence of finished products imported for centuries from China. Another example given by Kroeber was the invention of alphabets by natives who had come into contact with the whites' system of writing without mastering the European alphabet.

In the present context there is no question of ''inventions'' of the type that interests anthropologists and historians of technology. But the problem to be discussed nonetheless resembles the situation described by Kroeber. There was a ''pattern'', a set of ideas (''truth of material'', ''natural stone'') which was disseminated through channels which we can identify. There were difficulties in the implementation of the ideas, that is, the lack of an appropriate technology and of traditional skills present in the countries of origin. There were also conditioning factors of an economical, historical and cultural nature, which varied from country to country. Therefore the mutual impulses exchanged between Norway, Sweden and Finland represent only one side of the process. From the historical as well as from the aesthetical point of view another aspect stands out as more important, that is, the reception of the idea of natural stone in each of the three Nordic countries, where it remained, in Kroeber's words, for ''the receiving culture to develop a new content.''

2. IDEOLOGICAL ROOTS

The Truth of Material

The concept of *truth* in architecture was first formulated by Carlo Lodoli (1690-1761), the Venetian friar and architectural theorist. According to this "Socrates of Architecture," no part of a building should present itself as something which, in truth, it is not. Lodoli accused the Greeks and Romans of having committed a falsehood when they reproduced forms belonging to timber construction in their temples of stone. Since Classical architecture has served as a model, the abuse proliferated; indeed, stone buildings were the more praised, the more they imitated wooden construction, Lodoli maintained. "Why does not stone represent stone, wood represent wood, every material itself, and not some other material?"[1]

Lodoli's exclamation was to be echoed by numerous nineteenth-century writers on architecture. It was almost literally repeated by Gottfried Semper and Viollet-le-Duc. Lodoli's vocabulary was also adopted by a long line of moralists from Pugin onwards. To make a material represent, not itself, but some other material was, according to the Venetian friar "to put up a masquerade, indeed, to make a lasting lie."[2] By arguing in terms of masquerades and lies Lodoli anticipated the rich invectives used by Pugin, Ruskin, Reichensperger and the various minor prophets of architectural truth of the late nineteenth century.

Other standard arguments current in nineteenth-century architectural debate were also foreshadowed by Lodoli. Violations of architectural truth, the friar said, could not pass unpunished; the inevitable result will be cracks, crevices and decay. Therefore every material must be employed according to its natural properties.[3] In the foreseeable future stone will remain the principal building material, and to make the best use of it we will have to develop a special applied science, lithology.[4]

Lodoli did not himself commit his thoughts to writing. But thanks to his commentators they became widely known,[5] although he was, it seems, never explicitly referred to by any of the major theorists of the nineteenth century.

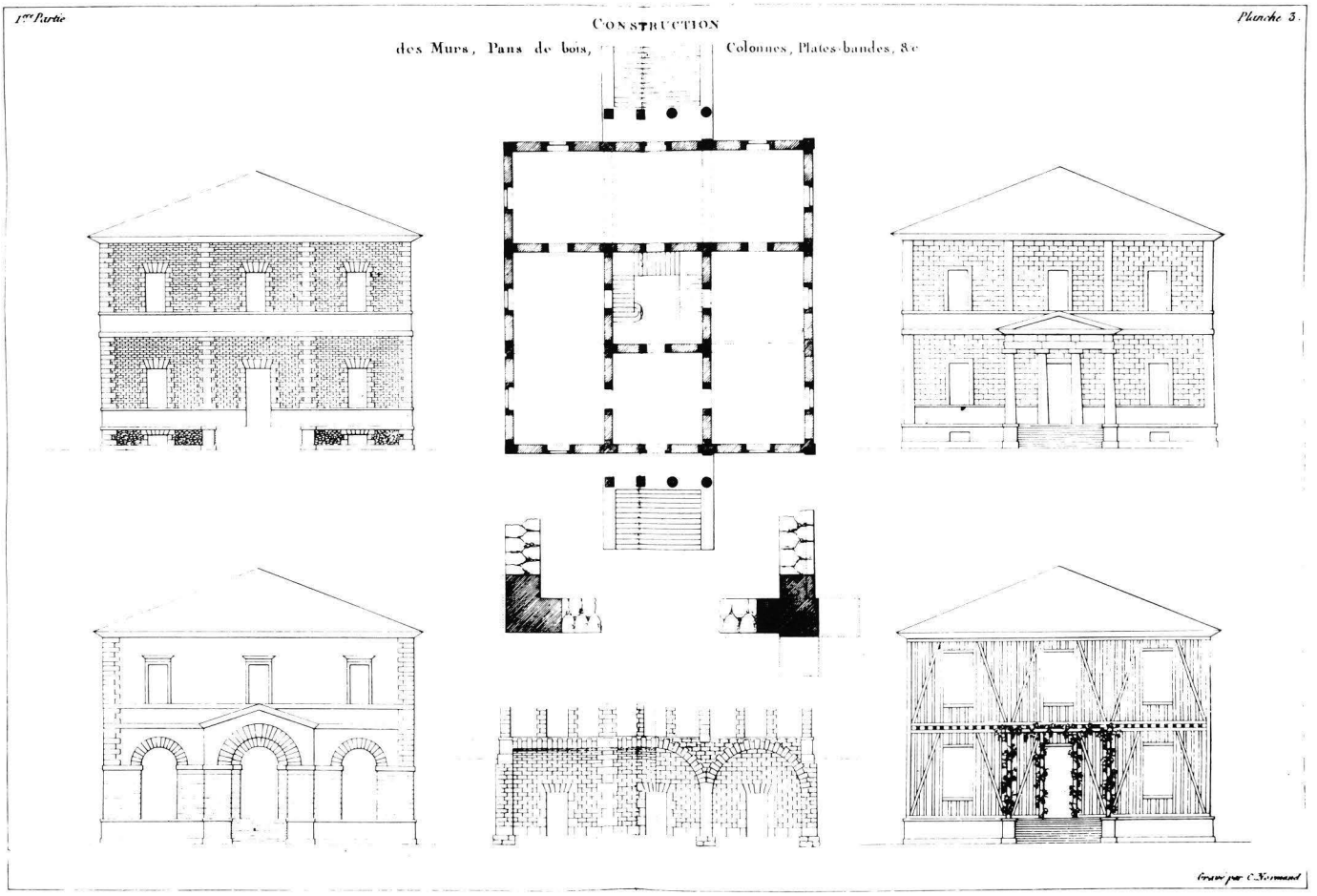
In his *Précis des leçons d'architecture*, which began to appear in 1823, J.L.N. Durand stressed the virtue of honesty in the exterior of a building. The *facing* should always reveal the construction, he wrote, pointing with approval to the ancient buildings of Italy, where stone, brick, marble etc. "se montrent pour ce qu'ils sont, à la place qui leur convient." Durand illustrated this "disposition of the materials according to their nature" with four alternative elevations made for one and the same ground plan: one in brick with quoins of masonry, one in masonry alone, one with a plain plaster coating and quoins of masonry, and one half-timbered (Fig. 1).

> L'on ne sera plus alors tenté d'abandonner cette décoration naturelle, satisfaisante, pour y substituer, par un surcroit de dépenses, tantôt l'apparence d'une construction imaginaire qui, n'etant pas la construction réelle de l'édifice, donne de celle-ci une idée fausse, lui ôte de son charactère au lieu d'y ajouter, et tantôt une décoration arbitraire qui résulte uniquement d'un assemblage d'objets inutiles, et qui, par-là, loin de procurer du plaisir, ne peut que fatiguer la vue, choquer le bon sens, et déplaire souverainement.[6]

Two decades later A.W. Pugin made free but unacknowledged use of Lodoli's teachings. Pugin ridiculed the classical architects for their employment of wooden forms in stone architecture. In his *True Principles* (1841) he insisted that the construction "*should vary with the material employed*, and the designs should be adapted to the material in which they are executed." As for plaster, he wrote, "when used for any other purpose than coating walls, it is a mere modern deception, and the trade is not worthy of a distinction."[7]

It is well known what conclusions Pugin drew from his principles. He praised the medieval architects for being the first to turn "*the natural properties of the various materials to their full account*".[8] In Pugin's opinion the Gothic church was the paragon of stone construction, it was a building whose every feature was peculiar to stone. In comparison, the Greek temples with their stone lintels represented a "barbarous" stage. But even worse was the concealment of the construction and the materials, an abuse practised by architects in the classical tradition. To Pugin lack of truth meant "deceit," "imposition," "trick," or a "debased" mode of building. His main concern was church architecture, where "all plaster, cast-iron and composition ornaments, painted like stone or oak, are mere imposition [. . .] utterly unworthy of a sacred edifice."[9] But he also applied his true principles to architecture in general, including interior decoration and shopfronts. England, he feared, was rapidly becoming defaced by "the resistless torrent of Roman-cement men, who buy their ornaments by the yard, and their capitals by the ton." Every linen-draper's shop apes the palaces of the Caesars, and mock stone columns hover above plate-glass shop-fronts.[10]

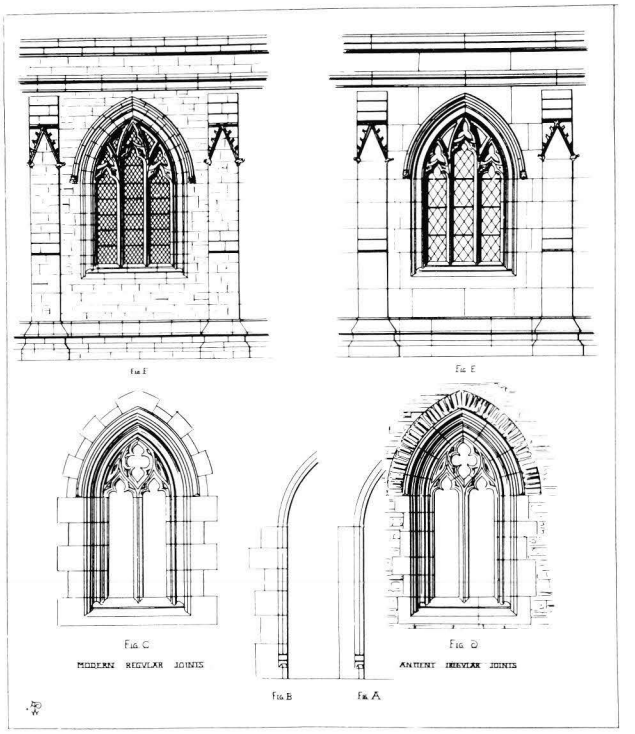
Pugin contrasted the cement and plaster imitations of his own day with "the rubble wall and oaken rafter"



1. J.L.N. Durand, "Construction des Murs [...]" From *Précis des leçons d'architecture,* 1, 1823, pl. 3.

of old. But even where his contemporaries did use real stone, he was critical. He objected to the prevailing admiration of regularity and neatness in masonry, pointing out that the small size and the irregularity of the stones in old masonry was superior from the practical as well as from the aesthetic point of view. In the first place, small stones result in a strong construction; then the irregular jointing does not interfere with the lines and contours of the building. *"Large stones destroy proportion."* Pugin illustrated his point with two drawings of bonds executed according to "old" and "modern" rules (Fig. 2).[11]

The aesthetic category of "architectural truth" was further elaborated by John Ruskin, who made *truth* one lamp in his book *The Seven Lamps of Architecture* (1849). In architecture, Ruskin maintained, one can violate truth in a subtle, contemptible way, that is, by "a direct falsity of assertion respecting the nature of the material, or the quantity of labour."[12] Ruskin distinguished between three types of "architectural deceits": (1) structural deceits, or the suggestion of a structure other than the true one; (2) surface deceits, or the suggestion of some other material than the one actually employed; (3) operative deceits, or the use of cast or machine-made work instead of hand- made.[13]



2. Old, irregular bond (above left) and modern large stones (above right); modern regular joints (below left) and ancient irregular joints (below right). From A.W. Pugin, *The True Principles of Christian Architecture,* 1841, pl. ii.

Ruskin worked out a veritable casuistry of architectural ethics. To coat brick with plaster, and to decorate the plaster with non- imitative al fresco painting appeared to him as fully legitimate. "But to cover brick with cement, and to divide this cement with joints that it may look like stone is to tell a falsehood; and is just as contemptible a procedure as the other is noble."[14]

It made Ruskin sad to think of the time and money lost in marbling the shop-fronts of London alone. "But in architecture of a higher rank, how much more is it to be condemned!" Painted imitations of stone bring shadows of vanity into the house of prayer." Like Pugin before him, Ruskin preferred "the simplest or the most awkwardly built village church, where stone and wood were roughly and nakedly used" to modern disguises and falsehoods.[15]

In Ruskin's system of ethics the concept of *surface deceit* required certain qualifications. Both whitewash and gilding are harmless, since in both cases the thin coating is never taken for anything more than it is. Ruskin extended the same argument to the thin coating with marble as long as it was not used to suggest a marble wall.[16] With this discussion Ruskin broached an issue that was to preoccupy architectural moralists in Scandinavia by the turn of the century. Thus in Norway the radical purists condemned the use of thin marble slabs, whereas more pragmatic minds defended this time-honoured practice by pointing to ancient and Islamic architecture (see below p. 37).

While marble lining was accepted by Ruskin, he nonetheless ranked the solid construction in one material much higher. Just as we esteem a column shaft more highly for its being a single block, we feel satisfaction with walls "if they are known to be all of noble substance." In this context Ruskin also formulated a principle which was to become central in the search for a new architectural idiom around 1900: "a better manner of design, and a more careful and studious, if less abundant, decoration would follow, upon the consciousness of thoroughness in the substance."[17]

Ruskin's feeling for true materials and for the individual properties of stone was rooted in his life-long interest in geology and mineralogy. Ever since his youth, or, more correctly, his childhood, he had collected minerals and studied geology. At the age of seventeen he published an article dealing with the "induration" of softer stones, and some four decades later, in his *Val d'Arno*, he returned to the finer points of the aesthetics of stone cutting.[18] Nor was Ruskin alone in cultivating such interests; as pointed out by Nikolaus Pevsner, he shared this passion for geology with another influential reformer, Viollet-le-Duc, who was both an accomplished geologist and a practicing mountain climber.[19] The very title of one of Ruskin's best known books, *The Stones of Venice* (1851-1853), bears witness to his fascination with this material, as

3. John Ruskin, Window from the Ca' Foscari, Venice. Soft-ground etching by R.P. Cuff. From *The Seven Lamps of Architecture,* 4th ed., 1883, pl. viii.

do also his architectural sketches and drawings. In the illustrations to *The Seven Lamps of Architecture* the sensuous quality of the stone texture is brought out by Ruskin's exquisite draughtmanship and his engraver's sensitive hand (Fig. 3).

To Ruskin, stone in its natural state possessed an aesthetic value of its own. For this reason one should never conceal masonry. The visual effect of a building, moreover, depended on the execution of the wall. Small buildings require bold masonry — it is no use trying to increase the apparent size of a small building by employing small-size masonry. Ruskin had been impressed by "the element of sublimity in the rude and irregular piling of the rocky walls of the mountain cottages of Wales, Cumberland and Scotland."[20] Masonry is a means of expression; it can be varied from Titanic heaps of rock to vaults and domes of edgy splinters. Ruskin was not, to be sure, the first to observe the beauty of rustic stone, and among his contemporaries Gottfried Semper was at the time using strong textural effects in his buildings (cf. Fig. 5-6). But Ruskin was

certainly the most eloquent expounder of the natural beauty of stone textures.

> And if the nobility of this confessed and natural masonry were more commonly felt, we should not lose the dignity of it by smoothing surfaces and fitting joints. The sums which we waste in chiselling and polishing stones which would have been better left as they came from the quarry, would often raise a building a story higher. Only in this there is to be a certain respect for material also: for if we build in marble, or in any limestone, the known ease of the workmanship will make its absence seem slovenly; it will be well to take advantage of the stone's softness, and to make the design delicate and dependent upon the smoothness of chiselled surfaces: but if we build in granite or lava, it is a folly, in most cases, to cast away the labour necessary to smooth it; it is wiser to make the design granitic itself, and to leave the blocks rudely squared. I do not deny a certain splendour and sense of power in the smoothing of granite, and in the entire subduing of its iron resistance to the human supremacy. But in most cases, I believe, the labour and time necessary to do this would be better spent in another way; and that to raise a building to a height of a hundred feet with rough blocks, is better than to raise it to seventy with smooth ones. There is also a magnificence in the natural cleavage of the stone to which the art must indeed be great that pretends to be equivalent; and a stern expression of brotherhood with the mountain heart from which it has been rent, ill-exchanged for a glistering obedience to the rule and measure of men. His eye must be delicate indeed, who would desire the Pitti Palace polished (cf. Fig. 5)[21]

Ruskin, for his part, preferred a noble surface of stone "to most architectural features which it is caused to assume."[22] At his most extreme he even condemned the use of machinery for the working and polishing of stone, calling it an "operative deceit" hardly better than stone imitation. This fundamentalist view was retracted by Ruskin in later editions of *The Seven Lamps*.[23] In Ruskin's later thought the colour of stone became more important than the texture of stone. In *The Seven Lamps* he had defined the true colours of architecture as those of natural stone,[24] and in *The Stones of Venice* colour became his overriding interest: what distinguished Venetian Gothic from its Northern counterpart was the beauty and permanent colour of its stone. Within a few years Ruskin had come to despise the "dark streets and grisly castles of oak and sandstone" built by the burghers and barons of the North while the Venetian merchants "were covering their palaces with porphyry and gold."[25]

Despite their internal inconsistencies, Ruskin's essays became fundamental for the philosophy of "architectural truth" such as it was developed during the latter half of the nineteenth century. His impact was partly indirect and transmitted through various intermediaries. Thus the professed Ruskin admirer G.E. Street, preached this doctrine in practice as well as in his writings: "It is truth only, in every line and every detail, which can ever make great architecture."[26] In his books on the stone architecture of Northern Italy and Spain Street made a careful study of the relationship between material and architectural form. Not only that; he also drew the practical conclusions, pointing to the possibilities offered by the many British varieties of marble, granite, serpentine etc.[27] For the early stages of Swedish "material rationalism" Street provided an important source of inspiration, since his *Some Account of Gothic Architecture in Spain* (1865) was used by Isak Gustaf Clason during his studies of Spanish stone buildings.[28]

Less illustrious intermediaries than Street contributed to the diffusion of Pugin's and Ruskin's ideas. In 1853 the Swedish *Tidskrift för praktisk byggnadskonst och mekanik* published two papers by a certain Joseph Boult. In the first Boult dealt with utility and function; here the author joined the chorus of voices demanding a stop to copyism. In his polemic against the Greek Revival Boult made use of arguments drawn from Pugin and Ruskin, including the former's well-known definition of St.Paul's Cathedral as a building where "in fact one half of the edifice is built to conceal the other."[29] Boult's florid condemnations of plaster coating and painted imitations echoed the two archmoralists' style and arguments, and his conclusion was the expected one: what is needed is *truth*.[30]

Boult's second paper to be published by *Tidskrift för praktisk byggnadskonst* was also concerned with copyism and truth of material. Again the towering figure of Ruskin looms in the background. When a person lies with his lips, he is rightly stamped as dishonest, but if he lies with his hands, he is admired for his skill in deceiving others, Boult complained. He praised the scholars demanding truth of material, but he also differred from Ruskin on certain points. He found Ruskin's argument in favour of gilding unsatisfactory and suggested another criterion based on the concept of *skin*. The skin of the human body, as well as the furs and feathers of the animals are real material; human beauty derives from the combination of an inner structure with a coating skin. Sometimes imperfection of the skin is concealed behind paint and face-powder, the make-up box being used for falsely suggesting a beauty which in truth does not exist. In architecture, similarly, gilding and mosaics are real, forming a skin which pleases the eye without deceiving it. But to use cement and paint in imitation of other materials is like having resort to the make-up box. Boult also took

Ruskin to task for rejecting machine work, pointing out that the polished granite from the machine-works of Aberdeen are just as impressive proofs of human ingenuity as the polished granite of Egypt. If, thanks to Savery, Smeaton and Watt, we are capable of cutting and polishing granite as finely as the Egyptians there is no reason to give up our advantage and return to a more primitive state.[31]

The trickle of ideas from British discussions reaching Scandinavia directly or indirectly was supplemented by rationalist and moralist currents of continental origin. Durand has already been mentioned. Among Germans, Karl Friedrich Schinkel proved to be important. As early as 1804 Schinkel had been impressed by the use of true materials in Lombardy, comparing the Carrara marble of the Milan Cathedral with what "wir selbst bei den imposantesten Werken durch Blendwerk und Übertünchung verstecken." He had also rediscovered brick construction by studying the architecture of Northern Italy.[32] Back in Germany Schinkel wanted to revive "the old workmanship of our ancestors." But only once he was given the chance to use real masonry. In his Königswache (1816-1818) Schinkel was allowed to use natural stone instead of a combination of sandstone and plaster. The latter possibility had been suggested as a compromise, but Schinkel found that the stone imitation would form "an unpleasant contrast" against the true masonry.[33] But the only "true" material available in quantity in Berlin was red brick, and Schinkel's famous works in *Backsteinrohbau*, notably the Berliner Bauakademie (1832-1835) became important models for brick architecture elsewhere.

4. Chr. H. Grosch and K.F. Schinkel, The Oslo University Building, Central portico completed in 1852. (Photo SR)

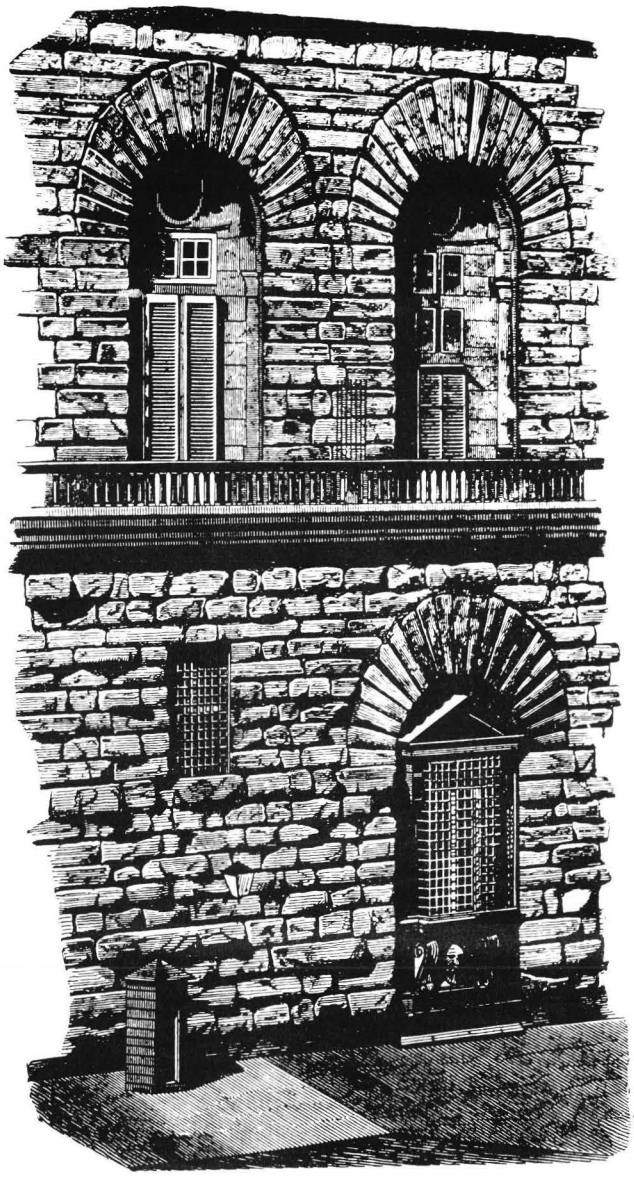
In Norway Schinkel's influence was felt in more than one way.[34] When revising Chr. H. Grosch's project for the University of Christiania in 1838, Schinkel recommended Norwegian marble for the main portico and the vestibule "since in this manner the building will achieve a monumental character and thus stand through the centuries as a fitting expression of the spirit and the cultural situation of the present era" — or so Schinkel's opinion was reported in the official papers. Although the marble needed would increase the total cost of the building by more than one tenth, the Building Commission welcomed Schinkel's suggestion, since, they argued, an order of this magnitude would "give the first strong impetus towards the re-opening of our closed marble quarries"[35] — Norwegian marble had not been used in quantity since the construction and subsequent repairs of the *Marmorkirken* in Copenhagen. In the end, however, the employment of true materials in the University building was restricted to the column shafts which were cut from reddish grey syenite.[36] The *antae* and the pediment were built of plastered brick and the capitals cast of zink (Fig. 4).

Heinrich Hübsch, a contemporary of Schinkel's, presented Neo-Romanesque *Rundbogenstyl* as the only viable alternative for the nineteenth century. Again "truth" was the key word. Hübsch referred to the *Lügen-Styl* that would be the inevitable outcome of the combination of Greek ideals with inferior materials — architraves must not be constructed of soft stone.[37]

Hübsch's pamphlet carried the provocative title *In welchem Style sollen wir bauen?* and triggered off a debate that was to last until the end of the century. In Germany and Austria "the battle of styles" was conducted with frequent recourse to Lodolian verism. "Truth" was appealed to in defence of Neo-Grecian as well as Neo-Gothic styles, to justify *Rundbogenstil* as well as the "Byzantine Manner."[38] In 1846 J.H. Wolff made an attempt to reconcile the conflicting opinions. There was, he argued, one principle on which every one must agree, and this was *the principle of truth in construction and material.* From this premise Wolff worked out a system of aesthetics applicable to construction. Let us use ashlar when a monumental effect is desired, rubble (*Bruchstein*) or brick where ashlar is not to be had — yes, let us build in timber and iron, "aber jedesmal sei die Natur des Materiales [...] die erste Grundlage für die Formgebung."[39] Wolff's conclusion was, however, disappointingly conventional: he was convinced that "the Greek forms correspond, in the most direct way that is possible, to the principles of mineralogy." By means of Wölfflinian pairs of opposites he set about to prove the superiority of large-sized ashlar.[40]

In Germany Pugin's programme was taken up by August Reichensperger in his book *Die Christlich-germanische Baukunst* (1845).[41] Reichensperger had the moralist's liking for piling up invectives:

Insbesondere gilt das Gesagte auch noch von der *Auswahl des Baumaterials.* Heutzutage weiss man durch Mörtel und Tünche aus Allem Alles zu machen. Der gebrechlieche Ziegelbau wird unter ihrem Beistande in einen florentinischen Felsenpalast verwandelt; der Gyps zaubert jede Mauer und jeden Balken in eine strahlende Wand oder Säule von Marmorstein und Porphyr um; die Steinpappe (neuester Erfindung!) und das *Papier maché* wissen den Bildnermeissel durchaus entbehrlich zu machen, wie die Tüncher-Schablone die sichere Hand des Meisters!
Solches Schauspielern, Kokettieren und Schwindeln, solches Pappen, Flicken und Klatschen, solcher hohle Bettelstolz, wie es sich allerwärts, bis hinauf zu den Mörtelpalästen unserer Hauptstädte aufbläht, mit *einem* Worte, eine solche *Lügen*hantierung war tief unter der Würde jener grossen Meister des Mittelalters, deren innerstes Wesen vor



5. Gottfried Semper, Ashlar bond of the Pitti Palace, Florence. From Semper, *Der Stil,* 2, 1863, p. 362.

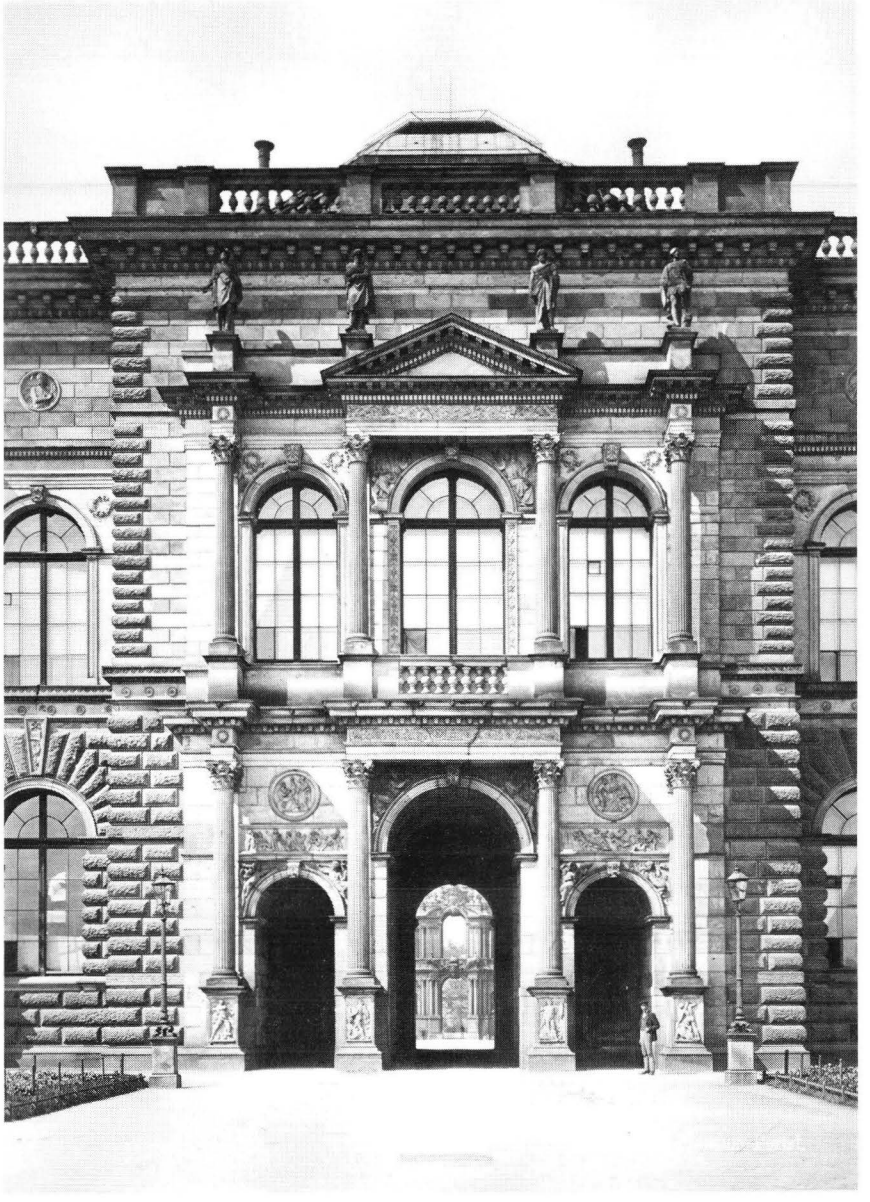
allem das Gepräge der *Wahrhaftigkeit* und der *Gesetzmässigkeit* an sich trug und die dasselbe allen ihren Schöpfungen aufdrückten.[42]

Like Pugin, Reichensperger readily extended his argument from Christian architecture to practically all other branches of building. With distaste he watched the cheap commercial architecture next to the Cologne Cathedral, "der fettglänzende, sandbeworfene Quaderbau aus Tannenholz auf seinen gläsernen Füssen da, als ein Musterbild *heutiger* Architecktur."[43] Contemporary architecture was in a state of anarchy, where "alle kosmetischen Mittel nicht zureichen wollen, um die immer mehr um sich greifende Hinfälligkeit zu verbergen."[44] Reichensperger's book was discussed and quoted extensively by the *Allgemeine Bauzeitung* in 1846, again with a liberal selection of the author's invectives.[45]

Gottfried Semper's long activity as a writer and architect made him a contemporary of both Schinkel and Ruskin. One of Semper's best known early papers was an article on polychromy of 1834; since colour was inseparable from material he also dealt with the latter in the article. On the face of it, Semper sounded like a good Lodolian:

> Es spreche das Material für sich und trete auf, unverhüllt, in der Gestalt, in den Verhältnissen, die als die zweckmässigsten für dasselbe durch Erfahrungen und Wissenschaften erprobt sind. Backstein erscheine als Backstein, Holz als Holz, Eisen als Eisen, ein jedes nach den ihm eigenen Gesetzen der Statik.[46]

But this general declaration was followed by all sorts of qualifications. We are told that since many materials (e.g. wood, iron) require a protective coating, we might just as well paint these materials in pleasant colours. As for stucco, Semper was as little pleased by



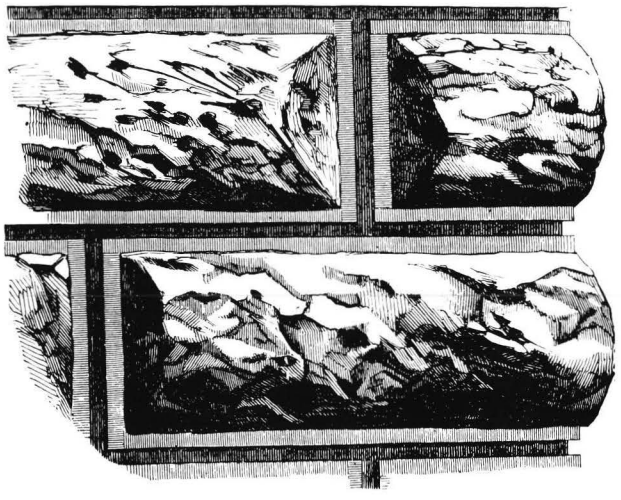
6. Gottfried Semper, Gemäldegalerie, Dresden. 1847-1854. (Photo c. 1884; ÅAK).

''awkward, old-maidish plainness'' as he was by the imitations of historical styles from the Renaissance to the Rococo.[47]

What Ruskin called ''operative deceit'' was also discussed by Semper in one of his important London lectures in 1853. The new working methods have revolutionized our conception of form in hard materials. The majestic calm and the rigour of the contours characteristic of Egyptian granite and porphyry monuments are still impressive; but in our time the economy of work is no longer a *necessary* trait of style, since ''we possess the means to cut the hardest stone as if it were just chalk.''[48] For this new situation Semper has no specific advice, only general principles, to offer: if granite is used in places where hardness and durability are desired, then the proper manner of treating it will once again become apparent.[49]

In his practical work Semper made use of the whole gamut of stone textures sanctioned by Classical and Renaissance precedents, from rough rustication to finely tooled ashlar (Fig. 5-6). In the presentation written by Semper for his first Dresden Hoftheater he proudly emphasized that the edifice is built ''in genuine sandstone masonry up to the second arcade.''[50] In his book *Der Stil* Semper included a section on ''Stereotomy or Stone Construction'' (Fig. 6-7). The ancients, he wrote, preferred a simple rhythm in their ashlar walls, whereas later styles display ''a more romantic-musical tendency towards a more elaborate variation of rhythmic cadenzas, intervals, caesuras etc.''[51]

Semper's reputation as a proponent of ''architectural materialism'' rests on his dictum ''Jedes technische Product ein Resultat des Zweckes und der Materie,'' originally a sub-heading in *Der Stil*.[52] In his London lecture of 1853 Semper designated the ''material system'' (i.e. the material and the working processes) one of the three factors determining style. He advised the practising architect to regard his material, not as passive matter, but as a source of inspiration.[53]



7. Gottfried Semper, Rusticated quoins of the Dresden Museum. From Semper, *Der Stil,* 2, p. 364.

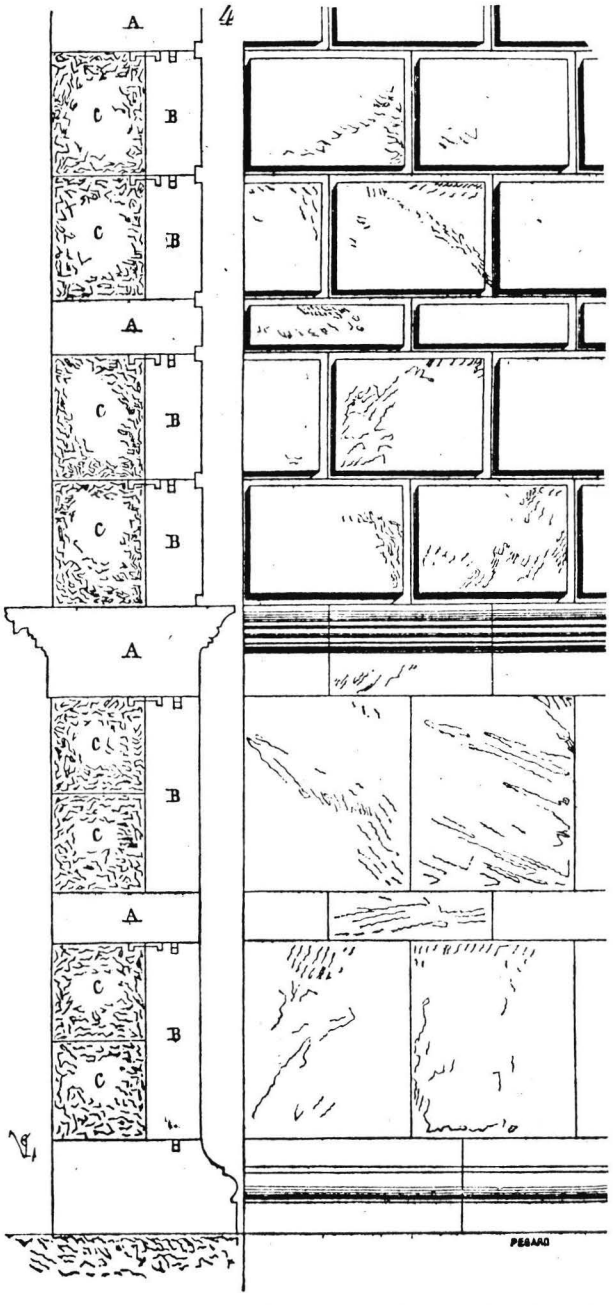
But despite his reputation as an architectural materialist Semper warned against overrating the role of materials in architecture.[54] He was anxious to preserve the priority of another favourite idea of his, the concept of coating (*Bekleidung*). According to Semper, the origin of architecture was to be sought in weaving, basketwork and the textile arts. He pointed out that the Greeks coated their superb stone constructions with a thin layer of stucco, which was then painted — thus the admired white marble was adopted in order to produce the painted finish that the Greeks wanted to give their buildings.[55]

Neither was Semper dogmatic in his architectural practice. The interiors of his Wiener Ringstrasse buildings abound in imitated materials — prevailing practice was not easily reformed. The Ringstrasse project had been accompanied by extensive prospecting for stone materials, available resources had been studied in several reports, but nonetheless only a few of the monumental buildings had façades of natural stone. In the interiors artificial stone was used side by side with real materials; this, moreover, by architects who unlike Semper had thundered against *Lügen* and *Scheinmaterialien* in their writings.[56]

Compared with Semper, Étienne Viollet-le-Duc made more consistent use of the Lodolian principle that ''la pierre paraisse bien être de la pierre; le fer du fer; le bois du bois.''[57] In his *Entretiens sur l'architecture* (1863-1872) Viollet-le-Duc made a distinction between truth of purpose and truth of construction, the latter being the employment of the materials in accordance with their properties. Architectural truth was more important than the traditional aesthetic categories.[58] Like Lodoli he criticized the translation into stone of forms derived from straw, clay and wood construction. But from the point of view of architectural truth, the imitation of a noble material in a mean one was obviously worse. Viollet-le-Duc stated the issue with precision: let us assume that we are required to build two different assembly rooms to hold two thousand persons each. In case A we are offered ample funds and materials of superior quality — marble or granite. In case B we have to restrict ourselves to a minimum of resources and to a choice of materials consisting of brick and timber. Ought we to give the two buildings the same area? Evidently, yes, since they are to accomodate the same number of persons. Ought we to give them the same apppearance? Evidently, no, since in the two cases we cannot command the same resources. Building for the same programme, we have yet to employ two entirely different modes of building. For if we apply plaster and paint to make a building of brick and wood look as if it had been erected in stone and marble, then, indeed, we do employ art for a miserable purpose.[59]

By the ingenious use of true materials, Viollet-le-Duc emphasized, we can give "style and a certain distinction" even to the most humble structures. "Une simple chaine de pierre, placée dans un mur devient ainsi une expression de l'art."[60] It is characteristic that in this *Entretien* Viollet-le-Duc's term "material" means, more or less, *stone*. It is only in the second volume of his work that other materials begin to attract his attention. Stone was to Viollet-le-Duc much more than a mere building material. Like Ruskin, he was an amateur geologist who had published in the field; he was, moreover, an accomplished mountain climber.

In the historical section of his *Entretiens* Viollet-le-Duc had given an example of the successful employment of masonry, the round temple of Vesta in Rome:



8. E.-E. Viollet-le-Duc, Wall from the cella of the Temple of Vesta. After Viollet-le-Duc, *Entretiens,* I, 1863, fig. 4.

"Voilà donc un mur, un simple mur, dont la construction a du style" (Fig. 8). The rhythm produced by the different heights of the courses is explained by the utterly rational and economic use of materials: the fine and hard, although expensive marble (A,B) is combined with cheaper travertine (C). Marble is used in small blocks for coating, and in slabs serving as binders which strengthen the wall construction. Now, suppose that a Parisian architect should want to imitate this elegant and firm wall. How should he treat the domestic building stone which he receives from the quarry in blocks of varying heights and in lengths of 1-2 metres? To cut the stone in small pieces would be useless and expensive. To carve mock joints in order to produce the same effect as in the temple wall would be "a lie." Both solutions conflict with the true nature of the material actually used in Paris.[61]

*

Continental rationalism reached Sweden as early as the 1830's. Durand was praised by the Swedish architect and engineer Carl Stål, the author of a standard text-book on building construction (1834). Stål quoted Durand's *Précis des leçons* in his section on "Form and Proportion," emphasizing the role of "truth and nature". The only important forms are those derived from "the nature of the materials and the use to which these materials are put."[62]

A key figure in this context was Axel Nyström, city architect of Stockholm and professor of architecture at the Royal Academy of Fine Arts 1836-1848. Nyström had travelled extensively in Europe from 1819 to 1825, with longer stays in Paris and Rome. From the 1830's to the 1850's he visited Berlin, Paris and London.[63] He had met some leading European architects and he supplemented his first-hand experiences with reading professional journals. Nyström was sensitive to new signals; in 1839 he revised his façade designs for a building in Lund to suit his recent reorientation towards Schinkel's *Rohbau,* which he had seen in Berlin, Dresden and Stettin.[64] It has also for good reasons been suggested that he was influenced by Hübsch.[65]

Nyström was a shrewd observer and sharp commentator. Among his extant papers is a text headed "Arkitekturstudier," which according to its opening passage was in progress in 1845. These "Studies" have been construed as forming a kind of personal manifesto.[66] Rather, they represent a medley of the architect's own reflexions and excerpts from various sources such as the *Zeitschrift für praktische Baukunst, Kunstblatt*, and *Allgemeine Bauzeitung*. The abuses criticized by Nyström were hardly as common in Sweden as in the metropoles visited by him during his travels, and his jeremiads may partly be ascribed to his wish to keep up with contemporary debate.

> Nothing, it seems, is more detrimental to the progress and advancement of architecture in our age

than the practice of using imitated and deceptive materials. In our day the sense of honour which characterized the architects of old is no longer current. Instead, there is a spirit of conceit, a hankering for display and superfluous ostentation which prompts people to make things appear different from what they really are. Hence the debasement of the noblest and finest forms of architecture, which is so typical of contemporary building and decoration. This is why the cathedral, the court room, the tavern and the trinket shop are decorated with cement, putty, iron or clay, which are given forms that were invented for stone, marble and bronze.[67]

In 1845 Nyström travelled in Europe to study municipal engineering, fire prevention, street paving etc. In his report he devoted much space to building methods, noting with apparent envy that Parisian façades were ''richly ornamented in stone;'' this could be had at a moderate cost thanks to the great number of skilled stone carvers. In Berlin, on the contrary, true masonry was seldom seen, the ornaments being, for the most part of cement, gypsum or other mean materials. In Hamburg the situation was similar:

> Rarely does one see true masonry, and when stone is employed, it is given exactly the same forms which are just as adeptly used for cement in countless other places. Speed, showiness and low cost are what counts here. The employment of cast and moulded ornament is often exaggerated, and the resulting gaudiness is tiring to the eye [. . .][68]

Nyström pleaded for honesty and simple materials. This was all the more important in cases where economy set a limit to the use of more expensive building methods. He argued that the reform must begin in public projects; in the private sector taste had already become corrupted by commercialism. We must restore the sense of propriety in architecture in order to ''stop the building turkey from attiring itself in the feathers of the peacock.''[69]

With his attacks on the use of false materials Nyström initiated a tradition in Sweden. The ideas expressed in his notes and manuscripts were transmitted to a generation of younger architects. His rationalism influenced his pupil F.W. Scholander, who, in turn, became a professor at the Academy in 1846 and preached the same lesson to his students. Only with the generation following Scholander did the good intentions ripen into action and the use of genuine materials become general.[70]

Fredrik Wilhelm Scholander, Nyström's son-in-law and his successor in the Academy, has sometimes been referred to as a Swedish Gottfried Semper. Scholander was the leading Neo-Renaissance architect of Sweden, sharing with Semper an admiration for things Italian and a general liking for polychromy in architecture. He knew Semper's writings and many of his buildings; yet, as pointed out by Bo Grandien, the Swedish architect was no reformer or theoretical thinker.[71] In fact, Scholander made unrestrained use of the meanest imitation materials. When visiting Innsbruck in 1863 Scholander frowned at brick and sandstone imitations painted on plaster, but returning home in the following year he built a manor where exactly the same imitations were employed.[72]

In his teaching Scholander stressed the importance of true materials, but deplored the fact that in practice plastered brick was usually the only alternative. The result could hardly be anything but ''a worthless cake of useless ornaments.''[73] This comment dates from the 1870's when Scholander became increasingly aware of the contradiction between the good intentions and the everyday practice of most architects. In 1878 he wrote to C.G. Estlander, one of the figureheads of the art establishment in Finland at the time:

> And even if Utility is decorating itself with a couple of mouldings and a little gew-gaw which any one could knock down with a sugar hammer, it hardly becomes Art. [. . .] This is why I am so furious about our plaster architecture here in Stockholm and in every other place where it also rules. I would like to see true material well worked and well assembled. Only in this manner, there will emerge something which, although imperfect, would have at least some resemblance with art.[74]

Scholander's excuse for plaster was practical and in accordance with Semper's principle of ''protective coating.'' Plaster was needed in Sweden, since, he observed, the climate was severe and durable brick impossible to get.[75] On this point Scholander's view was accepted by I.G. Clason, one of his pupils, and also the pioneer of true materials in Swedish architecture. Clason noted the inconsistencies in Scholander's work, but he praised his teacher's attempts to ''transpose stone motifs to suit brick and plaster construction'' without recourse to plaster of Paris.[76]

The chief credit for inspiring a new generation of architects to moderation and honesty was given by Clason to A.T. Gellerstedt, a professor of architecture at the College of Technology in Stockholm 1877-1882 (in 1876 the training of architects was transferred to that institution from the Academy of Liberal Arts). Himself a mediocre architect, Gellerstedt inspired his pupils to study the use of true materials in the architectural heritage of Sweden: the medieval churches of Gotland, many Renaissance castles, and especially seventeenth-century buildings in Stockholm with their carved portals.[77]

The influence of the three professors, Nyström, Scholander and Gellerstedt, reached the neighbouring countries, too. Several Finnish architects completed

their training at the Academy in Stockholm, a practice that continued even after the founding of the Polytechnical Institute of Helsinki in 1879. In Norway the Swedish rationalist trend was reflected in the *Stortingsbygningen* in Christiania, a brick structure designed by one of Nyström's former students, the Swedish architect Emil Langlet.[78]

Continental rationalism was also directly transmitted to Norway. Schinkel's role has already been mentioned. In 1838 the German architect Heinrich Ernst Schirmer (1814-1887) arrived in Christiania to assist in the work on the Royal Castle. In 1859 another German, Andreas Friedrich von Hanno (1826-1882) joined Schirmer, with whom he planned several public buildings in *Backsteinrohbau* with quoins and dressings in stone; von Hanno also ran a pioneering stone firm.[79]

From the 1850's until the end of the century generations of Norwegian architects received their training in Hannover. According to Stephan Tschudi Madsen more than fifty Norwegians attended the Hannover Polytechnic with its leading teacher, Konrad Wilhelm Hase (1818-1902). Hase preached architectural truth and taught his students to shun false materials; with varying success, it might be added. From the 1880's Hannover was superseded by other destinations for Norwegian students of architecture.[80] A few studied at the Zürich Polytechnic and may in this way have learnt about Semper's ideas.[81]

In the technical journals of Scandinavia the purist debate is at first echoed in the form of free translations from British and Continental journals. A more independent debate started in the 1880's, even then with foreign inspiration. In 1883 the Norwegian *Teknisk Ugeblad* printed a text from the *Deutsche Bauzeitung*, where a writer had proposed a ban on all plaster of Paris ornaments. By this time the decorated façades built in the preceding decades had begun to take their toll: pieces of decaying and frost-damaged cornices were causing an increasing number of accidents. In a comment to the proposal the *Bauzeitung* editor called attention to the recent move for true materials; against this background, he argued, a legal ban on plaster will appear just and reasonable.[82]

Although dropping cornices must have been as unpleasant in Stockholm and Christiania as they were in Berlin, the phenomenon seems to have caught the attention of architects in Sweden and Norway only after *Deutsche Bauzeitung* had commented on it. Even the term *Gesimsfallzeit* was imported, referring to a fifth season between winter and spring. In January 1884 *Teknisk Ugeblad* noted that the winter that year looked especially bad: ''We can hardly recall ever having seen as many plaster ornaments coming down wholly or in part.'' To add weight to his observation, the commentator again appealed to the authority of *Deutsche Bauzeitung*. The German journal had reported recent cases of crashing cornices and crumbling façades in Berlin, and it also mentioned the mounting opposition to such dangerous methods of construction. In Paris, we are informed, there were already regulations stipulating that cornices made of other materials than natural stone must not project more than 16 cms from the wall. Less than two months later, in March 1884, *Teknisk Ugeblad* reported a fatal accident in Stockholm, where it was said that the cornices were in a particularly bad state.[83]

In fact, one of the earliest and most important debates on true material was focussed on this tangible issue, dangerous cornices. At the Second convention of Swedish Technologists in 1886 the House Building Section debated the topic ''What can be done to restrict the abuse of ornaments of plaster of Paris?'' The wording deserves to be quoted:

> This topic has been prompted by the disgusting spectacle, at regular intervals presented by quite new, seemingly luxurious, so-called ''stone'' buildings, which have lost long stretches of their cornices with appurtenant consoles etc.; and done so in a manner jeopardizing the life and limb of passers- by; wherefore this meeting is invited to discuss whether other methods should be employed to find an appropriate form, decoration, method of construction and material for the above mentioned details [. . .] This is an issue where rational architects should, if ever, be entitled to receive support from legislation.[84]

In the ensuing discussion plaster of Paris was both attacked and defended. Some speakers suggested ornaments of sheet metal or cement as alternatives, only to be haughtily rebuffed by the purists. Others recommended *Backsteinrohbau* as such or combined with natural stone. At this juncture A.H. Hörlin, an architect active in the arts and crafts reform and familiar with the ideas of Pugin, Ruskin and Semper, rose to speak in order to place the issue in a wider perspective. The abuse of plaster is a sin that will always find you out, it has become its own punishment ''ruining the appearance of the building as well as constituting a danger.'' The use of false and perishable materials is a fashion, and like other vogues it can be changed: someone has only to begin and set a new example. ''The architects ought to form a conspiracy against the tyranny of plaster.''[85]

Another aspect was taken up by the architect Ferdinand Boberg. Boberg called attention to the rational foundations of the ''good Italian Renaissance'' whose forms were copied with such unfortunate results. The enormous cornice of the Palazzo Strozzi, which projects two meters, is constructed of large blocks of stone. Other Florentine palaces have cornices of timber. In the Palazzo Fava in Bologna the architect has had only brick at his disposal and acted in accordance with the circumstances: here the cornice projects a mere half

meter in a rise of one meter. All this is rational and honest; a striking contrast, Boberg concluded, to the gypsum suspended in rails and iron baskets in Stockholm.[86] The challenge of the cornice is, it seems, felt as late as 1894 when Aron Johanson designed the Stockholm Savings Bank building with its defiantly projecting cornice, perhaps the only bold feature of this academic composition (Fig. 83).

At the 1886 Convention many speakers opted for brick *Rohbau* since natural stone still seemed unrealistic. In 1878 the Building Section had already taken an interest in the University Building in Uppsala, recommending that uncoated brick and dressings of stone be used for this important structure (Fig. 49-50; cf. below Chapter 6). By the time of the 1886 Convention several prestigious red brick projects were under construction, some designed by architects present at the discussion. But a more ambitious goal was defined in the heading of another topic debated at this important meeting: ''How is the use of natural stone in building construction to be promoted?''

> Although Sweden abounds in granite, sandstone, limestone, soapstone and other rocks suitable for building, these stones have almost completely gone out of use as a material for cornices, portals, window surrounds etc., whereas in earlier times entire buildings, or at least the parts just mentioned were executed in stone. Instead of being made of stone, columns are now built of brick and coated with plaster. [...] Imported gypsum has taken the place of our own building stone, spoiling the exterior of our buildings, especially since the ease with which it is obtained, results in an overloading of ornaments. If the upper courses of the cornices were built in masonry, we could, as suggested in the preceding topic, largely be saved the accidents in which enormous lumps of gypsum and plaster come crashing down. The principal obstacle to a more general use of masonry is to be sought in its [...] absurdly high cost. Is there then, no way of making reasonably priced stone available for building construction in order that we might today, as once before, use our own, considerable stone resources in a manner conducive to the improved solidity and appearance of our buildings?[87]

Forty years after Axel Nyström had first criticized the use of plaster, thirty years after Pugin and Ruskin were first introduced to Swedish readers, after three professors of architecture preaching Truth and Honesty to their students, we still find architects and engineers repeating more or less the same arguments in 1886. As late as the 'nineties, I.G. Clason still resorted to the falling cornices argument.[88]

But repetition need not imply stagnation. On the contrary, from now on the debate becomes more articulate, and writers known only through second-hand sources are rediscovered. Semper's posthumous *Kleine Schriften* (1884) is a case in point. Thanks to the crafts reform Ruskin became known in the 'nineties, directly and by way of German translations. Swedish translations of Ruskin began to appear only after the turn of the century. In 1898 the Finnish critic and architect Jac. Ahrenberg wrote that the Swedes have come to know the ''Neo-English ideas'' of architectural realism through Ruskin's *Seven Lamps* and *The Stones of Venice*; in this way they have received an antidote for the German influence that Ahrenberg found so harmful in Finland.[89]

In an article called ''Architecture and the General Public'' the Swedish architect Gustaf Lindgren did indeed summon Ruskin's assistance in his attack on speculative building in Stockholm. Lindgren's ''value of labour'' and ''value of material'' come straight from Ruskin, as does his comparison with womens' dress. A decent person would not let his wife or daughter wear talmi gold or celluloid tortoise; in the street all of us can tell a *demimonde* from a woman of the world. But in architecture ''we attire our beloved like a *demimonde*, with every conceivable, meaningless frippery,'' brass gold, paste diamonds, glass pearls, false teeth and wigs — a somewhat overdone version of the corresponding passage in *The Seven Lamps* where Ruskin wrote that ''exactly as a woman of feeling would not wear false jewels, so would a builder of honour disdain false ornaments.''[90]

The Truth of Style

''Is there any one in his right mind who would not laugh if a person appeared right in the middle of the market square, clad in finely polished armour with chasings by a Cellini?''[91] Lodoli's biting comment on historical disguises sums up another aspect of architectural truth, which was to preoccupy countless later writers on architecture.

By the first decades of the nineteenth century the growing body of archaeological works, including accurate measurements and delineations of ancient and medieval buildings, had opened the doors to the past. The situation was, at the same time, inspiring and contradictory. On the one hand, the documentation of historical buildings provided an increasing assortment of models to be adapted for contemporary needs. On the other hand, the new insight into past periods created unexpected inhibitions when it actually came to the exploitation of the historical models. It appeared, as Karl Friedrich Schinkel put it, that ''history has never copied previous history.'' ''Every epoch has left behind its own style in architecture. Why should we not try whether a style for our own might not also be found?''[92] The buildings of past epochs, it appeared, were the products of specific conditions which did not necessarily exist

in the nineteenth century. It seemed as if nineteenth-century architecture was indeed behaving like Lodoli's Quixotic fool, masquerading in attire borrowed from past epochs.

Peter Collins has devoted a whole chapter to "The Demand for a New Architecture," where he points to André Chenier as one of the first to question the authority of the past. In a poem published posthumously in 1819 the poet asked why we make such efforts to live in the past, although everything around us has changed, habits, customs and sciences.[93] Chenier did not explicitly refer to architecture, but from the 1820's the problem of a true nineteenth-century style began to attract increasing attention. Heinrich Hübsch's *In welchem Style sollen wir bauen?* (1828) precipitated a debate in German-speaking countries. In England Thomas Hope closed his book *An Historical Essay on Architecture* (1835) with a plea for an architecture which "should truly deserve the apellation of 'Our Own'." Twelwe years later T.L. Donaldson presented the following challenge to the Architectural Association: "The great question is, are we to have an architecture of our own period, a distinct, individual, palpable style of the nineteenth century?"[94]

Although a subject of lively discussions in British and continental architectural publications in the 1840's and 1850's, the New Style did not seem to materialize. Whereas in the question of "Truth of Material" there existed a general agreement about means and ends, the idea of the "Truth of Style" proved difficult and controversial. Some leading authorities rejected the demand for a New Style altogether, others seemed content with sitting down to wait for it. Ruskin and Semper belonged to the first category. In *The Seven Lamps* the former observed that "a day never passes without our hearing our English architects called upon to be original, and to invent a new style."[95] Semper returned the argument to the senders: if styles are indeed shaped by ideas (as those who harped about the New Style presupposed), where is the Great Idea of the nineteenth century which architecture is to express? Many young architects of today, Semper believed; would be fully capable of giving such an idea the appropriate architectonic expression. But until the advent of the necessary conditions we have to make do with old formulas.[96]

A moderate eclecticism, or the judicious borrowing of usable motifs from earlier styles, was proposed by many writers. In 1850-1851 the debate in Germany quickened owing to the Maximilianeum competition in Munich. The programme for this project called for the creation of something new instead of copying existing models. By combining elements from different styles it must be possible to create "an original, beautiful, organic whole," the organizers argued.[97] Semper ridiculed the programme, and "Maximilianstil" soon became a byword for eclecticism gone wrong.

If a New Style could emerge only as a result of a new concept of construction, then the nineteenth century had an obvious alternative to offer: iron. But, as we know, the attitude to iron among the mainstream architects was ambiguous and contradictory. Ruskin and Semper denied the possibility of articulating iron,[98] and Viollet-le-Duc approved of the material, in theory rather than in actual practice.[99] Others were more hopeful or enthusiastic, especially after the sensational success of the Crystal Palace. But since the debate on style concerned façades rather than any other features of architecture, the impact of iron construction remained negligible and restricted to a few experiments.

The concept of the New Style became commonplace, and the demand for a nineteenth-century style was repeated in countless articles, pamphlets and books. The first echoes of this debate reached Scandinavia by way of translation of texts from German and British periodicals and pamphlets. In one of the 1853 Swedish translations from Joseph Boult (see above p. 16) the author called for a stop to the historical masquerade. The one lesson taught by history, Boult maintained, is that every age has created its own mode of building, a style based on available materials and adjusted to the demands of the time. Instead of imitating the forms of the past, we, too, should give the creations of our time, the bridges, warehouses, dwellings and churches, the stamp of original beauty and truth.[100]

In 1859 the Swedish *Tidskrift för byggnadskonst och ingeniörvetenskap* serialized a translation of Edward L. Tarbuck's R.I.B.A. Prize Essay *A Popular Account of the Styles of Architecture* (1855). Tarbuck's last chapter, "The Present State of Architecture" formed a long litany on the lack of a nineteenth-century style. Is design at last exhausted? Has not another style arisen suited to the present age?

> The answer is simply, that, while nearly every great nation of antiquity, and a grand Institution, which flourished in its greatest splendour during the Middle Ages, devised and carried out systems of decorative architecture, peculiarly suited to the purposes for which they were required, and rising directly out of them, we, in these days, when the world has attained a higher degree of civilization than it ever before arrived at, possess so little vigour of intellect, and such slight inventive powers, as to be able to do little better than copy, oftentimes without feeling and effect, without an imbibition of their spirit, the works of those, whom, in so many other respects, we have long far excelled."[101]

In Tarbuck's opinion, even the Crystal Palace was merely "the clothing of new materials with old forms." He did not for a moment doubt in the efficacy of the repeated calls for the New Style: "let once an indigenous style which shall rise out of the peculiar circum-

stances of modern days be demanded as a crying necessity, no doubt can be entertained that, sooner or later, its development must follow."[102] But he had, of course, no more than the other critics presenting the same demand, any concrete suggestions to offer.

In 1864 an anonymous commentator in *Tidskrift för byggnadskonst och ingeniörvetenskap* made a somewhat tentative use of the New Style criterion as a critical concept. The commentator referred to the repeated allegations that the present era had failed to create its own style, resorting instead to the aping of earlier epochs. For his part, he believed that from the aesthetic as well as the technical point of view contemporary architecture had kept pace with the sciences and with civilization in general. "An original style of architecture is not invented in the manner of an innovation in mechanics, which can be patented; for a beginning, it develops gradually, and only in the course of time it assumes more salient characteristics, which are typical of the style in question." In the course of time, he thought, it has become increasingly difficult to create new styles. The styles of Antiquity were shaped under extremely simple conditions: models were provided by nature and represented in solid and handsome materials. Similarly magnificent styles were invented in the Middle Ages. But the complexity of modern civilization has resulted in an *embarras de richesse*: it is difficult to decide what materials to use, and how to use them. "This may be an advantage [. . .] but it does not favour the formation of original, permanent styles of architecture." The commentator's conclusion is interesting: the correct thing to do would therefore be to favour *local traditions*. With the assistance of applied science, developing taste and practical insights it will thus be possible to develop an independent style, which will also become national. This is the first time that we come across the notion of regional pluralism as conducive to a national style; two decades later the same idea was to recur in a more articulate form in the Swedish discussions on a national style.[103]

Peter Collins has pointed out that the idea of a New Style laid dormant during the decades between the mid-century debates and the revived interest in the problem at the turn of the century.[104] This was also true for the rudimentary "debate" in Scandinavia. Until the 1890's we come across few, if any, references to the New Style in Nordic technical journals. But with the crafts reform and the revival of rationalist ideals the notion again became topical. "Do we have a Style of our own?" ("Hafva vi en egen stil?") was the heading of an account of Jakob von Falke's reflections on the crafts reform published in *Teknikern* in Finland (1891).[105] Here von Falke — who also played a role in the organization of Scandinavian crafts — concluded that the New Style had indeed arrived, at least in the field of design. It has not yet a name, but then styles are generally named by posterity. The nineteenth century, von Falke argued, had indeed succeeded in creating novel combinations of the various historical elements which it had appropriated.

During the early 1890's there was a tendency to regard eclecticism as the final answer to the demand for a New Style. The Swedish architect Gustaf Lindgren, for instance, argued that it was no longer possible to create a New Style, if by this term we mean a unified design based on common motifs. The tasks presented by contemporary society, he wrote, had become so varied that no unified design could cover all the different contingencies. Therefore the historical forms were still of use. Understood in a wider sense, however, the New Style was not only possible but actually in the making. The first step had already been taken: the respect for the *material* was being restored. Form is dependent on material, and the choice of viable styles is determined by our resources. Wood and granite are our most common materials, although the latter is so expensive that it is rarely used. Then Sweden has sedimentary stones, brick clay, iron, copper, "in addition to plaster, gypsum, cement and concrete." According to Lindgren, these materials defined the range of styles possible in Sweden: Old Nordic wood style, Baltic (i.e. Swedish, Danish, North German) Gothic in red brick, French Gothic with a combination of stone and brick, English and Dutch Gothic and Renaissance, Danish-German Renaissance, and, last but not least, traditional Swedish plaster architecture with plain surfaces and articulation in natural stone. This was a long list, and one that already reflected the success of projects such as Isak Gustaf Clason's Bünsow House (1886-1888, Fig. 63). Lindgren concluded his essay with a reminder that the work for a New Style, if this will ever materialize, will in any case require considerable time.[106]

Towards the end of the 1890's the concept of the New Style acquired a different meaning. By virtue of its very name, Art Nouveau seemed entitled to become the long-awaited panacea. Its emancipation from the Renaissance tradition, its novel interpretation of natural forms, and its receptiveness to contemporary materials seemed to support this claim. Nonetheless, the claim was contested by many. The Swedish architect C.J. Forsberg addressed the problem in an article headed "The Old Style of Architecture and — A New Style?" He admitted that materials have in the past given rise to new styles, but in the case of the most recent of materials, iron, all such hopes have been thwarted. Neither was there, according to Forsberg, any new principle of *construction* which might give rise to a new style. What remained, then, was *decoration*, a field where the modern movement has indeed brought about a renewal. "But *for the time being* the question as to whether *a new style* exists, has to be answered with 'No!' " Although it was thus premature to talk about a new style Forsberg predicted that "after two decades from now

we will see the emergence of a new, logical style of architecture''[107] — not a bad forecast as forecasts go.

Occasionally the New Style was appealed to in appreciations, for instance, in the case of the Skånebanken (Fig. 164; cf. below p. 154). In Finland one of the more prolific architectural writers, Bertel Jung, published a lecture, where he dealt with recent movements. He was not, any more than Gustaf Lindgren, willing to admit that Art Nouveau or the Wagner school yet represented the New Style.[108] This was in 1901; two years later Jung was carried away by the architecture of the Poli, the Technical Students' Union in Helsinki (Fig. 205-206), which he named ''the first true representative of 'the new style','' the modern style about which so much has been said, but of which we have seen so little. Jung exclaimed that ''now we do no longer have to write and discuss; now the stones themselves speak'' (see below p. 182)[109]

3. STONE TRADE, GEOLOGY AND ARCHITECTURE

Sweden: From Eighteenth-Century Physiocracy to the Geological Survey

In Sweden local building stone has been used ever since the Middle Ages. From the twelfth century onwards, softer varieties such as limestone and sandstone as well as harder rocks, notably granite, had been quarried for churches, fortifications and castles. As a rule the quarries had been opened to serve the needs of specific building projects. After the completion of the building in question the quarry was abandoned, to be reopened, perhaps, when a new project was started at a suitable distance.

Until the early nineteenth century there were only a few quarries, which had been in continuous operation. Thus Silurian limestone was shipped from Gotland and Öland, becoming widely used for stairs and flooring. Kolmården marble had been utilized since the middle of the seventeenth century and Älvdalen porphyry since the late eighteenth century; neither stone, however, was suitable for façades.

The Royal Swedish Academy of Sciences, founded in 1739, encouraged the study of the country's natural resources. From the 1740's the transactions of the Academy featured articles on geology and reports on quarries.[1] In 1758 A.F. Cronstedt published an essay on mineralogy which appeared in a second, revised edition in 1781. For the benefit of mineralogists as well as mining and quarry men Cronstedt appended a classification of usable rocks and stones. In this list building stone occupied a relatively insignificant place. The use of polished granite and porphyry for architecture was still regarded as an exotic speciality cultivated by the ancient Egyptians and contemporary Italians. Among the building stones proper, only sandstone was dealt with at any length.[2]

Stone building techniques became topical in connection with government attempts to check deforestation, which had become a matter of concern in eighteenth-century Sweden. Since it proved difficult to cut the iron industry's demand for charcoal or to reduce the consumption of fuel for heating purposes, economists and technologists turned their attention to the building sector. Alternatives to timber construction were sought in order to save the forest resources of Sweden. Gabriel Polhem, the son of the famous inventor Christopher Polhem, gave a summary list of available domestic building materials in a treatise published in 1760.[3] A.F. Cronstedt dealt at greater length with the brick and stone resources of Sweden in the Transactions of the Royal Academy in 1761.[4] The same concern for the regrowth of the forests accounts for the Royal Decree of 1776 prohibiting the use of timber for churches, town halls and other buildings built at public expense.[5]

Natural stone, however, was not a realistic alternative to timber. The working and transport costs in the sparsely populated country remained too high. In 1752 a writer on building techniques, Carl Hindrich König, commented on the situation. He admitted that the most handsome buildings are those that are built of masonry throughout, but since these would become too expensive, "cut stone is used here in Sweden only for quoins, cornices, entablatures and for coating certain parts of palace façades."[6] A decade later (1761) the acceptance of economic and technical realities was summarized in the following way by Cronstedt: "As a substitute for the scarce natural stone, which, to be sure, should and could be used more widely than is the case, red brick remains the safest alternative, since clay is to be found in most parts of the country."[7]

To writers of the period, brick construction almost unvariably meant a plastered brick wall. Even where the stone resources were abundant and the patron was wealthy, cut stone was displayed in architectural details only, whereas the main expanse of the façade received a coating of plaster. The façades of the Royal Palace in Stockholm have plaster surfaces with architectural details of natural stone which originally were painted for weather protection; the high base of the palace is coated with sandstone from Roslagen in the Stockholm archipelago. Another example of such a selective use of stone is provided by the Övedskloster castle in Scania, designed by Carl Hårleman and built for the wealthy magnate, baron Hans Ramel in 1768-1776. Here the magnificent red sandstone is displayed in the first floor rustication and in the pilaster strips; otherwise red tinted plaster is employed for the façade. A century later Övedskloster stone became one of the façade materials favoured by designers of public buildings in different parts of Sweden (cf. Fig. 166-167).

In the eighteenth century vast fortifications and naval installations also contributed to the improvement of quarrying techniques and stone working methods. The naval base of Karlskrona in the province of Blekinge became a centre of stone technology in the 1770's, and from Karlskrona military engineers brought with them their craft to other parts of Sweden. At Sveaborg, the vast naval base and garrison island in the Gulf of Finland in front of Helsinki, the stone works were supervised by lieutenant Nils Stenstam, a Karlskrona engineer (cf. below p. 39).

It was an army officer, Carl Stål, who wrote the first modern manual on building construction to appear in

Swedish, *Utkast till lärobok i byggnadskonsten* (1834). The book contains detailed information on building stone, quarrying sites, quarrying and stone cutting techniques, and the construction of masonry. However, Stål had compiled his text from various sources, many of them foreign, and for this reason his book gives no clue to actual stone building practice in Sweden at the time. His description of the ashlar bond, for instance, must have been of mainly theoretical interest to builders who in any case had to make do with simpler materials. Like its eighteenth-century precursors and its nineteenth-century followers Stål's *Utkast till lärobok* proclaimed the desirability of stone materials but it could not, of course, alter the factual situation on the building market. [8]

An important impetus to the emergence of the stone industry in Sweden was given by the construction of the Trollhättan and Göta Canals (completed in 1800 and 1822/1832) respectively. These projects created a demand for skilled stone cutters and engineering personnel capable of dealing with large quantities of stone. In 1816 the Göta Canal Company acquired the exclusive rights of the limestone quarry at Borghamn, east of Lake Vättern. Borghamn stone had been used since the early Middle Ages, and it occurs, for instance, in the monasteries of Alvastra and Varnhem. The quarry was Crown property, and when the canal company withdrew from Borghamn it became state-operated once again. From 1845 Borghamn stone was quarried for the Karlsborg fortress north of Lake Vättern (begun in 1819), the most extensive fortification project of nineteenth-century Sweden. It was at Karlsborg that the army captain Johan af Kleen (1800-1884) learnt how to handle limestone, a skill he was to exploit later on when acting as the leader of the Nationalmuseum project in 1850-1863.[9] Borghamn limestone was used for the façade of the Nationalmuseum, thus setting an important but ambiguous precedent for the decades to follow, ambiguous because this stone variety happened to weather rather badly.

On the Swedish West coast another fortress served as an impetus to an emerging granite industry. In 1834-1857 Carlsten was extensively remodelled, and for the fortification large amounts of granite were quarried in Malmön island outside Lysekil and Uddevalla.[10] The crown quarries of Malmön mark the beginning of an impressive industrial development. In Uddevalla the merchant Carl August Kullgren (1793-1851) saw a potential market for granite in the seaports of North Germany, where extensive rebuilding and enlargement of the harbours were under way. In 1842 Kullgren acquired the right to quarry granite on Malmön. This was the beginning of one of the most important stone firms of Sweden. Kullgren himself died in London during his visit to the Great Exhibition of 1851, where his firm exhibited samples of its output. But the enterprise lived on under the name of his widow, C.A. Kullgrens Enka, from 1891 Granitaktiebolaget C.A. Kullgrens Enka.[11]

The north German port projects attracted another entrepreneur, the German *Bauinspektor* F.H. Wolff, who explored the coast of Blekinge in the early 1850's, prospecting for granite. In 1853 Wolff acquired his first lease, and during the subsequent three decades he expanded his firm, importing new tools and techniques, as well as skilled labour. He is reported to have hired one hundred Bavarian stone-cutters who settled in Blekinge with their families. Wolff died a wealthy man in 1886.[12] The main output of Wolff's firm was paving stone and raw blocks for export, not façade stone, but his success inspired other entrepreneurs and so contributed to the boom in the stone trade.

The granite districts of Östergötland, Blekinge and Skåne (or Scania) on the Baltic coast, and Halland and Bohuslän on the West coast of Sweden were conveniently within reach from Germany, where the demand for monumental, building and paving stone was steadily growing. This branch of the stone industry, therefore, became heavily dominated by German interests. The Germans enjoyed the combined advantage of capital, superior techniques and a world-wide sales network. On the Swedish market, however, the German granite firms played a less prominent part since here limestone and sandstone were generally preferred for buildings. When finally, around 1900, granite became fashionable in Sweden, too, most of the coastal granite industry had already passed into Swedish hands. One of the German owned establishments deserves special mention: the firm Kessel & Röhl with quarries at Vånevik in Småland and at Lysekil and other sites on the West coast. From the 1870's Kessel & Röhl exploited several of the most important granite varieties of Sweden. Eventually it shared the fate of the other German firms, and by 1904-1907 most of its quarries had passed to Swedish owners.[13]

In 1908 the geologist Herman Hedström reviewed the development of the Swedish stone industry during the past half-century. He stressed that the figures given in official statistics are very unreliable, especially for the early part of the period. In fact, the sheer inadequacy of the reporting is instructive: for the year of 1861 the Swedish Board of Commerce reported 2 stone firms with a work force of 5! At the time in question, we recall, there were already three major establishments, not to mention all the minor quarries organized on traditional lines. Ten years later 8 plants with a total of 447 workers are reported. For 1881 the figures are 18 and 1,319, for 1891 they are 86 and 3,867 and for 1901 they are 229 and 11,646 respectively.[14]

The dramatic growth of the stone industry was made possible by a simultaneous rise in export sales and an increase of the domestic demand. The inadequacy of the statistics obscures the relation between the foreign and domestic markets, but contemporary analysts

agreed with Hedström in attributing the expansion primarily to successful export sales.[15]

A key role in the development was played by the Geological Survey of Sweden, *Sveriges Geologiska Undersökning*, and more specifically by some of its energetic and imaginative geologists. The Survey and its Bureau was established in 1858. From the start this institution stressed the practical applications of its activities. At the Scandinavian Industrial Exhibition in Stockholm in 1866 the Survey exhibited a collection of Swedish rocks suitable for building purposes.[16] But this was a mere beginning.

In 1870 professor Otto Torell (1828-1900) became Director of the Geological Survey, and he held this office until retiring in 1897. His tenure thus covers the period of the simultaneous flourishing of the stone industry and the heyday of stone architecture. Torell seems to have been an expansive personality, seething with fresh ideas and sanguinely optimistic as to the feasibility of his various projects. According to Torell's obituary in *Teknisk Tidskrift* "none of his campaigns for utilizing theoretical research for profitable enterprises seems to have been as successful as his work for the exploitation of the rich resources of handsome natural building stone which are to be found in Sweden."[17] Torell maintained good contacts with the engineering profession, and he was specifically given the credit for having taken a certain young engineer and road builder, Hjalmar Lundbohm, into the service of the Geological Survey. It was Torell who called Lundbohm's attention to Aberdeen as a centre of stone working and granite architecture (see below p. 56). Lundbohm's career will be discussed in a separate section; before this the contribution of two older engineers merit attention.

Albert Werner Cronquist (1846-1910) had actually entered the service of the Bureau as early as 1867, but he worked with Torell for two years before leaving the Survey in 1872. Cronquist was a chemical engineer serving as a chemist in the Survey. But his main interest lay with the use of natural stone for building, a cause for which he was still working in the early years of this century.[18] August Wilhelm Hoffstedt (1841-1907), Cronquist's brother-in-law, was never formally connected with the Geological Survey, but played an important role in the interaction between geologists, engineers and architects. Himself a specialist on machine building, Hoffstedt began to publish a technical journal, *Illustrerad teknisk tidning* in 1871. From 1872 the journal was called *Teknisk Tidskrift*, and eventually it was taken over by the Technical Society of Sweden with Hoffstedt as the Editor-in-chief. In its field *Teknisk Tidskrift* became Sweden's leading publication with sections from various branches of engineering to architecture.

In the first year of *Illustrerad teknisk tidning* Hoffstedt published information on modern stone drills and stone working equipment. A pioneering article was called "On the Uses of Swedish Rocks in Architecture and the Processing of Stone." Without worrying about the truth of material or any of the moral or aesthetic niceties debated since the 1840's, Hoffstedt merely presented the engineeer's point of view. His philosophy was a simple one: improved tools, machines and working methods were opening new possibilities to the stone trade. The Swedish stone industry has just to learn from the trends in more advanced countries.

> The growing use, especially in a worked state, of several harder rocks for decorative and other purposes in architecture can hardly have escaped the attention of travellers visiting some of the major cities abroad. In many places, such as Berlin, Paris and, in particular, London and many of the greater cities of England we see polished or finely dressed granite and marble used in connection with works of a monumental character. All the time architects are demanding more and more of this. For public buildings, monuments etc. they require numerous details, including columns, consoles, mouldings, ornaments, urns etc., to be made of such material and with such workmanship as will, through their durable and noble appearance, convey to these works the character of public buildings. But even in private houses such materials have lately come into use wherever a more elegant appearance is desired, that is, for wall facings, window-dressings, mantlepieces, pavings in hall and drawing-rooms.[19]

Hoffstedt reported that the lively demand for dressed and polished stone had resulted in the establishment of industrial plants where the stone was treated according to modern methods. The most interesting works were to be seen in England and Scotland. Hoffstedt had visited Scottish quarries and stone-cutting plants, and he was the first of a long succession of Scandinavian visitors to write admiringly about the the "granite-town" of Aberdeen.

The impressive development of the foreign stone industry presented a national challenge. "Do we not here perceive a field which the Swedish industry could exploit in the expectation of a rich yield?" A crucial question, Hoffstedt argued, is the stone resources, and in this respect the situation looks very bright indeed. "We have granites, lighter as well as darker varieties, both grey and red in colour; we have porphyries in almost every conceivable hue, we have marble, and so on." A visit to the museum of the Geological Survey, Hoffstedt assured his readers, suffices to show what enormous quantities of superb stone reside in the mountains of Sweden.

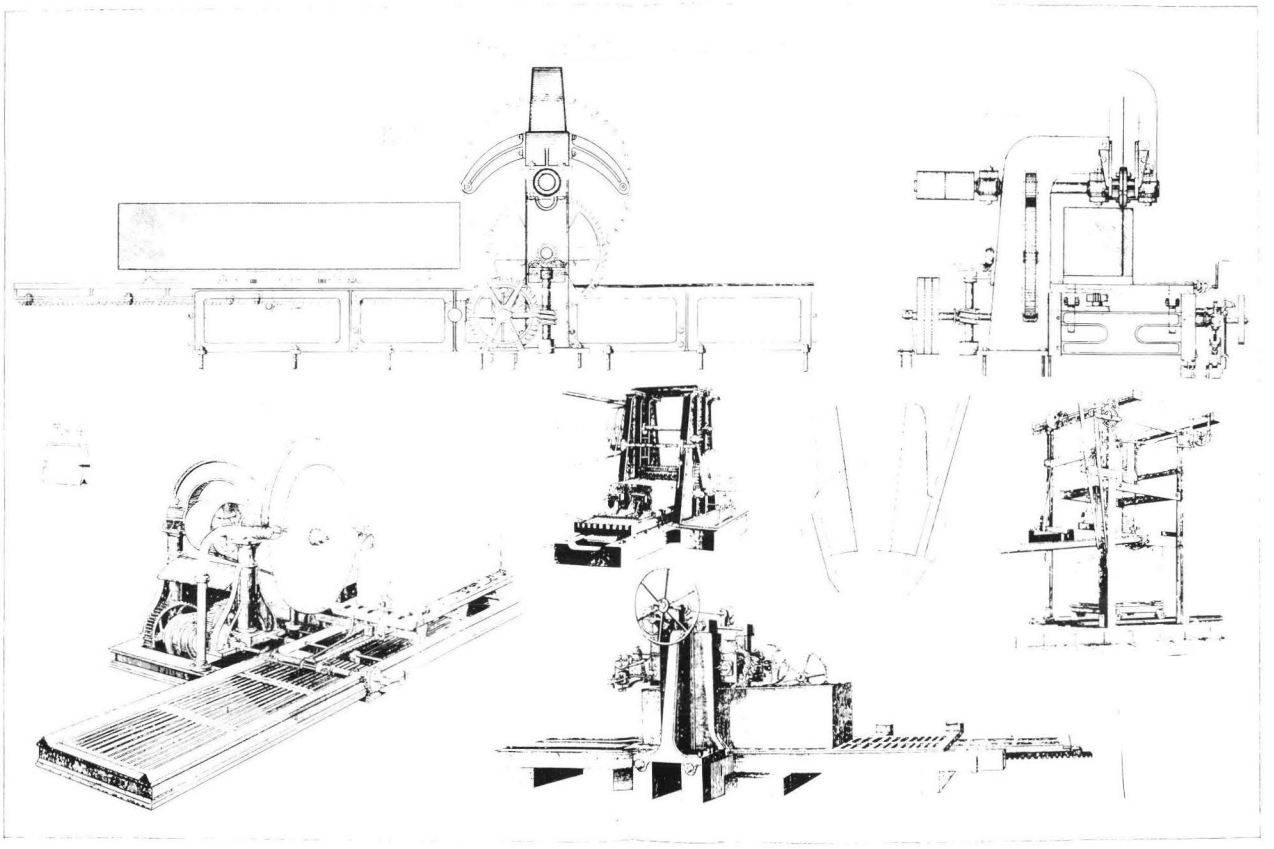
The necessary technology existed and it merely had to be introduced to Sweden; the resources were abundant, awaiting exploitation. But success would also de-

pend on the market. Hoffstedt was cautiously optimistic on this point. "Domestic demand is still restricted to products requiring but little working, such as stone for the foundations of houses, for the construction of bridges and similar crude structures. We cannot, however, see any reason why our granites and porphyries could not be used in a more finished state in public and monumental buildings. This would be possible if the production is large enough to permit a substantial cut in the high prices now asked for architectural details made of these materials." Still, Hoffstedt argued, the future stone industry must rely on export.

The latter half of Hoffstedt's article dealt exclusively with the techniques of quarrying and stone cutting. He was worried about the primitive methods still employed in Swedish granite quarries, where everything is done manually. Quarry men still believed the material to be "too hard" for machinery, which was also thought to be heavy and cumbersome. Yet rational operation of the kind seen by Hoffstedt in the Scottish quarries presupposed machine drilling, all the more so since recent technical improvements had made the diamond drill an economical and efficient tool. For the further treatment of harder stones the new tools were even more important: lathes, planes and cutters with diamond edges offered the stone industry a means of exploiting the hard rocks at a reasonable cost.[20]

The mechanization of the Swedish stone industry had indeed progressed very slowly. At Borghamn, where the very soft limestone for the Nationalmuseum was worked, two steam powered stone planes had been operating as early as the 1850's.[21] But on the whole man power and hand tools seem to have been the rule in Swedish quarries throughout the 1870's. C.A. Kullgrens Enka built a steam powered stone dressing plant in Malmön in 1870, the first of its kind in the country, but apart from the power source the machinery worked on the same principles as the Älvdalen porphyry works introduced in the 1780's. This obsolete technique seems to have been in use in most granite workshops until the late 1880's, when it was superseded by modern machines.[22] In 1879 Hjalmar Lundbohm observed that in the whole of Sweden there was not a single stone saw or planing machine for limestone or marble. This was why Swedish retailers could get slabs of sawed Italian marble from dealers in Paris or Hamburg at a lower price than if they tried to buy domestic marble.[23]

In *Teknisk Tidskrift* Hoffstedt published regular information on stone technology, and he also lectured on the subject to builders and architects. In Sweden machines were the exception and manual work the rule, Hoffstedt observed in 1877, when he reported on recent developments in stone technology which he had studied at the Philadelphia Exhibition in 1876 (Fig. 9).[24] In



9. Stone-dressing machines shown at the Philadelphia World Exhibition: 1-5 stone saws, 6-7 planes. From A.W. Hoffstedt, "Meddelanden från verldsutställningen i Filadelfia, 24: Stenbearbetningsmaskiner", *Teknisk Tidskrift* 1877, p. 230-232.

the following year he lectured to the Building Section of the Swedish Technical Society on "Recent Methods for Working Harder Rocks."[25] The rotating stone tools developed by Brunton & Trier were also described in *Teknisk Tidskrift* in 1878.[26]

But traditional methods still lived on in the working of freestone. When in 1881 the University building in Uppsala (Fig. 49-59) was under construction, seven stone planes were operated round the clock in Yxhult, turning out limestone for the façade; yet all curved surfaces of the façade details had to be worked by hand.[27] At Yxhult stone had been quarried since the Middle Ages, and in 1879 an important industrial plant was established under the name of Yxhult Stenhuggeri Aktiebolag. In 1881-1886 the young works manager of Yxhult, Emil Adlers studied stone working methods in the United States, where he accumulated experience in the employment of leading East Coast firms. On returning home Adlers put his experience to use in Yxhult, where in the meantime new machinery had been installed.[28]

The use of Yxhult stone had also been energetically promoted by the architect Adolf Kjellström (1834-1932), one of the early specialists on limestone. Kjellström was a lecturer of architecture at the Technical School in Örebro 1877-1901. He supervised the restoration of several older buildings where limestone was extensively used, above all the medieval Nicolaikyrkan in Örebro (begun in 1863).[29] He used the stone for his own house (1880, Fig. 20), which became known thanks to a much-read article by I.G. Clason.[30] Although active in the province, Kjellström was an important figure in the development of stone building. He educated his son Erik in the trade, the same son who in 1888 founded one of the important Stockholm stone firms of the ensuing period, since 1895 Eriksson & Kjellström.[31] Such was the authority of Kjellström senior that even Hjalmar Lundbohm consulted him in the 1880's.[32] When Lundbohm suggested to a group of architects that he would write a handbook on building materials it was agreed that he should enroll Adolf Kjellström as a co-author.[33] In 1886 Kjellström took part in the Second Swedish Convention of Technologists, where he advocated the use of limestone, without excluding other natural stones or brick.[34]

The Second Swedish Convention of Technologists in 1886 represents a turning-point in the contacts between architects and technologists. In the chapters to follow other aspects of this meeting will be discussed; here it may be noted that the issue of the mechanization of the stone industry was included in the agenda of the Section for Mechanics. The very manner in which the question was framed betrayed uncertainty about the future of the trade, and again the technological backwardness was deplored. The Section therefore decided to move "that the stone industry of this country does not at present keep on a level with what is to be desired, and that everything must be done to promote the industry; this end being best attained by an extended use of machinery for the working of the stone."[35]

Five years later the state of the stone industry was again criticized during a convention of technologists and manufacturers in Gothenburg. The architect Gustaf Wickman complained that the geological knowledge of the varieties of stone was not matched by any readiness to deliver the variety desired. "There is a complete lack of enterprising people in the stone industry of Sweden," Wickman declared. He went on to say that advice on what stone to use is always readily available, whereas to get hold of the material itself remains extremely difficult.[36] This was said in 1891, on the eve of the great boom of urban architecture with facade materials varying from domestic limestone, sandstone and marble to granite.

The Contribution of Hjalmar Lundbohm

Among the geologists offerring architects and technicians their advice Hjalmar Lundbohm (1855-1926) was no doubt the most articulate, energetic and successful. An engineer by training Lundbohm was self-taught as a geologist, but he soon came to be regarded as the leading expert on applied geology. He took a lively interest in art and architecture, counting several leading Swedish artists and architects among his personal friends.

Hjalmar Lundbohm studied chemical engineering at Chalmers Technical Institute in Göteborg, passing his final examination in 1877. In the following year he worked as an assistant with a geological surveying expedition to the province of Dalsland, and in 1879 he was appointed assistant geologist in the Geological Survey. In the winter of 1879 and also during winter months in the subsequent years Lundbohm attended lectures in petrology at the University of Stockholm, without, however, taking an academic degree. He served with the Geological Survey in various capacities until retiring in 1902, when he became the works manager of the iron mine of Kiruna in Lapland. The director of the Survey, Otto Torell had already advocated the utilizing of Swedish stone resources for building, and Torell now entrusted Lundbohm with developing this sector.[1]

Lundbohm's first major assignment, which he completed in the course of 1879, consisted of a preliminary report on the state of the stone industry. He compiled a list of quarries and stone works, many of which he visited in person. He investigated rocks that were already being utilized, and he surveyed the bedrock in search of new varieties suitable for exploitation. Specimens of the stone varieties were systematically collected for the Geological Museum. According to the original plans, Lundbohm was to visit the major establishments first, studying their quarrying methods and technical procedures. Only after this and time per-

mitting, he was to explore such new resources. But it proved hard to trace the names of existing establishments "since official data in this respect is utterly incomplete." The plans had to be revised, and instead of proceeding systematically from Scania to the Baltic coast, Gotland and Öland, Lundbohm was instructed to take the Stockholm region first and Dalecarlia afterwards. But even after this reduced survey Lundbohm was prepared to appraise the situation:

> My investigations have confirmed that our resources of valuable rocks of various kinds are indeed considerable; that among the crystalline rocks there are many varieties of granite and gneiss capable of being worked up; that there is a supply of limestone and sandstones, which in many cases and providing modern working methods are employed, could replace the foreign varieties that are now imported in considerable quantities.[2]

Lundbohm regarded recent developments in the granite industry as promising, all the more so in view of the increasing use of granite and gneiss in the architecture of many continental countries where granite is scarce. The Stockholm granite is regarded by Lundbohm as superior to any other Swedish stone if "detailed, smooth dressed work for monuments or architecture" is desired. With respect to softer stone the situation is less satisfactory. Sandstone is quarried in quantity only at Lugnås and Kinnekulle (Västergötland), in Gotland and near Motala and Gävle. Yet several well-known deposits utilized since early times would still be worth exploiting, for instance, Höör in Scania (where the material for the cathedral of Lund had been taken), Visingsö and Gränna in Småland, and Mora and Orsa in Dalecarlia. Lundbohm was thinking in terms of large-scale industrial exploitation, since in several of the places mentioned stone was already quarried on a modest scale, e.g. Orsa sandstone for grinding-stone. He noted that nowhere in the whole of Sweden did one come across planing and sawing equipment for limestone, everything was done manually. Nor would there be any improvement as long as the market was dominated by small firms without the necessary capital for investing in machinery. In Lundbohm's opinion the present state of the Kolmården marble works offerred "palpable proof" of the stagnation within this sector of the stone industry.[3]

From 1880 to 1888 Lundbohm travelled every summer in various parts of Sweden, surveying stone resources, studying quarries and stone works, and taking notes on the use of stone in the buildings of the various regions. The results of these expeditions were recorded in his diaries and in reports and memoranda submitted to the Geological Survey.[4] On occasion Lundbohm studied older architecture with a view to the use of Swedish stone, as when in 1882 he travelled in Gotland with its numerous medieval churches built of Gotland limestone.[5]

Since the 'eighties Lundbohm had regular contacts with the building profession. In March 1884 he "demonstrated a handsome collection of building stone from the Geological Bureau" to a meeting of Byggnadssamfundet (The Building Branch of the Swedish Technical Society). He also invited every one present to visit the Bureau to acquaint themselves more throughly with the more comprehensive collections of the Survey. Lundbohm's talk followed on a discussion about brick "rohbau" in combination with details of natural stone — a subject typical of this phase of the stone movement. The topic had been introduced by the architect, professor F.G.A. Dahl, who closed his introduction with a plea for the increased use of Swedish natural stones, to the improvement of our buildings as well as for the benefit of the Swedish stone industry.[6] In 1888-1889 Lundbohm was in touch with "The Building Brethren" (De Byggande Bröderna), a group of successful young architects in Stockholm, including such names as Gustaf Wickman, Ferdinand Boberg, Ludvig Peterson, I.G.Clason, Gustaf Lindgren and Axel Lindegren. Lindegren thus sent stone samples from Italy to Lundbohm. The latter also offered to write a handbook on building materials, but this plan was never carried out.[7]

During the 'eighties Lundbohm published a steady flow of articles and pamphlets on stone resources and the use of stone for building. Some of these were merely edited versions of his manuscript reports,[8] but by the end of the decade a new type of pamphlet was introduced. Lundbohm had received travel grants to study the stone trade abroad, and now he accounted for his experiences in travel reports issued by the Survey. The first reports dealt with Great Britain where he went in 1888: "English Building Materials and Building Methods," "The Working of Sandstone, Limestone and Slate in Great Britain" and "On the Granite Industry Abroad, in Particular in Great Britain."[9] Lundbohm had travelled via Germany, Belgium and France, but the stone technology of these countries is dealt with only summarily in the reports. In April, 1890 Lundbohm gave a talk on Swedish building stones seen in the light of his recent tour of England. Inspired by this report the Building Section of the Swedish Association of Technologists passed a resolution calling for a systematic inventory of natural stone to be undertaken at public expense (see below p. 58). In 1891 Lundbohm published an account of "Scottish Stone Building Construction," where he corrected some of the information given in the earlier reports.[10] A trip to the United States in 1891-1892 resulted in a pamphlet on the American stone industry.[11]

Lundbohm's authority was appealed to even by the American geologist William C. Day in the 1893 volume of *Mineral Resources of the United States* published

by the United States Geological Survey. Commenting on the foreign stone exhibits of the Chicago Exhibition, Day gave an account of the stone industry of "Other Countries," which forms one long quotation after Lundbohm. "His publications are of special interest," Day told his readers, "since few scientists, if any, before him, have given so much attention to the study of stone from the economic as well as the scientific side over so large an area of the globe."[12] Such praise of the Swedish geologist angered the editor of *The Builder*, who claimed "that the pith of the information furnished originally appeared in our columns, and that many of the investigations made by him were in some measure due to assistance received from us." Left in the hands of this authority on granite, the editorial continued, the compilers of *Mineral Resources* "have fallen into the ridiculous error of imagining that the only building stone of any importance in the United Kingdom is granite."[13]

Undaunted, the geologist Lundbohm took part in the architects' discussions, often extending his argument far beyond the purely technical aspects of building. To the General meeting of Technologists and Manufacturers in Gothenburg in 1891, Lundbohm contributed a paper "On the Use of Natural Stone as Building Material," where he theorized about the relationship between available materials and the development of architecture. "One need not enter deeply into geology, nor into the history of art, to recognize the connections between these sciences," he declared. Ashlar, as well as cyclopic bonds, are connected with the properties of the available stone material, the abundance of homogenous marble accounts for the architectural forms of antiquity, and so on. The introduction was read to the audience in the author's absence (Lundbohm was at the time heading for USA), and in the ensuing discussion the chairman, I.G. Clason emphasized the remarkable fact that Lundbohm, a scientist, displayed such knowledge and such sensibility in matters of architecture.[14] As American architecture became topical in the 'nineties, Lundbohm was again credited with having called the architects' attention to the interrelation between the material, the construction and the stylization of natural forms.[15]

Shorter notices in *Teknisk Tidskrift* suggest that Lundbohm regularly attended the meetings of the Building Section of the Swedish Technical Society. On these occasions he reported new finds and techniques; in April 1893, for instance, he "called the attention of the architects to the desirability of using the so-called rubble bond for new buildings," since by utilizing reject stone it would become possible to lower the price of façade stone.[16] Lundbohm was consulted in connection with several major building projects from the Uppsala University Building by Holmgren (1879) to the Central Post Office by Boberg and Dahl (1899 and 1904).

What amounted to a farewell lecture was delivered by Lundbohm to the Building Section in January 1896. Later that year he began work on a project that was to engross him for the rest of his active life: the Luossavaara-Kiirunavaara ore fields. The lecture had the unassuming title "Odds and Ends about the Stone Industry and Architecture" (Ett och annat om stenindustrien och byggnadskonsten). Without so much as hinting at his own role in the development, Lundbohm looked back at the past decade of building in natural stone. "As for the façades of the buildings [of Stockholm], natural stone cladding has now become the vogue."[17] But this breakthrough had created new problems. Most frequently the stone chosen had consisted of easily worked Silurian limestone or of certain sandstones, that is, rather colourless varieties, which mostly occur in thicknesses of merely 20, or exceptionally 30 centimetres. Some architects as well as the public saw this as a restriction limiting the choice of architectural form, and they demanded more colourful stone with thicker strata, even if the material had to be imported from England or Scotland. Lundbohm did not share this view. With novel quarrying techniques, he said, new varieties could easily be had in Sweden, too, and he generally questioned the predilection for conspicuous effects that underlied these demands. He also deplored the fate of some of the innovators in the stone industry. Only those firms that had specialized in the exportation of raw blocks and paving stone had thrived, whereas the ones that had spent both money and energy on finding and introducing new materials for building had received little in return for their work. Indeed, some of the persons who had contributed decisively to the progress of Swedish architecture had been forced by their losses to go out of business.

From this state of affairs, Lundbohm continued, architecture must inevitably suffer. According to his analysis, the main cause was the prevailing practice of designing the building first, and choosing the material afterwards, usually by taking the lowest tender for façade stone. A more careful procedure is required. It must be recognized that different stones require different treatment. The colour, texture, cleavage and bed thickness of the stone will affect the appearance of the building in many ways, not least the height of the courses of the wall. From the beginning the architect should know which material he is going to use, adjusting his design to the properties of that specific variety. Lundbohm admitted that advance decisions about which stone to use are liable to lessen competition, but he was convinced that the increase in cost was worth paying. The result would be more satisfactory, from a technical as well as an aesthetic point of view. By the time Lundbohm uttered these words, improvised decisions about façade material were indeed common, and frequently plans were changed while the building was under construction (p. 85).

In 1902 Lundbohm finally retired from the Geological Survey, settling in Kiruna, the industrial community of his creation. After this date he had only occasional contacts with what had once been his main preoccupation, the promotion of the stone industry and stone architecture.

Norway: Geologists vs. Architects

In Norway, as in neighbouring Sweden, local stone had been utilized ever since the Middle Ages, when several churches were erected in crystalline limestone or marble. The most important gothic structure of Norway, the Nidaros Cathedral in Trondheim was built of soapstone, with details of limestone and marble.

The first attempts to utilize marble on a commercial scale were made in the early eighteenth century. A little later, c. 1750-1770, no less than 10,000 m^2 marble was brought from Gjellebaek by Lier in Southern Norway to Copenhagen, where it was used for the Marmorkirken (''Marble Church''). The Gjellebaek marble happened to be of poor quality, and the eroding surface of the Marble Church brought Norwegian marble into disrepute.[1] Actually the building campaign was resumed a century later, and the Marmorkirken was finally consecrated in 1894.

In the eighteenth century marble finds were made in Northern Norway. This marble was very durable and it gradually became known even outside Norway. We recall that new hopes for the marble trade had been aroused by Schinkel's plans to use marble for the portico of the University building in Christiania; this time the expectations were not fulfilled since in the end granite was chosen instead (above p. 18). Industrial exploitation of the northern marble was initiated as late as 1882 by a certain Dr. H. Stolz. Two years later Stolz entered into partnership with Chr. Anker, who became the sole owner in 1888. In 1895 the firm became a Danish-Norwegian joint venture, Den Ankerske marmorforretning.[2]

The early development of the granite industry in Norway parallelled that of Sweden. The principal market was Germany, where the demand for paving stone and blocks for harbour construction accounts for the expansion in the 1870's. The most important region was Idefjorden, the firth that forms a natural border between Norway and Sweden. From the early 1870's Norwegian firms established works on both sides of the border, the most important being N.S. Beer & Co, Erik A. Gude and Fredriksstad stenhuggeri (Jacobsen & Co). Some of the Norwegian entrepreneurs, notably N.S. Beer & Co, expanded their activity to other parts of the Swedish granite region. At a convenient distance from the Norwegian capital were the vast Christiania syenite and Drammensfjorden granite fields.[3] The value of the Norwegian export of raw stone, mostly granite from Østlandet grew from c. 50,000-60,000 crowns in 1875 to c. 500,000 ten years later.[4]

The Norwegian Geological Survey was established in 1858. For a beginning the Survey played a rather modest role in the utilization of the country's stone resources for building purposes. Its first leader was Theodor Kjerulf (1825-1888), professor of geology at Christiania University since 1866.[5] Kjerulf was a member of the editorial board of the *Polyteknisk Tidsskrift* founded in 1853. A series of unsigned articles on ''Natural materials in Architecture and the Decorative Arts,'' appearing in the founding year of the Geological Survey, was certainly written by Kjerulf. In their substance the articles consisted of extracts from a text issued in connection with the Paris Exposition universelle de 1855, that is, the jury report on *XIV^e Classe, Constructions civiles*, which dealt with ''Natural Materials in Architecture.'' The display of Norwegian stone products at the 1855 exhibition was noted with satisfaction.[6]

Kjerulf began the work on a stone collection which, however, grew rather slowly. The collection of specimens was of limited use to a stone trade that rode the boom in raw granite and paving stone. The further working of stone was restricted to small monumental pieces or decorative objects. In 1883 a commentator in *Teknisk Ugeblad* deplored ''the fact that domestic stone products have so far been shown in exhibitions but never where they should be put on display: in our buildings.''[7]

A new era in the activity of the Norwegian Geological Survey began as Hans Reusch (1852-1922) was appointed its Director in 1888. Reusch had studied for Kjerulf together with his friend W.C. Brøgger (1851-1940), Norway's most famous geologist. Brøgger had become appointed to the chair of geology in Stockholm in 1881, but from 1890 he was back in Christiania as the professor of geology at the University. A third geologist of note was J.H.L. Vogt (1858-1932), who had studied for Brøgger in Stockholm, and returned in 1886 to Christiania to become a professor of metallurgy.[8] All three happened to be extremely gifted and versatile scientists, with wide interests and intent on making their branch of science useful. Reusch was an excellent draughtsman, the son of a painter and, incidentally, also married to one.

On returning home to Christiania in 1886 Professor Vogt published an article advocating the establishment of a grinding and polishing plant specifically for Norwegian raw materials, which he also listed and described.[9] Four years later Hans Reusch began to argue for the use of granite in building construction, calling attention to Scottish architecture.[10] Neither plea received much response at the time. In 1892 a Danish geologist, Viktor Madsen published a series of articles ''On the Use of Scandinavian Stones as Building Materials'' in the Norwegian journal *Teknisk Ugeblad*. Madsen re-

ferred to a discussion about brick and stone in civil architecture initiated as early as 1880 by the Danish architect, professor Ludvig Fenger (1833-1905), and he cited the recent reports by Hjalmar Lundbohm.[11]

In 1894 the architect Henrik Thrap-Meyer wrote a review where he seized the opportunity to warn against granite as a building material. Granite, Thrap-Meyer wrote, is unfit for all finer architectural articulation, and despite all the notions of solidity and strength that one is accustomed to associate with stone, granite is also one of the least solid of materials. It succumbs to the impact of fire no less than that of water. Thrap-Meyer had himself witnessed how both paving and foundations made of granite had been destroyed in city fires. As for water, Thrap-Meyer pointed to examples where granite in combination with brick had gradually destroyed the latter through dampness. ''I believe that one should be very careful and really think twice before building facades of granite throughout.'' At the Gaustad Mental Asylum north of Christiania (1844-1855, arch. H.E. Schirmer) granite had been used for quoins, bands and other details, the result being that the brick construction behind the stone had become damaged by dampness and the wooden panelling had been destroyed by rot. ''It cannot be denied that there is something awe-inspiring in the word 'granite,' but by long experience I have come to regard it with awe rather than inspiration,'' Thrap-Meyer concluded his argument.[12]

In early 1894 Thrap-Meyer's diatribe called Hans Reusch to the defense of granite. In Morgenbladet the geologist referred to his earlier plea for ''our excellent granites as a building material.'' Reusch admitted that granite does not resist fire, but then not many wall constructions other than brick are fire-proof. He had never heard of any instance where granite construction had been rejected for reasons of fire safety. The dampness and damages cited by Thrap-Meyer were due to the porousness of the stone in those special cases. What Reusch recommended was the Fredrikstad variety which is dense and thus safe to use. However, it has a grey colour and it may therefore seem ''to many less attractive that red granite.''[13]

But Thrap-Meyer did not yield. In a rejoinder in *Teknisk Ugeblad* in March 1894 he repeated his earlier points together with new arguments. The Scottish climate is *not* the same as the Norwegian one: the mean temperature in Scotland being 10-12 centigrades whereas in Christiania it is 6 centigrades.

> I believe [wrote Thrap-Meyer] that the curiosity to use granite is not matched by the technical ability to handle it. If one wants to let granite emancipate from the relatively modest position it has occupied so far and promote it to a structural and aesthetic factor in architecture, then one must also study its various properties and incorporate these in the technical knowledge.[14]

In March Hans Reusch answered in the same journal. He charged Thrap-Meyer with being over-cautious, and he added rather pointedly that, as far as he knew, Thrap-Meyer's views were not shared by his architect colleagues in Christiania. Reusch claimed that the damp problem could be prevented with suitable insulation. He had also appealed to ''one of Sweden's leading experts on stone,'' Hjalmar Lundbohm. According to this authority, the perviousness of granite could hardly be the cause of damp injuring the brick and mortar of the wall. If porosity was crucial, then sandstone would clearly be even more harmful than granite. ''Here in Stockholm,'' Lundbohm had written to Reusch, ''granite as well as limestone and sandstone are used for the revetment of brick walls. As far as I know, this has caused no problems.'' Lundbohm referred to the Skandia insurance company (Figs. 79, 81-82), where the three main façades were built in brick covered by a layer of fine-grained granite. An official of that company had assured him that there had been ''no problems whatever with moisture, almost less, the official believed, than in other buildings.''[15]

In his last rejoinder in *Teknisk Ugeblad* Thrap-Meyer concluded that a geologist apparently operates with narrower safety margins than does the architect and builder. He ridiculed the idea of insulating granite with cement, asphalt or the like. What monumentality is there in a material that has to be insulated lest it destroy the structural part of the wall? As for Reusch's hint that the architect was alone among his colleagues in distrusting granite, Thrap-Meyer replied that this was exactly the point: it was for this very reason that he had tried to sound an alarm. In a weary tone he added that some weight might be attached to experiences relating to the behaviour of granite collected during the past thirty years.[16]

An important discussion ''On the Use of Cut Stone in our Architecture'' (Om huggen stens anvendelse i vor husbygningskonst) was arranged by the Norwegian Association of Engineers and Architects in January 1896. The debate was introduced by Adolf Schirmer, the architect of the Main Office of the Trondheim Savings Bank (1879-1882, Fig. 77), of which designs and photographs were shown to the audience.[17] Schirmer expressed his satisfaction with the development of the Norwegian stone industry. The country abounds in good stone, for instance, sandstone, granite, soapstone and marble. There is no reason why the use of stone could not become widespread in Norway, as it has long been in England and Scotland. But the architects will have to be content with a simplified ornamentation. More emphasis must be laid on the structural side, and it will become necessary to discard the detailing customary in plaster architecture. Schirmer wanted a real reform and he did not approve of the recent method of using merely thin slabs for coating.

The ensuing discussion was chaired by Henrik Nis-

sen, the architect of the Freemasons' Lodge in Christiania (inaugurated in 1894, Fig. 70). Nissen proposed that attention should be concentrated to the following points:

1. Is cut and dressed stone to be recommended in our country from the point of view of construction, climate, sanitary consequences and economy?
2. If the above is answered in the affirmative, how are we to account for the fact that there has been so little progress in this sector? Is the blame to be placed with the architects or with the stone industry?
3. Remedies.

Hans Reusch and J.H.L. Vogt were both present at the meeting, taking a lively part in the discussion. The latter predicted a bright future for building with massive marble, a material he was to describe in a monograph which appeared in 1897. The meeting was attended by several engineers, who adopted a cautious attitude to the use of natural stone. The meeting was closed by Nissen with an appeal to both engineers and architects to work for the common goal, while at the same time forming a front against the misuse of stone for overelaborate decoration, sheer frippery. "Such is humbug. If our cause is to make progress, then the structural form must come to the fore."[18]

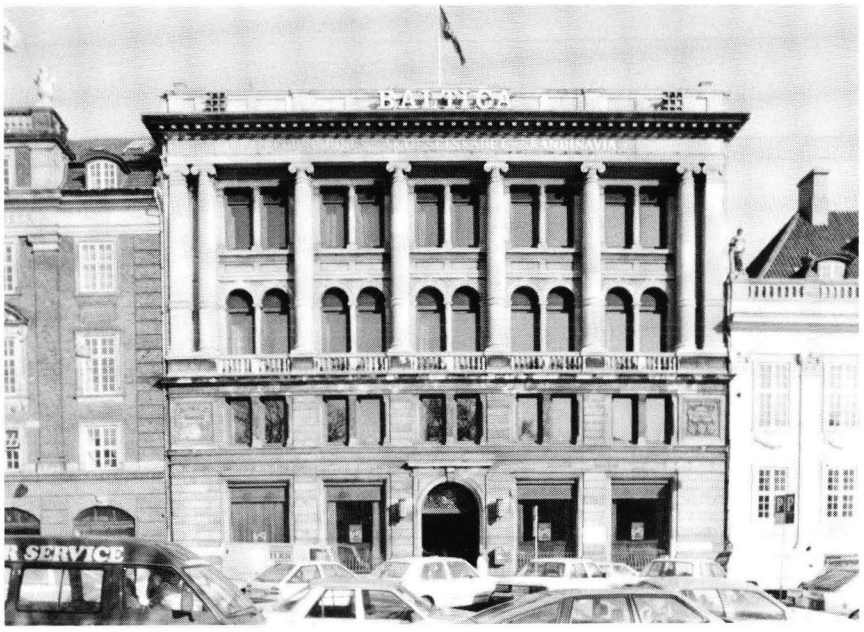
The January meeting evoked a lengthy comment from W.C. Brøgger, who had not been present at the occasion. Brøgger questioned the validity of laboratory tests with stone materials; the best clue, he argued, is given by the condition of the material in question in older buildings. He did not think marble a suitable material for modern cities with their soot and air pollution. He referred to several foreign authorities, Hjalmar Lundbohm (whom Brøgger knew since his Stockholm years), Sir Archibald Geikie (Director of the Geological Survey of the U.K.), George P. Merrill (Curator of Geology in the U.S. National Museum), A.A. Julien (a New York geologist) and others to prove that polished stone is to be preferred in all cases. Dr. Julien, in particular, had warned against using raw dressed stone, even granite, instead of polished work. Brøgger agreed with the meeting's criticism of flimsy marble lining, adding a few invectives of his own: "that mishmash of marble stew, which is, often with an appalling lack of taste, pasted on the facades of numerous commercial buildings in the central part of the city," that is, of Christiania.[19] If used at all in a northern climate, marble should be used in blocks, not as thin slabs; the appropriate use for marble being interiors rather than facades. Solid granite or syenite in the exterior, marble in the interior — this was Brøgger's recipe. As for the other natural stones of Norway, he saw some prospects for Brumunddalen sandstone and Trøndelagen soapstone, two varieties that had the virtue of being fireproof. The fact that sandstone and soapstone do not lend themselves to polishing somewhat lessened their attraction in Brøgger's opinion.[20]

Brøgger was immediately contradicted by Henrik Lund, an engineer representing the marble industry.[21] He asked whether the Professor had ever imagined what the streets would look like if houses on both sides had façades of dark, polished granite. "There is enough gloom and melancholy in the Norwegian character and no need to build our houses with façades of tombstones." Contrary to what Brøgger and his foreign geologist colleagues maintained, soft varieties are much more used abroad than polished granite. The Americans do not fear soft stone, but build their giant buildings with limestone facades, "and 340 feet high, one can watch the light and kindly limestone gleaming proudly, as an eloquent denial of all accusations levelled against the material." And why was the use of marble slabs such a sin? Lund reminded Brøgger of the fact that slabs had been used since the earliest times by Greeks, Romans and Arabs, by nations, that is, that had just as much good taste and feeling for truth as we have. The main thing is that the coating is not made to look like a solid bond built of blocks throughout.

By the turn of the century Henrik Thrap-Meyer reviewed the hectic development of the past five years. Once a staunch opponent of the use of granite, the old architect had to admit that "even granite [. . .] now appeared from its more pleasant side."[22] The first excesses in materials, textures and colours, have been succeded by a more balanced attitude. The conservative Thrap-Meyer was especially satisfied with the development of marble architecture, and he praised the building of the Standard Insurance Company in Copenhagen, "one of the most handsome modern buildings I have seen." He pointed out that "both its architect and its material are Norwegian" (Fig. 10).[23]

Natural stone was becoming increasingly common for more demanding projects, but to a younger, more impatient generation this was not enough. In 1901 the architect Peter Hofstad, contemptuously dismissing the polished stone favoured in commercial architecture, called for simpler materials and standard sizes.[24] Hofstad's plea revived the old controversy of solid wall versus brick faced with slabs. Andreas Bugge, the architect in charge of the building of the Rønvik Asylum (1894-1903, Fig. 171-172), agreed with Hofstad in insisting on solid walls of natural stone, but disagreed with his younger colleague on the issue of norms. According to Bugge, standard sizes would impede the architect's freedom of movement, perhaps lead us back to the mechanical view on decoration of the plaster-of-Paris period. The size of the blocks must, moreover, depend on the stone variety used.[25]

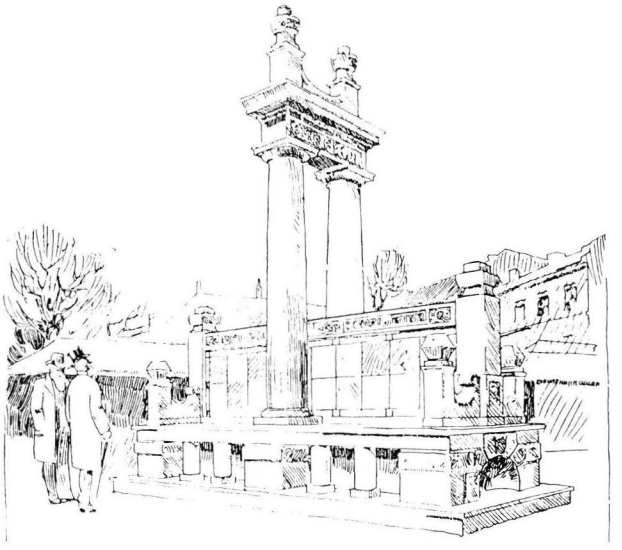
Andreas Bugge was invited to lecture on the use of natural stone to the Association of Junior Architects (Yngre arkitektforening or Y.A.F). After Bugge's lecture the young architects conceived the idea of forming



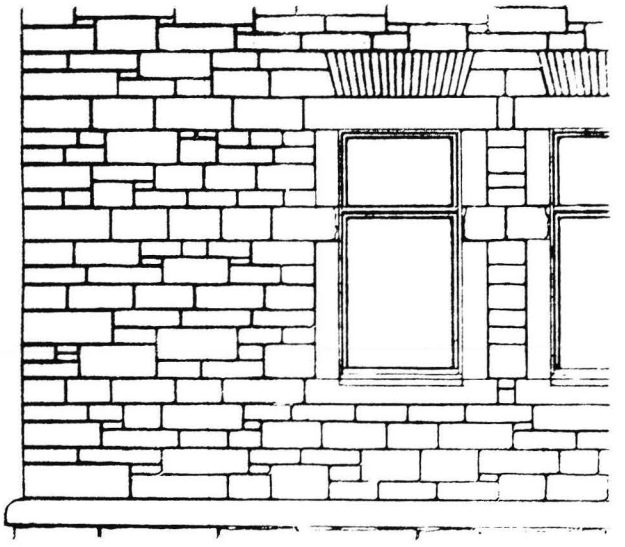
10. Chr. Arntzen, Standard Insurance Company, Copenhagen, Kongens Nytorv 6. 1895-1896. (Photo SR)

a committee to investigate the promotion of natural stone. In March 1904 a joint meeting was held by the Architects' Section of the Norwegian Association of Engineers and Architects and the Association of Junior Architects. A committee was appointed to investigate the question of how to promote the use of natural stone.[26] The committee chose Bugge to be its chairman, and in November 1904 it submitted its report, which was dealt with at three joint meetings of the two associations. Bugge introduced the topic with a lecture, which dealt exclusively with the rubble bond (''råkop''), its price and alternative specifications for its execution. The committee had collected information in Britain and in neighbouring countries; thus, in the published version of Bugge's lecture the only photographs reproduced were of Finnish buildings (Nylands Nation and Pohjola in Helsinki, The Church of St.John in Tampere). The architects had specifically invited master-builders and representatives of the stone trade to the meetings.[27]

The 1904 discussion reveals the dramatic change in outlook which had occurred in the six years since the Stockholm Exhibition of 1897, when the stone firm of Erik A. Gude showed dressed and polished stone in a stand designed by Henrik Bull (Fig. 11). The structure with its couple of Tuscan columns was reported to have ''occasioned much well-deserved admiration;''[28] but to younger architects polished marble and granite represented ''commercial architecture.'' In their opinion, stone should not be a token of elegant luxury but a standard method of construction. The Bugge Committee proposed three standard bonds, (1) a free rubble bond, (2) a combination of rubble and regular courses (Fig. 12), and (3) a bond with regular courses of varying height. But before these recommendations were implemented, alarming reports seemed to confirm the mis-



11. Henrik Bull, Exhibition display of dressed and polished stone from the firm of Erik A. Gude, shown at the Stockholm exhibition in 1897 and reassembled in Christiania in the autumn of 1898. From *Teknisk Ugeblad* 16, 1898, p. 74.



12. Squared rubble interspersed with regular courses. Alternative 2 proposed by the Norwegian architects' Stone Committee of 1904. From *Teknisk Ugeblad* 1904, p. 578, fig. 2.

givings once expressed by Thrap-Meyer, and the last phase of the technical discussion 1906-1909 focussed on the possibility of preventing damp by means of the hollow "Ålesund wall," mainly inspired by Scottish examples (see below p. 63, 210).

Finland: Catching Up

In Finland the choice of natural building stone is restricted and almost entirely limited to hard rocks. There is an abundance of gneiss and granite, some of it of excellent quality, but among softer varieties only soapstone occurs in quantity. Marble was quarried until the Second World War in a region now belonging to the Soviet Union. Insignificant quantities of sandstone in erratic blocks are found on the western coast near Pori (Björneborg). In the seventeenth century local limestone was quarried, cut and shipped from Kemiö (Kimito) to Stockholm for use in the Royal Castle. But on the whole crystalline limestone has been used for burning lime rather than for building or decoration. Softer, silurian limestone suitable for building is not found in Finland.

Traditionally, stone architecture in Finland has thus been restricted to the use of hard rocks. Of the major buildings dating from the Middle Ages all but three are built of fieldstone, as were many utilitarian buildings and structures of a later date. Monumental architecture, even of the most prestigious kind, was erected in brick and plaster. Until the late nineteenth century cut and dressed stone was considered a luxury to be used only for details such as copings, portals etc. Thus the monumental centre of Helsinki with its Neo-Classic buildings by Carl Ludwig Engel was realized in the usual way, brick wall with plaster coating in masonry imitation. It is true that at the time such combinations of elaborate monumentality and mean materials were acceptable elsewhere in Europe, as in Christiania, in St.Petersburg as well as in Vienna; whereas in a Western European capital a project of the corresponding status would have demanded true masonry and columns of real stone.

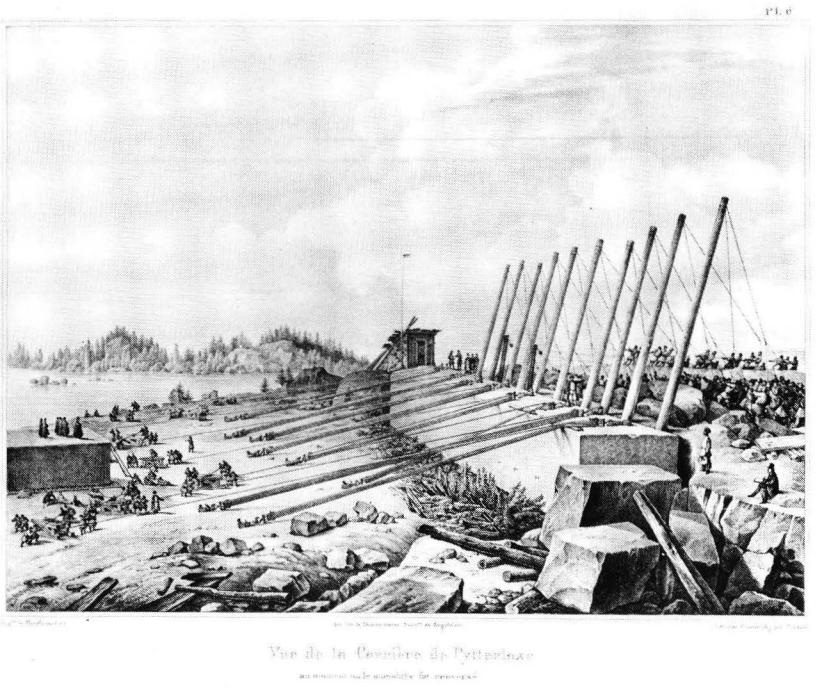
In Finland the first plant for the mechanical working of stone was established in Turku (Åbo) in 1805, when the fortification officer Nils Stenstam (1767-1806) constructed a stone lathe for the columns of the Festivity Hall of the new Academy building. Here ten columns and eight pilasters of red granite were turned and polished. These monolithic shafts measure 4.16 m in height. Stenstam's workshop was seen as the beginning of a new trade, but the master's premature death thwarted the hopes for a continuation; some of the work on the stone columns even had to be completed manually. Originally Stenstam came from Karlskrona where he had received his training, and in 1787 he was summoned to Sveaborg were he executed the granite tomb of Augustin Ehrensvärd.[1]

Stenstam's stone-working plant is predated by developments in a region which did not at the time form part of Finland. In the peace treaties of 1721 and 1743 considerable portions in the southeast had been ceded by Sweden to Russia. The territory later became known as "Old Finland," and in 1812 it was reunited with Finland, which had become a Grand Duchy under the Russian Czar in 1809. This region became a source of raw materials for the new Russian capital of St. Petersburg, where increasingly magnificent buildings were succeeding the more austere architecture of the foundation period.

An important role in the emerging stone trade was played by a clergyman and amateur mineralogist Samuel Alopaeus (1721-1793). Formerly a pastor of the Finnish congregation of St.Petersburg, Alopaeus had become a dean in the town of Sortavala in 1755. From Sortavala he travelled annually to the mines of Petrosavodsk, where he combined his pastoral duties with mineralogical field excursions. In 1764 Alopaeus called attention to the mineral resources of the region, and in 1765 he assisted the master mason Pilugin, who had been commissioned to survey the local stone resources in search of building material for the Academy of Arts in St.Petersburg. Alopaeus brought Pilugin to the marble beds which he had discovered in the vicinity of Sortavala, and in the following years the quarrying and working of the marble was begun. Specialists from St.Petersburg were brought to set up stone-saws and grinding-machines in Ruskeala, where the richest finds were made. Because of the ready access to cheap labour, the machinery and the adjacent mill-dam were left to neglect, despite the fact that several thousand rubles had already been invested in them. Having received remuneration for his assistance, Alopaeus withdrew from the stone project "in order to devote appropriate care to the spiritual office" with which he had been entrusted.[2] In 1787 he published an account of the beginnings of the Ruskeala marble works, *Kurze Beschreibung der in Russisch- Kaiserl. Carelien befindlichen Marmor- und andern Stein-Brüchen, Berg- und Steinarten*, which also contains a survey of other Carelian quarries and stone resources.[3]

Ruskeala marble was used for the floor of the Kazan Church (1801- 11) and for the interior of the Isaac Cathedral in St.Petersburg. From the vicinity of Viborg (Fi.: Viipuri) vast amounts of granite were brought to the quays and bridges of the St.Petersburg canals. Viborg granite was also used for the tall columns of the Kazan Church, an enterprise which evoked the admiration of contemporary observers.[4]

It was the architect of the Isaac Cathedral, Auguste Ricard de Montferrand (1786-1858), who made the red, porphyritic granite of Pyterlahti famous and, as it soon appeared, also notorious. In 1816 de Montferrand had



13. View of the Pyterlahti quarry with the monolith for the Alexander Column. From A. Ricard de Montferrand, *Plans et details du monument consacré à la mémoire de l'empereur Alexandre,* 1836, pl. 6. (Photo MV).

arrived in St.Petersburg, where he obtained the Czar's approval for one of his alternative plans for the new church. For the forty-eight columns of the Isaac Cathedral the architect and his Russian assistants decided to use granite from Pyterlahti in the parish of Virolahti by the Gulf of Finland, a region, that is, which had been reunited with the Grand Duchy in 1812. When in 1829 Montferrand was entrusted with the planning of a colossal column to commemorate Czar Alexander I, he chose Pyterlahti granite, which he knew from several visits to the site.[5] The various phases of the quarrying, working, transportation and raising of the monolith were described by de Montferrand in a lavishly illustrated folio volume (Fig. 13). From the architect's own account of the project we also learn that the Alexander Monument was deliberately designed to compete with the pyramids and obelisques of the ancient Egyptians.[6]

The precedent of the Alexander Monument and the columns of the Isaac's Cathedral was rather ambiguous. The projects made Finnish granite famous, and national sentiment in the small Grand Duchy was flattered by the conspicuous display of a magnificent material of Finnish origin in the imperial capital. The architect himself noted that "La Finlande est sans contredit, de tous les pays de l'Europe, le plus propre à favoriser l'exploitation des grandes masses granitiques."[7] The Pyterlahti quarries were proudly featured in topographical works, and in his elementary text book *Boken om vårt land* the poet and writer Zachris Topelius included chapters on Pyterlahti as well as on Ruskeala.[8] But unfortunately the coarse grained granite weathered very badly, which became apparent soon after the completion of the Alexander Column. In the columns of the Isaac's cathedral dilapidation was observed even while the fabric was still under construction. Small pieces came off the surface, leaving holes and crevices which had to be patched up. St.Petersburg geologists, who were required to investigate the phenomenon, concluded that there was nothing to be done in order to prevent the decay, which was believed to proceed very quickly.[9] In the end the ominous Finnish name of the stone, *rapakivi* ("rotstone"), proved justified, and the Pyterlahti granite fell into disrepute as a monumental material. Curiously, the material proved much more resistant to weathering when used for the construction of quays, bridges, foundations, and the like. For such use *rapakivi* granite was shipped to St.Petersburg throughout the nineteenth century.[10]

Meanwhile, the other principal variety exported from Carelia, Ruskeala marble, also sufferred setbacks, not because of any fault of the material itself, but owing to economical factors. The primitive working methods in Ruskeala and the lack of adequate transportation made the Carelian marble unable to withstand competition from Italian brands sold in thin slabs by various continental firms. In 1847 the technical journal *Teknologen* reported that a stone saw and grinding machine had been in operation in Ruskeala for more than a year, having produced hundreds of marble slabs for the floor of the Isaac's church.[11] But by the middle of the century the operations came to a stand still. In the 1880's the building of the Carelian railway again changed the prospects for the Ruskeala marble, which was first utilized only for burning lime. In 1896 a branch line was built for transporting the stone, and in the same year Ruskealan Marmori Oy - Ruskeala

Marmor Ab was founded.[12] From now on Ruskeala marble could again claim attention as a building material.

Until the last decades of the nineteenth century quarrying and stone working in Finland were pursued with traditional methods. The organization remained on a pre-industrial level, and the only major projects were those conducted with military labour or prisoners, or a combination of these. The Bomarsund fortifications on Åland were begun in 1830 and they were still unfinished when ruined by bombardment by the French-British navy in 1854; here red Åland granite was employed on a vast scale for the wall construction. In Turku (Åbo) the Kakola prison was built in 1854 with granite quarried on the building site.

A turning-point is marked by the year 1886. Early that year baron Anton von Alfthan conceived the idea of forming a stone company, which would combine the production of finely worked monumental and building stone with the exportation of blocks and paving stone. Alfthan was at the time a high official in the office of the Governor General for Finland and he was in a position to assess market prospects in Russia. The firm adopted the name Ab ''Granit'' and acquired the right to quarry stone in the town of Hanko (Hangö). Here a dense, red granite had been utilized on a smaller scale in the harbour region (Drottningberget) and on a small island nearby (Märaskär). The company soon secured itself other sites along the Finnish coast and in Carelia, where the proximity to the Russian capital was an asset.[13] In the autumn of 1886 the works manager, Sebastian Tammelander was sent to Sweden and Denmark (Bornholm) to study ''the more advanced stone industry of these countries.'' It was hoped that ''the results of this study tour will be apparent in a near future.''[14] A few years later, however, Tammelander was dismissed for an unsatisfactory control of quality. In 1889 the new works manager Adolf Engström was sent ''to study the stone industry in its true centre, Scotland,'' since it proved that this industry ''in Sweden, too, had been behind the times.'' As a result new machinery was bought, that is, stone saws and rotating grinding-machines. A rotating machine performed the same work as twelve machines of the old reciprocating type, and what formerly required a whole week was now accomplished in a single workday.[15]

In 1886 *Suomen Teollisuuslehti* (The Finnish Industrial Journal) also began to publish material on stone working techniques. This publication had been founded in 1883 by the architect Josef Stenbäck, whom we shall meet further below; in 1885 Stenbäck had argued for true materials in church architecture.[16] From 1886 the journal regularly published material on the stone industry culminating in a long series of articles by Tammelander.[17] After his dismissal from Ab Granit Tammelander continued to work for the exploitation of Finnish stone resources. With a grant from the Board of Industry of Finland he made a systematic survey of the granites of the Åland islands and submitted a report on this topic in 1891. In the manuscript version of his report Tammelander had a lengthy introduction where he blamed the professional geologists in Finland for neglecting practical applications, and he pointed to the Swedish Geological Survey and Hjalmar Lundbohm as models to be imitated in this country, too.[18] This attack provoked a rejoinder from the acting director of the Geological Commission, K.A. Moberg, who pointed out that the scientific work on a geological map of Finland must be given priority over purely practical tasks of the kind proposed by Tammelander; in principle, however, Moberg agreed that there is every reason to support the emerging stone industry[19]

In Finland geological surveying did indeed gain momentum a little later than it did in Sweden or Norway. The first proposal for a geological survey was made as early as 1856, but the outcome was a mere three year campaign carried out by officials of the Board of Mines (1865-1868). In 1877 surveying was resumed and as late as 1885 a special bureaucratic unit, the Geological Commission, was founded and subordinated to the Board of Industry. Since the country was poor in ores and valuable minerals, the search for stone varieties useful to the stone industry appeared as an important task.[20] When in 1893 J.J. Sederholm (1863-1934) became the director of the Geological Commission, a new era was inaugurated.

Sederholm enjoyed a considerable reputation as a scientist; incidentally one of his specialities was the formation of granitic rocks. But like his Norwegian colleagues, he was strongly aware of the need for geologists to show the useful applications of their knowledge. Again a precedent was set by Hjalmar Lundbohm, with whom Sederholm was personally befriended. Already in 1892 Sederholm had written an article on the rapakivi granites, where he warned against the use of Pyterlahti stone and argued instead for granite from the Åland islands.[21] As demands for a specialist inventory of the Finnish stone resources were repeated,[22] Sederholm deployed part of the very limited resources at his disposal to practical work. As a result, the Geological Commission could present a selection of useful stone varieties in the Finnish section of the general exhibition in Nishny-Novgorod during the summer of 1896.[23]

In order to catch up with Sweden, Sederholm decided to study Swedish quarries and stone works on the spot. He consulted Lundbohm on where to go in order to learn about the granite industry, and the latter answered that there was no need to visit too many firms, since they all looked much the same. He recommended visits to, among others, Malmön (Ab Kullgrens Enka), Varberg and Graversfors.[24]

On February 12, 1898 Sederholm lectured to the Architects' Club of Tekniska Föreningen i Finland (The

Fig. 1.
GESIMS I TÄLJSTEN FRÅN SAVONRANTA.

Fig. 2.
GESIMS I TÄLJSTEN FRÅN JUUKA.

14. Ornamental details of Savonranta and Juuka soapstone carved by F. Holmström, preparator of the Geological Commission of Finland. From Benjamin Frosterus, "Om täljstenar och asbest med hänsyn till finska förekomster", *Teknikern* 1899, pl. 143.

Finnish Technical Society) on "Our Resources of Building Stone."[25] He had by this time modified his earlier censuring views on the *rapakivi* granite of eastern Finland. Although the stone is liable to weathering, this is a very slow process. If carefully chosen, *rapakivi* will prove sufficiently durable; it has a good cleavage and it can be had in large blocks at a very moderate cost. As for the other stones of the country, Sederholm had to repeat what had long been known: apart from soapstone the country has no soft variety to offer the architect, who will have to be content with the various granitic rocks. Yet Sederholm expressed the hope that the stone industry will flourish in Finland, too. He reminded his audience of the important role of architects and builders and finally he suggested that a commission be nominated to investigate the possible use of stone for building. On its following meeting (23.3.1898) the Architects' Club appointed the commission, which included architects who had already begun to use natural stone or were involved in projects where this alternative was being considered: Sebastian Gripenberg, Karl Hård af Segerstad, Hugo Lindberg, Selim A. Lindqvist, Alexander Nyström, Gustaf Nyström and Josef Stenbäck. Sederholm and one of his geologist colleagues who also was present, Dr. Benjamin Frosterus, both offerred to assist the committee in its work.[26]

Actually Sederholm's survey drew upon recent prospecting by geologists and engineers. Tammelander's 1892 report on the Åland granites had recently been revised by Benjamin Frosterus, who had also inspected the marble at Ruskeala; in 1899 Frosterus also published an article on the Juuka soapstone (Fig. 14).[27]

But Sederholm's most important source of information was the engineer Hugo Blankett (1872-1949), who had inspected all Finnish granite quarries of any significance in 1895.[28] Blankett's activity merits closer attention: he transmitted ideas from abroad, and in 1900 he founded a new stone firm, Finska Stenindustri Ab - Suomen Kiviteollisuus Oy, which was to play an important role in the first decade of the century. In 1896-1897 Blankett went abroad to study his trade. He spent the first months of 1896 in Stockholm, where he worked for Hjalmar Lundbohm, who received him very kindly. Among other things, Lundbohm had introduced Blankett in the Building Section of the Swedish Technical Society where the Finnish engineer "although a layman, was received with open arms," as Blankett reported to Sederholm on February 1, 1896. However, it soon appeared that the Swedish geologist was not going to part with any really new information to a potential competitor to the Swedish stone industry.

> Despite Lundbohm's kindness there is a great deal that seems hard to worm out of him. Still, he is an extremely nice person and as far as I can judge extremely competent in the field, indeed, even more so than any one on the Continent. His activity has already born rich fruit. Exports have doubled many times. As for architecture, there is in Stockholm no new building project, where stone is not used as much as possible (in façades). And it has been realized that this is not so much more expensive than plaster. However, for the most part soft stones are used. In Helsingfors, too, houses will soon be built of stone. Only a few prerequisites are still lacking, but these, too, will soon be fulfilled.[29]

In the same letter Blankett envisaged a contribution to *Teknikern*, a journal that had begun to appear in 1891, and which was to cover important material in the field during the years to follow. Blankett made arrangements with C.A. Flodquist, the leading stone dealer in Sweden, who was willing to exhibit a selection of soft building stones on the premises of the Geological Commission. He also tried to establish an exchange of samples between the Swedish Geological Survey and the Geological Commission of Finland, although "Lundbohm insists that the exchange is to be limited only to those stone varieties that are at present quarried and used."[30] Having concluded his tour of the Swedish firms Blankett complained to Sederholm about the unwillingess of the higher employees to part with "more important or even correct information." For this reason Blankett had resorted to pumping the workers, "although this is not quite honest nor pleasant; yet in most cases it is the only method to yield any results."[31]

Later in February Blankett continued to Norrköping, Gothenburg, Hamburg, Berlin, Freiberg, Chemnitz, and over Western Germany to Belgium. In Berlin he conferred with the director of the Baumaterialiensammlung of the Technische Hochschule at Charlottenburg, Professor H. Koch, who indicated willingness to open an exchange with the Geological Commission.[32]

In September Blankett wrote to Sederholm that he had now talked to "practically every important owner of stone working establishments in Germany and Austria". He felt optimistic about Finnish exports. "The main thing is that the prices can be set low enough to beat the Swedish granites, which are hard to quarry; this can easily be done." He thought it a pity that there is only "that miserable firm 'Granit' to establish contact with German firms." Then he returned to a favourite theme of his, the collection of samples which he was acquiring for the Geological Commission:

> I think the present and future members of our architectural profession will remain grateful to the Commission for such a collection, especially since I have concentrated on materials that have been used for the masterpieces of architecture in these parts, and since the collection will prove important as teaching material in the Polytechnical Institute. [...] Our future architecture needs natural stone for cladding façades.[33]

From Belgium Blankett's route went to England and Scotland, where he arrived in November 1896 (see below Chapter 5). The year 1897 was spent in Sweden.[34] Blankett had long wanted to address the Architects' Club on the issue of stone building, but other commitments intervened. In March 1900, finally, he was able to deliver his lecture on granite building; by that time he had already established his own firm, Finska Stenindustri Ab - Suomen Kiviteollisuus Oy, which was chartered on the 23d of the same month. J.J. Sederholm became the first chairman of the company board, a post which he held until his death in 1934. Blankett also had the good foresight to enroll architects as shareholders, among others Onni Tarjanne, Lars Sonck and Vilho Penttilä.[35] Blankett's firm specialized in a light grey granite quarried in the region of Uusikaupunki (Nystad). It was used, for instance, in the National Theatre (Figs. 157,163), the Finnish National Museum (Fig. 197-198), the Polytechnical Students' Union (Figs. 205-206), The Finnish Mortgage Society Building (Fig. 296, 298) and the Otava Publishing Company Building (Fig. 207, 210). The design of the first share certificate

15. Share-certificate of the Finska stenindustri Aktiebolaget - Suomen Kiviteollisuus Osakeyhtiö 1900-1901. Archives of Suomen Kiviteollisuus Oy, Vinkkilä. (Photo ÅAKop).

of Finska Stenindustri Ab - Suomen Kiviteollisuus OY (Fig. 15) bears witness to the aspirations of Blankett's firm.

In his letters to Sederholm Blankett had repeatedly recurred to the notion of ''inspiring the architects'' in favour of natural stone. But there seems to have been little resistance to overcome. Only one discordant voice was heard, that of the architect Jac. Ahrenberg. As early as 1893 Ahrenberg had written an article on the possibility of reviving the stone industry of Carelia; the ''realistic movement'' and the vogue for true materials had reached St.Petersberg and ''we should not miss this opportunity.''[36] But five years later Ahrenberg felt less confident about the success of that movement, at least as far as the architecture of Finland was concerned. The activity of the Geological Commission has been mostly theoretical, he maintained. ''Even today the question of true materials — limestone or sandstone — belongs to the category of pious wishes, since we are not helped by the fact that a geologist is able to point to limestone here, or sandstone there; first it has to be ascertained that the material is usable, that it is found in sufficient quantity, and that it can be had at a reasonable price.'' Quite recently, he added, it was impossible to get a quotation for Ruskeala marble. For his part, Ahrenberg seriously doubted the possibility of an architecture based on true materials in Finland. We will have to make do with plastered brick, and the most sensible thing to do is therefore to revert to the simplified forms and classical austerity of C.L. Engel.[37] A little later Ahrenberg returned to the question of form and true materials, voicing his disapproval of the romantic excesses occurring in granite architecture around 1900 (cf. below p. 184).

But on the whole the architects reacted favourably, some of them even contributing actively to the promotion of stone materials. In 1896 the architect Alexander Nyström (1869-1926) went abroad to study stone architecture. Nyström spent some time together with Blankett in Berlin, and towards the end of the year in Scotland. The outcome of Nyström's trip will be dealt with below in Chapter 5, as will the Scottish tour undertaken in the summer of 1898 by another architect, Hugo Lindberg.

The latter, we recall, had been nominated to the stone committee appointed by the Architects' Club in March 1898. Lindberg was an architect in the Board of Public Buildings, where he took part in the planning of the new Historical Museum. At this very juncture the plans for the Museum building had been revised, and in January 1899 the Board of Buildings applied for permission to use granite instead of brick and plaster for the façades (Fig. 154-156).[38] In June 1899 a convention of technologists was held in Helsinki and here Hugo Lindberg lectured to the House Building Section on the topic ''How can the use of our natural building stone be promoted?'' He pointed to the example provided by recent architecture in Stockholm, and he referred to J.J. Sederholm's lecture of the preceding year. He closed his lecture by formulating a seven point programme for promoting the use of natural stone in architecture.[39]

Lindberg's lecture was followed by a session during which J.J. Sederholm demonstrated various granites, sandstone from Pori (Björneborg) and Ruskeala marble. According to reports from the meeting ''a very rich assortment of samples was exhibited on the premises, including carved ornaments of soapstone''. After the meeting had been sojourned, Karl Hård af Segerstad demonstrated a recent work of his, the apartment house ''Falken,'' where for the first time Finnish soapstone had been used for ornamentation and window jambs (Fig. 122).[40]

In the various assessments of the Finnish stone resources there is a recurring theme: the concern for softer building stones. The praise of ''our handsome granites'' sometimes sounds a little hollow. When all was said and done, geologists as well as architects had to admit that the success of the Swedish stone industry and Swedish stone architecture was due to the abundance of easily worked materials. In Finland sandstone and silurian limestone were lacking. This is why architects and geologists attached so much hope to the only easily worked variety to be found on Finnish soil: steatite, soapstone or serpentine. Since the earliest times soapstone from Juuka in eastern Finland had been utilized for stoves, cooking vessels and the like. In 1899 Finska täljstens Ab (Finnish Soapstone Co.) was registered by the Board of Industry.[41] Among the shareholders were Hugo Lindberg and Benjamin Frosterus.[42] Earlier the same year, we recall, Frosterus had published an article on Finnish steatite resources. The article was illustrated with mascarons carved by the preparator of the Geological Commission (Fig. 14), elaborate sculptures clearly intended to show that here, at last, we had a domestic material suitable for delicate detail. When soapstone nonetheless was used in a romantically primitive, rusticated rubble bond (Fig. 187, 191) the geologist Sederholm could not but protest against this abuse of the ''essence'' and ''plasticity'' of the material.[43] The story of Finnish soapstone architecture, however, remained rather short. In 1907 Finska täljstens Ab went bankrupt, and its successor formed in the following year, Oy Vuolukivi - Ab Täljsten met with the same fate during the First World War.[44] From a technical point of view the Juuka works were rather advanced, and the stone was sawed in regular blocks with so-called channeling machines.[45]

The amiable dialogue between architects and geologists continued after the turn of the century. In March 1900 the committee, which had been appointed two years earlier, submitted a proposal for standard sizes for rubble stone, an initiative which was to have repercussions in Norway (see above p. 38).[46] When in 1905 the issue again became topical in the Architects

Club, both Sederholm and Blankett were present at the discussion, which by this time had also begun to address the question of massive stone construction.[47] By 1905 results of the concerted efforts of geologists, stone entrepreneurs and architects were already there to be seen and judged. When writing about ''Recent Experiences of the Use of Finnish Stone Materials,'' Sederholm noted that almost all available varieties had already been tried out in practice[48]. He did not, however, restrict himself to mere technical matters but confidently adopted the role of an architectural critic distributing blame and praise in just proportions; such pretentions to become an arbiter of the true use of stone materials had earlier been current among his geologist colleagues in Sweden and Norway. As late as 1911, when the heyday of Finnish stone architecture was drawing to a close, Sederholm once again returned to a favourite subject of his, publishing an article ''On the Technical Properties of Finnish Granites''[49]

*

The work for an indigenous stone industry and stone architecture followed a similar pattern in the three Nordic countries under consideration. The process first gained momentum in Sweden, where the tradition of stone working had never died out completely, and where quarries with excellent freestone only had to be reopened to yield a variety of building materials. The economical basis, of course, was stronger in Sweden than in either of her neighbouring countries. But Norway soon followed suit, whereas in Finland the movement gained a foothold only in the 1890's. In all three countries the geologists and engineers played an important role. The leading geologists knew each other professionally, and they were in several cases also personal friends. The contacts between the architects are not so easy to map. In any case the professional journals served as channels of transmission - we recall that Finnish national romantic buildings were reproduced in *Teknisk Ugeblad* in 1904. In a travel letter from the Nordic architects excursion in Finland in 1909, H.J. Sparre noted that Scandinavian architects were at last able to see for themselves that Finnish architecture ''which had earlier been known through drawings and photographs'' — as in Turku (Åbo) the party inspected ''the handsome small museum with façades entirely of granite'' (Fig. 199).[50]

4. MATERIALS AND NATIONAL EXPRESSION

Neo-Classical theorists had already postulated a connection between building materials and historical styles. Their foregone conclusion had been that whatever the material, be it timber or marble, the classical Greeks and Romans had achieved perfection in their treatment of it.[1] But once formulated, the principle that form follows material could be given alternative applications. It could be expanded to become a general law of architectural history, or it could be suitably extrapolated to fit a particular situation. By about 1840 the issues of "national architecture" and "truth to material" were often combined and discussed in terms of geology and natural resources.

In Germany *Backsteinrohbau* was presented as the solution of the problem of a "national German style." In the *Allgemeine Bauzeitung* this tendency was questioned by Wilhelm Stier, who pointed out that the mid-southern and western regions of Germany abounded in excellent sedimentary rocks, that is "a wide choice of sandstones and limestones," which could just as well serve as a basis for the development of a national architecture.[2] Another writer, Professor J.H. Wolff, whom we met in Chapter 2, called for "one principle and no factions." Wolff remarked that both the advocates of *Rohbau* and the conservatives adhering to the classical tradition appealed to the nature of the material as a governing principle of architecture. The former wanted to create a national style based on the properties of the material, the latter maintained that the Greek forms "derive most directly from its mineralogical basis."[3]

But the Greek example could be elevated to a general principle. In 1850 the archaeologist Ludwig Ross (1806-1859) published a travel account where he explained the emergence of the cyclopic bond as a direct result of the specific cleavage of the stone employed: in the island Dolichiste Ross had seen Early Christian ruins with extremely precise polygonal bonds, which clearly reflected the geological properties of the material. Ross concluded that the cyclopic bond is neither a primitive trait, nor a technique which is spread by cultural contact, but simply an expedient which occurs in different periods and places as a result of the specific cleavage of the available building stone.[4]

Ross's observation was quoted and elaborated by a certain J.F.L Hausmann in a study *Ueber den Einfluss der Beschaffenheiten der Gesteine auf die Architektur*, published in 1858. Here the author attempted to show the intimate connection between nature and architecture, or how the occurrence and the properties of building stone impinge "on the development of the architectural style and the aesthetic effect of buildings."[5] Even later, when the connection between natural resources and national styles had become commonplace, Ross's observation was adduced.

Thus in 1891 Hjalmar Lundbohm still explicitly referred to Ross and the cyclopic bond. This was in his address to the General Meeting of Technologists and Manufacturers in Gothenburg, a text which incidentally was introduced with a quotation from Goethe to the effect that the artist cannot change nature even if he may have command of his material.[6] At the session, the chairman Isak Gustaf Clason praised Lundbohm for his work, adding that architects were now beginning to realize what it means to use natural instead of artificial stone.

> It is as if our architecture was growing up from Swedish soil, now that we are given the chance of building with the natural stones of our country. Each variety of stone gives rise to its own architectural style. If thus our natural stone varieties were to be used more extensively for building, we could hope for a more national tendency in our architecture.[7]

This is an interesting declaration of principle. Actually the issue had been discussed at a similar occasion five years earlier, that is, at the Second Swedish Convention of Technologists in 1886, when the abuse of plaster had been unanimously condemned (cf. above p. 23). Here the promotion of stone construction was also linked to the task of creating a national, Swedish style, but no really clear-cut conclusion emerged from the debate. Thus Ferdinand Boberg called attention to the rational use of brick and stone in the same Italian Renaissance which was so thoughtlessly reproduced in plaster copies of later times. Boberg argued that in Sweden, too, a similarly rational adjustment to existing conditions and available materials could result in "a beginning to some independent and rational work, which may possibly, through the endeavours of future generations, provide a base for the emergence of a *national* style."[8]

Boberg's contribution can hardly be characterized as firing rhetoric. Nor did Adolf Kjellström, the limestone expert from Örebro, arouse much national enthusiasm with his prudent reminder that a given style need not presuppose one single material. The Gothic style, for instance, began in France with easily worked limestone, but later on other materials such as sandstone and brick were employed. The climate, Kjellström pointed out, is another factor in the formation of architectural traditions; therefore, Kjellström did not believe in a unified national style:

> We ought to strive for the use of natural stone and for a Swedish or Nordic building style adjusted to this material. But this style has to be modified in accordance with the various natural materials, which will lead to the creation of a Nordic granite style, a Nordic limestone style etc., exactly in the same way as there are to be found in different parts of Germany limestone Gothic, brick Gothic and so forth. We cannot possibly achieve any complete unity, but have to be contented with numerous different modifications of the principal forms which we regard as suitable for our climate.[9]

Kjellström's declaration is characteristic of the Swedish attitude to the relationship between stone and style. This attitude is consciously eclectic and it can be seen as reflecting two circumstances which set Sweden apart from its neighbours Norway and Finland as far as this issue was concerned. In the first place the stone resources of Sweden were more abundant and more varied than those of either of the neighbouring countries; a wide variety of stone had also been utilized for architecture ever since the Middle Ages. In the second place Swedish architects were both better trained and more widely travelled than their Norwegian or Finnish colleagues. Together these circumstances were apt to favour a pluralistic attitude, rather than to foster a belief in a unified national style determined by one nationally significant stone material. Actually stylistic pluralism had been recommended much earlier in an article in *Tidskrift för byggnadskonst och ingeniörvetenskap* (1864); here, too, local diversity had been represented as the correct way of creating a national Swedish style (see above p. 26).

In its most typical form this pluralistic tolerance appears from the buildings and writings of the leading architect of the period, I.G. Clason, whose opinions were already touched on above. In 1883 Clason went on a European tour which was to last for three years and which was mainly devoted to Spain, Italy and France. His letters from his sojourn in Spain in 1883 reveal his preoccupation with building materials. In Escorial he noted the use of granite. "Granite, granite, granite, yellow-grey granite in the exterior, granite in the interior, granite in the floors, granite in the ceilings and you know that any delicate mouldings cannot be carved in that material," he wrote to his friend Kasper Salin. At another occasion he reminded his friends: "Surely you do not forget that the Swedish soil does not consist merely of sand and lime but also of granite and sandstone, marble and numerous handsome stones."[10]

What did impress Clason was the *regional* variation. "Just as in Italy, every town and every region here in Spain has its specific type of building derived from the character of the people and from the natural building materials" he recalled in 1891 (cf. Fig. 57, 58, 60, 91). The architecture of Segovia, based as it is on intractable granite, is simple and severe, whereas the sandstone façades of Salamanca display an almost tiresome wealth of ornamentation; in Zaragoza houses are of sparsely decorated brick.[11] In our day, Clason argued in 1896, regional and individual variations are all the more natural since we have an overall view of historical architecture which earlier generations did not possess; hence "the reappearing of a well-defined and generally accepted style is no longer conceivable." To Clason the turn to true materials was a matter of "architectural realism or rationalism," and it did not occur to him that it could, let alone should, result in a unified national style.[12]

Clason's architectural views were typical as well as influential, but they were not, to be sure, shared by all and every one. At the turn of the century a new generation of architects, among them Clason's pupils, questioned the historicist part of his programme. But his critics did not, any more than Clason himself, regard natural stone as the key to a national style. On the contrary, one of the younger architects, Ragnar Östberg, ascribed the motley of historical styles in recent Stockholm architecture to the experiments with natural materials. Östberg thus saw no connection between truth of material and truth of style. The use of natural stone had, he admitted, done away with the plaster imitations of Italian Renaissance forms, but instead the true materials had inspired architects to copy Medieval masonry, French Renaissance castles, Spanish Gothic, Venetian arches, Florentine windows, Genoese stairs, Nordic Baroque and Norwegian stave churches.[13] Another member of the younger generation, Carl Westman, shared Clason's insistence on true materials and did indeed believe in a national renewal of Swedish architecture. Yet he did not see the use of stone as a panacea for national regeneration. According to Westman the models were rather to be sought in "our red painted cottages" and "old palaces with plastered walls."[14] This declaration dates from the year 1900; actually the straightforward, non-imitative plaster façades of the seventeenth and eighteenth centuries had earlier been recommended by Clason "as a domestic plant deserving cultivation."[15]

The regional, rather than national connotations of the various stones of Sweden are especially prominent in the work of Gustaf Wickman. For Skånebanken in Stockholm (1897-1900; Fig. 164) Wickman employed Övedskloster sandstone from Scania and for Örebro enskilda bank (1909-1912) he chose Ekeberg marble from the landscape of Närke. In both cases the choice of material was determined by a wish to add local colour to the corporate image of the respective banks.[16]

A striking contrast to this regional pluralism is offerred by the national interpretations which became current in the architectural debate in Norway and Fin-

land. In 1886 Herman Major Schirmer (1845-1913), one of the chief ideologues of the Norwegian national romantic movement, published a survey article on the medieval architecture of Norway. Here Schirmer argued that the buildings of this period represent the only style "which has pervaded all strata of society, and so become genuinely national property." In contrast, later currents have had a merely superficial influence. Only if we recognize this fact do we have a chance "to find our own selves again in the field of architecture."[17] Schirmer's argument was elaborated by a commentator in *Norsk Teknisk Tidsskrift*: the durable works of art shaped by our ancestors were built in our own, partly common materials. In the Middle Ages neither sandstone nor brick was imported from abroad, and the medieval builders did not cover their buildings with plaster of Paris ornaments and cornices.[18]

As the discussion about stone materials quickened, appeals to the national argument also became more frequent. In the important discussion arranged in January 1896 by the Norwegian Association of Engineers and Architects (cf. above p. 36) the chairman Henrik Nissen emphasized that "all national architecture must evidently be built in the natural materials of the country in question."[19]

Later the same year, in 1896, Herman Major Schirmer returned to his favourite subject in an article entitled "The Stylistic Influence of the Material." He began by referring to the "well- known stylistic rule" according to which particular attention must be paid to the material employed for translating a natural motif into an artistic form. In granite a pattern will become different from what it will become in marble or bronze. In Norwegian architecture of the Middle Ages the forms are simple in regions where hard, intractable limestone has been used, whereas the easily worked soapstone has favoured a rich articulation. So far Schirmer's line of reasoning runs parallel with the Swedish discussions referred to above. But a little further on he seemed to have forgotten most about the possibilities of variation offerred by soapstone and other easily worked materials. Schirmer's main concern proved to be the return to simplicity. Such simplicity would be necessitated by the natural stones of Norway, which "are by no means among the more plastically yielding materials." We will get rid of the mass of superfluous details, and the newly won artistic restraint will place us on a par with the best periods of the history of art.

> By this path and through the endeavours, experiments and variations of our numerous able professionals it will also become possible to achieve independence, originality and style, a style which does not merely sit in the clothes but in the body itself, and which will therefore become one with the economic conditions of our country: a national style.[20]

Schirmer's text ends on this hopeful note. What he had in mind was not regional variation but a unified national style based on the simple idiom necessitated by the intractable nature of domestic stone.

A few months later Schirmer's ideas were further developed by Holger Sinding-Larsen, the architect responsible for Vålerengen church in Oslo (Fig. 240-242). Sinding-Larsen headed his article " 'Norsk stil' " — with ironical quotation marks. As far as wood was concerned everyone knew what "Norwegian style" meant: carved dragons and other superficial patterns derived from the rich heritage of Norse wooden architecture. But when it came to stone, the situation was different, Sinding-Larsen continued. There was a mere handful of monuments to rely on, such as the Trondheim Cathedral, the Håkonshallen in Bergen and a couple of others mentioned in the school books. But a "Norwegian style" could not be based on such major monuments, and Sinding-Larsen instead pleaded for the numerous small and simple medieval churches, so despised that they were being pulled down one after another. For one thing was certain: if, as he hoped, the study of Old Norse art was to become an "honourable duty" among the architects, then the breadth and merits of this heritage will be appreciated.

> Only then will it be recognized that these despised, small structures, with their noble simplicity and their original effect achieved by simple but genuine means, do actually manifest our national character even better than the major monuments. [. . .] For whereas these were built under the direct influence of the culturally advanced nations with which we had contact during that time, the minor stone buildings originated among the people themselves and so partook of that same originality which characterizes our wooden buildings. If we consider the matter seriously, we will find that in our old stone architecture as well as in our wooden buildings we possess valuable elements for a sound development towards a national style.[21]

But it was not easy to define in what exact manner the use of domestic materials was to bring about a national style. Two different proposals can be discerned in the debate. More conservative Norwegian architects projected their traditional values onto the problem and concluded that the solution lay in a study of *the historical heritage*, whereas the younger generation pointed to *contemporary British and American architecture*, not as models to be copied, but as instances of rational solutions of the task of adjusting form to available materials. Around the turn of the century these divergent tendencies were brought out more sharply.

In 1900, H.J. Sparre, the architect of the Neo-Baroque law court building in Oslo, completed in 1903 (Fig. 71-72), tried to define at least some principles of national architecture. Just as in the case of timber and

wood, it must be possible to develop a national idiom for stone buildings, too, despite the fact that historical models in this material are more scarce. Sparre's programme included four principles based on the Norwegian conditions of living. First, Norway has a harsh, damp and cold climate, wherefore only the most durable stones must be used and so fashioned that they are not destroyed by frost and dampness. Second, the Norwegian summer is short, and the rest of the year is predominated by dusk and indefinite lighting; "hence we should adjust our architectural idiom to these conditions by using large sized, vigorous profiles and projections, which work by their grandness rather than by their delicacy, profusion or light effects." Thirdly, Norwegians live under relatively simple conditions; with simple means they must attain the same artistic goals to which richer nations can devote their abundant wealth. Fourthly, the materials are for the most part unusually hard and difficult to work; "we must therefore restrict ourselves to large, easily produced forms, in which the material acts more by its structure and its natural beauty than by its profusion of forms and vivid play of line."

> In short, even if we cannot attain a "Norwegian style", we should at least try to develop an architectural movement which harmonizes well with our nation, its way of living and its habits, with our climate, our lighting conditions, our entire nature, and above all with the materials which are produced by the nature of our country.[22]

Henrik Thrap-Meyer, a member of the conservative wing, whom we met above as an opponent of the use of granite, warned against forcing the national issue. Stone can be used in a rational way for details exposed to climatic conditions. "If thus employed in the simplest forms without any marked historical style, natural stone can be given a dignified simplicity, which will have a very edifying and ennobling effect on the taste of the public."[23] But the utilizing of granite, marble and soapstone must be undertaken with moderation.

> A really genuine national stamp cannot be produced by force or pressure; the development must proceed gradually. The national sources must be allowed to flow inconspicuously, as rain trickles into the brook. For if you collect the rainwater in a tub and pour it out all at once, then the brook will become muddy. What recently happened to our wooden architecture would thus happen to our stone architecture, too. In the former field our buildings, although intended for modern people, were so to speak drenched under the entire national array inherited from bygone days, without any sifting or contemporary appraisal. We became sated with nationality.[24]

Thrap-Meyer also questioned the basic premise of the national reformers, i.e. that a national style has to emerge from national materials. The present day international community will favour an interchange of materials and styles. Norway exports granite, soapstone and "our excellent marbles," while at the same time importing sandstone, limestone, not to mention brick and tile materials. The mediterranean forms of our older tomb monuments, for instance, derive from marble — although by that time we did not yet have any marble ourselves. "But now: who would have dreamt that marble one day was to become such a thoroughly national material that it will send the mind of many a superpatriot right up into the snow region!" With heavy irony Thrap-Meyer congratulated the nationalists on the new possibilities of this material, one-piece Norse dragons sawed out of marble. No, the international community represents a phase in the development of nations, and we have to recognize this fact which will give a freedom of choice. "The imagination of the architect will no longer be restricted merely to granite or spruce."[25]

As the *Yngre arkitektforening* celebrated its tenth anniversary in 1901, its chairman defined its aims and accomplishment: when the Association was founded, Norwegian architecture, alone among the arts, lacked a national character. "Here the Association of Junior Architects had its mission, defined at the start and still valid: to create an architectural style founded on a national basis, a style which would manifest that it was deeply and inextricably rooted in the character of our people and the nature of our country." [26] At about the same time Andreas Bugge, the architect supervising the building of the Rønvik Asylum (Fig. 171-172), exclaimed: "No imported stone on the Norwegian bedrock!"[27] Later that year even Sparre joined the chorus, deploring the use of imported stone, since the material must in his opinion remain the means for creating a national style.[28] In a lecture in December 1901 Joh. Meyer, himself a representative of the wooden "Dragon Style", recommended the use of historical models for stone building, too. The style that he found particularly promising in this respect was the Norman Romanesque, since in contrast to the "aristocratic" Gothic style, the heavy and simple Romanesque harmonized with the severity of nature, materials and conditions in Norway.[29]

Norman and Romanesque forms were indeed, together with impulses from American and Scottish architecture, to form the basis for the Norwegian national revival around the turn of the century. Henrik Nissen's Christiania Savings Bank (Fig. 168-170) and Henrik Bull's Government Buildings (Fig. 148-149) were praised for their "recourse to the national spirit," less in the distribution of masses than in their decoration and use of materials.[30]

But one of the recurring criteria for identifying the true national spirit, the argument of *economy*, was soon to strike back at the proponents of natural stone. When

in 1908 Henrik Bull was awarded a prize for his Government Building, the jury remarked rather primly that "the lavish use of natural stone does not quite appear to harmonize with its function of an office building, considering the economic capability of our country." *Teknisk Ugeblad* concurred with this view and went a step further:

> The first appropriation for the Government Building was passed in the period of speculative building [jobbetiden], and it is in that respect a child of its age. But in order to create a really sound, national manner of building, it is not sufficient that the materials are domestic and the ornamentation modelled after the old national motifs. The economic base, too, has to be related to the conditions of our nation. Only when a balance is struck between the two extremes of luxury and parsimony, the national tendency will develop in a free and natural way.[31]

This comment is typical of a period when architects in Norway, no less than in Sweden and Finland, had already come to regard plastered walls as expressive of a genuine Northern tradition. Nonetheless, the criticism of Bull's Government Building represents an extreme position. To the majority of the active architects the rock-faced ashlar or rubble bond, with or without articulation of wall apertures, seemed to be the natural answer to the demand for an architecture in tune with the nature, people and economy of Norway. The double shell construction known as *Ålesundsmur* or Ålesund wall was hailed as a modern revival of its medieval counterpart and as a successful step towards the creation of a national style.[32]

There are certain parallels in the political and cultural developments in Norway and Finland during the last decades of the nineteenth century. Both nations enjoyed a limited autonomy and certain constitutional rights within a personal union represented by the Swedish king and the Russian Czar respectively. By the turn of the century, both countries were asserting their national rights and distinctive identity. In Norway the struggle was soon to end with the final dissolution of the union with Sweden in 1905, whereas in Finland the resistance against mounting Russian repression formed a mere prelude to the struggle for independence which followed in 1917. Although the similarity only works in a general way, the conditions in both countries did favour a national or nationalistic tendency in the arts, a search for a unified national expression rather than regional pluralism.

In Finland, just as in Norway, the scarcity of easily worked stone and the abundance of hard rock gave a definite, symbolic twist to the insistence on true materials. Both Finns and Norwegians tended to see themselves as the greystone peoples of the North. In the latter country, the inexhaustible *fjeld* mountains were proudly "referred to by the greystone mason as 'Old Norway';"[33] in Finland Zachris Topelius had already compared the greystone itself with the "staid and serious inhabitants" of the country.[34]

In the 1890's the idea of granite as a "Nordic" stone was also exploited by German nationalism. In his notorious *Rembrandt als Erzieher* of 1890 Julius Langbehn contrasted the marble culture of the Greeks against the granite culture of the Germans:

> Die Griechen hatten eine Kultur von Marmor, die Deutschen sollten eine solche von Granit haben. Der Granit ist ein nordischer und germanischer Stein; in dem ur- und reindeutschen Nordlande, Skandinavien, steht er in grossen Felsmassen an; und über die ganze niederdeutsche Tiefebene ist er in erratischen Blöcken verbreitet. Er ist ein sehr gewöhnlicher Stein; aber seine Widerstandskraft übertrifft die der meisten andern; er eignet sich gerade so gut zum Strassenpflaster wie zu unvergänglichen Bauten und Denkmälern: er ist ein volksthümlicher und zugleich, in geschliffenem Zustande, ein sehr aristokratischer Stein.[35]

Langbehn compared the innumerable masses of the German army soldiers to the granite palaces of the German cities, standing solidly shoulder to shoulder in an impenetrable row. "Auch die Steine haben ihre Sprache; und auch sie predigen die Lehre, dass alle Bildung der Natur parallel gehen müsse."[36]

In Germany the climax of the enthusiasm for granite was connected with the wave of national monuments in the 1890's. Here the dominating group was formed by the numerous monuments devoted to Bismarck, whom Langbehn in all seriousness had likened to "an enormous erratic block." As a phenomenon the Bismarck towers or keeps are contemporary with Langbehn and symptomatic of related tendencies. In these structures the symbolic connotations of the material were mustered for extolling the Iron Chancellor. The monuments were to be erected in local stone quarried as close as possible to the site itself, each regional material thus paying homage to the unifier of Germany. Then the personal characteristics of the revered Chancellor were expressed through rock-faced granite, that German stone. Often erratic boulders or fieldstone in cyclopic bond were used for the same purpose.[37] Thus in the German context we meet a code of meanings which includes both the regional symbolism and the unified national significance which we have discussed above.

But striking as these German parallels may appear, they seem to have played, at most, a marginal role in the formation of the stone symbolism in the Nordic countries themselves. For instance, I have not found a single explicit reference to Langbehn's granite fantasies in the extensive discussions on the national question which were conducted in the technical journals and

progressive periodicals, this despite the fact that a German book that saw more than forty editions must have been fairly well known in a part of Europe where German was still the cultural *lingua franca*. As for the application of granite symbolism for monumental purposes, Nordic architects seem to have sought their models in Scottish and American rather than in German architecture, which despite this rather specialized genre of national monuments still bore the discrediting stamp of imitative plaster architecture.

It was a visit to Scotland that set the Finnish architect Alexander Nyström thinking about the relationship between materials, techniques and national expression. The two opposed traditions in contemporary Scottish granite architecture, that is, virtuoso historicism realized with the aid of pneumatic tools and moderate stylization respecting the hardness of the material, were regarded by Nyström in terms of national architecture. Even if modern technology provides us with tools to treat the hardest stone as if it were sandstone or marble, such forcing of the material can hardly be regarded as national. Nyström therefore opted for the simple granite style employed in the residential architecture of Aberdeen.[38]

> But if we do go in for building with natural stone, there is no material more natural than our own, magnificent granite. True, we have to abandon the old, traditional cliches and try to invent new forms instead, although this may at first prove quite laborious. But given a little good will and interest in a worthy goal, there will gradually come a golden age for the use of granite in the architecture of our country.[39]

In the same year, 1897, an anonymous commentator in the daily Hufvudstadsbladet also referred to the Scottish example as a pointer to the creation of a national style. Again it was taken for granted that the renewal must be based on the use of granite. It only remained for the Finnish architects to strike a harmonious balance between their works and our characteristics as northerners, our ethos and our nature. ''We are a serious minded people, our nature is serious and even melancholy; if our architecture is to be felt as really belonging to us, it must be given a serious and severe character,'' the writer went on. But the conclusion remained meagre; the only concrete recommendation he could offer architects was to find their models in the French Renaissance and the architecture of the Loire castles.[40]

Hugo Lindberg, whom we met in the preceding chapter, also based his appraisal of the situation on the Scottish experience. Granite has been left unexploited in the Finnish bedrock because it cannot at a reasonable cost be forced into the traditional architectural forms.

> We have, in a blind and tasteless manner, deemed fit to transplant to our bleak North the luscious flower of Italian architecture, the rich Renaissance style, from the southern sun and marble to which it belongs. Yet we have been unable to invent an architectural style adapted to the hard granite which in many ways is suited to our severe climate. Since in other respects we take our models from the intellectual movements in the major centres of civilization, we might do well to learn from that modern artistic movement which insists on an intimate bond between the bedrock of a country and its architecture.[41]

But Lindberg, who was a rather conventional architect working in the Finnish Board of Public Buildings, had himself no opportunity to carry out the good resolutions quoted above. He was unable to break loose from the academic tradition, and when he revised the official project for the Historical Museum in Helsinki in accordance with the new principles, he ended up with a Tuscan or ''Roman Doric'' idiom (Fig. 155-156). It was left to a younger generation to implement the programme for a national stone architecture, partly, it is true, with the help of information collected and published by Lindberg (cf. next chapter).

Just as in Norway, sceptical voices were also to be heard in Finland. The architectural heritage contained few elements adaptable to contemporary conditions. Little could be made of, say, the medieval castles and churches with their thick walls in cyclopic bond, a type of construction possibly suited to freestanding villas in natural surroundings but hardly realistic in an urban context. The most articulate expressions of vernacular architecture were, in Finland as in Norway, to be found in timber buildings. But wooden architecture could only provide architects with ornamental inspiration, not with any fundamental principles related to construction.[42] In the light of material rationalism the mere procedure of translating one material into another appeared suspect and was practised with caution.

In 1900, the same year that Thrap-Meyer commented on national satiety in Norway, the Finnish architect Nils Wasastjerna wrote a short comment on ''The 'Finnish Style'.'' He declared that the creation of a Finnish style must remain an utopia, since a national style cannot be based on national motifs alone. Decoration is no doubt important in the making of furniture as well as of buildings, but ''no style is created out of the details since it is the total design that gives each style its specific character.'' In any case it is impossible to force the national issue.[43] A few years later the rationalist writer and architect Sigurd Frosterus declared that the search for forms had entered a new phase. One of the chief tasks of architecture has always been to ''give life to the material.'' The task still remains, but today the national issue will be superseded as a formative force by social dynamism. ''National art will be replaced by an art of the classes born under the sign of cosmopolitism.''[44]

5. SCOTTISH, ENGLISH AND AMERICAN MODELS

Although granite was merely one of the numerous stone materials at the builder's and architect's disposal, the nineteenth-century vogue for natural stone seems remarkably fixated to this particular rock. The reason for this was twofold. On the one hand, the industrial revolution brought improved transportation, steam power and new machinery facilitating the mass production of polished granite slabs and columns. On the other hand, the industrial revolution also meant increasing air pollution. Acid rain, soot and grime made polished granite an increasingly attractive alternative in environments where the appearance of marble, limestone and calciferous sandstone could be ruined in a few months.

After the middle of the nineteenth century Scandinavian visitors to the major cities of the Continent and Britain were often impressed by the finely dressed and polished granite in the façades of public buildings and commercial architecture. In 1871 Wilhelm Hoffstedt published a report in his *Illustrerad teknisk tidning*, where he described this new vogue (cf. above p. 30). He noted that the great demand for polished hard stone had resulted in impressive stone working establishments, among which the largest and most interesting were to be found in England and Scotland. In the latter country, in particular, the flourishing of the stone trade is evidenced by the city of Aberdeen, whose thriving industry is dominated by the working and shipping of granite.

> Almost every house is here from the foundations to the roof built of granite, many presenting a very fine appearance with extremely delicately worked ornamental details, such as Corinthian capitals,

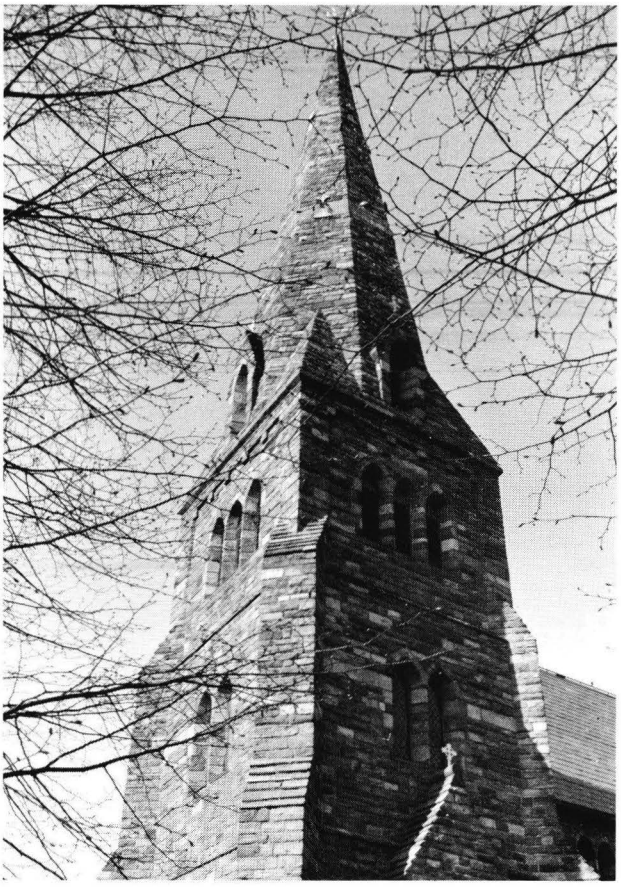
16. James Souttar, The English Church, Stockholm. 1863-1866. Moved from its earlier site in 1913 and rebuilt in an enlarged version. (Photo SR)

cornices, urns etc. The epithet "the city of granite," which is commonly applied to Aberdeen, therefore seems well deserved.[1]

In Sweden the contacts with British stone building actually hark back to the 1860's, when the Aberdeen architect James Souttar (1840-1922) designed and supervised the building of the English Church in Stockholm (1863-1866, Fig. 16-17).[2] It is true that Souttar's church remained an isolated phenomenon without immedate impact, but like its somewhat older contemporary, the National Museum (1848-1866), it formed a continual challenge to later architects involved in the stone movement. The two structures were the first major buildings in Stockholm to be built with facades of natural stone, but whereas the National Museum was soon referred to as a bad example, the English Church with its coursed rubble of Södertälje and Roslagen sandstone proved technically successful.[3] "The useful practice offerred to numerous stone masons in the construction of this building will no doubt exercise a favourable influence upon architecture and, as we hope, church architecture in particular," a commentator wrote in *Tidskrift för byggnadskonst och ingeniörvetenskap*.[4] The expectations on this point were not fulfilled, and a generation was to pass before rubble construction was again employed in Stockholm.

Together with the asymmetrically placed tower, the picturesque rubble wall served as an index of nationality in English churches erected in other European cities. An equally eloquent device was employed in the St. Albans Church of Copenhagen, designed by A.W. Blomfield, and built in 1885-1887 under the supervision of the Danish architect Ludvig Fenger (who, incidentally, had initiated a discussion about stone materials as early as 1880)[5]. The walls of this English Church (Fig. 18, 19) are faced with what is known as "knapped" flints in rubble bond, a technique typical of the English chalk districts, notably Norfolk and Suffolk.[6] But it could also be conveniently employed in Denmark, where chalk and flint occur in quantity. In any case the English Church in Copenhagen aroused interest even outside Denmark. At the Second Swedish Convention of Technologists in 1886 its flint construction was referred to as a successful precedent, and it was suggested that flint walling deserved to be tried out not only in southernmost Sweden, but even in the Swedish capital.[7]

In Sweden another influx of English stone building ideas is represented by the activity of Adolf Kjellström, whom we remember from Chapter 3 as a proponent of Yxhult limestone. Kjellström had visited England and befriended the Swedish born architect Axel Herman Hägg.[8] In collaboration with Hägg he remodelled a medieval house in Örebro with masonry and worked stone in a vaguely English style. In the same town Kjellström also designed an "English styled" villa for

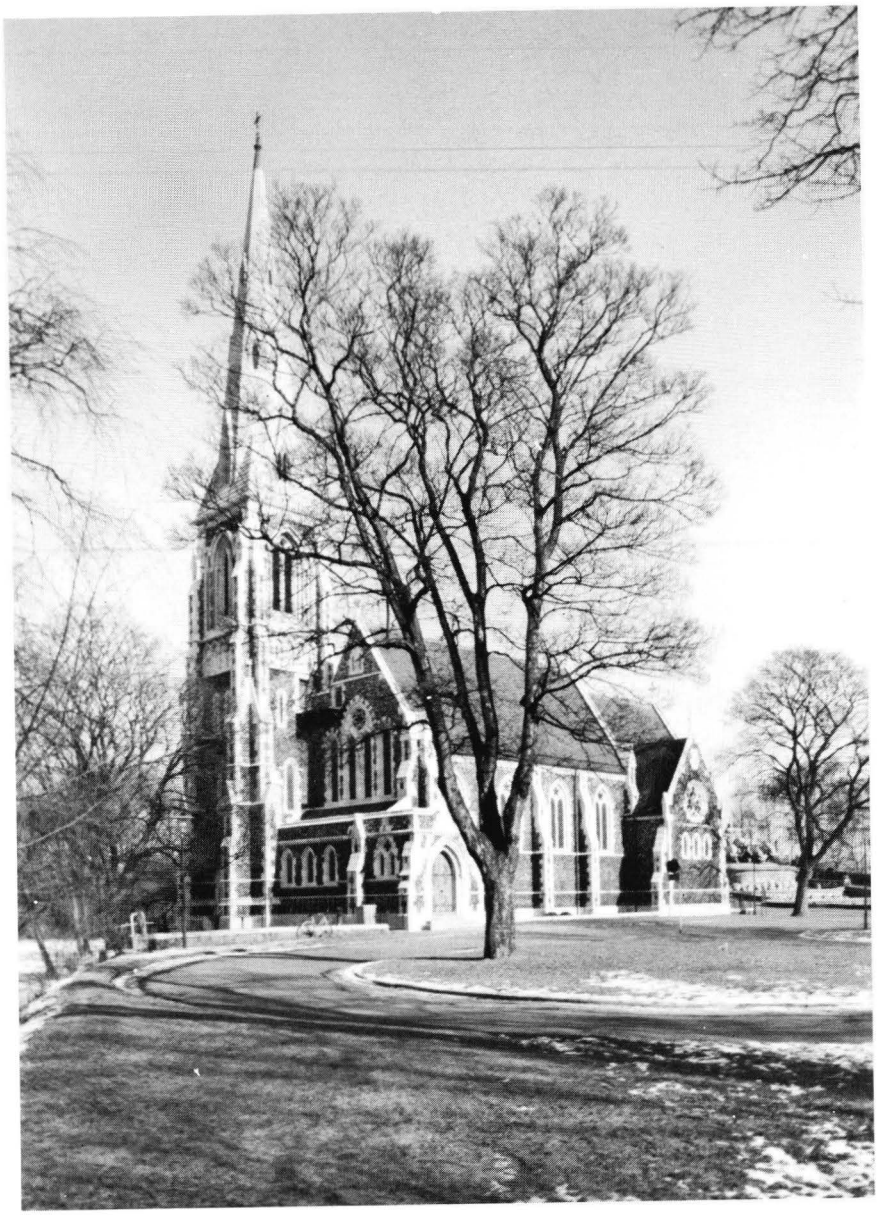


17. James Souttar, The English Church, detail. (Photo SR)

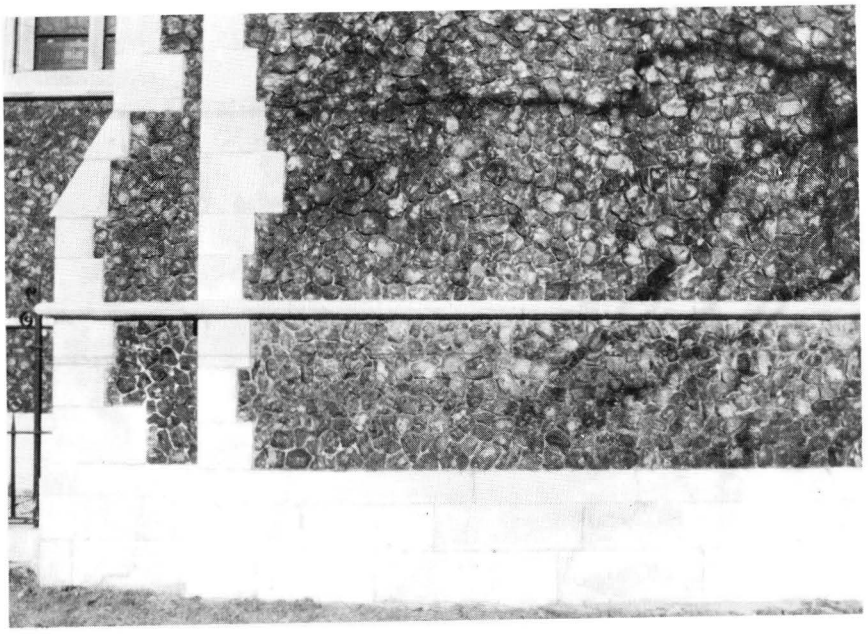
his own use (Fig. 20). The façade of the house was built of limestone, and next to it Kjellström established a stone workshop. The Kjellström Villa was given a place of honour and its own illustration in Isak Gustaf Clason's 1896 review of the recent achievements of Swedish architecture.[9]

Kjellström played an active role in the important discussions during the Second Swedish Convention of Technologists in 1886 (see above p. 32, 46). At the same Convention the precedent of Scottish stone building was again brought up, this time by the architect Gustaf Sjöberg, who posed the question why granite was not more often used for public buildings. According to Sjöberg, this stone was the variety best suited to the Swedish climate. He regretted the fact that for the monumental edifice of the National Museum granite had not been employed instead of the limestone which was now crumbling. Granite, it was true, would require a style suited to its properties and to the requirements of the climate, but in Sjöberg's opinion this was no problem. "We would not have to experiment in this respect, since, as we know, both private and public buildings in Scotland, for instance, are built entirely of granite; since these buildings satisfy all architectural and sanitary requirements in that country, this must be the case in Sweden, too."[10]

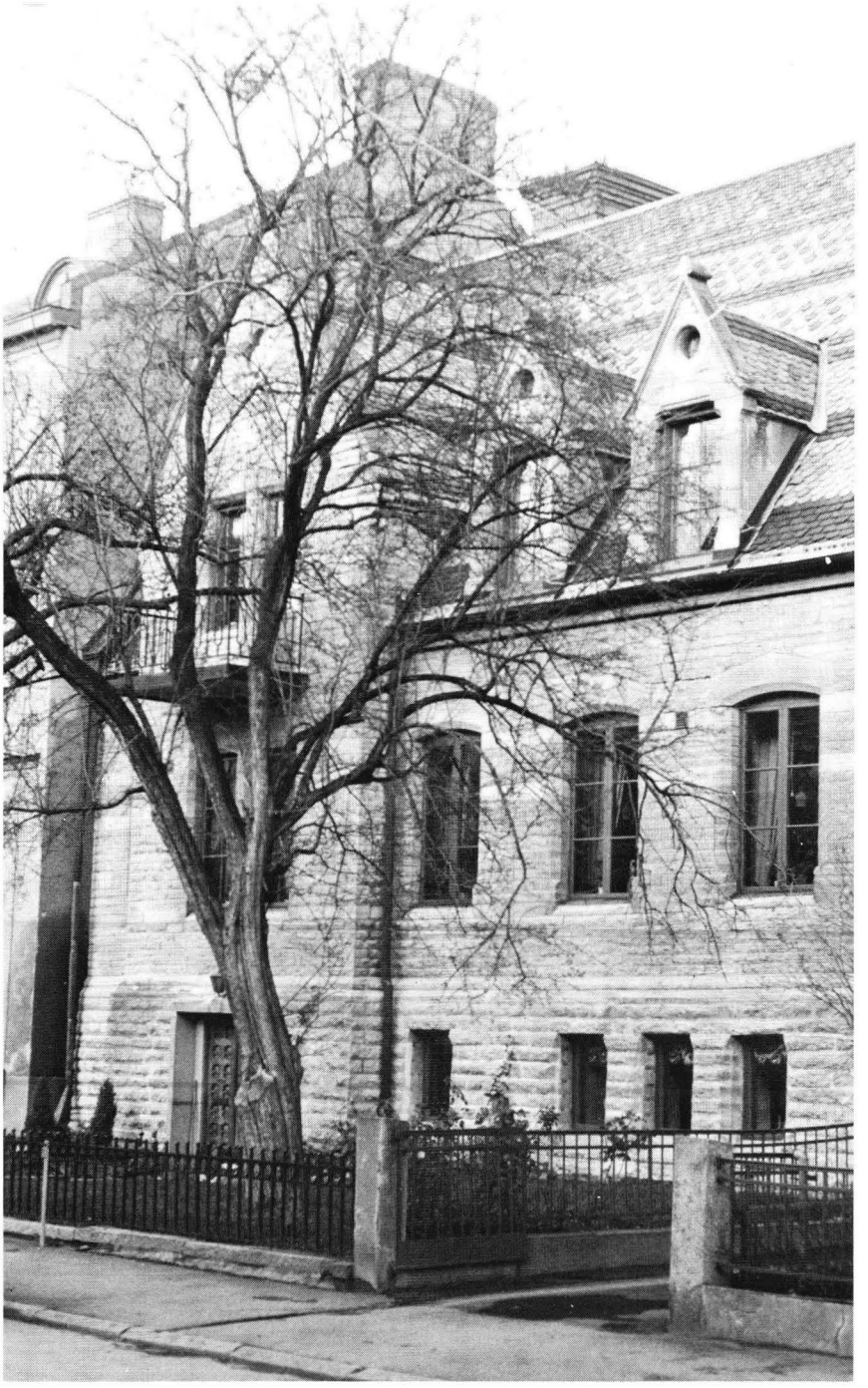
The awakening interest in Scottish granite building coincided with the boom in the Scandinavian granite



18. A.W. Blomfield (arch.) and Ludvig Fenger (supervisor), St. Albans Church, Copenhagen. 1885-1887. (Photo SR)



19. A.W. Blomfield. St. Albans Church, detail of flint walling, S. wall. (Photo SR)



20. Adolf Kjellström, The architect's house in Örebro. 1879-1880. In its original state the villa had a gabled porch, later it was removed and replaced with a window. The present entrance replaced two original ground-floor windows. (Photo Bengt Svensson)

industry precipitated by export to Germany and the Continent. Swedish and Norwegian firms strived to take over the trade from German entrepreneurs; in Finland new firms were founded with a view to compete with Russian entrepreneurs who quarried granite along the Finnish south coast for transportation to Russia. The stone firms sent their engineers abroad to study modern working methods. Thus the new works manager of ''Granit Ab'' was sent to Scotland, because it was found that Sweden had lagged behind (see above p. 41). As the geological bureaux of Sweden, Norway and Finland became more practically oriented, it seemed natural to send geologists abroad to study the stone industry.

For this Scotland obviously provided a suitable destination. With a native tradition going back to the Middle Ages the Scottish stone trade had turned to export in the last decades of the eighteenth century. In 1832 the mason Alexander Mac Donald invented steam powered machines to dress and polish granite, and from then on Aberdeen became a leading centre of the industry. Among the Aberdeenshire varieties the grey to bluish Aberdeen and the reddish Peterhead granites became famous. The Rubislaw granite, which was quar-

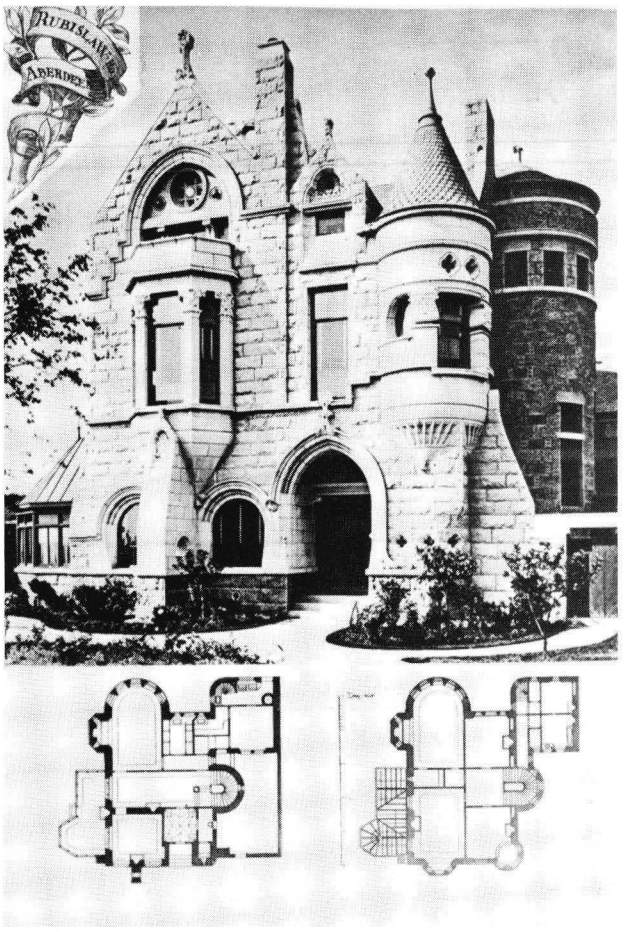
ried two miles from Aberdeen, was considered one of the best granites in Great Britain.[11] Some of the wealth pouring in from the export of granite was invested in granite architecture. In 1872 an authority on building stone praised the result:

> Out of this stone the city of Aberdeen, perhaps the cleanest and freshest-looking city in the British Isles, is built; and might be referred to by Mr. Ruskin to illustrate his views of the purifying influences of granitic rocks on the inhabitants of countries where they prevail.[12]

Two decades later, a travel guide to Aberdeen praised "The Silver City of the Sea," so called because of "the nature of the soil, the material of its buildings, and, as a late writer has discovered, the character of the citizens, for we have lately been treated to the phrase, 'granite-browed Aberdonians'."[13]

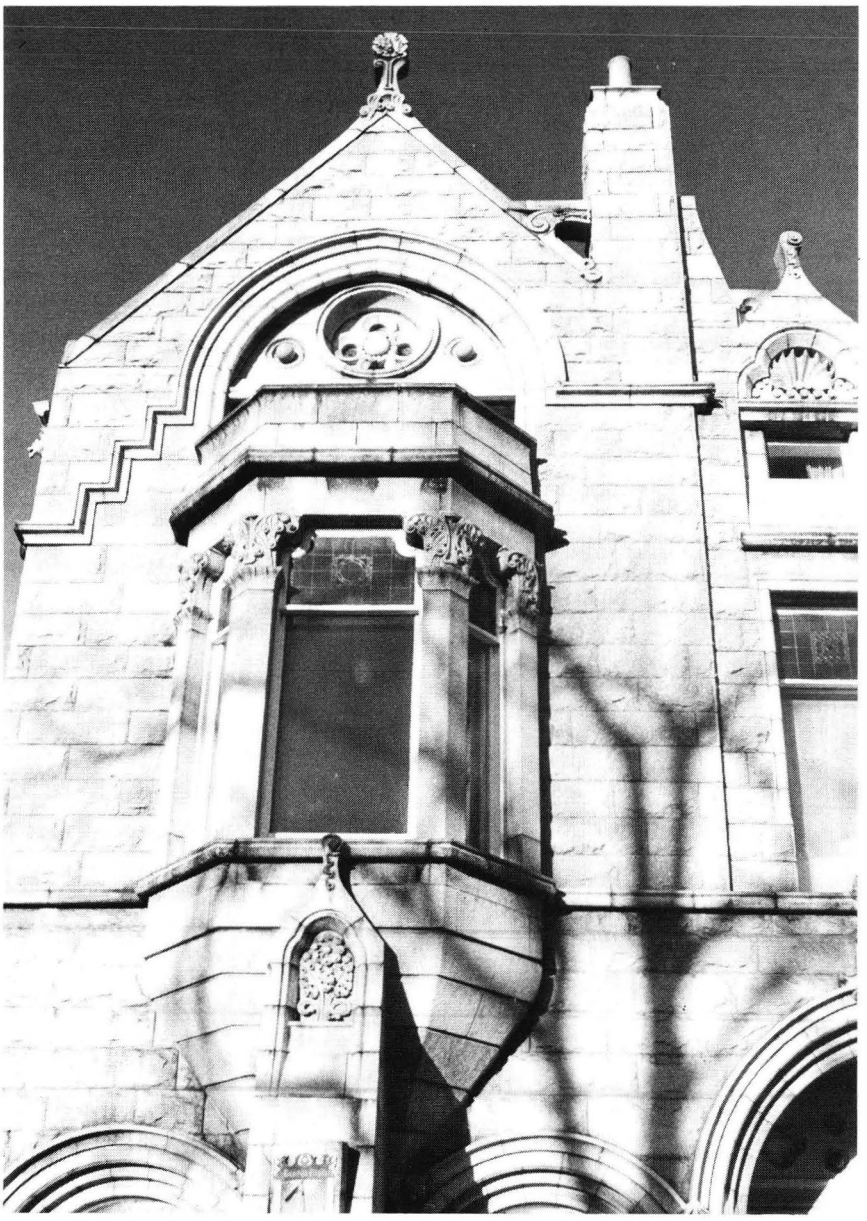
Such was the city that impressed Hjalmar Lundbohm during his tour of the Continent and Britain in 1888. It appears that it was Otto Torell who had called his attention to "the peculiar granite constructions employed in Aberdeen."[14] This city formed the climax of Lundbohm's visit to the part of Europe which offers the geologist an almost complete chart of the geological periods. As he observed the buildings of Britain, Lundbohm reflected on the connection between the geological structure and the architecture of a country; there was hardly any other place where the former had influenced the latter as much as here. Even after modern communications had facilitated the use of stone from distant regions, British builders seemed to prefer local materials as long as these were fit for the purpose. The medieval feeling for natural stone also appeared to have survived in Britain. All these factors accounted for the fact that the geological limits tended to coincide with the geographical spread of various building techniques.[15]

As far as the building technique was concerned, "Aberdeen appeared to be the most interesting among the cities of Great Britain," Lundbohm concluded in his travel report of 1889, *Engelska byggnadsmaterial och byggnadssätt samt de senares tillämplighet i Sverige*. The city had more than 100,000 inhabitants and about 17,000 dwelling houses; during a week's stay Lundbohm could identify only a few brick houses and a couple of churches built of sandstone. Everything else, from factories and dwelling houses to church spires and monuments, was built of granite. For the most part grey stone was employed, and the older buildings with dressed ashlar without ornamentation impressed Lundbohm as rather monotonous. But the opposite extreme was also to be seen: buildings which display forms and ornamentation of a kind normally executed in freestone such as sandstone or limestone. Lundbohm saw Corinthian capitals that had cost up to £ 100 a piece. Between these extremes were commendable instances such as the Town Hall and a bank building, which "are characterized by a style which is both simple and impressive, and a certain restraint in the decoration which appears more pleasing than its opposite."[16]



21. J.B. Pirie & John Morgan, The Rubislaw House, Queen's Road, Aberdeen. From Hjalmar Lundbohm, *Engelska byggnadsmaterial och byggnadssätt,* 1889, pl. 1.

Polished granite, still fashionable in the metropoles of England and the Continent and a major product of the Scottish granite industry, was rarely to be seen in Aberdeen façades. Lundbohm noted that rustication, "a treatment which is undoubtedly among the ones best suited to granite," was very common, especially in suburban villa architecture. The ornamentation of these façades was restricted to a few tooled dressings and mouldings. Of the two plates of Lundbohm's report one is a photograph of the Rubislaw House in Queen's Road (Fig. 21, 22), the private residence of a leading Aberdeen builder, John Morgan. The villa was adduced by Lundbohm as "a particularly handsome and at the same time original instance of what can be had in Aberdeen at a very low price (in relative terms), provided that the building method and the ornamentation is adjusted to the properties of the material." He quoted detailed specifications and arrived at the conclusion that "hammerblocked ashlar [sic]" did not cost more than a brick wall built to receive a plaster coating in Stock-



22. J.B. Pirie & John Morgan, The Rubislaw House, detail. (Photo SR)

holm; the simpler granite walls were much cheaper than Swedish brick walls. The belief that granite did not suit the Swedish climate was countered by Lundbohm with two arguments: on the one hand the inner panelling and airing cavity employed in Scotland was represented as sufficient, on the other hand the difference in temperature between the Scottish east coast and the warmer parts of Sweden should not, in his opinion, be prohibitive.[17]

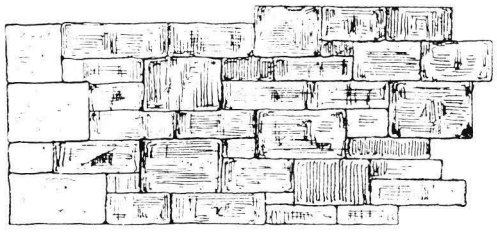
As a geologist Lundbohm was favourably impressed by what he saw as a governing principle of English and Scottish building: the wish to let the properties of the natural stones determine the construction and decoration. The rich variety of local building traditions in Britain was a result of this ambition to let the specific properties of the material produce the desired decorative effect. Lundbohm's admiration of the regional variation is thus in line with the pluralistic attitude that we met above in connection with such Swedish architects as Clason, Kjellström, Boberg, Wickman and others, who also found the individuality of local traditions more interesting than the unity of a national style.

Plastering struck Lundbohm as far less common in Britain than elsewhere, and he quoted the proud words of a London contractor in answer to Lundbohm's question why cement is not more commonly used for ornamentation: "Because it is not stone." Such honesty, Lundbohm argued, accounted for the fact that not only monumental architecture but small dwelling-houses and churches are built in an original and artistic manner, sometimes quite simple but generally with a very pleasing style. He saw the key to this success in the prudent utilization even of those stones that cannot be had in uniformly large ashlars. If, in Sweden, too, the smaller stone could be utilized instead of being wrecked, many quarries could be operated more rationally and economically. Morevover, varieties that until then had remained unexploited could be taken into use.

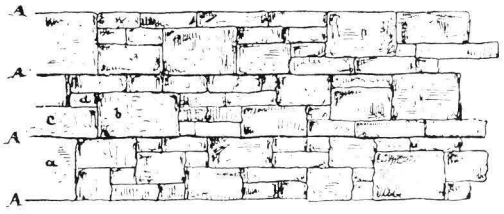
The method recommended by Lundbohm for utilizing waste stone was *squared rubble*, a bond known in Swedish as ''nubbstensmur,'' although in Sweden it was hardly used at all and in any case never executed according to the system followed in England. Lundbohm described the rubble techniques (Fig. 23, 24) according to a well-known English textbook, the so-called ''*Rivington's Building Construction*'' (Fig. 25,26).[18] The rubble bond became one of Lundbohm's hobby horses, and in numerous meetings with architects he recommended it as suitable for Swedish conditions. In April, 1890 he lectured to the Building Section of the Swedish Technical Society, using extensive visual documentation of his British experiences. The ensuing discussion was lively, and the meeting adopted a resolution stating ''that the use of Swedish stones was desirable from the technical as well as the aesthetic point of view, and that no technical or economic obstacles prevented a more general employment of these materials.'' The resolution, moreover, called for an investigation of the relevant stones, instituted at public expense.[19] Three years later we find Lundbohm repeating his recommendation, this time in favour of certain Jämtland limestones, where large quantities of waste stone resulted from the removing of shallow sediments to reach more valuable layers below.[20]

Two years after the publication of his first travel account, Lundbohm had to retract part of his information on rubble construction. During his 1888 trip he had apparently concentrated on Aberdeen, where ashlar, not rubble, is the most common bond; his technical information was based on Rivington's textbook. But afterwards he had come into contact with two Edinburgh builders, R. and J. Kennedy, who provided him with a detailed description of the correct way of carrying out sandstone rubble. R. Kennedy had informed Lundbohm that this was a specifically Scottish technique not mastered by the English. This was why some of the drawings in ''*Rivington's Building Construction*'' represented what Mr. Kennedy referred to as ''not masonry.''

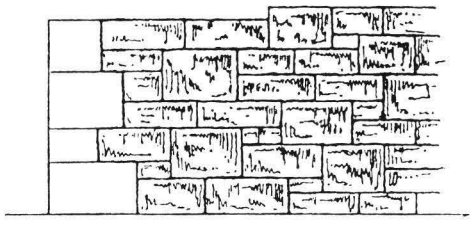
This supplementary information was provided by Lundbohm in an article in *Teknisk Tidskrift* 1891 and in a separate pamphlet *Skotska byggnadssätt för naturlig sten* of the the same year.[21] Here he described and illustrated the true Edinburgh rubble wall, in which there were not more than three stones to one vertical joint, nor more than four stones to one horizontal joint (Fig. 27). Since this strictly correct bond tended to become expensive, rules could be a little eased. In Belfast a rubble bond with a maximum of four stones to a standing joint was tolerated (Fig. 28); this made it



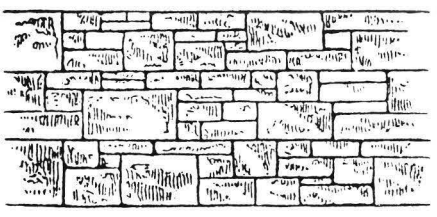
23. ''Irregular coursed rubble''. From Lundbohm, *Engelska byggnadsmaterial,* fig. 1.



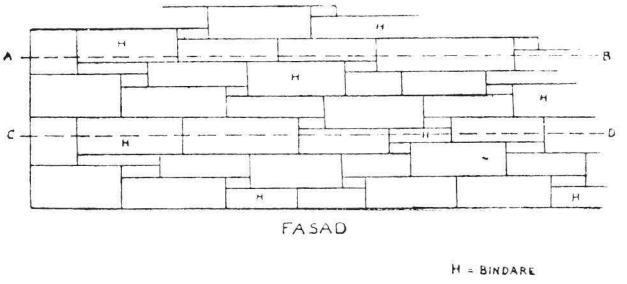
24. ''Irregular coursed rubble brought up to level courses''. From Lundbohm, *Engelska byggnadsmaterial* fig. 2.



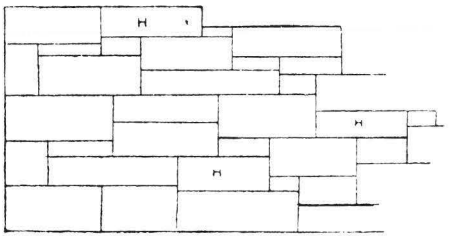
25. ''Irregular coursed rubble''. From *Notes on Building Construction* [the so-called *Rivington's Building Construction*], 1875, fig. 113.



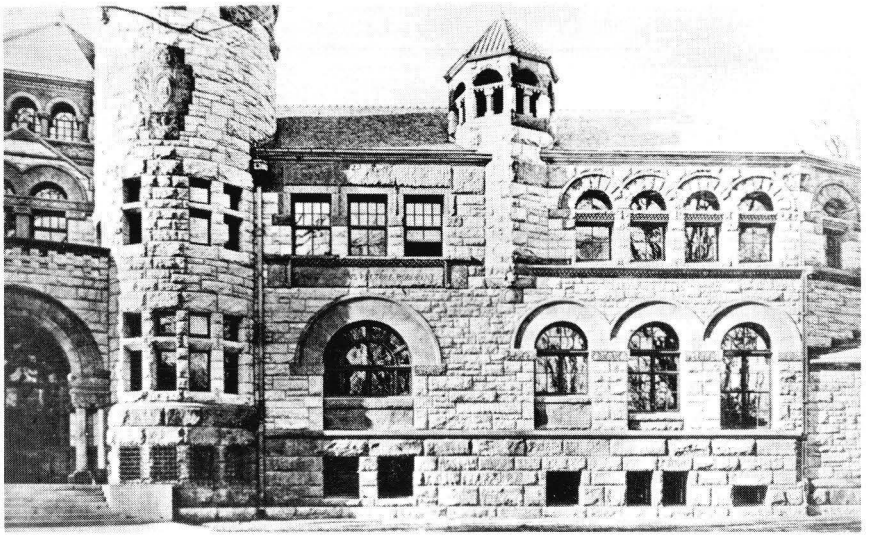
26. ''Irregular coursed rubble brought up to level courses''. From *Rivington's Building Construction,* fig. 114.



27. ''Square'' or ''snecked rubble'' according to Edinburgh standards. From Lundbohm, *Skotska byggnadssätt för naturlig sten,* 1891, fig. 4.



28 ''Square rubble'' according to Belfast standards. From Lundbohm, *Skotska byggnadssätt,* fig. 9.



29. Bruce Price, Osborn Hall, New Haven, Conn. From Lundbohm, *Skotska byggnadssätt,* frontispiece.

possible to use stones of practically any height, which in turn reduced the building cost.

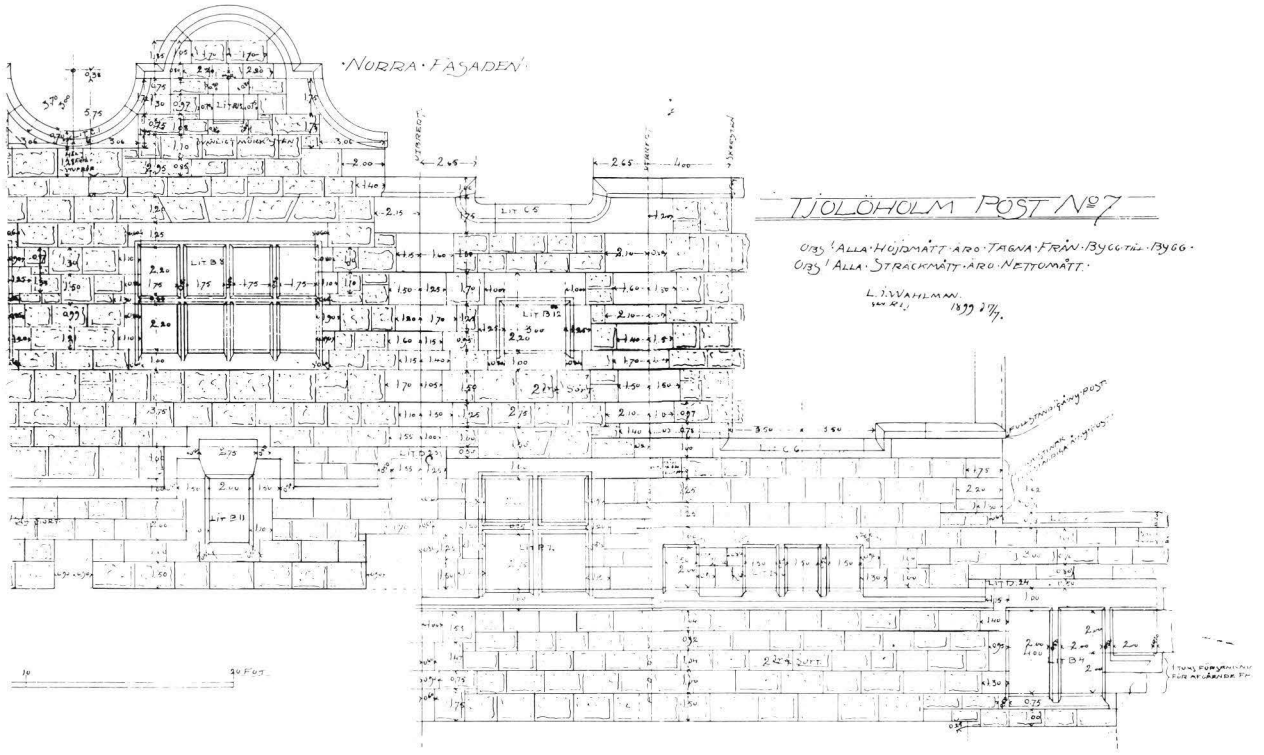
But when it came to illustrating the Edinburgh method, Lundbohm was at a loss. In the decades immediately preceding his Scottish visit, pretty façades in various types of rubble had been coming up in central Edinburgh; in Cockburn Street he might even had had a chance to see masons at work with rubble. Still, suitable illustrations were apparently not available, and Lundbohm resorted to a substitute. "Besides, the rubble wall seems to be quite widely used in America, too," he concluded his paper, and with this excuse he reproduced an American building instead of a Scottish one. The one full-page heliogravure in Lundbohm's report on Scottish building techniques for natural stone thus represents Osborn Hall in New Haven, Conn., reproduced from the *American Architect and Building News* (Fig. 29).[22] When perusing the illustrations in this journal Lundbohm had been struck by the fact that more than half of the modern buildings, both private houses and monumental edifices, were built in rubble. He had further noted that a great many of them were built of granite. This was important. In Edinburgh the rubble bond was common but mostly built with sandstone, whereas in Aberdeen granite was common but usually used as ashlar; in America the virtues seemed to unite, that is, the economical rubble bond was carried out in the common stone, granite.

Scottish granite architecture was also deliberately imitated in the manor of Tjolöholm near Gothenburg. Tjolöholm was built for the wealthy merchant James Fredrik Dickson (1844-1898). Dickson was a third generation Scotsman and his wife Blanche (1852-1906) was of English extraction. In 1897 he sponsored a competition for a manor in "Elizabethan" style," and the commission was given to the winner of the second prize, Lars Israel Wahlman, who had not himself been to Britain.[23] The building campaign was led by lieutenant Hans Rydén, who had to instruct the architect in matters of insulation. As Blanche Dickson put it in a letter to to the architect (with whom she corresponded in English; the spelling is original):

> As regards the insulating of granite from damp. That is not Captain Rydéns idea at all. He was sent by my husband to Scotland to see how stone houses were built there & isolated from damp, as in Sweden stone houses invariably are cold and damp, whereas in Scotland where great numbers are built of stone they are not. The method to be imployed at Tjolöholm is the Scotch one & there has never been a question of not useing it.[24]

When in 1898 J.F. Dickson died, Blanche Dickson was left to direct the architect's and the contractor's work, and so bring the Tjolöholm project to a conclusion. But even before her husband's death Mrs. Dickson was responsible for important decisions, such as the choice of the facade material. In order to stress the Scottish character of the building, it was from the beginning decided to use granite.[25] But instead of Swedish West coast stone, brown-red Graversfors granite from Östergötland was chosen for the main expanse of the facade. In 1896/97 the Graversfors stone company in Östergötland had supplied the granite for the Stockholm Savings Bank (Fig. 83) and contracted part of the facade of the Swedish Riksdag Building. Through the architect of these buildings, Aron Johansson, the company had heard about the Tjolöholm project, and in July 1897 they approached Wahlman, pointing to the Savings Bank as an example of their work.[26] Wahlman passed on the suggestion, which was well received, since in the autumn Blanche Dickson wrote to him:

> Could you let Lieutenant Rydén know by return of post what the granite the savings bank in Stockholm we looked at together is made of, as the contracts for delivery of stone if possible should be made up at once, some good offers having been



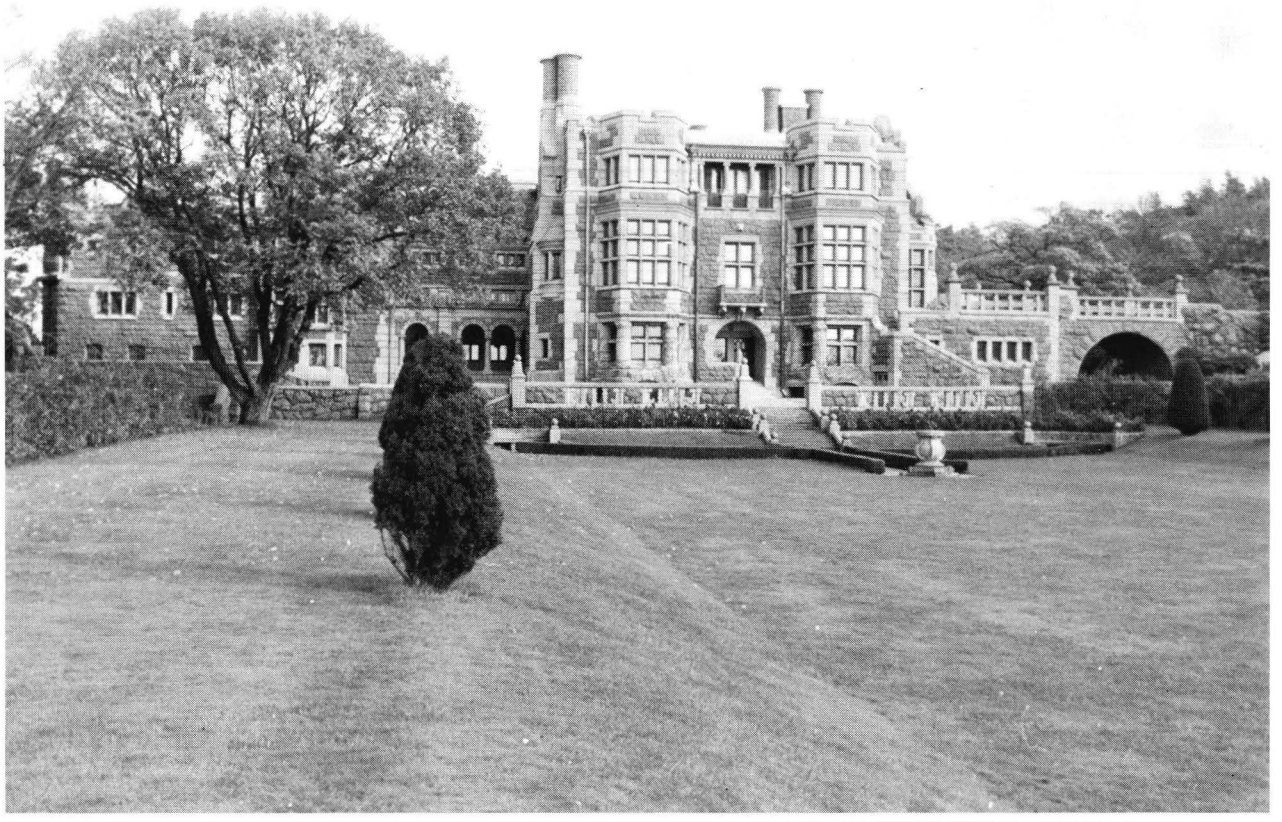
30. L.I. Wahlman/R.Lj., Detail of the North façade of Tjolöholm. Dated 17. 7. 1899. Stockholm, Arkitekturmuseet.

made & it would be a pity if we could not get as near as possible if not the same stone as that of which the bank is built.[27]

In the end Graversfors granite was chosen, but as the deliveries and prices of this firm gave occasion to complaint, Blanche Dickson decided to order the dressed copings and jambs in light grey granite from Kessel & Röhl in Vånevik.[28]. This decision was made despite the protests of the architect, who claimed that the building, which in any case was much divided, would suffer from "spottiness."[29] Wahlman's prediction that this arrangement would complicate the delivery of the material proved more than justified. In addition to the general drawings with stone measures (Fig. 30), he had to supply two different firms with working designs made to full size.

"How strange! All the love that I feel for English taste I have expended on Tjolöholm. What else I am working with is — Swedish."[30] Wahlman's words to Blanche Dickson may be construed as a polite way of expressing his relief at the completion of this "English" project. He had had to comply with Mrs. Dickson's various wishes as to materials and execution — "I have never seen iron or bronze balconies on any Tudor house & therefore most decidedly wish you to change them to stone."[31] He was proud to have Tjolöholm illustrated in an English architectural magazine, and Mrs. Dickson immediately wanted to know further details — "I should like so much to get it to shew my English relations." As long as seven years later Wahlman still deplored the fact that the English publication to illustrate Tjolöholm was not *The Studio*, which "in England as well as in Sweden is the one to have the widest circulation among people of taste."[32] In fact Wahlman's project was reproduced in *Academy Architecture and Architectural Review*.[33]

Yet in the end the result came to bear the mark of a compromise. Despite lieutenant Rydén's studies of Scottish building construction, Tjolöholm was built, not in solid stone, but with a mere lining of granite. The contractor even felt he had to warn against using thicknesses less than 5-7.5 cm with headers 12-13 cm.[34] In Scottish architecture two granites of different colour were rarely combined, and the device was regarded by many as dubious. At Tjolöholm the patron summarily dismissed her architect's doubts on this point (Fig. 31, 32). Moreover, the grey Vånevik stone for dressed copings and other details was originally resorted to as a mere reprisal against Graversfors, the firm supplying the darker stone for the walling.[35] In Scotland the stone used for rubble walling was delivered cut but unsorted to the builder, who sorted the material according to size and quality; the solidity and handsome appearance of the final wall were left to the masons' skill.[36] At Tjolöholm we see a construction which superficially looks like a "regular coursed rubble," but which is in fact a lining, in which each stone was cut to measure and carefully numbered by two stone firms constantly clamouring for 1:1 scale drawings from the architect. The varying heights of the courses and different sizes of the stones, a visual effect which in



31. L.I. Wahlman, Tjolöholm from the South. 1897-1904. (Photo SR)

Scotland was achieved by competent improvisation on the building site, were here laboriously fixed and dimensioned in the architect's office (Fig. 30). What was originally a cost-saving simplification became an expensive stylistic conceit when abruptly transplanted to a country lacking the necessary traditions of workmanship. The Tjolöholm campaign illustrated the difficulties facing those who wished to apply imported techniques to domestic problems, difficulties of which many architects were aware, and which also account for the call for the standardization of rubble sizes after the turn of the century.

32. L.I. Wahlman, Tjolöholm, North entrance. (Photo SR)

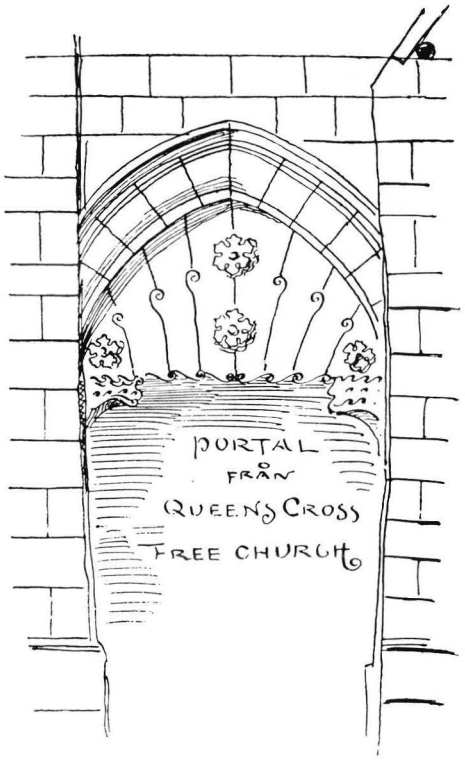
In Sweden most cases of deliberate emulation of English and Scottish formulae prove to have had a specific motivation, such as the British descent in the case of the Dicksons. In Norway the British model had a more general significance and was soon associated with the search for a Norwegian style. Above all it was presented as an alternative to the traditional dependence on German architecture. During the first half of the nineteenth century many leading architects were naturalized Germans, and until the inauguration of the Technical University of Norway in Trondheim in 1910 practically all Norwegian architects received their training in Germany. Hannover was the Alma mater of more than fifty Norwegian architects, but from the 1880's it was superseded by Berlin, Karlsruhe, Zürich and Dresden.[37] The German domination was so overwhelming that a reaction appeared unavoidable. In the 1890's a break with the German tradition was regarded as a necessary first step towards a true renewal of Norwegian architecture.[38]

In 1886 Herman M. Schirmer published articles on the influence of Irish, Norman and English architecture in medieval Norway. Schirmer did not explicitly refer to the contemporary situation, but his conclusion that only in the Middle Ages did Norway have her own, national architecture was clear enough and readily understood by his readers.[39] The practical outcome of this interpretation of the past was to be seen in connection with the competition for a church in the parish of Oslo in 1893. It will here be recalled that "Oslo" was the name of the old Norse capital. After the renaming and the transfer of the capital to a new site in 1624, Oslo formed a district in the city of Christiania. The associations of the name and location were awe-inspiring, and the architects were expected to produce a monument "answering to the historical traditions of this old town." It thus seemed natural to draw on "motifs from England, that is, the very country, with which in earlier times we maintained such profitable contacts, and which has exerted a most important influence on our early architecture."[40] In the first versions the "English" character was enhanced through the shape and asymmetrical placing of the tower, but as the project advanced, new features were added, notably the Scottish rubble bond replacing the brick walling of the competition project (Fig. 240-242).

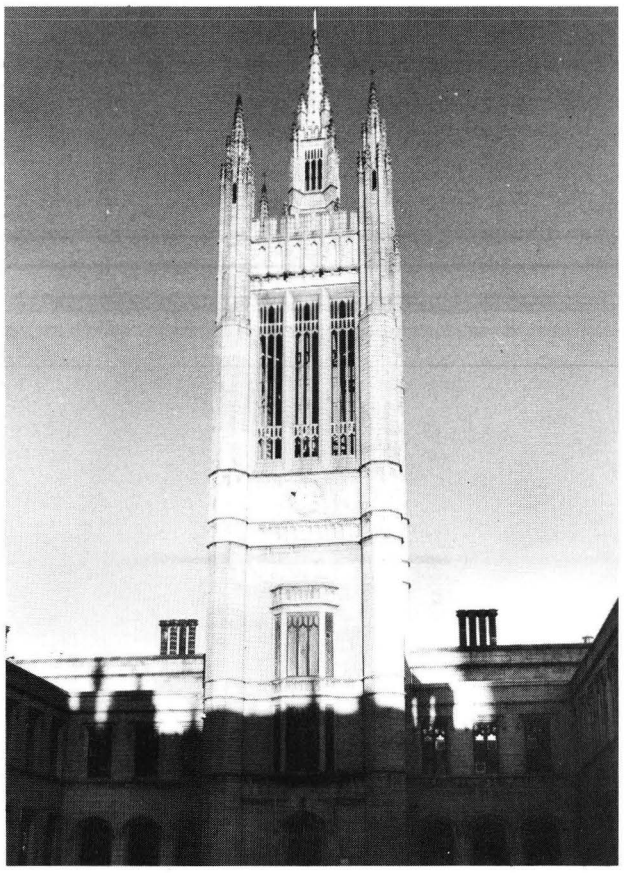
The architect of the Oslo-Vålerengen church, Holger Sinding-Larsen, also wrote a series of articles expounding the Norman-English connection. During the past periods of national independence, he claimed, Norse architecture had reached its proudest achievements in harmonious interaction with England and Normandy, whereas the period of debasement began with Danish domination and continued with German influences. "Only by abandoning the connection with Germany and by renewing the cooperation with English and related art movements (and this is the direction in which we are now beginning to move), will we again resume the thread guiding us to the understanding of our old architecture."[41]

In Norway Scottish granite construction seems to have been recommended first by the geologists, to whom this precedent was more familiar than to the architects. In his 1890 article Hans Reusch had already referred to Scottish methods as applicable in Norway, inspired probably by Lundbohm's travel accounts of the preceding year. Reusch's polemic with Thrap-Meyer about the suitability of granite centered around the Scottish precedents. In 1894 the latter protested:

33. Aberdeen, St. Machar's Cathedral. (Photo SR)

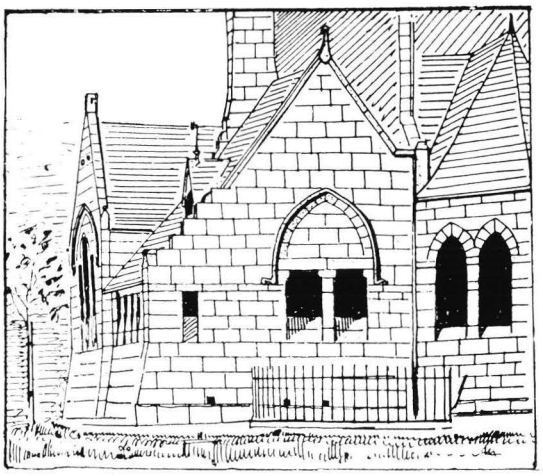


34. Portal from Queen's Cross Free Church (arch. J.B. Pirie), Aberdeen. Drawing by Alexander Nyström, in "Några anteckningar rörande granitarkitekturen i Aberdeen", *Tekniska Föreningens i Finland Förhandlingar,* 1897, p. 156.



36. Alexander Marshall Mackenzie, The Marshall Tower, Marischal College, Aberdeen. Extension completed in 1906. (Photo SR).

> I have not been to Scotland, and I have consequently not seen these houses, but nonetheless I know a few things about the subject. As far as I have been able to find out, the wall thicknesses are about twice the ones we use in Norway, and one might perhaps here apply the dictum uttered by a famous aesthetician about Greek architecture: 'Die griechischen Säulen würden stehen, wenn sie auch aus Butter gemacht wären.' But what I do know, Dr. Reusch, is that the climates of Scotland and Christiania are so far from being 'roughly similar' as to present a divergence of 5-7 degrees in mean temperature. Scotland has 10-12 centigrades and Christiania 6 centigrades. — This makes an enormous difference.[42]



35. Detail from Queen's Cross Free Church. Drawing by Alexander Nyström, in "Några anteckningar", p. 156.

Despite Thrap-Meyer's misgivings, the Scottish precedent was referred to as a matter of course in the discussions conducted in the Norwegian Association of Architects and Engineers as well as among the junior architects in the Yngre arkitektforening.[43] Again Lundbohm's reports from England and Scotland formed a basis, and when the 1904 stone promotion committee submitted their report, the standards used in Scotland were still quoted after the Swedish geologist.[44] The same report also offerred detailed information about Finnish proposals to standardize the course heights of the Scottish rubble bond, proposals that had been discussed five years earlier by the Architects' Club in Helsinki.

These Finnish developments also derive from the inspiration of Hjalmar Lundbohm. In 1896 the geologist and engineer Hugo Blankett went on a tour which more or less repeated the 1888 route of the Swedish geologist. Towards the end of the year Blankett reached Aberdeen; in the latter place he spent well over one month, making excursions to the surrounding quarries, Peterhead, Glasgow and Edinburgh.

37. Alexander Marshall Mackenzie & James Matthews, Northern Assurance Co., Aberdeen. 1882-1885. (Photo SR)

> In Aberdeen I was lucky to spend 1 ½ weeks together with my old friend from Berlin, the architect Alexander Nyström, a brother of the professor's, and like him very competent and industrious, too. With his help we studied, among other things, granite architecture quite thoroughly, and I'll be darned if we shan't soon learn how to build in honest granite back home, too; for it's a fact that the architects are quite excited about the possibility, although they have lacked the courage because of the expense etc. It will be a real pleasure to tell them something about what it really costs to use granite compared with the price of brick and plaster —.[45]

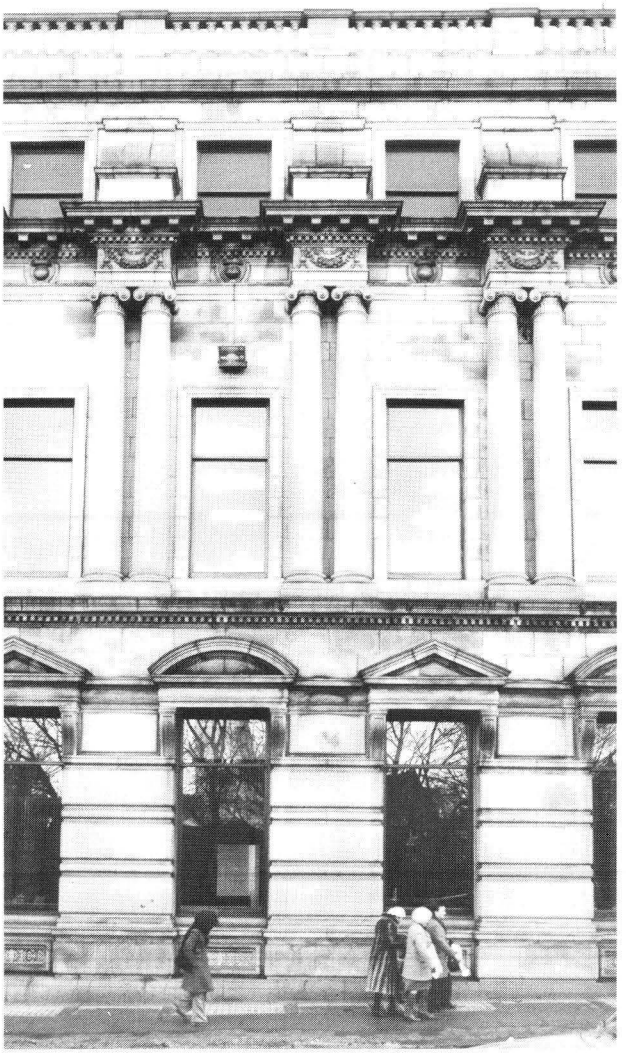
Blankett wrote these lines to Sederholm in November 1896; he planned to be home by Christmas and hoped to be able to "give a talk to the Architects' Club on 'The Use of Granite in Foreign Architecture'." But other tasks intervened, and it was Sederholm who was to address the architects in 1898 (see above p. 41-42). Blankett's turn came in 1900, when he was already leading his newly founded firm, Finska Stenindustri Ab - Suomen Kiviteollisuuus Oy.[46]

Blankett's companion in Aberdeen, Alexander Nyström, was the one to draw the architectural conclusions of the geologists' recommendations. In his travel report of 1897 Nyström took for granted that "Lundbohm's excellent small pamphlets" on rubble construction were so widely known as to make presentation unnecessary. Nyström's concern was the stylistic implications of using granite and his was the first illustrated discussion of the subject to appear in a Nordic language. He reproduced a photograph of the medieval St.Machar's Cathedral as "an instance of the rational treatment of this material employed even at that period." Far from trying to imitate styles and forms developed for freestone, the builders had consistently restricted the articulation to a degree corresponding to the hardness of the stone (Fig. 33.). Nyström contrasts this restraint against certain exaggerations in modern buildings, singling out the Marischal College (Fig. 36) and the offices of the Northern Assurance Co. (Fig. 37, 38), buildings where forms appropriate to sandstone and marble had been forced onto the hard stone. All the more promising, therefore, were the developments in the suburban buildings, "in which the time-worn rules have been overcome and new forms are being sought in which the character of the material is taken into account." Nyström also reproduced sketches he had drawn of a recent church, the Queen's Cross Free Church (Fig. 34, 35).[47]

Lundbohm's, Nyström's and Blankett's interest in the specific architectural tradition of Scotland has parallels outside the Nordic countries. Even in Britain, where there was an unbroken tradition of stone building, a reawakened interest in materials can be noticed in the early 1890's, when the issue was debated in *The Builder*.[48] In 1898 *The Builder* also featured a lavishly illustrated article on Aberdeen, where the hard and stubborn quality of granite was greeted "as a natural check against that over-exuberance of detail which is one of the the most frequent sins of modern street architecture." The Queen's Cross Free Church was also characterized as "a really spirited attempt at originality in the ornate treatment of a granite building."[49]

For Nyström the 1898 article in *The Builder* came too late to be of use. But the next Finnish visitor to Aberdeen made good, though unacknowledged use of it. In the summer of 1898, it will be recalled, the architect Hugo Lindberg, undertook a tour of Scotland and the Scandinavian countries. From this tour, which lasted four months, he published an account based on his own observations and technical information supplied by Lundbohm's pamphlets and various British manuals of building. Three of his illustrations came from the 1898 *Builder* article mentioned above. Aesthetically, Lindberg's reactions parallel those of the earlier visitors. He was at first disappointed by the utter simplicity of the façades of Union Street, but gradually came to accept "the nobility of this solid and simple honesty." Like Lundbohm, he questioned the exuberant forms of the Northern Assurance Company (Fig. 37, 38) and the Marshall Tower (Fig. 36), and expressed his unqualified approval of the granite villas in the suburbs. But on one point Lindberg felt doubtful. From the Central Meteorological Institute of Finland he had received statistical data on the respective climates of Aberdeen, Stockholm and Helsinki. For instance, the absolute amplitude of temperature in Helsinki (56.7 centigrades), proved to be more than 1 ½ times that of Aberdeen (36.6 centigrades). The conclusion was inescapable: "The climate of Helsinki must, in comparison with those of Aberdeen and Stockholm, be regarded as the least favourable for the use of natural stone in buildings."[50]

The realistic attitude adopted by Lindberg is apparent from his approach to the question of the costs of granite construction. He shared Lundbohm's optimistic views on the future use of granite, while realizing that the prices current in Scotland could not be schematically transposed to Finnish conditions. But the Scottish example indicated ways of making granite more economical, and in a lecture in June 1899 he summed up the conclusions he had drawn from his Scottish tour. First, the working methods and mechanical equipment had to be developed in the quarries; second, the waste stone had to be utilized for paving stone and macadam; third, when stone is used for building, attention must



38. Alexander Marshall Mackenzie & James Matthwes, Northern Assurance Co., detail. (Photo SR)

be paid to the specific properties of the material, with respect to both the size of the stones and the degree of articulation of the surface. Lindberg also proposed a number of measures to be taken in order to promote the use of stone in general and granite in particular, and his lecture was followed by a discussion with contributions by the geologists J.J.Sederholm and A.F. Tigerstedt.[51]

When the Architects' Club met in December, 1899, Josef Stenbäck, the architect specializing in parish churches, proposed that a committee be nominated to work out a size standard for rubble ("nubbsten"). Lindberg, Stenbäck and Karl Hård af Segerstad became members, and in March 1900 the Committee presented their proposal. Since building with rubble throughout appeared as an unrealistic alternative, the proposal presupposed brick construction with a mere cladding of stone. The standard measures were therefore chosen to suit brick measures, or 75 × 225 mm (75 mm being the height of a brick course), 160 × 460 mm (160 = two courses and one joint), 245 × 695 mm (245 = three

39. F.R. Schock, C.W. Potter House, 130, Lake Shore Drive, Chicago. 1890-1891. From *Neubauten in Nordamerika,* I, [1897], pl. 23. The marked area indicates the part reproduced by Hugo Lindberg, *Granitens brytning, bearbetning och användning till byggnadsändamål i Aberdeen,* 1899, fig. 17.

courses and two joints). According to the committee, ''the proposal was based on dimensions and methods employed in Scotland.''[52] The dimensions do indeed, if 10 mm is allowed for each brick joint, agree exactly with rubble dimensions recorded by Lindberg in Edinburgh.[53] The similarity in ''method'' did not, however, reach much beyond the surface, since true rubble construction was not contemplated by the Committee. In any case the recommendation was followed in the building of the Turku (Åbo) Art Museum (Fig. 199-200). When a few years later, the findings of the Finnish committee were made known to the corresponding committee set up in Norway, this difference of construction was duly noted; what the Norwegians were out to do was a truer application of the Scottish model (see p. 37-38 and 63, 210).

Lindberg had taken several photographs of Aberdeen buildings, among others of Rubislaw House and Queen's Cross Free Church. But when he wanted to illustrate rubble in his travel report, he met the same difficulty as Lundbohm a little earlier. Like the latter, he resorted to a substitute drawn from American architecture, although, unlike Lundbohm, he failed to mention the fact. The close-up of a rubble facade among the Aberdeen buildings depicts the C.W. Potter House in Chicago (Fig. 39); this Lindberg reproduced after the well-known collection of heliogravures, *Neubauten in Nordamerika*, which the architect owned himself.[54] Lundbohm's and Lindberg's small substitutions were indeed more than mere makeshift solutions. In fact they symbolize a dilemma faced by architects turning to Aberdeen granite architecture for a model: the Scottish precedent did certainly show the blessings of restraint and competent crafting, but except for certain motifs in Aberdonian villa architecture it offered little guidance for the creation of a ''New Style'' and a ''National Revival''. For a really bold and innovative use of stone materials, it seemed, models had to be sought on the other side of the Atlantic.

The impact of American architecture and, in particular of H.H. Richardson, on European building has been studied by Leonard Eaton, although among the

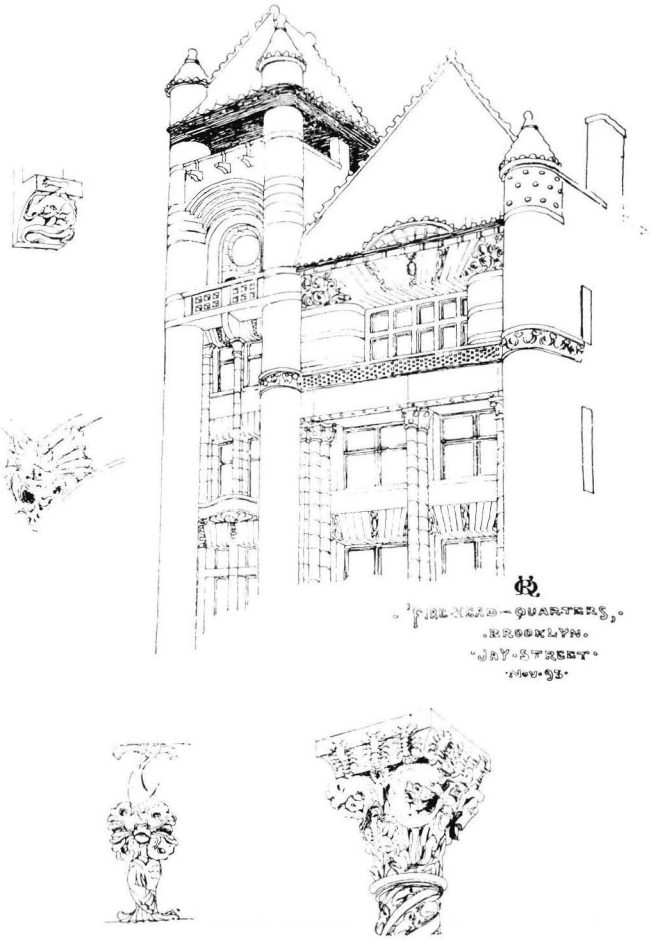
Nordic countries Eaton considered only Sweden and Finland, not Norway.[55] As such the role of American models around 1900 was well-known and evident to contemporary observers, who also frequently commented upon it. In the course of time, however, the strong national connotations attached to turn-of-the-century architecture tended to obscure this connection, especially in Norway and Finland. Only with the renewed scholarly interest in the period, has the share of American models again become acknowledged.[56]

There were several aspects of American architecture to account for the Nordic architects' interest, but admiration for the honest treatment of stone was certainly one of the important reasons and one which can also be followed back beyond Richardsonianism. As early as 1874 *Teknisk Tidskrift* reprinted an account on "The Yankee Style" by Ludwig Gruner (1801-1882). Here the author praised the use of tile, brick and brownstone in USA. "Blessed with an abundance of materials and intent on building despite costs, even deliberately ignoring them, the Americans seem to dislike deceits, at any rate spectacular fakes," Gruner wrote, carefully noting examples of the use of marble and granite for monumental architecture.[57]

Swedish, Finnish and Norwegian geologists entertained professional contacts with American colleagues, and regularly appealed to American handbooks in technical matters such as the testing of stone (cf. above p. 37). But here, as in other contexts, the geologists did not always stick to their last. Typical is the advice offerred by a Norwegian quarry engineer in 1896: "I think our architects should study the American achievements rather than the worn German models. There is more truth and real beauty in the home of 'humbug' than in Europe."[58] The Chicago Exhibition in 1893 offerred a reason to visit USA, which some twenty Swedish architects also did;[59] that year Hjalmar Lundbohm also made an extensive tour to study the American stone industry.

Leonard Eaton has stressed the impact made by Richardson's buildings "by the boldness of their compositions and the forcefulness of their stonework. In an age of jerry-building, Richardson not only insisted on the integrity of the masonry wall but often employed a powerful, rock-faced ashlar to obtain a characteristically strong textural effect."[60] It has often been pointed out that Richardson's influence on Europe came posthumously and that it was at least one decade delayed; further, that the rustic romanticism inspired by his example was a past chapter in its country of origin, where classicism and historicism were again gaining ground.

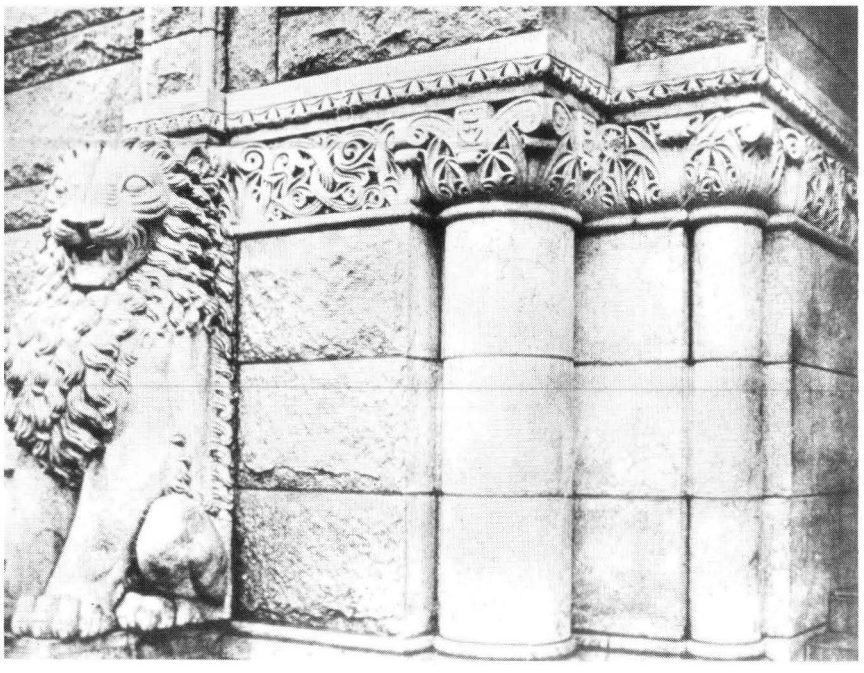
In Sweden the first examples of Richardsonian composition occur around 1890 in the work of Ferdinand Boberg. But the introduction of rock-faced surfaces and similar effects belongs to the later 'nineties, in Sweden as well as in Norway and Finland. As late as 1894



40. Ragnar Östberg, Drawing illustrating "Om några byggnadsmaterial och arkitekturformer i Förenta Staterna", *Teknisk Tidskrift, Afd. f. byggnadsk.*, 1894, pl. 5.

Ragnar Östberg criticized the Richardson tradition for its "extravagances in the exceedingly robust treatment of the material."[61] What appealed to Boberg, Östberg and the younger Swedish architects in recent American architecture was, above all, the adaptation of entirely novel motifs in the decorative parts of the building, a stylization based on Romanesque formal principles but nonetheless entirely original (Fig. 40).[62] In Sweden this preoccupation with ornamental accents became more important than the rustic treatment of the stone, whereas in Norway and Finland the other aspect of American form, the rock-faced rubble, was eagerly adopted as a means of creating a national style. Boberg and his colleagues had a wide variety of easily carved freestone to choose from, whereas the Norwegian and Finnish architects wrestled with that "national" material of theirs, granite. As Sederholm told Finnish architects in 1898: the main material in Finland must always remain granite, since "if we content ourselves with merely adapting the building methods and styles employed in Sweden and elsewhere for softer stones, then we will probably have to continue with importing not only the architectural style, but the building stone, too."[63] For that reason, a combination of Scottish

41. Harald Boklund och August Lindvall, Teleborg Castle, near Växjö, completed in 1900. (Photo Växjö kommun)



42. H.H. Richardson, Allegheny County Buildings, Pittsburgh, PA. 1883-1888. From *Neubauten in Nordamerika,* pl. 128.

and American models looked especially promising, and in *American Architect and Building News* as well as in the widely used *Neubauten in Nordamerika* an almost inexhaustible wealth of first class illustrations spared the architects the expense of transatlantic travel. The Swedish attention to detail as opposed to Norwegian and Finnish interest in drastic material effects illustrates, of course, a general tendency, not an absolute rule. Exceptions are found in both areas. Thus the castle of Teleborg, built in 1896-1900 for count Gustaf Fredrik Bonde, is an instance of Swedish emulation of Richardsonian granite architecture, down to the very system of alternating courses of higher and lower stones (Fig. 41). Conversely, the Finnish National Theatre in Helsinki displays a thoroughly Richardsonian interplay of the rock-faced wall, the finely dressed jambs and copings, and the Romanesque scrollwork in the capital frieze combined with animal carvings (Fig. 42, 43).

A common American ancestry also accounts for similarities between contemporaneous buildings in Stockholm and Oslo, as shown by a comparison between Ludvig Peterson's and Ture Stenberg's "Passage Birger Jarl" (Fig. 44; 1894-1897) and Kristen Rivertz's "Serpentingården" (Fig. 45; 1898-1901). Ture Stenberg had himself spent several years in USA,[64] and the facade of the Passage contains a deliberately full repertory of American motifs: gables, arcades of circular arches, clustered piers, rubble and diaper stonework. A contemporary review noted the fact: "The facades conform to American models, that is, they agree with that thriving group of buildings which shot forth from the furrows ploughed and sowed by the American architect Richardson, whose formal idiom is based on French and Spanish Romanesque models while having a strong Byzantine inflection in the details."[65] In the original project for the building, the three gables had been made to correspond to the three groups of windows; after the Building Authority had turned down the owner's application to leave out the gables altogether, it finally gave its approval to the present composition, where the gables are all placed above the central group of windows (which was extended from three to four openings). The rubble bond, executed in Roslagen sandstone, is carefully marked on the official facade designs (as was required by the authorities).[66] A less orthodox Richardsonian structure than its Swedish counterpart, the Serpentingården in Oslo combines Romanesque forms with conventional, gothicizing window dressings on the third and fourth floors. Instead, the rough-hewn serpentine conveys the textural effect associated at this period with American architecture.[67]

On the pages to follow, further examples of Scottish, English and American influences and allusions will be discussed, in specific buildings as well as in a wider stylistic perspective. What the preceding paragraphs have been intended to demonstrate is the two-way connection between the choice of materials and the choice of stylistic models. The wish to make the use of natural stone economically feasible led geologists, engineers and architects to study techniques and styles in Scotland, the country famed since the early years of the century for its stone industry and stone architecture. As the Scottish models proved insufficient, attention was shifted to USA, where Chicago and New England architecture seemed to offer even better precedents. The free Neo-Romanesque style represented by Richardson and his followers answered many different demands. In Norway and Finland it provided the key to the question of a granite style; in the former country, moreover, Norman Romanesque possessed specific national values. In the rapidly growing centres of Stockholm and Oslo the American models could just as well be chosen because of their associations to modernity. In all three countries the choice of models in Britain and America was motivated in the younger architects by a conscious wish to emancipate from the earlier predominance of continental, especially German architectural movements, which were often represented as epitomes of empty copyism and faked materials.

43. Onni Tarjanne, The Finnish National Theatre. 1899-1902. SW corner. (Photo SR)

44. Ludvig Peterson & Ture Stenberg, Passage Birger Jarl. 1894-1897. (Photo ca 1897, Courtesy SSM)

45. Kristen Rivertz, ''Serpentingården'', Stortingsgate 4, Oslo. 1898-1901. (Photo SR)

6. STONE AND/OR BRICK?

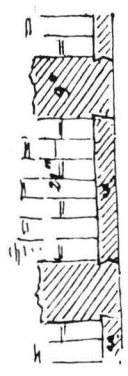
For the development of stone architecture in Sweden the building of the National Museum 1847-1866 forms a turning- point. It became paradigmatic in more than one respect, and it served as an example both as a success and as a failure.

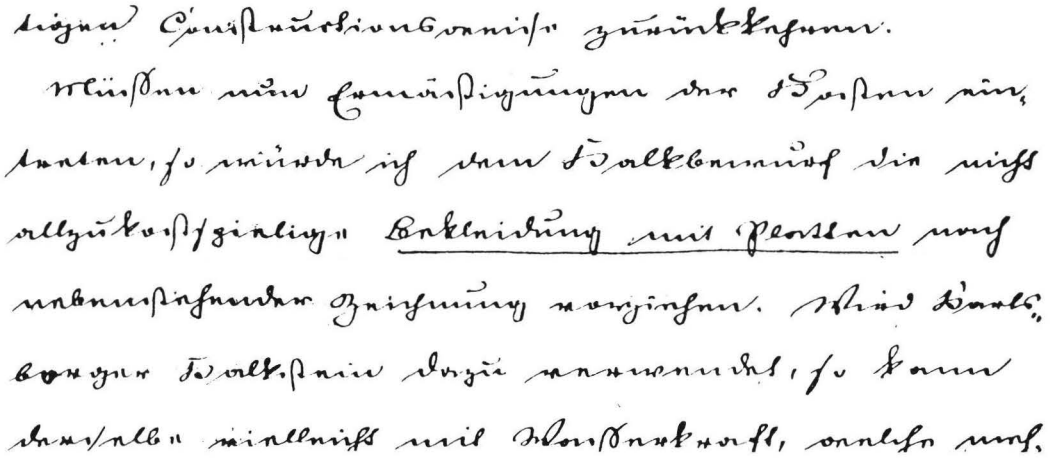
The question of the façade material was raised in 1847 as the museum project was removed from the hands of F.W. Scholander and entrusted to F.A. Stüler, the architect of the Neues Museum in Berlin. The key figure in this intrigue was the fortification officer Johan af Kleen, who by this time was still engaged with the building of the Karlsborg fortress and the operation of the Crown quarries at Borghamn (cf. above p. 29). At an early stage Captain Kleen had told Stüler that the material for the mouldings was to be a durable limestone; the treatment of the other parts of the façade seems to have been left open for the time being. But Stüler wished to have the point clarified, and in a letter to the Building Committee in August, 1847, he explained his view. Although plaster coating is widely used, he wrote, limestone would be much preferable "even in case it were not worked to the highest degree of refinement."[1]

In 1848 Stüler submitted his project, for which he suggested Karlsborg sandstone, which he had seen *in situ* during his visit to Sweden in 1847, and which he regarded as "handsome and solemn in colour."[2] But as the building costs threatened to become prohibitive, the Building Committee began to consider plaster coating as a serious alternative.[3] Again Stüler had to defend the stone alternative, which he did in a lengthy report dated 12th November, 1849. He admitted that one reason for the high cost was "the monumental character of the building," which required vaulting and stone façades.

> Die äussere Wandbekleidung könnte im Nothfall nach dem Muster anderer Pracht-Gebäude Stockholms mit Kalkbewurf bekleidet werden, wenn nur die Gesimse und Architecturtheile aus Baustein ausgeführt werden. Die Beobachtung des Mangels an Dauer einer aus Italien entlehnten Bauweise in unserem Klima, in welchem man von Alters her den natürlichen Baustein oder den festgebrannten Ziegel, ohne allen Ueberzug, dem Wetter auszusetzen pflegte, und das Streben nach constructiver Haltung in der Erscheinung der Gebäude, lassen indess den äusseren Abputz in neueren Zeiten immer mehr verwerfen und zur ursprünglichen tüchtigen Constructionsweise zurückkehren.
> Müssen nun Ermässigungen der Kosten eintreten, so würde es dem Kalkbewurf die nicht allzukostspielige *Bekleidung mit Platten* nach nebenstehender Zeichnung vorziehen. Wird Karlsborger Kalkstein dazu verwendet, so kann derselbe vielleicht mit Wasserkraft, welche mehrere Sägen an einem Gatter treibt, in Mottla, oder an einem anderen Orte zu Platten geschnitten und auf diese Weise billig bearbeitet werden. Die nähere Erwägung aller Hilfsmittel bleibt jedoch den ortskundigen Architecten überwiesen.[4]

Stüler's original façade design of 1848, as well as the revised version submitted a little later[5] displays a revetment with regular courses, different from the economy variant suggested by the architect in November 1849 (Fig. 46). The latter type had, however, already





46. F.A. Stüler, Proposal for the limestone lining of the National Museum in Stockholm. Marginal sketch in Gutachten 12. November, 1849. Stockholm, Riksarkivet (Äk 438, Vol 5, no. 5). (Photocopy RA)

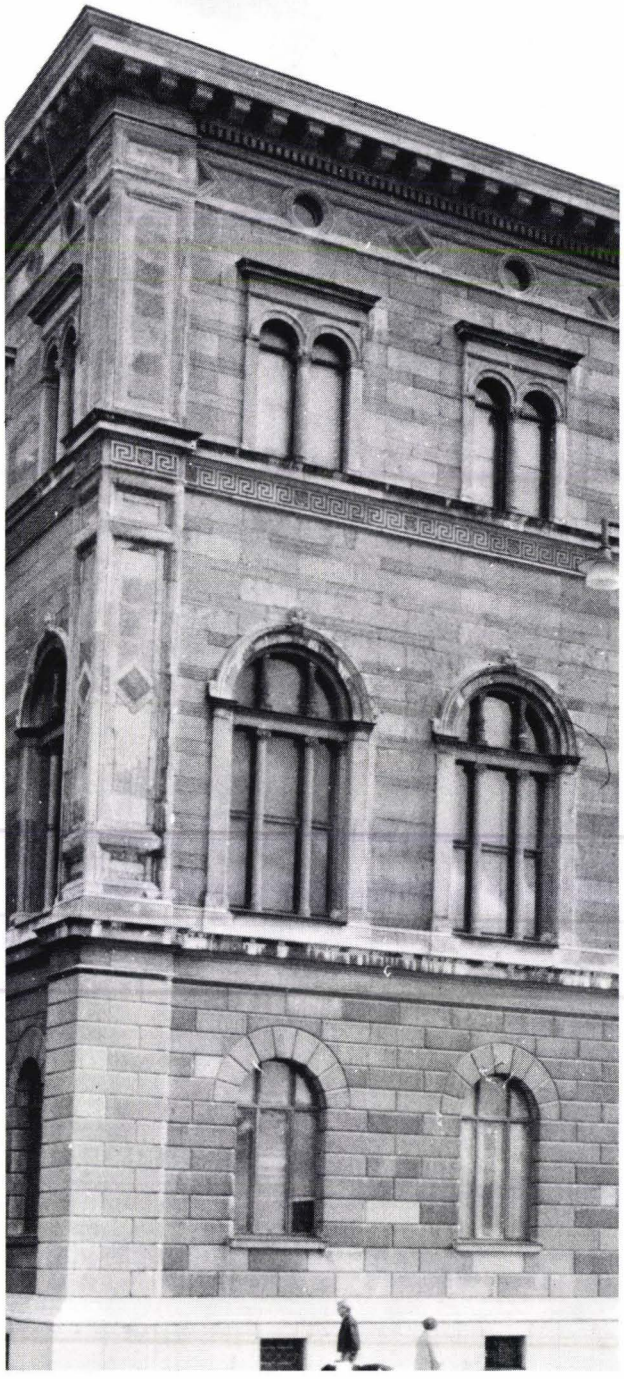
been employed by the Romans for marble lining (Fig. 8). We recall that Viollet-le-Duc was to praise the pleasant rhythm created by the alternating slabs and binders; this construction, however, was according to the same author adapted to marble and not to freestone, where it was either an expensive conceit or an outright lie. Nonetheless it was widely used on the Continent for sandstone as well as limestone revetment; Friedrich von Gärtner, for instance, had used it in Munich in the 1830's.

Stüler had it his way; af Kleen saw to it that despite the cost Borghamn limestone was chosen for the whole façade. In his final report af Kleen emphasized the fine façade material, noting that Stüler's other great museum, the Neues Museum in Berlin, had a mere plaster coating. The working of the stone lining required no less than six years, although two steam planes were in operation round the clock during this entire period. For the outer portico Kolmården as well as Carrara marble was employed, and in the interior various Italian marbles were used.[6]

The stone material was duly noted, both by the critics attacking the museum building as an instance of irresponsible spending of public money, and by such commentators as were more kindly disposed to the project. Right from the beginning Stüler had maintained that a house for the arts must itself be a work of art, and this objective was noted with approval by a commentator in *Tidskrift för byggnadskonst och ingeniörvetenskap*, who also defended the use of imported stone by pointing to the fact that Swedish granite would have been even more expensive.[7]

The Venetian accent of the main façade was also noted. One prominent critic, Nils Fredrik Sander, assumed that during his visit to Sweden in 1847 Stüler had been struck by the similarity of Stockholm with the Lagoon City. Sander recommended his readers to enjoy the building from one of the steam sloops passing the view, just as one admires the architecture of Venice while gliding down the Grand Canal in a gondola. To Sander the "limestone lining, a plastic material which is both colourful and finely worked," was reminiscent of the marbles of Venice.[8]

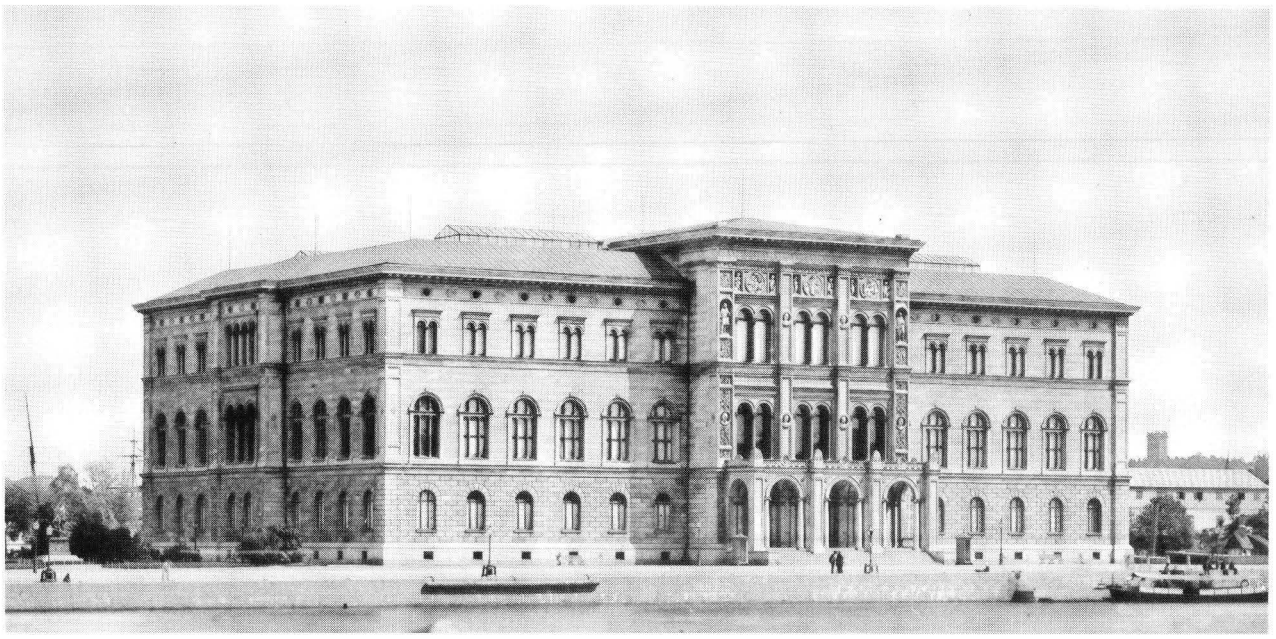
Sander was less confident about the durability of the controversial stone lining, which had already shown symptoms of crumbling. Worse was to come, and in due course the weathering limestone of the National Museum became a warning to architects and builders. At the 1886 Convention of Technologists, Adolf Kjellström, the specialist on limestone techniques, gave his analysis of the errors committed in connection with the museum façade. The height of the courses exceeds the maximum layer thickness of the stone used. To make things worse, some of the stones have been laid on edge, that is, at right angles to their natural beds. Kjellström concluded that the plans had been completed before it was known what material was to be employed.



47. F.A. Stüler, The National Museum, Stockholm, detail of main facade. (Photo SR)

If, as in the case of the National Museum, one insisted on 18 inch courses, it was necessary to use perfectly solid limestone of 6-7 inch thickness laid on edge, or else choose an altogether different material. In the last resort, however, revetment with alternating binders and slabs is an inferior type of construction, not to be compared with bonds built entirely of courses where the stones rest on their natural beds.[9]

In 1896 Isak Gustaf Clason asked himself why "such an important *stone* building as the National Museum"

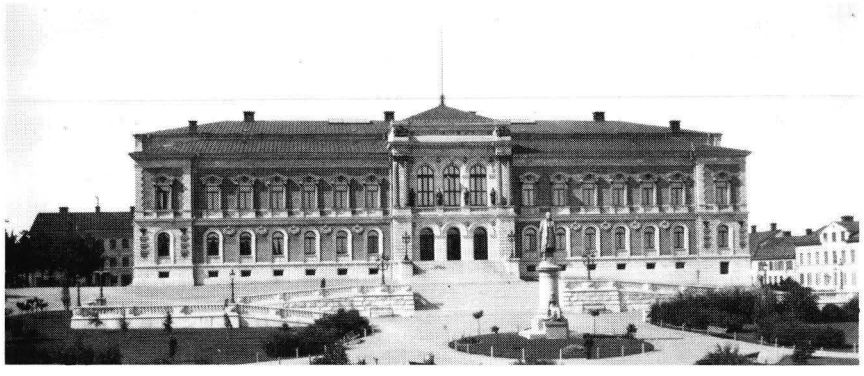


48. F.A. Stüler, The National Museum, Stockholm. 1847-1866. (Photo J. Jaeger, late 19th c., ÅAK)

could not bring about a change in the prevailing plaster of Paris architecture. He ascribed this singular lack of impact to the fact that the isolated location did not make justice to the fine architecture of the building, which looks "like a piece of luggage thrown on the quay, waiting to be transported to its proper place in the city."[10] Himself an advocate of stone building, Clason did not mention the more obvious reasons, that is the inordinate cost (thrice the original estimate) and the disappointing lack of durability of the limestone.

Price and durability were indeed circumstances noted by patrons and decision makers as the experiences from the first phase of *Materialgerechtigkeit* ca 1820-1860 began to accumulate. Uncoated brick or "Backsteinrohbau" had proved successful in comparison with natural stone. Sedimentary stones were not always reliable, some of them beginning their decay even before the building was completed. Hard rocks, notably granite, seemed to create problems of moisture. Natural stone, moreover, tended to upset estimates of building costs. Against this background it is not surprising that Heinrich Ernst Schirmer in Norway failed to convince his building committee of the superiority of stone when he planned the Museum of Sculpture in Christiania, later to become the National Gallery or Nasjonalgalleriet. Schirmer had himself designed numerous successful brick structures, but for a building of this character he regarded stone as mandatory. He submitted his plans in 1876, but when his proposal for the façade material was turned down, he resigned from his position. He was succeeded by his son, Adolf Schirmer, who just happened to return home after studies at the Berliner Bauakademie and the Paris École des Beaux-Arts. The younger Schirmer designed a brick building (1879-1881), where the details are made of Swedish limestone (from Kinnekulle).[11]

In the choice between "the true materials," the balance thus swung in favour of brick, or a combination of brick and details of stone. From the late 1870's this solution appeared as the viable alternative to the despised plaster of Paris building. An important manifestation of this trend is to be seen in the debate oc-



49. Herman Theodor Holmgren, The University Building, Uppsala. Competition 1877, built 1879-1887. (Photo c. 1890, ÅAK)

50. Herman Theodor Holmgren, The University Building, Uppsala, detail. (Photo Uppsala University Dept. of Art History)

casioned by the University Building in Uppsala (Fig. 49, 50). A competition held in 1877 had been won by H.T. Holmgren, and as his project was to be realized, the Building section of the Swedish Association of Technologists seized the opportunity to make a statement of principle. At a meeting in February, 1878, the façade material of the proposeed University Building was discussed. All speakers agreed in demanding that "plaster, which is too much used in this country, should be avoided, especially in monumental buildings; instead the natural colour of the material employed should be left visible." After a discussion described as "lively" a clear majority was won for a resolution demanding natural materials for the University Building. [12] The façade was finally built with a combination of brick and limestone, of which the former had to be imported from Denmark while the latter mainly came from Yxhult. The limestone was worked with stone planes, of which two were operating at the quarry and three on the building site. The shafts of polished granite for the 56 columns of the upper storey were manufactured in Västervik, whereas the capitals and bases were made of bronzed zink.[13]

For the University Building there was a precedent which may have inspired the Building Section to their intervention in 1878. The offices of Skandinaviska Kreditbanken in Stockholm, completed in the same year, featured details that caused a stir at the time (Fig. 51). The bank was designed by E.A. Jacobsson, the architect of a red brick printing establishment, Centraltryckeriet (1871-1873, demolished), which had been admired for its handsome simplicity. In his bank building Jacobsson had used brick, tile, granite and artificial stone. Curiously enough, commentators did not take exception to the last mentioned material, Ransome Stone, which had been introduced to the readers of *Teknisk Tidskrift* in 1872, the year before Jacobsson designed the building.[14] Instead, the true materi-

51. Ernst Jacobsson, Skandinaviska Kreditbanken. 1874-1878. (Photo SSM)

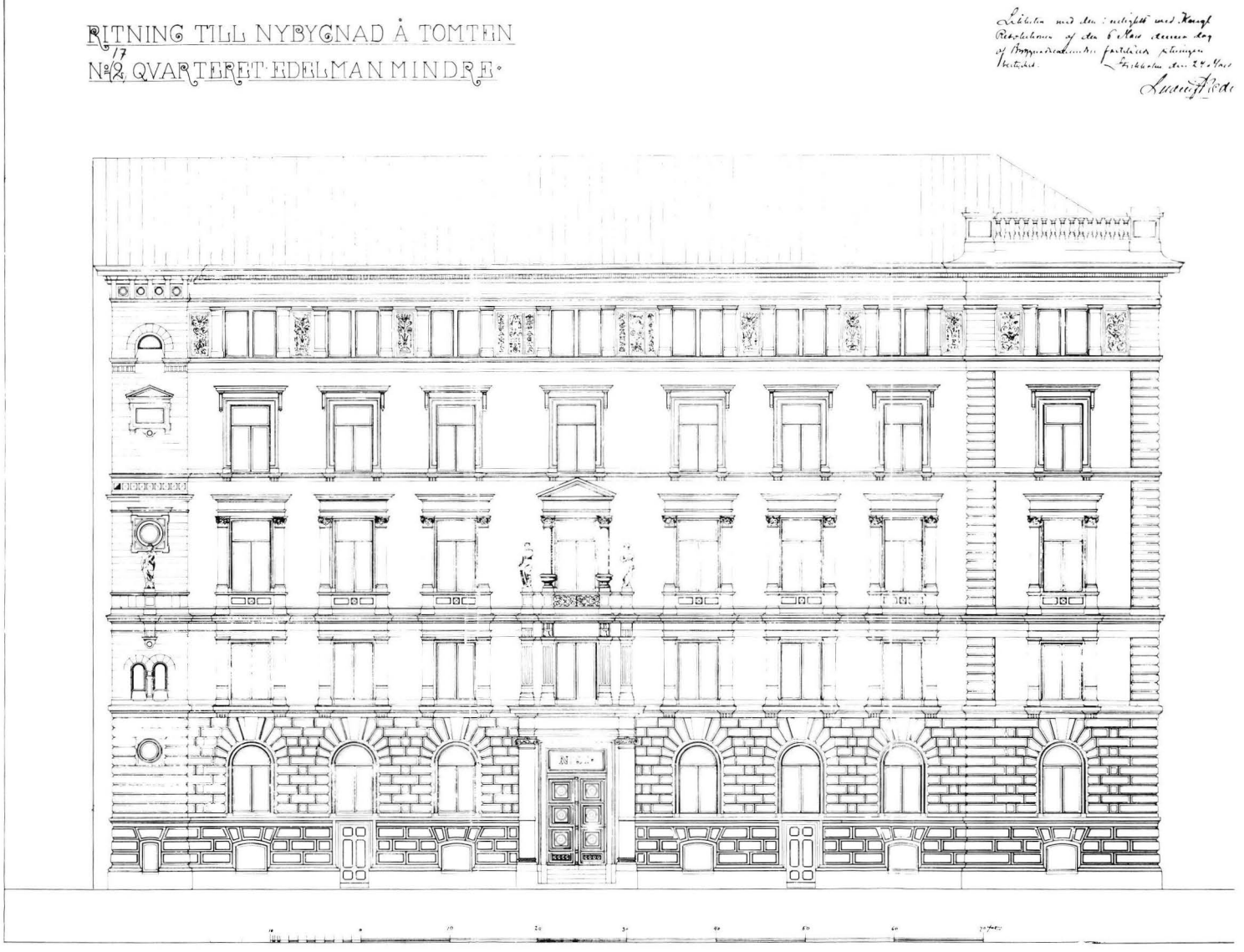
52. Axel och Hjalmar Kumlien, Entrance to block of flats, Engelbrektsgatan 19, Stockholm. Designed 1883. (Photo SR)

als, above all the eight engaged columns of polished granite from C.A. Kullgrens Enka,[15] commanded the respect of architects well into the 1890's. Thus I.G. Clason euphemistically wrote about the "good materials" of this impressive and solid façade.[16] Gustaf Lindgren was of the opinion that Jacobsson had produced "a most splendid work, which maintains its position among the best modern buildings of Stockholm."[17]

As early as 1871, we recall, Wilhelm Hoffstedt had commented on the handsomely polished granite and marble he had seen used in window dressings and other architectural details abroad. The office building of Skandinaviska Kreditbanken showed that the European example could be followed in Sweden, too, thanks to the improvement of the granite working methods. In 1870 a steam powered polishing works had been established by C.A. Kullgrens Enka on the Malmön island,[18] and other firms soon followed suit. In the 1880's polished granite columns were widely used for office buildings and more elaborate blocks of flats in Stockholm; in the course of one decade the practice enviously observed by Hoffstedt in Berlin, Paris and Lon-

53. Theodor Höijer, Entrance to Ateneum, Helsinki. 1885-1887. (Photo SR)

54. Selim A. Lindqvist (façade) & Elia Heikel, Merkurius Building, Helsinki. 1888-1890. Granite facing of ground and first floors. (Photo SR)



55. I.G. Clason and Kasper Salin, The Thavenius House, Stockholm. Elevation designed February—March 1885. Stockholms Byggnadsnämnd. (Photo SB)

don had thus reached the Swedish capital. It is characteristic that the façade of one of the first buildings in Stockholm to feature this detail, Wilhelm Davidson's House (1881; demolished in 1942) was built according to German designs. Here the granite columns and pilasters came from Bergebo stone works in Småland.[19] Often the column shafts represent the only genuine material in a setting of plaster ornamentation, as in the typical example illustrated, a block of flats designed by Axel and Hjalmar Kumlien in 1883 (Fig. 52).[20]

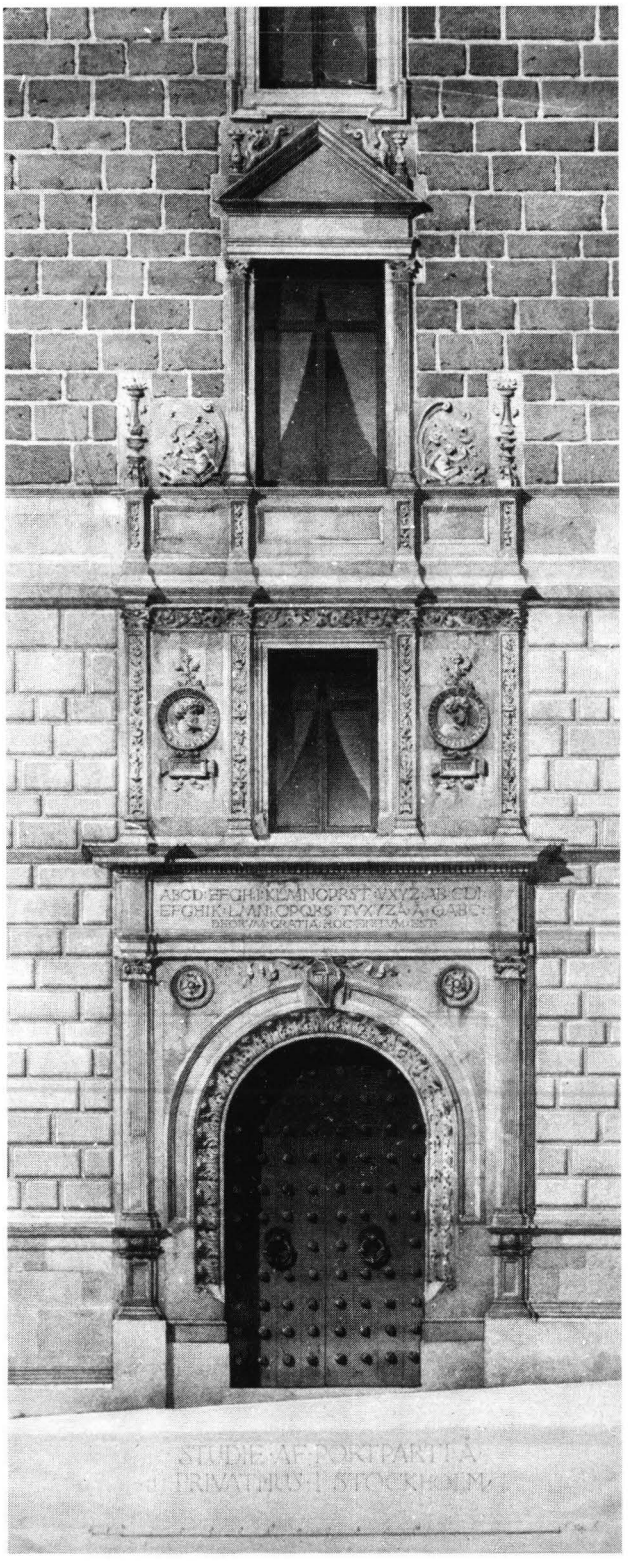
In Finland the first stone firm to be organized industrially, Ab Granit, created a precedent by supplying the polished columns and corner pilasters for the entrance of the Ateneum, the combined art museum and art school building in Helsinki (Fig. 53). The order was the firm's first work in polished stone, delivered during its first year of operation.[21] Together with an inscribed stone frieze in the central projection, these columns and pilasters represent the only "true materials" in a façade that was otherwise decorated with plaster ornamentation. At one stage the possibility of adding majolica and terracotta detailing had also been discussed, but in the end this luxury was rejected as being too expensive.[22]

Modest as they were, the granite elements of the Ateneum building did become admired and imitated. During the decade to follow, Ab Granit delivered numerous polished granite columns for the porches of Neo-Renaissance blocks of flats in the central parts of Helsinki. For the most part these details were combined with ordinary plaster façades in the manner customary in Stockholm since the early 'eighties (cf. Fig. 52), but in a few cases granite was applied on a more lavish scale. For a combined office and residential building adjoining the central esplanade of the Finnish capital the architect Selim A. Lindqvist was allowed to employ

granite on the first two floors (Fig. 54). This building, "Merkurius," was designed in late 1888 and completed in 1890;[23] it was the first Finnish instance of the shop-front facings of polished granite that had become commonplace on the Continent several decades earlier. In a building for the insurance company Kaleva, designed in late 1889, Theodor Höijer placed 36 ground columns in the façade and two polished columns by the entrance.[24] The Kaleva building as well as the other instances of ground and polished granite in Helsinki had, according to Jac. Ahrenberg, evoked admiration among visiting architects from St.Petersburg and even Paris. This made Ahrenberg speculate on the prospects for export, not to France, where Scottish, Swedish and Norwegian firms already dominated the market, but to Russia and especially St.Petersburg.[25]

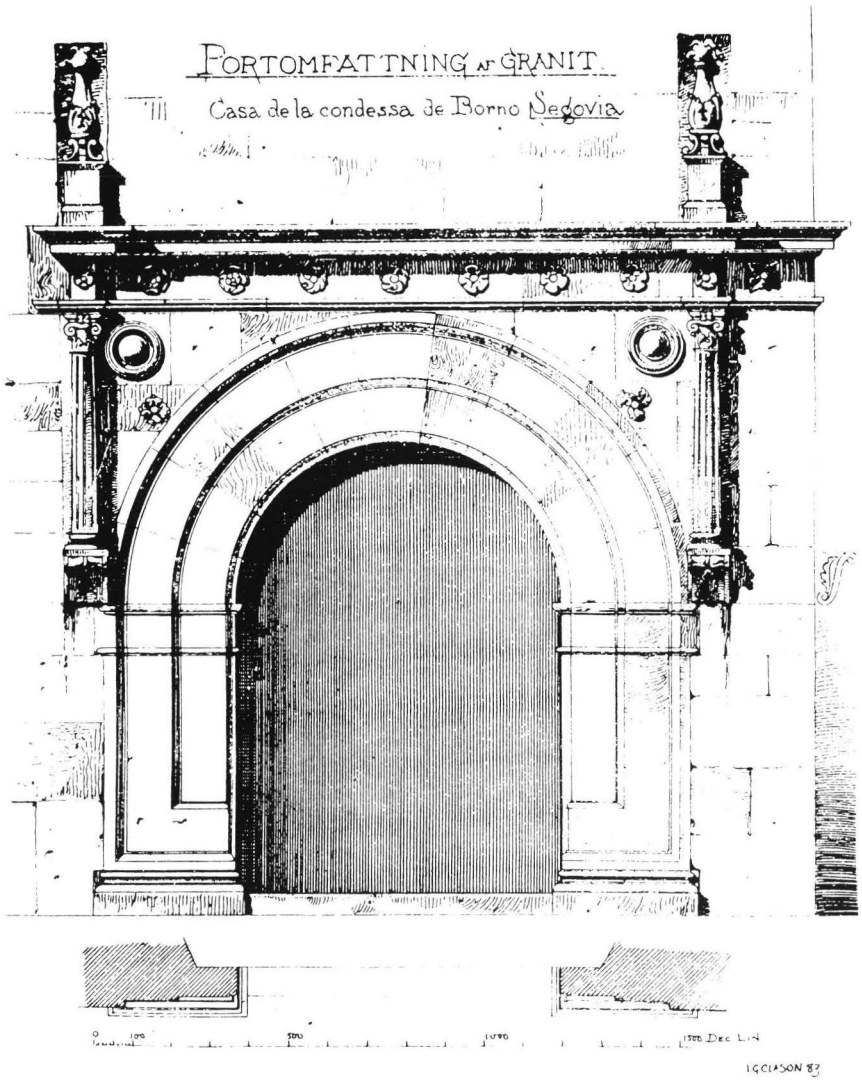
In the long run, however, the contrast between polished granite and painted plaster became increasingly glaring. The noblest of materials, it was felt, was being treated as if it were no better than the inferior imitations surrounding it. "The most tasteless arrangement was when polished granite columns were placed as a decoration in the midst of all this gewgaw of plaster of Paris," I.G. Clason recalled in 1896.[26] A dead end had been reached. How was one to find a way out? In the 1880's the only realistic alternative seemed to be to leave out the plaster coating and return to brick *rohbau*. Thus the Swedish Byggnadssamfundet discussed this solution in 1884, but found that brick and tile of satisfactory quality were hard to come by in Sweden. An increased use of *rohbau* in combination with natural stone would therefore have a favourable effect on the Swedish brick industry no less than on the stone trade.[27] During his travels in 1883-1886 I.G. Clason wrote impatient letters home to Sweden, calling it "a shame that Stockholm architects were unable to insist on a real variety of brick instead of being content with the mash that they were being offered."[28]

Since 1881 I.G. Clason owned an architectural firm together with Kasper Salin. Among Clason's works from this period there is one project in particular which sheds light on the search for new forms through "new" materials. While in Italy in 1885 Clason received from his collaborators in Stockholm an elevation for a block of flats to be built by the master builder and property owner Evald Thavenius. The building was to be erected in Strandvägen, the avenue which had recently been created through extensive earthwork by the water, and which was to become the most elegant part of Stockholm during the last decades of the century. On receiving his collaborators' designs, Clason set about to "translate the project into Spanish."[29] Today the successive stages of the project can be traced in the studies which are still extant in the Sveriges arkitekturmuseum, as well as in variant official versions submitted to the building authority in Stockholm. An elevation executed in the Clason-Salin office and approved in March 1885

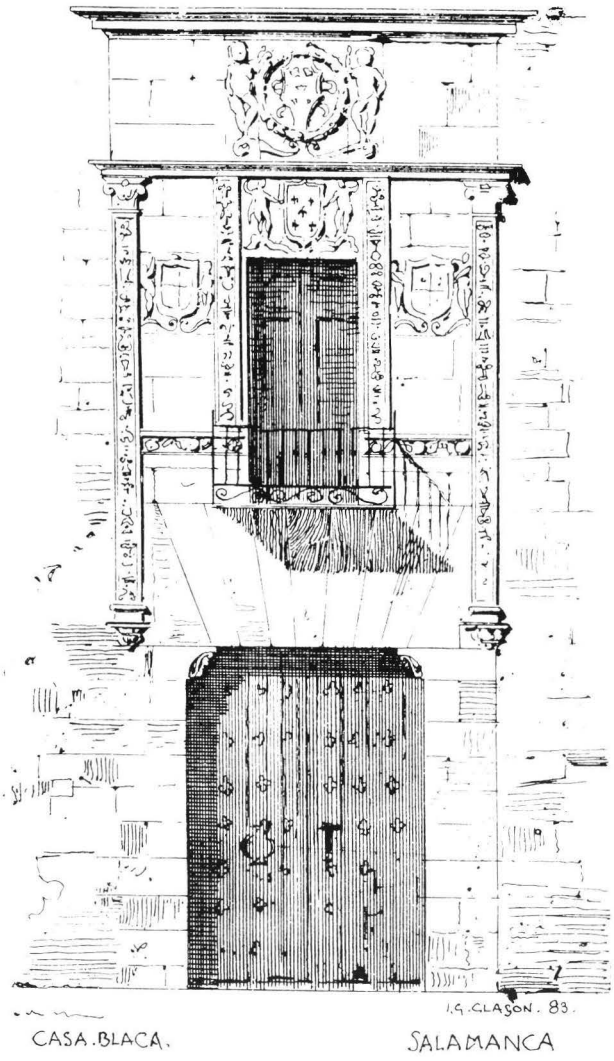


56. I.G. Clason, Doorway for the the Thavenius House. Pen and watercolour. Dated Rome 1885. Sveriges Arkitekturmuseum. (Photo SR)

(Fig. 55) incorporated a doorway composition signed by Clason in Rome 1885 (Fig. 56). The latter study is a skilful compilation of motifs which the architect had recorded in his sketchbook during his Spanish tour made two years previously (Fig. 57, 58).[30] But Clason's collaborators in Stockholm seem to have watered down the exotic traits of his project, which be-



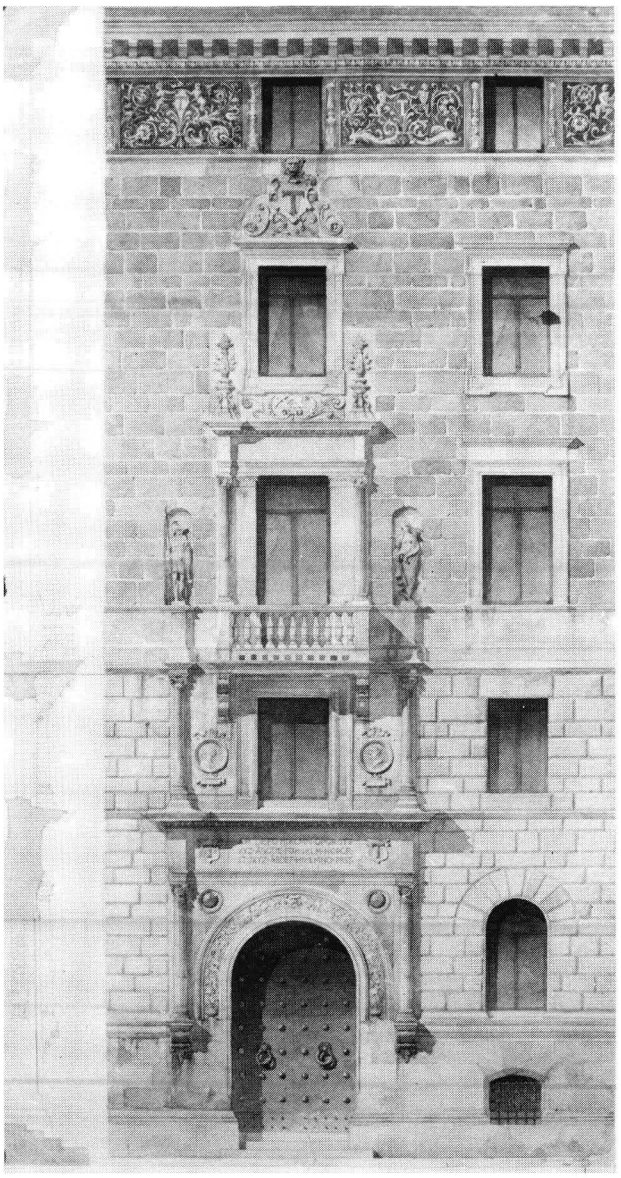
57. I.G. Clason, Travel sketch from Spain (Segovia). 1883. Published in *Teknisk Tidskrift* 1891, pl. 16.



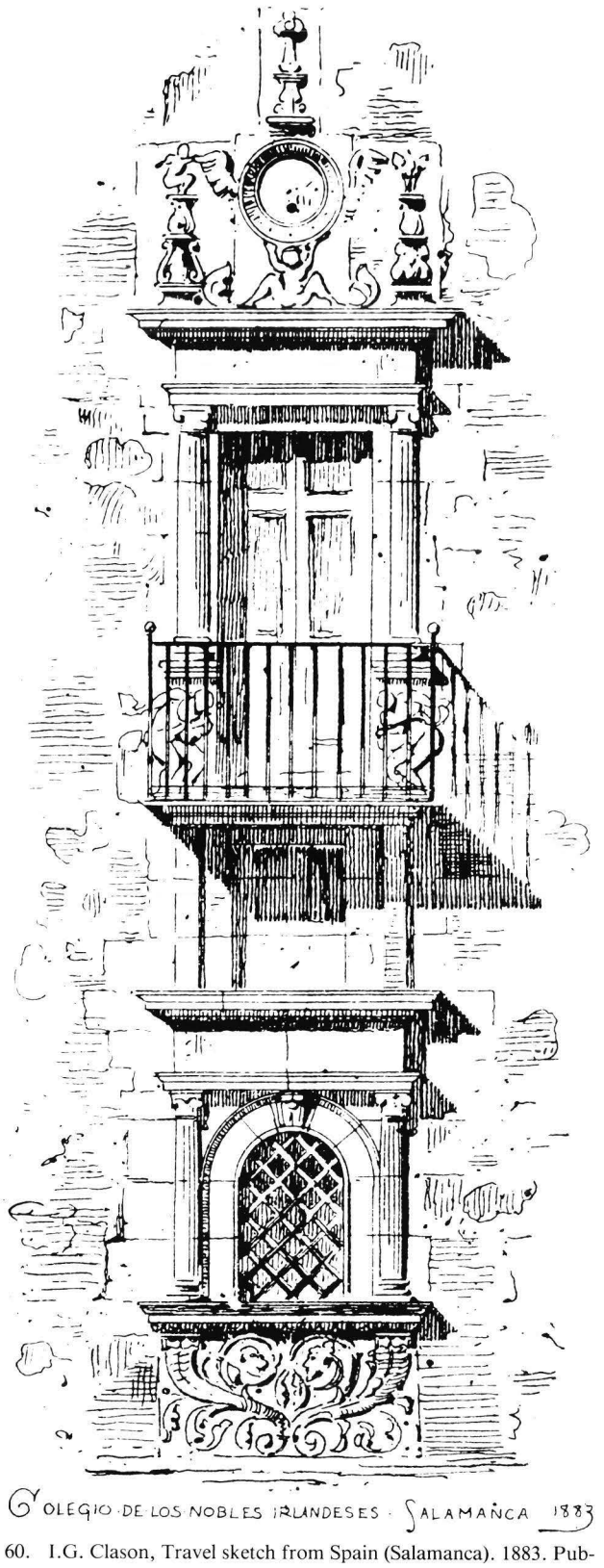
58. I.G. Clason, Travel sketch from Spain (Salamanca). 1883. Published in *Teknisk Tidskrift* 1891, pl. 17.

came, as it were, retranslated from Spanish into Stockholm standard diction once again. An undated sketch and an elevation with a cross section of the wall dated "Venezia 1885" (Fig. 59), both in the Swedish Museum of Architecture, restate the motifs of the first study while adding yet another Spanish motif: the rhythm of a window axis recorded by Clason in Salamanca (Fig. 60). It was this study that served as the basis for the final revision of the project (Fig. 61, 62), which Thavenius submitted for approval in June, 1885.[31]

As actually built, the façade of the Thavenius House featured no true materials whatsoever. The ashlars so lovingly rendered by Clason's brush were executed in plaster imitation where individual "blocks" were slightly varied in tone so as to perfect the illusion of real sandstone. The doorway decoration was cast in cement. About these details Clason wrote: "I 'dreamt' of them as carved in sandstone, but ultimately I planned them for plaster and gypsum."[32] Yet the Thavenius House must be considered in the context of the stone movement, just as in later times, the Einstein Tower belongs to the history of concrete architecture. Clason's creation ought to be judged according to its aims and ideas, rather than according to its incidental material properties. We recall that he had been impressed by the simplicity of Spanish granite architecture and by the individual characteristics of local traditions determined by the properties of available materials. The Spanish architects had turned the hardness of granite into a virtue by letting the façade appear plain and simple and by concentrating the sparse decoration on carefully chosen parts of the exterior. Although itself not yet built in real stone, the Thavenius House was, nonetheless, intended to show how a façade of true materials would appear. Like the brick and plaster Einsteinturm, it was a kind of natural sized maquette. As poin-



59. I.G. Clason, Doorway for the Thavenius House, Stockholm. Pen and watercolour. Dated Venice 1885. Sveriges Arkitekturmuseum. (Photo SR)

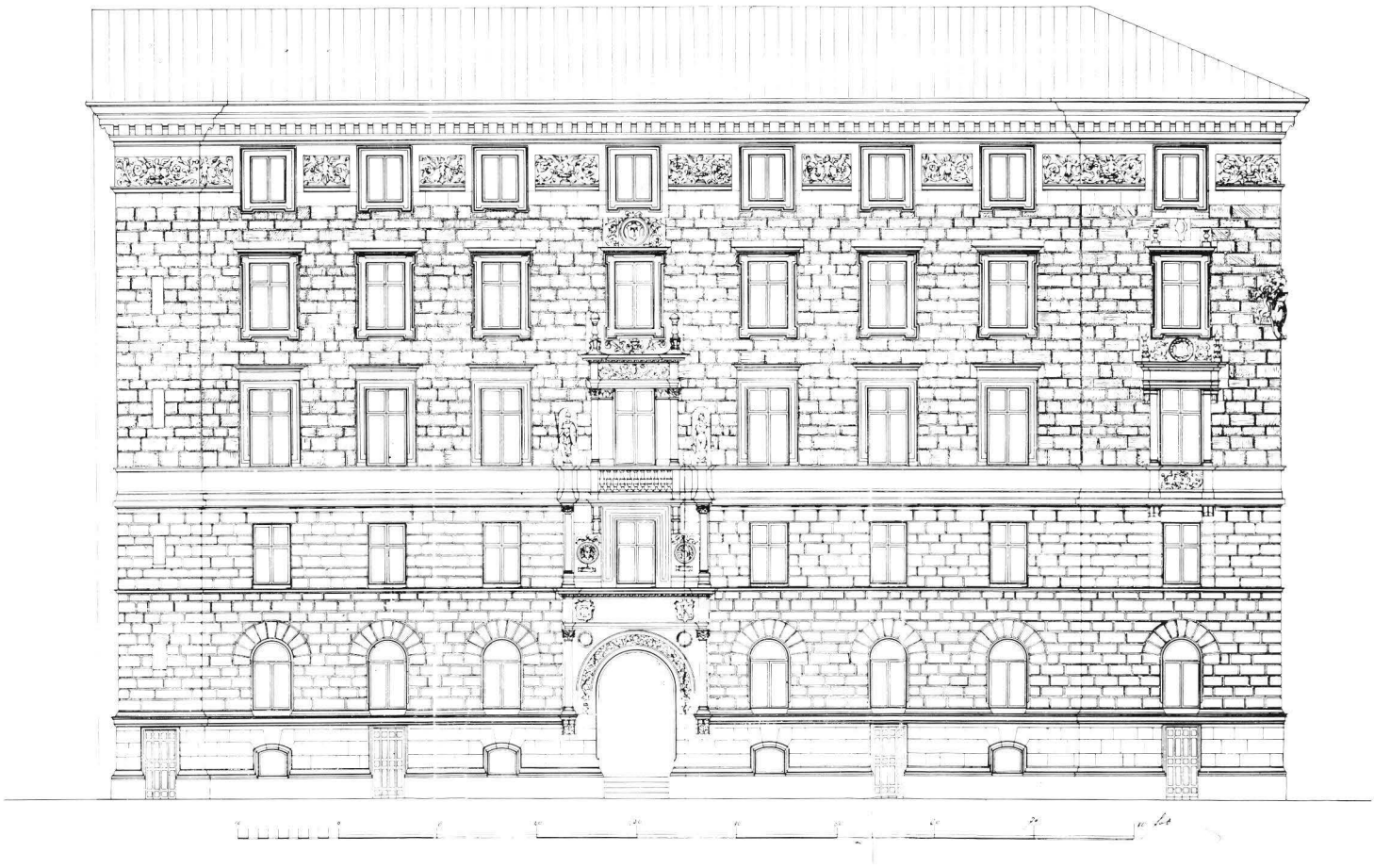


60. I.G. Clason, Travel sketch from Spain (Salamanca). 1883. Published in *Teknisk Tidskrift* 1891, pl. 17.

ted out by Edestrand, the Thavenius House gave Clason the opportunity to implement a programme formulated in a letter from Granada in July, 1883. "It is, for God's sake, walls that we are supposed to build, not windows. Windows are incidental apertures in the wall, and should appear as such instead of being fudged away with those d-d window fripperies. [...] Make the houses simple, but add a masterpiece here and there. No woman covers her whole body with jewellery."[33] A comparison between the earlier and the definitive version of the Thavenius House (Fig. 55 and 61) shows how Clason applied his principles in practice.

The Thavenius House remained an experiment, and there were contemporary critics who doubted that this type of architecture would ever become rooted in Sweden. "The building material already seems to preclude such a possibility; if an architectural style is based on a material which has to be imitated with trowel and paintbrush, it can hardly be regarded as natural for our conditions," one commentator wrote in 1889.[34]

Clason himself had to acquiesce in the prevailing conditions. Since a consistent use of stone for façades seemed out of the question, at least for the time being, he resorted to the true materials that were available.



61. I.G. Clason, The Thavenius House. Elevation. 1885. Stockholms byggnadsnämnd. (Photo SB)

Apart from the stone which had to be used sparingly, this meant brick or roughcast plaster, the latter being regarded as a straightforward, non-imitative coating with historical roots in the Swedish past. While still on his study tour in 1886 Clason received the competition programme for a vast structure to be built in Strandvägen by the timber tycoon Friedrich Bünsow. In his competition entry Clason deviated from the programme, choosing Francois I^{er} style instead of German or Italian Renaissance as required. And what was most important of all: Clason insisted that the house be built of limestone and brick.[35] The vast, 300 feet long façade of the Bünsow house evoked almost unanimous approval. The rhythmically grouped windows of varying size and the slight asymmetry of the gables were regarded as daring and as heralding a new era in Swedish architecture (Fig. 63). As for the materials, the bricks had to be imported from Pomerania, but the limestone was Swedish, quarried and worked at Yxhult in Närke and further sculpted on the building site by the brothers Gustafson, who were soon to become famous for their craftmanship.[36] Even if stone was not used for the entire façade, the sheer quantity of the limestone in the Bünsow House gave eloquent proof of the possibilities of the material. Ten years after the completion of the Bünsow House and at a time when excellent materials were already abundantly available, Clason ruefully recollected the troubles and difficulties in finding suitable stone and he made grateful acknowledgement to Adolf Kjellström, the limestone expert of Örebro (cf. above p. 32). Fortunate circumstances determined the choice of Yxhult stone. This stone occurred in thin layers only, a fact which excluded "all extravagances of form" and which "generally served as a regulator of the scale of details."[37]

But throughout the 1880's and well into the 1890's natural stone remained a material to be used only in conjunction with brick or, more rarely, plaster. After the Bünsow House Clason experimented with roughcast plaster in combination with hard stone,[38] and it was only in the 'nineties that he was given the opportunity to use stone for entire façades.

The fact that brick was used *faute de mieux*, as a substitute for natural stone that was still too expensive to be employed for the entire façade, is also reflected in the treatment of this material. In the Bünsow House

62. I.G. Clason, The Thavenius House. 1884-1885. (Photo SR)

Clason had executed all mouldings and ornamental modelling in limestone, whereas the brick portions represent a surface texture, a mere filling between the stone members. The Loire castles that served as Clason's models were not built of brick, nor would he have employed brick had he been given the opportunity to use stone instead. Clason's solution may be compared with the façade of a contemporary Stockholm building, where the brick material does indeed appear as a medium in its own right: the Beskow School (1886-1887; Fig. 64). This façade was designed by Gustaf Wickman, who was then working with the firm Isaeus & Sandahl.[39] Wickman reduced the Yxhult limestone to a neutral accompaniment to the discreet but distinct articulation of brick. The cornice, incidentally, is of sheet-metal, a solution of American origin which had been introduced to the readers of *Teknisk Tidskrift* in 1877 and also recommended by Magnus Isaeus in 1886, that is, as the building was being drawn in his office.[40] In the discussions about decaying plaster cornices (cf. above p. 23), sheet-metal ornamentation had been represented as a safe, rational and therefore genuine material.

Even in the 1890's brick and ceramic materials remained an alternative to natural stone, and in the beginning of the present century high-grade Swedish bricks, Helsingborg brick, did again achieve the position of a leading façade material. In the 'nineties we notice the same dualism as in the preceding decade: on the one hand brick is used as a mere substitute for the natural stone that the architect and builder would have preferred, on the other hand brick is employed with

63. I.G. Clason (façades), The Bünsow House, Stockholm. 1886-1888. (Photo SR)

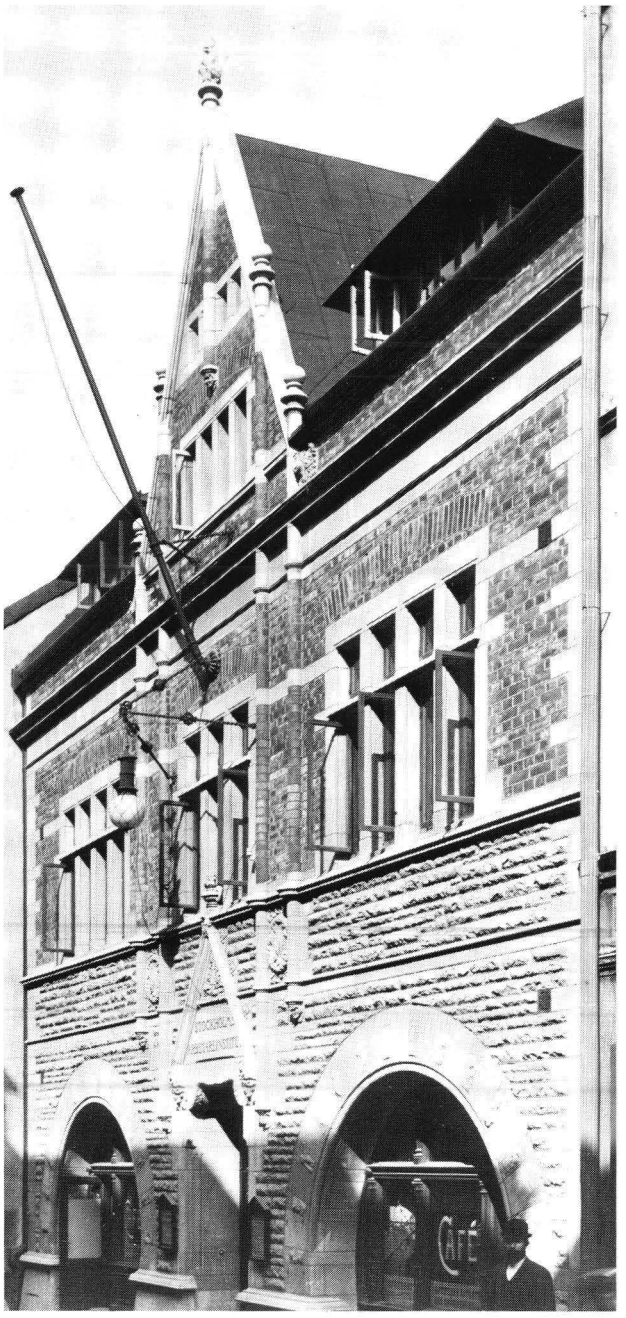
64. Isaeus & Sandahl, architects, The Beskow School, Stockholm (façade by Gustaf Wickman). 1886-1887. (Photo SR)

deliberate articulation stressing the properties of the material. It is the first mentioned practice, the use of brick as a substitute, that interests us in the present context. Thus the small building designed by Carl Möller for the Workers' Institute in Stockholm (1893; Fig. 65) was in its time much praised for the effect of its materials; yet the brick is used in this faintly Richardsonian composition as a mere surrogate for the more expensive Yxhult stone. As late as 1897 brick served as a mere filling in two Richardsonian façades in Gothenburg, the Dickson Public Library and the City Library (Fig. 66).[41]

The tendency to see brick as a substitute for natural stone is illustrated by a group of projects, where the facade material was changed while the building was already under construction. Such changes of plans became frequent in the 1890's as natural stone began to be marketed at competitive prices, in sufficient quantity and with persuasive arguments transmitted by professional journals.

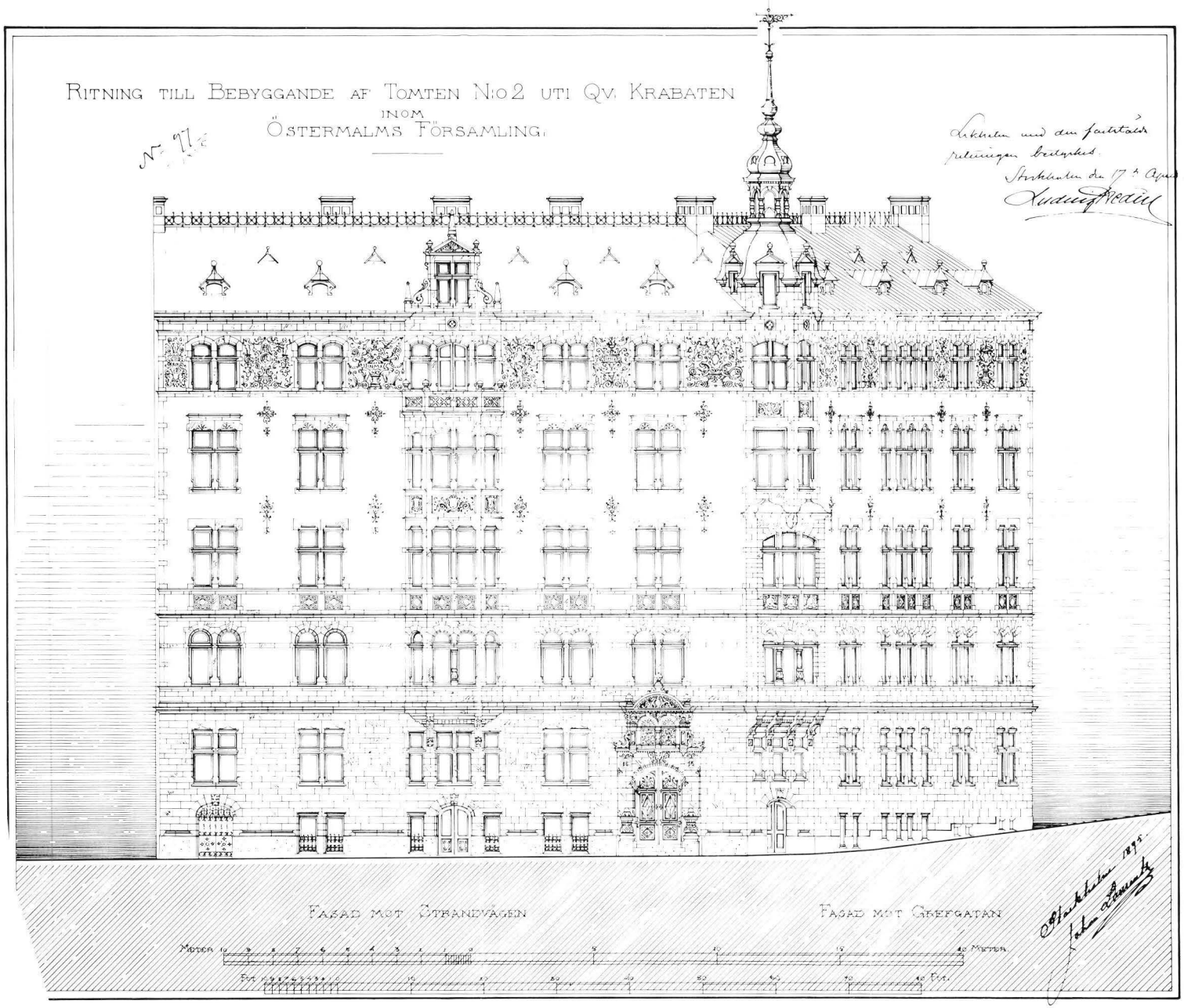
A case in point is a block of flats designed by Johan Laurentz for Strandvägen 15 in 1895 (Figs. 67-69). In April that year a façade in mixed materials was approved by the building authorities in Stockholm. Five months later Laurentz submitted a revised design, which was approved "on the condition that the stone blocks are with the utmost care bonded to the rest of the wall." Moreover, to ensure a proper drying of the inner brickwork, the Building Commission reserved itself the right to prolong the term stipulated before interior plastering could begin.[42]

In the 1890's the Building Commission of Stockholm had to print new application forms to meet the novel situation created by the various materials coming into



65. Carl Möller, The Workers' Institute (Stockholms Arbetarinstitut), Stockholm. 1893. Demolished. (Photo SSM)

66. Hans Hedlund, Municipal Library (Stadsbiblioteket), Gothenburg. 1900. (Photo SR)

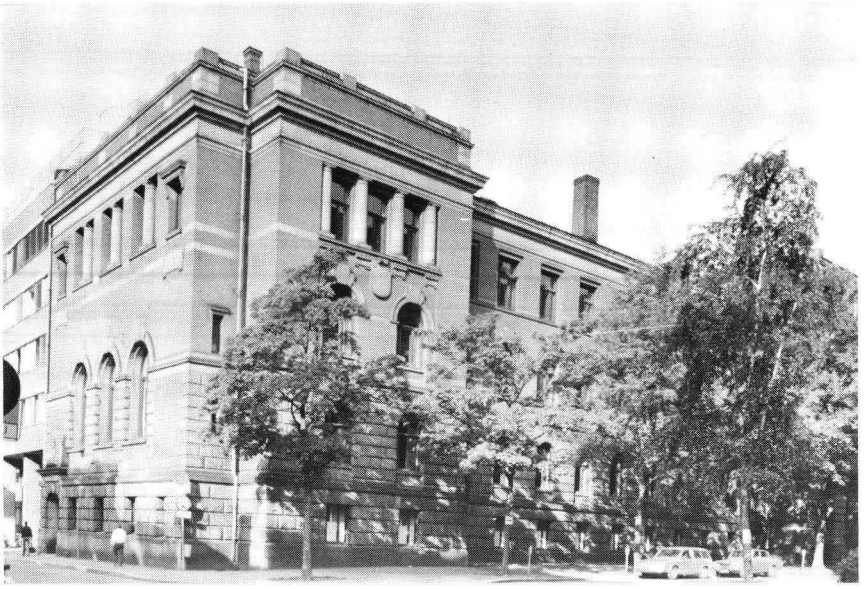


67. Johan Laurentz, Elevation for a block of flats, Strandvägen 15, Stockholm. Approved 17. 4. 1895. Stockholms Byggnadsnämnd. (Photo SB)

68. Johan Laurentz, Revised elevation for the block of flats Strandvägen 15. Approved 18. 9. 1895. Stockholms Byggnadsnämnd. (Photo SB)

69. Johan Laurentz, Strandvägen 15, Stockholm, with later alterations. (Photo SR)

70. Henrik Nissen, The Feemasons' Lodge, Oslo. Competition 1887, completed 1894. (Photo SR)

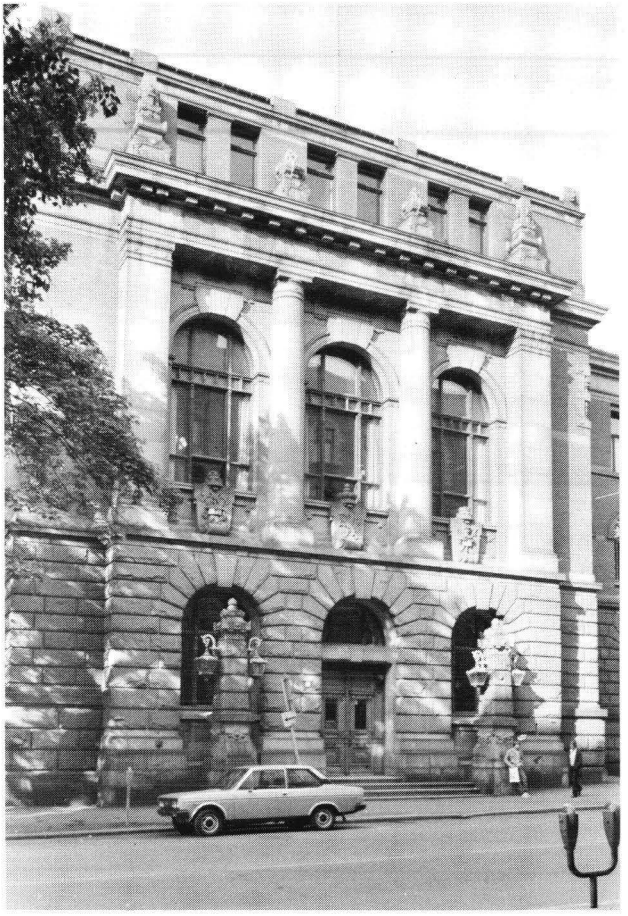


71. H.J. Sparre, The Court of Justice Building, Oslo. 1895-1903. (Photo SR)

fashion. A builder who planned ''an outer revetment of brick or limestone'' had to inform the Commission of his plans; the Commission then issued special instructions on how the work was to be carried out. Nonetheless, the demands of fashion and the availability of stone frequently caused builders to ignore the formalities. In the instance cited, the architect supplied a very imprecise design of the type of bond to be used (Fig. 68); the drawing of the wall surface does not even make a clear distinction between the alternating shifts of bond-stones and slabs. During the hectic development of the Strandvägen and the adjoining Östermalm region builders did not always remember to inform the building authorities of changes in the facade material. The Building Commission, in turn, seems to have had their papers mixed up.[43]

The change from brick to stone was usually made without any alterations of the design itself. This applies not only to fashionable dwelling houses; plans were improvised even for what was then called monumental architecture. In the 1890's we find examples of church designs, where brick was exchanged to stone without any alterations of the architectural forms. The Oscar Church in the Östermalm district is a case in point; here the House of God simply conformed with its secular neighbours in changing its attire from brick to stone in 1898 (Figs. 225-226). At about the same time the Finnish architect Josef Stenbäck changed his plans for the Juselius Mausoleum at Pori which was planned to receive a brick lining but which was actually carried out in sandstone. In monumental architecture the same phenomenon may be studied in the Nordiska Museet in Stockholm (Fig. 134-135) and the Government Building in Oslo (Fig. 148-149) — in the former case the transition from brick to stone occasioned no substantial alterations of the design, whereas in the latter case the architecture was completely remodelled to fit the new material (see below Chapter 8).

It was the casual attitude to the choice of material that prompted the geologist Lundbohm to remind the building profession of an elementary rule of archi-



72. H.J. Sparre, The Court of Justice Building, detail of central projection. (Photo SR)

73. Lars Solberg, Bergens Börs (Bergen Stock Exchange), today Bergens Bank. Competition 1896, built in 1893. (Photo SR)

tectural truth: ''The architect will hardly succeed in creating buildings answering both practical and aesthetical demands unless he recognizes the fundamental principle that the material must be chosen before he can design his elevations,'' Lundbohm told the Architectural Section in 1896. The architect's chances of creating a real work of art depend on his ability to adapt the construction and the distribution of the masses to the character of the material employed; this is not fully recognized by everyone, Lundbohm added. ''In order to succeed, the architect must draw with a specific material in mind, instead of first working out his elevation and only then beginning to look for a material that might fit his design.''[44] ''One should have thought that at least the planning of the parliament building of this country should have been preceded by investigations enabling the architect to design the elevations of the building with a view to the best materials available; but even these hopes have been thwarted.''[45]

In Norway the tradition of brick *rohbau* had been strong ever since the middle of the nineteenth century. The role played by brick architecture may be seen in the results of the major architectural competitions held during the last two decades of the nineteenth century. Until the late 'nineties, brick, or brick with details of natural stone, remained the only practical solution involving true materials at a realistic cost. In some cases (such as the Government Building, Figs. 148-149) the actual realization was delayed so much that the prize-winning design became obsolete and natural stone was chosen instead of the materials proposed originally.

In 1887 a competition was held for a new Freemasons' Lodge in Christiania. The winning entry was by Henrik Nissen, and the resulting structure was

74. Sebastian Gripenberg, The Suomi Insurance Company (today Helsingin Sanomat), Helsinki. 1893. (Photo SR)

completed in 1894 (Fig. 70). The facade is patterned with yellow and brown-red bricks imported from Silesia. Originally the material had been ordered from a Norwegian brick works, but the firm went out of business before it could deliver the order. The stone work represented an important breakthrough for several of the stone firms founded in the 1870's and 1880's (cf. above p. 35). Thus Erik A. Gude delivered the reddish syenite for the fundament and terrace, and N.S. Beer & Co made the columns and pilasters of grey Idefjord granite. Marble from the firm of Chr. Anker was used in the interior, this being the firm's first major consignment. Typical of this phase, however, was the lack of consistency in the choice of materials: the ornaments of the facade were made of *pisé* cement.[46] But just as in the case of Jacobsson's Skandinaviska Kreditbanken in Stockholm, this deviation from the straight path was condoned, and the building was presented as a model of the sound application of true materials. The classicizing Neo-Baroque style matches the conservatism in the use of materials; a few years later Nissen was to show similar prudence in his cautious application of ''national'' motifs in a basically academic composition, the Christiania Savings Bank (1898-1901; Fig. 168-170).

When the competition for the Court of Justice in Christiania was announced in 1895, the programme stipulated ''street façades without any imitated stone materials.''[47] The competition was won by H.J. Sparre, whom we met in connection with the debate on the national issue. In his use of materials as well as in his conservative, almost retarded stylistic conceptions, the Hannover trained Sparre carried on the tradition from Nissen into the twentieth century (the Court Building was completed in 1903). Sparre characterized his work as ''Italian Renaissance adapted to our specific conditions;''[48] we recall that he had recommended vigorous modelling rather than delicacy as better suited to the Norwegian dusk and dull lighting. The grey Idefjord granite is here made to contribute to this impression, being used for rebated rustication supporting a heavy Tuscan order with voluminous shafts (Figs. 71-72). Sparre's Tuscan severity has a parallel in a Finnish project of about the same date, that is, the official proposal for the Historical Museum in Helsinki (Fig. 155-156), although in this latter case granite has already been employed for the entire building.

In Bergen brick *rohbau* also had traditions from mid-century rationalism, and here, too, the renewed demand

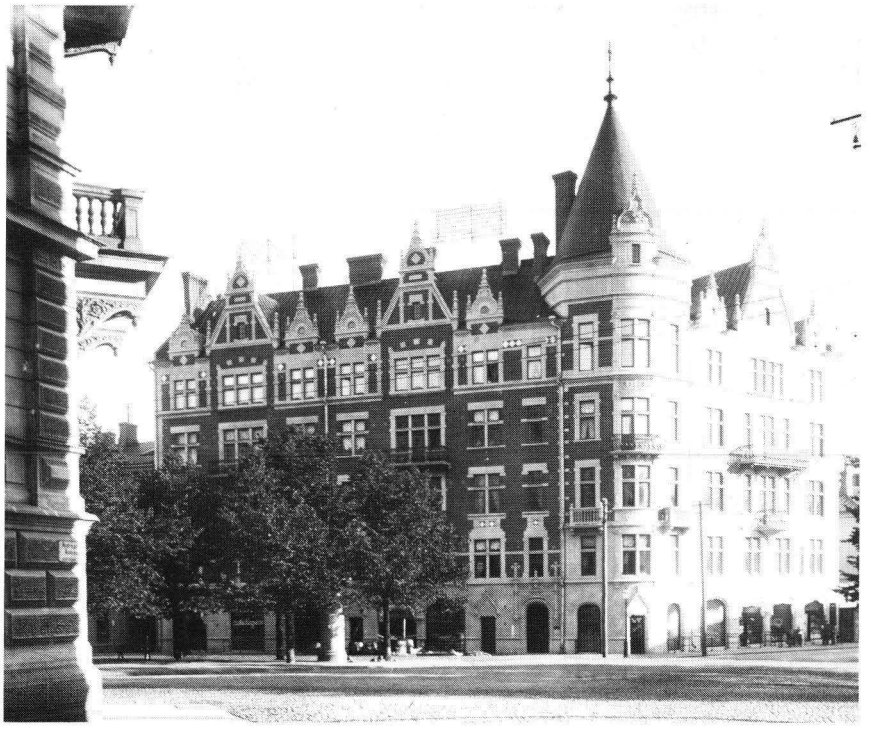
75. Sebastian Gripenberg, The Suomi Insurance Company, detail. (Photo SR)

for true materials resulted in combinations of brick and natural stone. In 1886 a competition for the rebuilding of the Bergen Exchange (A.W. Schiertz, 1862) was won by Lars Solberg, whose project was finally completed in 1893 (Fig. 73).[49] Solberg's façade is vividly modelled in both brick and stone, the latter being employed for quoins as well as for somewhat garish doorways, where Romanesque Composite columns are subordinated to coupled Tuscan columns, pushed, as it were, upwards by vigorous mezzanine mouldings.

The rationalist tradition in Finland was fed by impulses from Sweden. Isolated instances of brick *rohbau* are to be found in the first half of the nineteenth century, but the systematic use of the technique dates from the 1850's when the Swedish architect G.Th. Chiewitz settled in Finland. His House of the Nobility in Helsinki (1858-1862) was the first monumental building since the Middle Ages to have a brick façade. However, the shortage of soft building stone in Finland compelled architects to resort to substitutes if they wanted variation in the materials, a compromise that did not bother architects of Chiewitz's generation. But as the demand for true materials was raised again in the 1880's and 1890's, it was presented with a rigour that made compromise more awkward.

The merit of having revived the *rohbau* technique in Finland was early given to the Neo-Renaissance architect Theodor Höijer,[50] who, typically enough, often avoided the problem of supplementary materials by using brick throughout the façade. In 1893 a commentator in *Teknikern* deplored the fact that *rohbau* was not used more extensively in Finland, comparing the situation with that in Sweden, where especially the Berlin school had won numerous proselytes. His reflections were occasioned by a presentation of tinted cement bricks manufactured by a firm in Helsinki, a material which the writer welcomed as a new contribution to the struggle against plastered façades.[51]

Just as is Sweden and Norway, compromises were



76. Grahn-Hedman-Wasastjerna, The Argos House, Helsinki. 1897. (Photo A.E. Rosenbröijer 1897, HKM/HSM)

accepted in Finland, too. Under the aegis of Sebastian Gripenberg, director of the Board of Buildings, numerous public buildings were built with brick façades and plaster or cement ornamentation.

Although not a public building, the Offices of the Suomi life insurance company illustrates the practice, while at the same time addressing the beholder with the idiom of material rationalism (Figs. 74, 75). The building was completed in 1893, and its ''modernized German Renaissance'' greeted with enthusiasm. The brick and granite, not least the polished columns delivered by Ab Granit, were said to convey ''the total impression of that solid elegance, which first and foremost speaks, on the one hand, through the truth of the material and the relative simplicity of form, and, on the other, through well balanced proportions and the delicacy of the details.'' When an insurance company builds its own building, this should convey the impression of the owner's solidity, and the Suomi building was in that respect a success; just as in the case of Skandinaviska Kreditbanken in Stockholm and the Freemasons' Lodge in Christiania, the cast and pisé beton details were liberally placed under the heading ''true material.''[52]

If softer stone was used, it had to be imported. In 1897 an unusual commercial building was completed in the centre of Helsinki: the Argos house drawn by the firm Grahn, Hedman and Wasastjerna (Fig. 76).[53] Mainly responsible for the design was the Swedish architect John Settergren, who had come to the Finnish architectural firm after working with I.G. Clason, whose Bünsow House (Fig. 63) was frankly plagiarized in the Argos, a fact which was, of course, noted by contemporary critics.[54] The stone details were made of Swedish limestone, and it was perhaps this building that J.J. Sederholm had in mind when he told an audience of Finnish architects in 1898: ''If, with slight modification, we restrict ourselves to employing the building methods and architectural styles that are in use in Sweden and other countries where soft stone is available, then, it is to be feared, we shall in the future have to import not only the architectural style but also the stone in which we are to build.''[55] To the younger generation of architects the Argos House was a challenge, an example and a warning. It was the first modern building in Finland to be built in true materials, but it also posed the problem of an adequate and original style for the ''new'' materials.

7. THROUGH STONE BOOM HISTORICISM TO "MODERN TASTE"

It is hardly surprising that in Norway and Sweden, as well as in Finland, the first buildings to have stone façades were built by banks or insurance companies, institutions that were likely to have the necessary means as well as the inclination to manifest their solidity in architectural terms.

In fact the earliest of these projects, the Trondhjem Savings Bank (Fig. 77), was undertaken by a board of directors haughtily ignoring the board of representatives. In June 1879 the architect Adolf Schirmer presented his plans and estimates for a new building. Two years later a meeting of the representatives found that "an excessively vast and expensive building operation had been initiated without the Representatives' consent or appropriation;" but realizing that there was little to do except to go on, the meeting authorized the directors to complete the project. In November, 1882, the bank took possession of its new premises.[1] Schirmer's building combines a front of vaguely Venetian character with corner towers suggesting Loire castle architecture. This combination was no invention of Schirmer's. It had been used a decade earlier by Constantin Lipsius in the Chemnitz Exchange (Fig. 78), which Schirmer may have seen in the original or in the *Deutsche Bauzeitung*, where it had been published in 1871.[2]

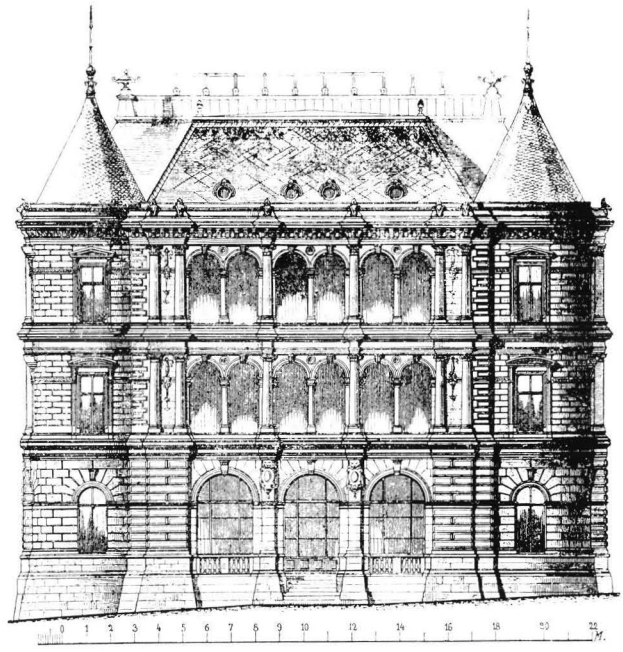
There is no explicit evidence to explain why stone was chosen for the facade of the Trondhjem Savings Bank. However, Adolf Schirmer was the son of Hermann Ernst Schirmer, the leading figure of the mid-century rationalist movement and the architect of *rohbau* buildings in Trondheim as well as in the Norwegian capital. In the 'seventies Adolf Schirmer had attended the Berliner Bauakademie and the École des Beaux-Arts in Paris. The Trondheim Cathedral had been under restoration since 1869, until 1871 under the direction of Adolf's brother Herman Major Schirmer. This campaign had called attention to the stone resources of the Trøndelag region. However, in the bank building only the more delicate details were carved in the famous local soapstone, whereas for the main expanse of the façade another local variety, a hard quartzite sandstone from Hovin was used.[3] Both stones are almost the same dark grey colour.

The comparative richness of the Bank façade and the fact that the architect and builder so readily resorted to soapstone for the more articulate details is revealing: it goes to show that the intractable sandstone was not chosen in order to justify a simplification of the architectural forms. Although this argument for choosing natural stone was known at the time, it does not seem to have been topical in this case. Later on, Adolf Schirmer did indeed comment on the salutary effect of stone construction, but this was as late as 1896, when the argument had already become a commonplace reiterated in almost every discussion about materials.

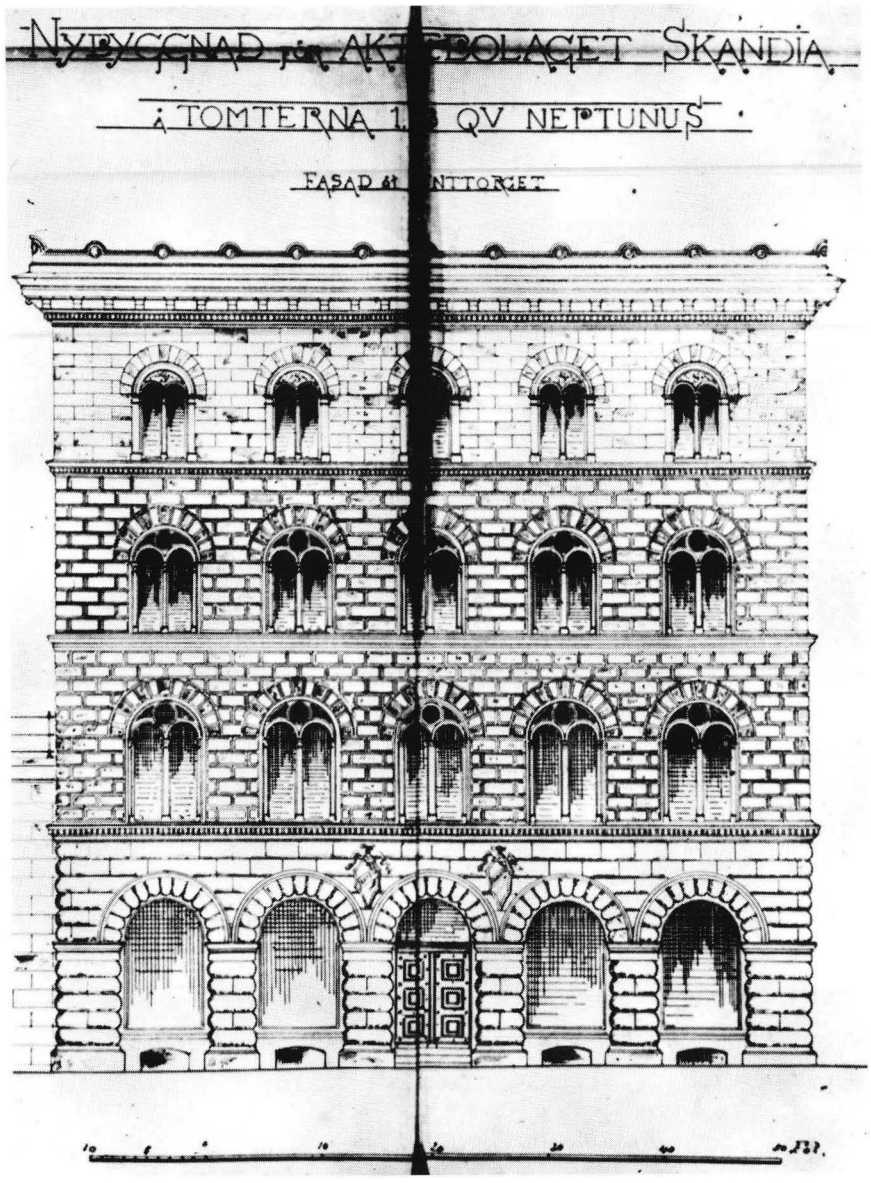
77. Adolf Schirmer, Trondhjem Sparebank. 1879-1882. (Photo SR)

The Savings Bank remained an important precedent. The occasion just mentioned, a well attended discussion arranged in 1896 by the Norwegian Association of Engineers and Architects on the topic "The Use of Cut Stone in our Architecture", was introduced by Adolf Schirmer, who showed drawings and photographs of the building. "By that time," the audience was told, "there were many difficulties connected with the use of natural stone, not least acquiring it. Thus a separate quarry had to be opened several miles from the town, workmen had to be trained etc. Later on, there were several churches built of natural stone in the Trondheim region (Ilen, Melhus and Orkdal)" (see Figs. 235, 238-239).[4]

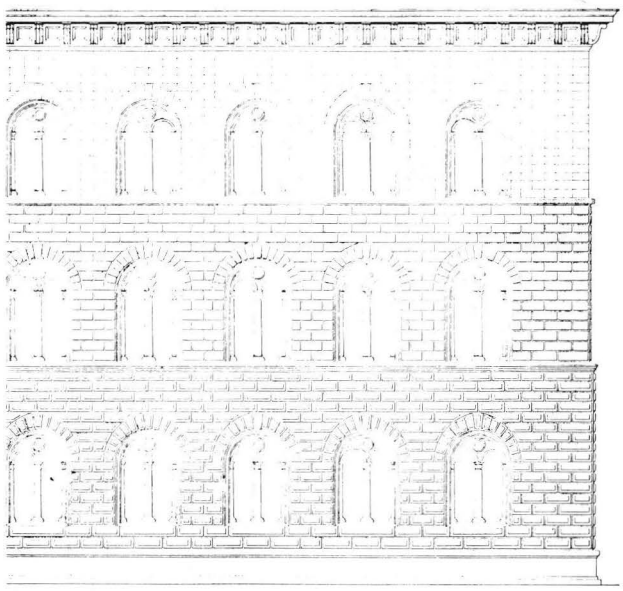
The first Swedish building of the period to receive a stone façade was the insurance company Skandia, mainly thanks to the extravagant doings of its managing director, Elis Fischer, whose lack of prudence in other matters led to his dismissal before the building was begun. Fischer, it would seem, had himself made plans for a new building on the former site next to the



78. Constantin Lipsius, Exchange, Chemnitz (Karl-Marx-Stadt). 1865-1867. From L. Klasen, *Grundriss-Vorbilder,* Abth. VI: *Gebäude für Handelszwecke,* 1884, fig. 514.



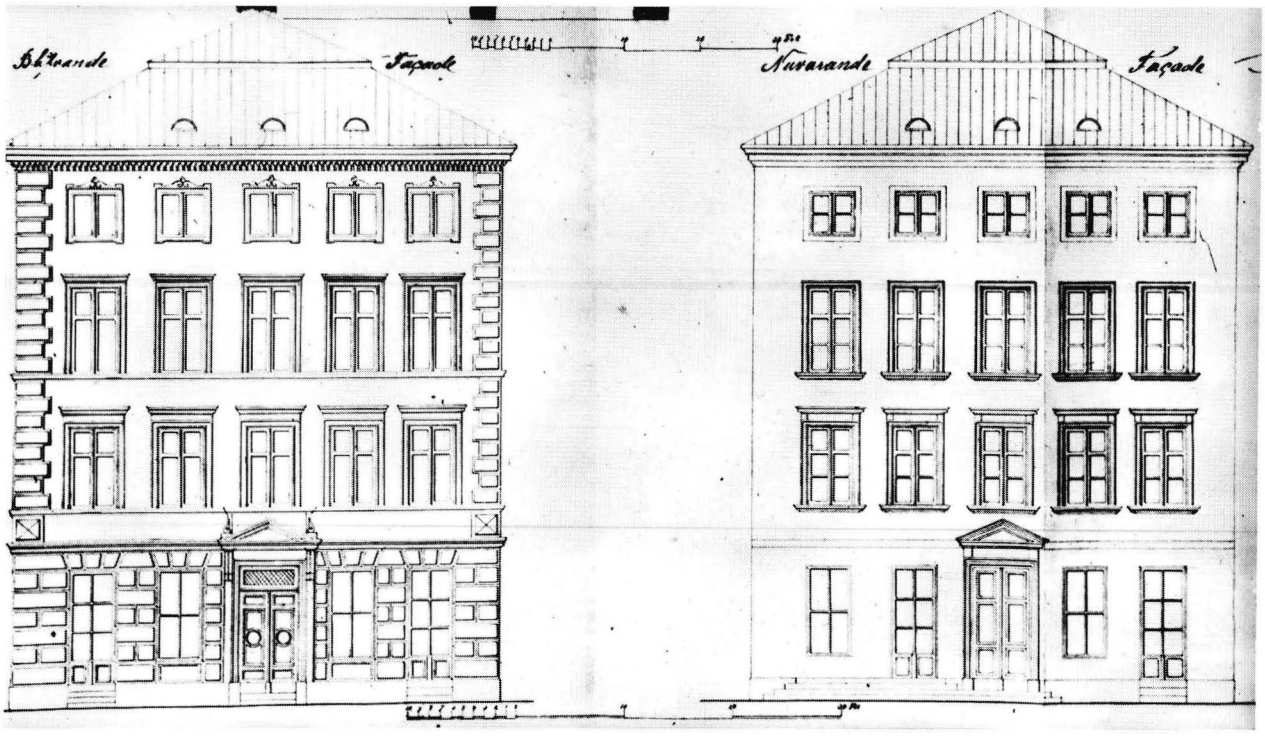
79. Magnus Isaeus & Carl Sandahl, Skandia Insurance Company, Stockholm. Elevation ca 1886. Skandia, Historiska arkivet. (Photo Skandia, Hist. Ark.)



80. Ernst Ebeling, Höhere Gewerbeschule in Hannover. From *Zeitschrift für praktische Baukunst,* 1846, pl. 1.

Royal Castle, and at a board meeting in June, 1886, he suggested that a competition be arranged to procure a suitable façade design. The competition did not yield the expected results, and in July Fischer persuaded his Board to call in the services of the firm Isaeus and Sandahl; at the same time the manager and Sandahl were authorized to travel abroad on a study tour. In October a report on the tour was presented to the board. At the same time the two architects were reported to be working with the elevation, which was presented to the Board in November; by this time Fischer had already been dismissed. The elevation in question, which showed the principal façade towards Mynttorget, may have been identical with one still in the archive of the Skandia company (Fig. 79). In any case it was approved by the Board, and the architects were authorized to work out the remaining façades on this basis. The construction of the Skandia head office took three years and the premises were inaugurated in the autumn of 1889.[5]

The Florentine appearance of the Skandia façade is deliberately obvious, providing the desired associations to solidity and commercial traditions. The walls are



81. The former Head Office of Skandia, demolished in 1886. On the left, suggested rebuilding; on the right, existing state in 1886. Elevation, unsigned and undated. Skandia, Historiska arkivet. (Photo Skandia, Hist. ark.)

built in brick with a lining of stone. There is no alternation of binder shifts and slab courses; on the contrary the masonry suggests a construction more solid than the one actually employed. The diminuendo pattern of the masonry is conscientiously regular, betraying the architects' schooling in the *Rundbogenstil* tradition (cf. Fig. 80). The composition is the simplest possible, and it reflects the façade of the seventeenth-century house that preceded the new offices on the left-hand half of the site (Fig. 81, right). Before their decision to build a new head office, the board had contemplated rebuilding the old house (Fig. 81, left). By conserving the axiality and storeys of the façade, the Skandia company added a suggestion of continuity to the associations already listed (Fig. 82). A certain colour effect was achieved by using two varieties of grey granite, a darker shade for the foundation and the rustication on the ground floor level (Stockholm granite) and a lighter one for the upper three storeys and the cornice (Malmön granite).[6] The transportation of the granite from the West coast was interrupted by the hard winter of 1887-1888, which resulted in a delay of the schedule.

The Skandia building became an important precedent showing that from now on the oft-repeated demand for natural stone was not merely theoretical. The consistent use of real stone represented a decisive step from Jacobsson's Skandinaviska Kreditbanken (completed in 1878). Stone was available for those willing to pay for it, and as for delays in the delivery, this was a disadvantage to be counted with in the case of other building materials, too.

Even outside Sweden the Skandia building was referred to as an example. In order to prove the safety of granite, Hans Reusch quoted a report by Lundbohm where the Skandia house was represented as an entirely successful construction, even as regards the moisture otherwise problematic in granite buildings.[7] From the artistic point of view, however, few contemporary commentators did find much occasion to praise it. The *litterateur* and Stockholm chronicler Claes Lundin seems to have been alone in calling it "one of the more remarkable Swedish buildings of this entire century."[8] Critics with professional competence usually passed over the architecture of the Skandia building without comments, but with an approving nod at the honest use of the material.

Nor was the Florentine model adopted by any of the progressive Swedish architects of the period, although in Gothenburg and in the province it is true, a number of banks and insurance companies followed Skandia's example, sometimes with more, sometimes with less genuine materials in the façade.[9] It is typical that the only major Swedish architect to continue this tradition was Aron Johansson, the man responsible for the conservative Parliament and State Bank complex so mercilessly criticized by contemporaries and later commentators (1892-1906; Fig. 140-141). In 1891 Johansson had travelled on the Continent and in Britain to study bank architecture, and in 1894 he won a competition for the Stockholm Savings Bank with a project comprising three alternative façades, one Baroque, one Italian Gothic and one Italian Renaissance.[10] The bank board preferred the Florentine option, where Johansson economized by using plaster for the upper two storeys, an expedient that was criticized in *Teknisk Tidskrift*, where a writer would rather have had granite for the entire façade.[11] The conspicuous rustication and quoins are built in Graversfors granite (Fig. 83), a variety which, we recall, impressed Mrs. Blanche Dickson so much that she chose it for her Tjolöholm (see above p. 59-60).

82. Magnus Isaeus & Carl Sandahl, Skandia Insurance Company, Stockholm. 1886-1889. Original state, photograph from 1889. From *Försäkringsbolaget Skandia 1855-1905,* 1905, pl. facing p. 208.

The strongly projecting cornice of the Stockholm Savings Bank built in granite, limestone and copper lined wood also caught the attention of the *Teknisk Tidskrift* critic. In 1886 the construction of cornices had been taken by the young Ferdinand Boberg as a starting-point for a long meditation on the true nature of the "good Italian Renaissance", so thoughtlessly and dishonestly copied, and therefore sometimes unjustly criticized. In the Palazzo Strozzi the cornice projects no less than two metres, being built of enormous self-

83. Aron Johansson, Stockholm Savings Bank. 1894-1897. (Photo SSM)

84. G.W. Nerman (?), Birger Jarlsgatan 10, Stockholm. 1890-1894. (Photo SR)

supporting blocks that remain sound after 450 years. The solution is thus conditioned by local conditions in Florence, where stone can be had for the purpose. Compare to this, Boberg argued, the Palazzo Fava in Bologna where the architect has been restricted to brick construction: here the cornice projects a mere 50 centimetres to a height of one meter. But the brick cornice, too, is self-supporting and it has also remained sound to this day. What is more: it presents a magnificent appearance. Both solutions are equally valuable, being based on local materials and rational principles. In contrast to these sound solutions the heavy plaster of Paris cornices of Stockholm send cold shivers down one's spine, pasted as they are onto baskets of rail and band-iron. To Boberg the two Italian cornices were paradigms of rational honesty and hence models for contemporary architecture.[12] That Boberg chose cornices as an example was no coincident. From the 'eighties on, crumbling and crashing corniches had become a stock argument against "dishonest" plaster architecture of Continental origin (cf. above p. 23). It is against this background that we should regard the self-conscious display of solidity in the Savings Bank cornice composition.

*

When in the 1890's freestone became available for builders, Swedish architects set about to meet the challenge of adjusting their style to the "new" material. Three distinct lines of development can be discerned in this process: (a) *a revised historicism* based on models chosen from such historical periods as were known for their excellence in handling stone, notably French and Spanish Renaissance, (b) *a tentative turn to the archi-*

tectural heritage of Sweden, with an emphasis on the Baroque and the eighteenth century, and (c) *a search for a contemporary architectural idiom* emancipated from historicism. The first mentioned trend had already been initiated by I.G. Clason with his Thavenius and Bünsow Houses in the 1880's, but it can be followed up to the turn of the century. The second trend was also initiated by Clason and comes to the fore in the mid-nineties; after the turn of the century it was to become a major movement in Swedish architecture, although in a different material medium: whitewashed brick and plaster. The third trend, which received its main inspiration from British and American sources, was widely thought of as the fulfillment of the dreams of a true rejuvenation of architecture; it was closely parallelled in Norway and Finland, where it early assumed a strongly national imprint.

What seems to be the first complete freestone façade in Sweden belongs to a building curiously neglected by architectural historians, a small block of flats with shops at Birger Jarlsgatan 10 (Fig. 84). The authorship is not quite clear. Georg Hesselman names G.W. Nerman as the architect and contractor.[13] However, the plans and elevations (submitted 24.2.1890), which are extant in the archive of the Building Commission, have no signature. Among the documents pertaining to the building permit is a letter of attorney for the architect Ernst Haegglund, empowering him to appear before the Building Commission on behalf of the owner; why G.W. Nerman (if indeed he had designed the building) was not empowered to perform this task remains uncertain.[14] The facade is in many respects remarkable. First, it is not only executed in stone throughout, but indeed planned and designed as an integral whole; that is, it lacks the horizontal main division which marks so many contemporary and slightly later compositions, where it seems to suggest that half-brick-half- stone still remained an alternative, although this time the builder could afford an all stone facade. Second, the vigorous modelling and the simple decoration show a surprisingly mature grasp of the material, an unevenly coloured sandstone. In fact the bond pattern suggests a "squared and tooled rubble laid to courses." The grouping of the windows with the bay motif and the suggestion of massivity achieved by means of a sculptural treatment of the apertures are other features that were possibly learnt through a study of British examples (cf. Fig. 99). The projecting timber roof shadowing the topmost part accompanies the vigorous modelling; such roof constructions were discussed in the period and praised for their rational application of a natural material.[15]

In comparison with this important example, the work of Erik Josephson (1864-1929) seems less assured, although it became well known and even praised as a manifestation of the novel use of materials. After his graduation Josephson went on a study tour to the Continent (1888-1889), where he took an interest in Gothic,

85. Erik Josephson, Industrikreditaktiebolaget, Munkbron 9, Stockholm. 1891-1893. (Photo SR)

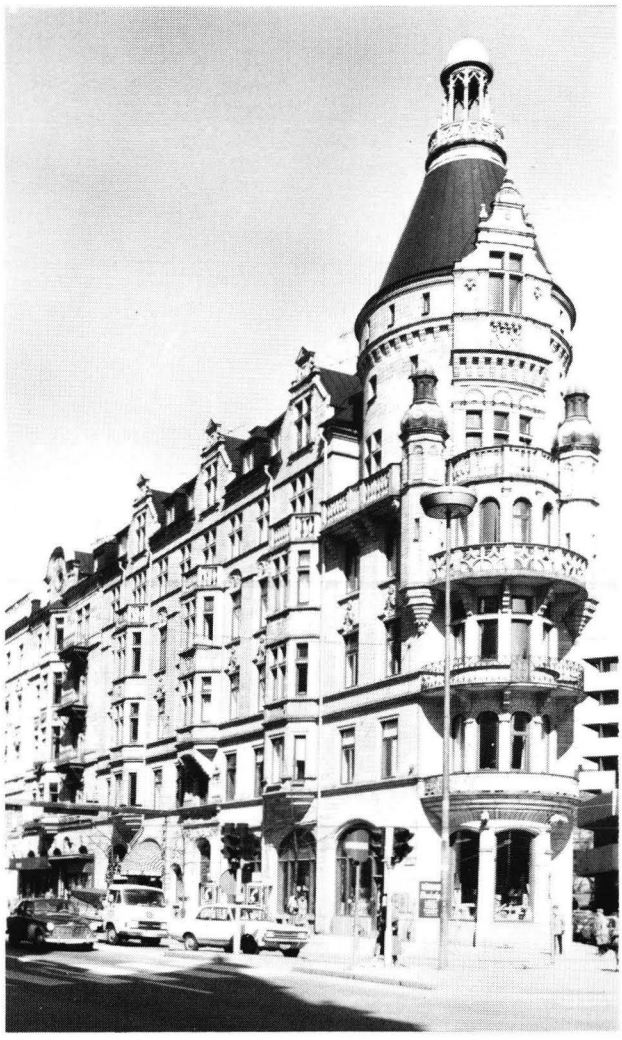
86. Erik Josephson, Industrikreditaktiebolaget, detail. (Photo SR)

especially French Gothic. As demonstrated by Anne-Mari Neovius, Josephson made direct quotations from the Castle of Blois and the Cologne Town Hall in his façade for the Industrikreditaktiebolaget (1891-1893; Fig. 85-86).[16] The lining was made of Yxhult limestone, whereas the details were executed in a variety of materials: the sculpture with their canopies of Gotland limestone, first storey column shafts of granite, and the second storey columns of alternately diabase and gneiss.[17] Despite the careful attention to ornamental detail, the total effect is one of shallowness and flatness, an impression enhanced by the slipshod execution of the upper storey slab revetment, where the doubled binder shifts look like repairs although they do appear this way already in the original elevation.[18]

Josephson's relative indifference to the subtler shades of the material also appears in one his best known buildings, the Danelius House (1898-1900; Fig. 87). Like the Industrikreditbanken, it contains direct loans from French architecture; moreover, this work belongs to the group of speculative Stockholm buildings, in which a planned lining of brick and stone was in the last minute and without much further ado changed to one of stone only.[19] The material is again Yxhult limestone. The Danelius House was severely criticized by Ragnar Östberg in 1901:

> In the building no. 20, Birger Jarlsgatan, also entirely lined with dressed stone, the architect has dismissed his better self and completely ''let the plaster of Paris devil loose'' — as we would have said when we were young in the 'eighties. Here, however, forms suitable to plaster of Paris have been cut in stone, whereas the older generation was content with casting stone forms in plaster. This sort of architecture is incoherent, careless and brutal, and the whole complex signals an alarming decadence of the art of building in stone.[20]

Östberg's comment is a revealing example of the power of the aesthetic categories and valuing criteria based on the stone building dogmas: by the turn of the century the type of historicism represented by Josephson was hopelessly out of date. A smaller project from 1895-1897, a block of flats and shops in Biblioteksgatan 9 (Fig. 88), shows Josephson trying to find a way out: there are pretty Gothic ornaments around the entrance



87. Erik Josephson, The Danelius House, Birger Jarlsgatan 20, Stockholm. 1898-1900. (Photo SR)

88. Erik Josephson, Block of flats with shops, Biblioteksgatan 9, Stockholm 1895-1897. (Photo SR)

and in the coping of the corner, but the wall itself is left undecorated, with the regular coursed rubble pattern as the only articulation. We recall that a little before this Lundbohm had propagated the use of rubble; by this time more progressive architects had also begun to experiment with rubble. The bond is also suitable for the material chosen, hard Roslagen sandstone, which can be had only in smallish stones of varying size and colour. Josephson may be adduced as the leading figure of the whole generation of Stockholm architects working in a late Neo-Gothic style and serving the needs of speculative builders. Among the numerous buildings of this type that are still extant, a block of flats by Erik Boström in Birger Jarlsgatan 26 may serve as a case in point; typically, the application for a building permit mentioned "limestone and brick" as the facade materials (1897-1898; Fig. 89).[21]

The leading figure of the historicist tradition in Swedish stone rationalism, I.G. Clason, had to wait until 1893 for an opportunity to work entirely in stone. In March that year Clason and his associates began to plan one of the most luxurious private residences to be built in Sweden in modern times: the Hallwyl Palace (1893-1898; Fig. 90). The building became a lavish specimen collection of the best materials to be had in Sweden, notably stone, and it was described in minutest detail in the lavish catalogue which was issued in accordance with the terms of the Hallwyl bequest to the Swedish Crown.[22]

In the Hallwyl Palace, at last, Clason could demonstrate the value of the formative principles that he had seen at work in Spanish architecture a decade earlier.[23] In the granite regions the hardness of the stone had resulted in the utmost economy of ornamentation, whereas the soft sandstone in other parts favoured a rich articulation. But the façade of the Hallwyl Palace was lined with pink Gävle sandstone, which happens to be very hard to work. Although he had described the sandstone architecture of Salamanca as particularly lavish, Clason also reproduced examples of this tradition (Fig. 91) which were just as sparingly decorated as any granite façade from Segovia (Fig. 57). The truth, it seems, is that Clason preferred calculated simplicity to lavishness. The doorway of Casa de Dª Maria la Braba is one of several travel sketches by Clason which foreshadow the Hallwyl entrance. As a whole the

89. Erik Boström, Birger Jarlsgatan 26, Stockholm 1897-1898. (Photo SR)

90. I.G. Clason, The Hallwyl Palace, Hamngatan 4, Stockholm. 1893-1898. (Photo SR)

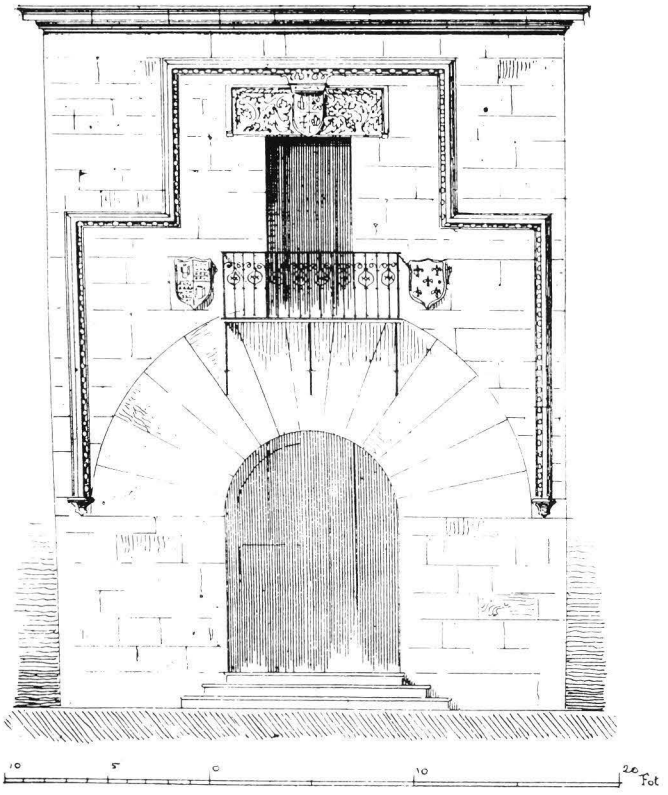
Hallwyl façade was made to prove Clason's general principle that natural stone will lead to a simplification of form. The gallery of the second storey may be seen as a concession to a taste for Venetian motifs in Stockholm architecture of the 1890's.

Not least thanks to Clason's own writings the Spanish associations of the Hallwyl façade became common knowledge. But as the building was completed in 1898, historical quotation had already gone out of fashion. A certain reserve was expressed by Ferdinand Boberg, who was only a few years younger than Clason, but a more innovative architect. ''Personally, I shall always wonder why, in 1898, in Hamngatan in Stockholm, an architect of Clason's enormous talent should build a house with an exterior [..] openly presenting an obvious compilation of old, mainly Spanish architectural and decorative motifs with a few local modifications.''[24] But Clason was too old to try another tack. As the Hallwyl Palace was nearing completion, he planned a gothicizing Gotland limestone façade (Fig. 92), which despite its careful execution, belongs to the same current as the less inspired creations coming up in Strandvägen and Birger Jarlsgatan (Fig. 89).[25]

The Hallwyl palace formed a direct and indirect inspiration to several Spanish-Venetian façades, where a smoothly dressed stone surface is enlivened by a delicately modelled accent, symmetrically placed in the middle, and extending over several storeys. In the hectic atmosphere created by the building boom in Stockholm during the 'nineties, reactions to novelties were swift. In August, 1897 the architect Sam Kjellberg submitted an elevation for a block of flats and shops at Birger

Jarlsgatan 24. This first design showed a façade with circular arches, a central gable, a tower and bay windows on one side. However, in April 1898 Kjellberg submitted a new version, which was entirely different and followed the Spanish-Venetian formula: ogee arches, discreetly modelled windows and a coping crowned with a balustrade (Fig. 93).[26] The stone employed for these elegant forms was white Ekeberg marble.

Spanish Gothic and freestone was taken up in the provinces, too. In Lund the architect Nils Arwidius designed an elaborate façade in light grey sandstone for a local industrialist (Fig. 94).[27] In Stockholm Ludvig Peterson, the first Swedish architect to make a study tour to Spain (1881-1884), had designed "Moorish" interiors in the 1880's. In 1896 Peterson designed the Artists' Club in Stockholm (Fig. 95). As recently shown by Johan Knutsson, the facade of this building incorporates direct borrowings from Spanish architecture.[28] The material is Portland stone, and the building remains one of the very rare instances where natural stone was imported for the facade. In Ludvig Peterson's development the Artists' Club represented, at one and the same time, a late reminiscence of the architect's Spanish impressions and a temporary excursion due to the de-

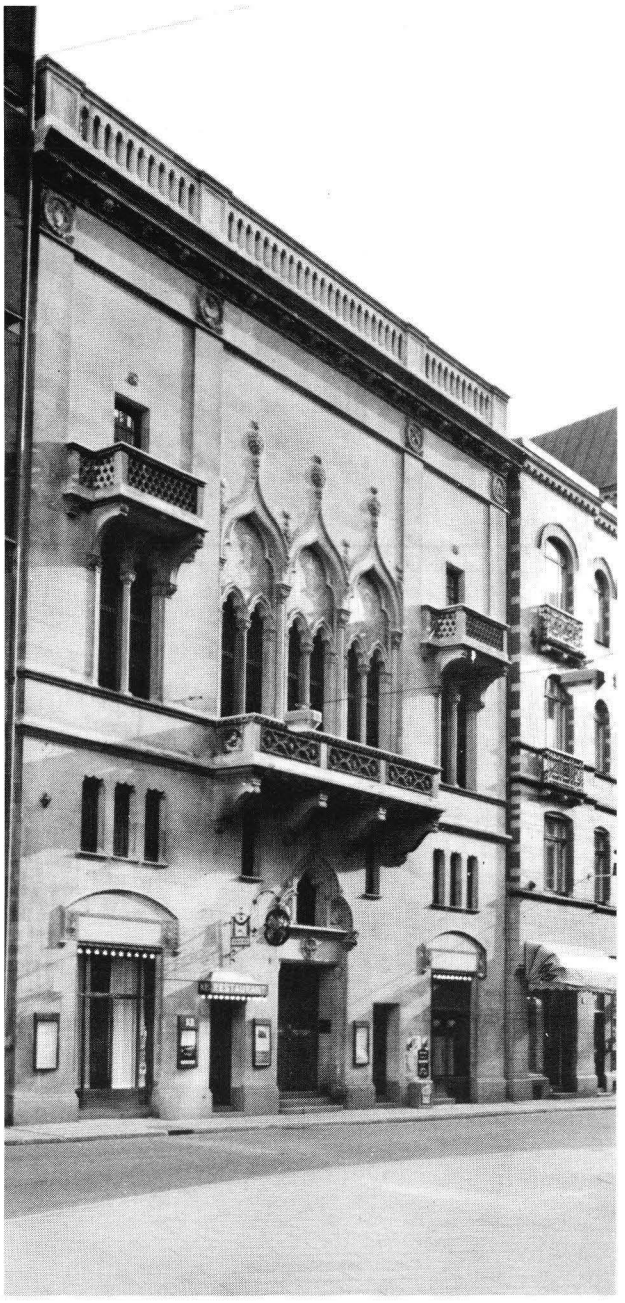


91. I.G. Clason, Travel sketch from Spain (Salamanca). 1883. Published in *Teknisk Tidskrift* 1891, pl. 15.

92. I.G. Clason, AB S:ta Birgitta, Regeringsgatan 80, Stockholm. 1898-1901. (Photo SR)

93. Sam Kjellberg, Birger Jarlsgatan 24, Stockholm. 1897, 1898-1900. (Photo SR)

94. N. Arwidius, The House of Carl Holmberg, Bantorget 4, Lund. 1898-1899. (Photo SR)



95. Ludvig Peterson, The Artists' Club (Konstnärshuset), Smålandsgatan 7, Stockholm. 1896-1898. (Photo SR)

mands of the occasion. Two years before the Artists' Club he had already planned a building that was greeted by the critics as pointing to the future rather than as evoking the past (Fig. 100); in 1894 he had also collaborated with his partner Ture Stenberg in a markedly Richardsonian project (Fig. 44).

An exuberant climax of the Spanish vogue during the Stockholm stone boom is to be seen in the building designed for the Stockholms Handelsbank by Gustaf Lindgren and Agi Lindegren (1895-1896; Fig. 96). Praised as "one of the finest private buildings in Stockholm,"[29] this extraordinary mixture of styles was realized in Orsa sandstone. But apart from the Spanish allusions that can be identified in individual motifs,[30]

96. Gustaf Lindgren & Agi Lindegren, Gustaf Adolfs Torg 1, Stockholm, Originally Stockholms Handelsbank. 1895-1896. (Photo SR)

the strong rebating heralds a new theme in the treatment of stone, which is connected with the second trend mentioned earlier.

The turn to the Swedish Baroque and the seventeenth century, was also initiated by I.G. Clason. In his youth Clason had been introduced to the riches of the national heritage by his teacher A.T. Gellerstedt, and in the late 1880's he had incorporated allusions to Swedish seventeenth- and eighteenth-century architecture in buildings with façades of roughcast plaster or plaster combined with stone. But in 1895 he planned a building which also, like the Bünsow House, was to become a turning-point: a luxurious residence for three families in Strandvägen, built for Count Clarence von Rosen (Fig. 97). This was the first time that white Ekeberg marble was employed for a façade, and Clason has mustered the qualities of this noble material for the whole gamut from rebated rustication to the tooled surfaces with delicate ornamental work. Thanks to the strong influence of the French architecture in eighteenth-century Sweden this medley of motifs from Blondel and Briseux could be marketed as "in style with the Swedish-French usage of the eighteenth century."[31] Technically, the marble revetment was an experiment. The height of the courses was 270 mm, corresponding to three courses of brick, and the thickness varied beteen 225 and 300 mm. As for the wheathering qualities Clason consciously took a risk: "The stone is very hard and seems to be excellent for ornamental work. If it proves resistant to the fluctuations of our climate, it can be expected to become widely used."[32] The façade of the von Rosen House conveys an impression of solidity, contrasting to the coating with slabs, which was a frequently used technique abroad. In Norway, where marble had been used earlier, the use of thin linings was attacked by geologists and architects alike (see above p. 37).

The liberal application of rebated rustication in the façade had its best known eighteenth-century model in the Neo-classical Customs House in Skeppsbron (1783-1790) by Eric Palmstedt, and the device soon became a mark of "Swedishness." Clason's rustic treatment of the white marble had been characterized as "a throughly modern license against the material"[33], but applied to a more suitable national material, Swedish West coast granite, the characteristic pattern with strongly emphasized horizontal rebates was acceptable, as evidenced by Erik Josephson's project for the second building for the Stockholms handelsbank to be built within the span of a decade (1902-1905; Fig. 98).[34] In this façade the parapet motifs, festoons and pediments provided the necessary suggestions of French-Swedish grace.

The third trend mentioned above, *the search for a contemporary style,* was based on a combination of two principles, the rational use of material and the rejection of historicism. In its late nineteenth-century context, the last mentioned part meant, not what we may today think it does, but rather a form of free eclecticism, which did not exclude every historical association, but which defied facile stylistic classification. The standard question, which architectural commentators often quoted with varying degrees of irony, was: "In what style is this house built?" The fashionable public and the speculative builders exploiting prevailing fashion were represented as looking on architecture merely in terms of superficial style characteristics. To a generation of architects wanting to emancipate from the tyranny of style, especially German and generally Continental historicism, the British and American precedents seemed especially promising (Fig. 99; cf. also

97. I.G. Clason, The von Rosen House, Strandvägen 55, Stockholm. 1895-1899. (Photo SR). The original mansard roof was later rebuilt into a sixth storey.

Chapter 5, above). An occasional Romanesque or Gothic quotation was readily excused in models that were otherwise based on simplicity, economy and honesty. As for the latter three qualities, the rubble bond made known in numerous publications and recommended by geologists and engineers, seemed to fulfill them all; moreover, in its rock-faced or hammer-dressed variants the rubble possessed a natural beauty which made traditional ornamentation superfluous and so offerred a way out from the historicist impasse. What had been introduced merely as an economical method of construction gradually developed into an indispensable means of expression.

A landmark in this development was Birger Jarlsgatan 2-4, a block of flats built for Joh. Sjöqvist by Ludvig Peterson and Ture Stenberg (Fig. 100). The planning of this vast complex started in 1891 and in the following year Sjöqvist submitted his application for a building permit.[35] As the building was completed in 1894, an anonymous reviewer in *Teknisk Tidskrift* commented on its many modern features: the free, asymmetrical grouping of the windows answering the needs of the rooms inside, the absence of unnecessary towers, and ''modern'' materials. The writer rejected the inevitable question ''In what style is this house built?'' A building answering contemporary requirements cannot be erected in ''any old style''; yet no architect can create completely independently of tradition. In its general appearance the Sjöqvist House reminded the writer of American architecture and Richardsonian Romanesque, although the details are Gothic in character.[36]

The commentator paid particular attention to the ''modern'' façade material, the coursed rubble of

98. Erik Josephson, Svenska handelsbanken (originally Stockholms handelsbank), Kungsträdgårdsgatan 2, Stockholm 1904-1905. (Photo SR)

99. John Lowe, Phoenix Insurance Co., Cooper and Lloyd Streets, Manchester. 1873 (?). From Klasen, *Grundriss—Vorbilder,* VI, [1894], fig. 574.

100. L. Peterson and T. Stenberg, The Sjöqvist House. Birger Jarlsgatan 2-4, Stockholm. 1892-1894. (Photo SR)

sandstone from the Stockholm archipelago (Arholma), combined with details of Närke (Yxhult) limestone and Gotland stone. He also volunteered an apparently apocryphal story explaining how the Arholma stone came to be "discovered."

> The story goes that one day a Roslagen shipper moored in the Nybro harbour [adjacent to the Sjöqvist site], and brought with him some of this stone as ballast. He knew that on his island in the archipelago there were large quantities of the stone, and his acquisitive instincts told him that it could be turned into money. Close to the harbour he saw a building site, where he went to see the property-holder. Feeling dubious about the shipper's statement about the available quantities, the builder had the matter investigated. It then appeared that there were no deposits of this rock, but that it occurred in erratic blocks in fields and grounds. The resources seemed very limited, but with a work force of 30 men it proved possible to collect the quantity needed. The stone is easily cut, but it can be had in small blocks only.[37]

In conclusion, the writer greeted the Sjöqvist House as a product of "modern materials, needs and taste." His analysis of the Richardsonian and the historicist elements holds good even today. The circular arches, gables and colonnette galleries derive from American models, whereas the Gothic motifs may be seen as concessions to the demand for "period" decoration. The treatment of the stone surface is not specifically Richardsonian, nor does it follow Scottish rules; the properties of the stone material and the lack of an established tradition in rubble masonry seems to account for the compromise. In the topmost storey the tooled stone is laid in alternating courses of slabs and binders, whereas the rest is executed in hammer dressed regular coursed rubble.

From about 1894/95 hammer dressed surfaces begin to dominate the Stockholm building market. Changes are made in buildings already begun, brick and plaster are changed to stone, as in Johan Laurentz's building Strandvägen 15 (Fig. 67-69). Even where the buildings were planned to have an all stone facade, the transition was so swift that the architectural form lagged behind. On the site opposite Strandvägen 15, Strandvägen 17, Laurentz planned a building which from the beginning was intended to receive a stone facade. In its general appearance Laurentz's design is reminiscent of Peterson's Sjöqvist House, but the horizontal division still harks back to the habitual brick and stone formula, although the contrast is here expressed by means of a darker sandstone and a lighter limestone (Fig. 101).

As the Sjöqvist House was nearing completion in 1894, Sjöqvist and Peterson travelled to the Continent to study shopping passages. The outcome was the Birger Jarl Passage (Fig. 44), whose façade is openly Richardsonian, and which was also presented as such in *Teknisk Tidskrift*.[38] Peterson's partner, Ture Stenberg had spent several years in USA (cf. above p. 69); he may have been the one to design the elevation. Like the Sjöqvist House, the Birger Jarl Passage has a regular coursed rubble lining of Roslagen sandstone, in which the uneven colour has been utilized for giving variety to the surface; the differences of tone had sufficed even for laying the diaper work seen above the balcony.

The lead was taken up by Fredrik Lilljekvist, an architect who up to then had become known for his historical restorations; after the turn of the century he was to become famous for his Dramatic Theatre in Stockholm (Fig. 142-143). In 1896 Lilljekvist designed a house in Stureplan 15 which contained shops, flats, the architect's own residence and his atelier (Fig. 102). With its delicate ornamentation and shallow modelling, the facade is less dramatic than Richardson's architecture. The materials match this moderation: marble from Mölnbo with mouldings and ornamentation in limestone from Lomma. In his elevation submitted to the Building Commission Lilljekvist had not yet envisioned snecked rubble but an irregular coursed bond.[39] As ultimately built, however, the snecked rubble façade belongs to the first clear cut instances of this technique in Swedish architecture. This "worthy representative of our modern art of building façades" gave a critic in *Teknisk Tidskrift* occasion to reflect on the relationship between material and form. A comparison with developments in Britain shows how much Swedish architects yet have to learn about modern conceptions of material and form.

> When we set up the best modern English architecture as an example, it is not a question of some specific extrinsic style or taste, but of its intrinsic qualities, its character. Good modern English architecture conveys the impression that the architect has mastered his material as well as the form, instead of the opposite, which unfortunately is the rule with Continental architecture, even the best. On the Continent the façades usually appear as surfaces in which one has been compelled to open holes; it has then been felt necessary to add a propitiatory decoration around these holes. The architecture of English façades conveys the impression of an organism, which grows from below and upwards. The *wall,* not the *hole,* becomes the principal thing. We have here the manifestations of two traditions: in the one case the Renaissance, in the other Gothic architecture.[40]

After this declaration of principle the critic went on to assess the merits of the Lilljekvist House in terms of the material and the rhythmic distribution of the apertures. The anonymous writer seems to have interpreted the architect's intentions quite accurately, since

101. Johan Laurentz, Strandvägen 17, Stockholm. 1895-1896. (Photo SR)

in his next project Lilljekvist drew the full consequences of these principles. In the façade of his block of flats in Drottninggatan 74-76 (1898/1899-1900) there were no cut or carved ornaments whatsoever. The whole effect, created by varying lighting conditions, was based on the interplay between the random rubble that covered most of the façade and the dressed stone of the first storey, the bays and the window openings, (Fig. 103). Instead of carved ornamentation, the gable triangle had a diaper pattern. The material was Hällekis limestone.[41] The fact that the façade was indeed deliberately and carefully planned for stone is shown by an annotation (''OBS. Genomg. sten'') on one of the elevations on which the rubble pattern had been drawn more summarily.[42]

In the Östermalm district of Stockholm both snecked rubble and regular coursed rubble were used for numerous high-class blocks of flats during a short but intensive period of building ca 1897- 1901. In some cases, it is true, the choice of material was rather unconsidered and last-minute changes from brick to stone were not uncommon even then. An example of the high standard of some of these buildings is provided by a block of flats by Hans Hallström in Storgatan 28 (1897-1899;

102. Fredrik Lilljekvist, The Architect's House, Stureplan 15, Stockholm. 1896-1897. (Photo SSM)

103. Fredrik Lilljekvist, Block of flats, Drottninggatan 76, Stockholm. 1898/1899-1900. Demolished. (From Hedström 1908, pl. 13)

Fig. 104);[43] a façade where all ornaments have been left out in favour of the colour and texture of the stone itself, changing with the varying conditions of light. In 1900 Sam. Kjellberg, whom we remember as the author of the Clasonesque Birger Jarlsgatan 24 (Fig. 93), had turned to a somewhat monotonous rubble, where the curved forms and the intricate doorway decoration represent Jugendstil clichés (Fig. 105).[44]

*

The three lines of development which we have followed above are specific for Sweden. In Norway and Finland the corresponding development displays a rather different pattern, although the basic structure is much the same: in all three countries the problem of form and material was seen partly in terms of historicist models, partly in terms of allegedly stylistically neutral British and American solutions.

In Norway, just as in Sweden, the increasing availability of stone materials in the 1890's confronted architects with the problem of finding adequate forms for the "new" materials. But the strong German influence in Norway, with generations of architects trained in Hannover, Berlin and Karlsruhe, gave a different twist to the historicist solutions. The Norwegians were willing to use existing historicist formulas instead of going to the historical past itself. Thus Josephson's and Clason's first-hand studies of French, Italian and Spanish monuments have no counterparts in Norway.

From the late 1880's an intense building activity transformed the commercial centre of Christiania. Here, too, the Continental taste for genuine, elegant materials was reflected in the use of details of polished granite, sometimes extending over part of the ground floor façade. What seems to be the first attempt to employ Norwegian marble on a more vast scale is to be seen in a commercial building for P. Backer in Kongens gate 31, built in 1893-1895 by the architect Herman Major Backer (Fig. 106).[45] In its general appearance the facade with its large shop-windows and continuous verticals follows Continental models, although the deep modelling, the heavy arcade and convex

104. Hans Hallström, Storgatan 28, Stockholm. 1897-1899. (Photo SR)

105. Sam. Kjellberg, Sibyllegatan 33—35, Stockholm. 1900-1904. (Photo SR)

106. H.M. Backer, Commercial building for P. Backer (''Backergården''), Kongens gate 31, Oslo. 1893-1895. (Photo SR)

coping seem original. It was, however, the material that attracted attention, and the Backergården was adduced in the debate between geologists and representatives of the stone industry. The engineer Henrik Lund challenged the geologist W.C. Brøgger to compare the pieces of polished granite seen in commercial buildings with the complete façade of the Backergården:

> The red granite, or whatever it is, appears as if it were treated with oil paint, and the solemn looking ground floor wall looks heavy and depressing, whereas Backergården, despite its many shortcomings, makes a far brighter and more pleasant impression. When the Backer House was built, the marble industry, unfortunately, was still so undeveloped that there was not enough material in stock to permit a selection of suitable slabs of sufficient size. This spoils the appearance quite considerably: still, the facade makes quite a good overall impression.[46]

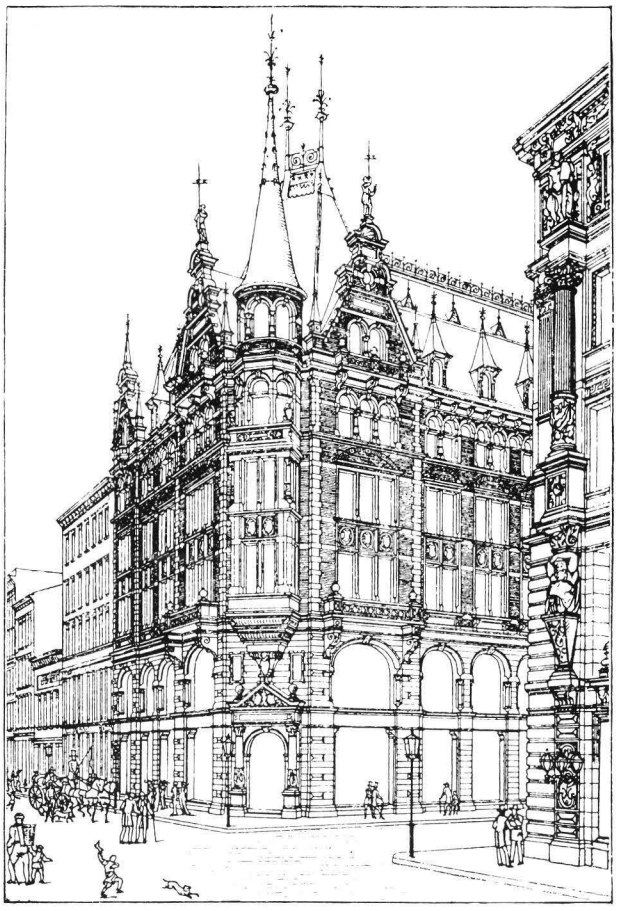
In 1895 the leading Norwegian marble firm was reorganized as a Danish-Norwegian joint venture; in that year the building of the Standard Insurance Company in Copenhagen was begun, designed by the Norwegian born architect Christian Arntzen (Fig. 10). Its façade was praised by Thrap-Meyer for its brilliant workmanship and noble material.[47]

Thrap-Meyer's praise of the Copenhagen example was occasioned by the sloppiness and bungling that he had observed in Oslo when the first all-stone façades were being built. A case in point was the Groschgården, an establishment built for Henrik Grosch (1848-1929), one of the leading figures in the Norwegian arts and crafts reform, director of the Crafts Museum in Christiania and founder of Den norske Husflidforening (The Norwegian Handicraft Association).[48] In 1896 Grosch had plans made for a building with sale-rooms in two storeys for the Handicraft Association and flats in the upper storeys. The architect was Bernhard Steckmest, born in Hamburg, trained in Hannover and one of the more prolific architects in Christiania. The ex-

107. Bernhard Steckmest, The Grosch Building, Karl Johans gate 45, Oslo. 1896-1900. (Photo SR)

terior of the building (Fig. 107), which was completed in 1900,[49] again follows German models — in this case so closely that a specific source, Hans Grisebach's Faber House in Berlin (Fig. 108) can be identified. Not all of the façade is of stone; the wall surface of the upper storeys is Danish brick, and in the façade turned away from Karl Johans gate artificial stone of red cement has also been employed as an economical surrogate. The red Main sandstone in the more important parts facing Karl Johan was delivered by a German firm, Gebr. Adelmann in Bettingen.[50] But how was the expensive material treated? Thrap-Meyer did not feel "tempted to let our Norwegian workmen handle ashlar and blocks for a building. When one inspects the unusually handsome building in the corner of Universitetsgaden and Karl Johans gade, one will easily find that there are numerous ashlars where the edges have been partly chipped off, the contours broken and scratches everywhere." Despite the patching up, it really hurt to see all this, Thrap-Meyer wrote.[51]

But if one turned to a nearby site in the Karl Johan, Thrap-Meyer continued, one found an exemplary treatment of the building stone employed: no scratches, no chipped edges, no uneven joints, in short, an unusually fine workmanship (Fig. 109). In this case, sad to say, the work had not been carried out by Norwegians. Thrap-Meyer did not want to deny that there were competent workmen in Norway — especially in the stone firms — but that did not help so long as the material was spoilt on the building sites.[52] The building referred to was the Magnusgården (1898-1901), a Neo-Baroque creation in grey sandstone by Ove Ekman, a Munich trained architect active in Christiania since the beginning of the 1870's.[53] Thrap-Meyer's diatribe eli-



108. Hans Grisebach, Fabers Geschäftshaus, Berlin. 1882. From L. Klasen, *Grundriss-Vorbilder,* VI, 1884, fig. 584.

cited a rejoinder from the Stone Masons' Union of Norway. The masons agreed with Thrap-Meyer in his criticism of the conditions on the building sites, and they offered an explanation to the maltreatment of stone seen on new buildings in Oslo. In Groschgården the stone was handled and moved by construction workers with primitive tools including crowbars, whereas in Magnusgården the blocks were hoisted with cranes and handled by skilled stone-masons from Germany. The union also complained that Norwegian stonemasons had not been given a chance to practice for the last 3-4 years. Private builders ordered whole façades from Germany. In public buildings, it was true, Norwegians were allowed to carry out mouldings etc., but even there the finer profiles and ornamental work was invariably ordered from Germany.[54]

In his next building with red sandstone, the Christiania Handelsbank (1901; Fig. 110) Bernhard Steckmest saw to it that the façade was executed with appropriate care. Although the exterior received favourable comments,[55] it is clear that it was buildings such as this (and the Neo-Baroque imports by Ove Ekman, e.g. Fig. 109) that the younger Norwegian architects had in mind when they criticized the fashionable commercial buildings and called for a break with German tradition.

In the endless discussions conducted during the late 'nineties a recurrent theme was the beneficial effect on architectural style attributed to the intractable rocks of Norway. A preliminary step towards the simplification of form that was expected to follow from the use of hard stone is to be seen in two works by Harald Olsen, an architect still dependent of the German heritage, but at the same time involved in the work of making Norwegian materials known and used. The David Andersen House (1897-1898; Fig. 111) was built for a successful goldsmith, who was at the same time a leading force in the national revival of his craft. Although the composition of the façades draws on Berlin architecture, the detailing is simple and intended to display the material in harmonious, unbroken surfaces (Fig. 112). The stone is Norwegian: red syenite from Bolaerne in the Oslofjorden delivered by E.A. Gude's firm; Olsen praised it in his comment on Henrik Bull's stone display for the Stockholm exhbition in 1897.[56] The other

109. Ove Ekman, Magnusgården, Karl Johans gate 33, Oslo. 1898-1901. (Photo SR)

110. Bernhard Steckmest, Christiania Handelsbank, Prinsens gate 9, Oslo. 1901. (Photo SR)

Olsen building to attract attention for its display of a Norwegian material was Glassmagasinet (1897-1901; Fig. 113). The decision to use lightgrey Idefjord granite was apparently made in 1898.[57] The stone surface has lasted extremely well to this very day. Although the rather conventional *Warenhausarchitektur* was quite well received, one anonymous critic touched on a question that was becoming increasingly topical in the contemporary architectural debate in Norway. Although grey granite is in itself a solid and handsome material, the critic wrote, it tends to become monotonous if displayed *en masse*, "owing to the somewhat dull colour which is typical of granite." The lower floor pilasters were rusticated, but this was not enough for the critic who would have preferred more of the sort: "uncut stone with its rock-faced surface displaying the natural texture fresh from the quarry; through this the material would gain considerably in variety and life."[58] This commentary was printed in August, 1900; one month earlier the magnificent premises of Den Norske Enkekasse (The Norwegian Widows' Fund) had been taken into use (1898-1900; Figs. 114-115).[59] Here the Vienna trained Harald Bødtker — whom we shall meet again as a designer of Grorud Church (Fig. 246) — had reverted to traditional bank iconography, Florentine Renaissance, a solution which is unique in the predominantly Baroque exuberance which otherwise stamps Christiania commercial architecure of the 1890's. The hammer dressed and tooled surfaces bring out the texture as well as the colour of the two granite varieties employed. Bødtker's building is not explicitly mentioned by the *Teknisk Ugeblad* commentator, who referred to another, more important building then in course of construction, Henrik Nissen's Christiania Savings Bank (Fig. 168-170). In that latter building "granite is, for the most part, employed as rusticated ashlar, which undoubtedly is the treatment that brings out the best qualities of this otherwise somewhat dull stone."[60]

In Norway, no less than in Sweden, the search for a contemporary mode of expression focussed on British models. In Chapter 5, above, we met some of the reasons for this preoccupation: for architects wishing to overcome the allegedly German plaster of Paris copyism, the material solidness of British buildings seemed exemplary, and in a society demanding a national style, the medieval contacts between Norway and Britain provided a motivation for turning West in search of inspiration. We also saw that the search did not stop in Britain, but extended over the Atlantic.

In Norway the early manifestations of English inspiration are to be seen in buildings with façades of soapstone. In itself this stone was not, of course, particularly English, but it had been used in medieval Norway for Gothic structures. Then soapstone is a durable and easily worked material, its dark grey colour making it suitable for Gothic rather than for Renaissance or Baroque forms. It was discussed by architects and engineers in the 1890s,[61] and in 1899 Alfred Dahl could welcome two remarkable additions to the architecture of Christiania: Henrik Nissen's Karl Johan 2 (Fig. 117) and Carl Michalsen's Tordenskjolds gate 1 (Fig. 116), both coated with soapstone. The quality of the stone work also demonstrated that now, at last, it had become possible to get handsome carvings and masonry from Norwegian masons. Nissen's building for O.B.H. Haneborg is classified by Dahl as being in "English Renaissance" style. In its proportions and façade rhythm it is no doubt vaguely inspired by English Neo-Gothic-Tudor architecture (cf. e.g. Fig. 118). With its unfamiliar contours and fresh approach, Nissen's creation impressed Dahl "as a breath from a foreign, noble tradition in the midst of all the mean buildings in the vicinity." What in particular caught his attention, was the irregular bond, for which he did not even have a term:

> The irregular division of the stone in the wall surfaces is very attractive. With true understanding of the material, the architect has used stones of

111. Harald Olsen, The David Andersen House, Kirkegata 17, Oslo. 1897-1898. (Photo SR)

> every possible size, down to quite small pieces. By this he makes it clear that the costly stone material has to be utilized to the last bit. This is made possible thanks to the softness of soapstone, whereas the utilization of small pieces would become too costly in harder rocks.[62]

The bond in question was a squared rubble, not only in Nissen's but also in Michalsen's building. The stone was dressed smooth, but with enough irregularities to produce a varied texture which was praised by Dahl, whose interest in the matter was not merely theoretical. In January 1899 Dahl had submitted his design for the Vestre Gravlund Chapel in Christiania, a project comprising façades of granite with quoins and jambs of soapstone (Fig. 244-245). In June it was proposed that the natural stone of the chapel be replaced with a less expensive material, and later that summer the matter was on the agenda of the Christiania city government and city council.[63] Thus, what Dahl really had in mind when he praised soapstone in *Teknisk Ugeblad,* is clear enough from his first paragraph: "an architect may have both the will and the ability to produce a handsome result, but he is frequently stunted by the economical pressure exercised by the builder."[64] In the end Dahl's design was carried out in its original conception; he was among the first to take the next decisive step, that is to use hammer-dressed rubble instead of the tooled variant.

In combination with rustic ashlar, hammer-dressed rubble laid to regular courses had been used as early as 1897 by Kristen Rivertz in a suburban residence, Marmorgården ("The Marble House"; Fig. 119).[65] Marble had become topical in the early 'nineties (cf. above p. 35, 37), and in this early instance Rivertz obviously strived for a coloristic effect with the contrasting white and red stone applied in a manner strongly reminiscent of Richardson's Crane Library in Quincy, Mass.[66] It was also Rivertz who designed the first openly Richardsonian exterior in Oslo, the Serpentingården, so named after the stone variety employed in the façade (1898-1901; Fig. 45). Rivertz's preoccupa-

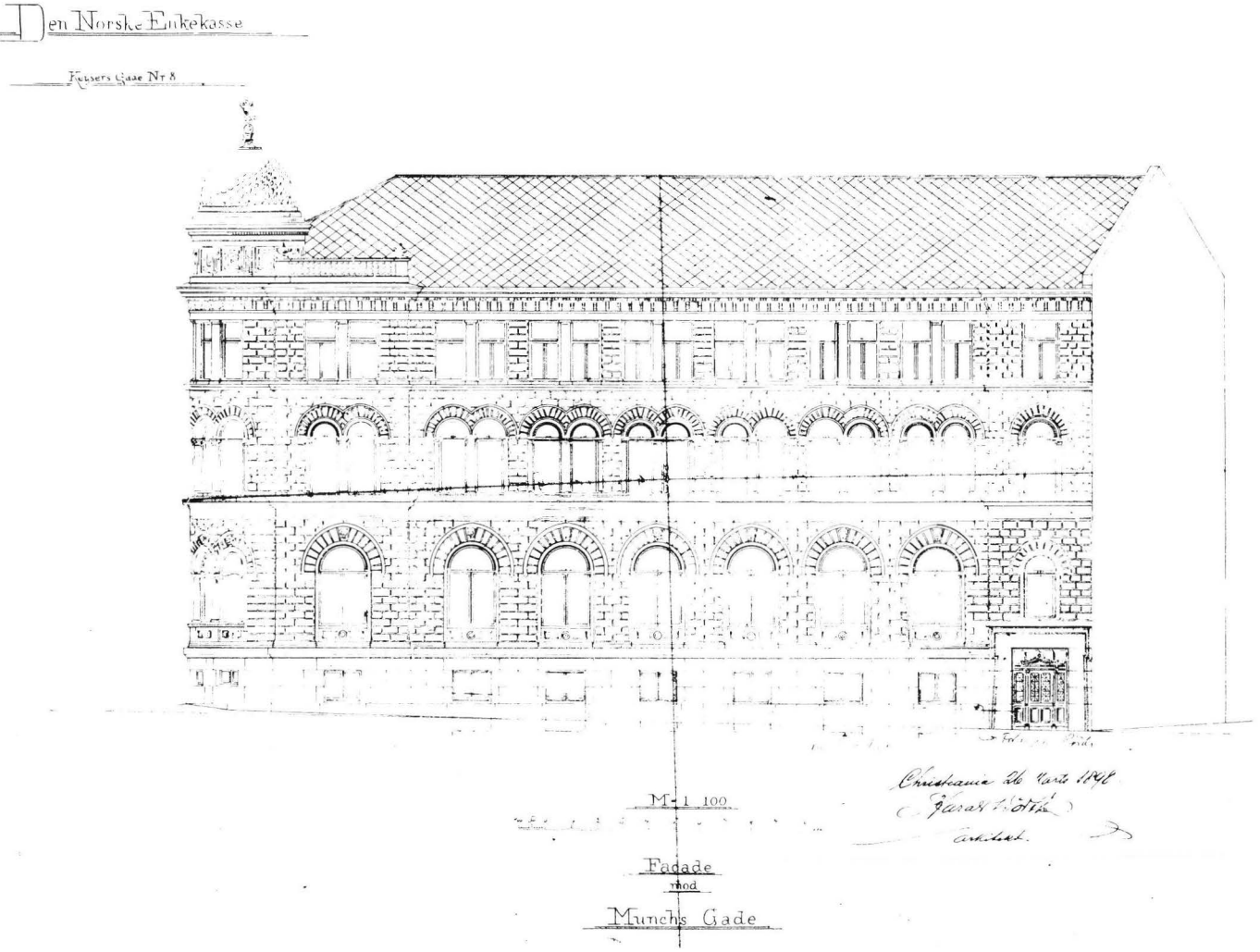
112. Harald Olsen, The David Andersen House, detail. (Photo SR)

tion with the textural effects of masonry appears from his attempt to vary a formula worn from frequent repetition in the commercial centre of Christiania: in Sontumgården (1899-1901) he has combined a slick, German-inspired *Warenhaus* façade with the irregular, rubble-like bond associated with the English and American tradition (Fig. 120).

The climax of Norwegian Richardsonianism is to be seen in Waldemar Hansteen's Centralbanken for Norge (Fig. 121). Designed and built in two phases (1900-1903 and 1905-1906),[67] Centralbanken looks like a crossbreed of Richardson's Cincinnati Chamber of Commerce and Boston Ames Store with a little crenellation added on top.[68] Although trained under Hase in Hannover, Hansteen was well acquainted with American architecture, since he designed the Norwegian pavilion at the 1893 Chicago Exhibition, to which he also travelled.

The stone employed in Centralbanken was Brumunddalen sandstone, a brown-yellow variety, which had been used earlier for a building in the district where it was quarried.[69] The basement and first storey are lined ashlar rustication, and the upper three storeys have hammer-dressed rubble. The corner and central projection, the crenellation and the jambs are in dressed stone, enhancing the rough texture of the rest. In *Teknisk Ugeblad* a critic wrote that "professional people

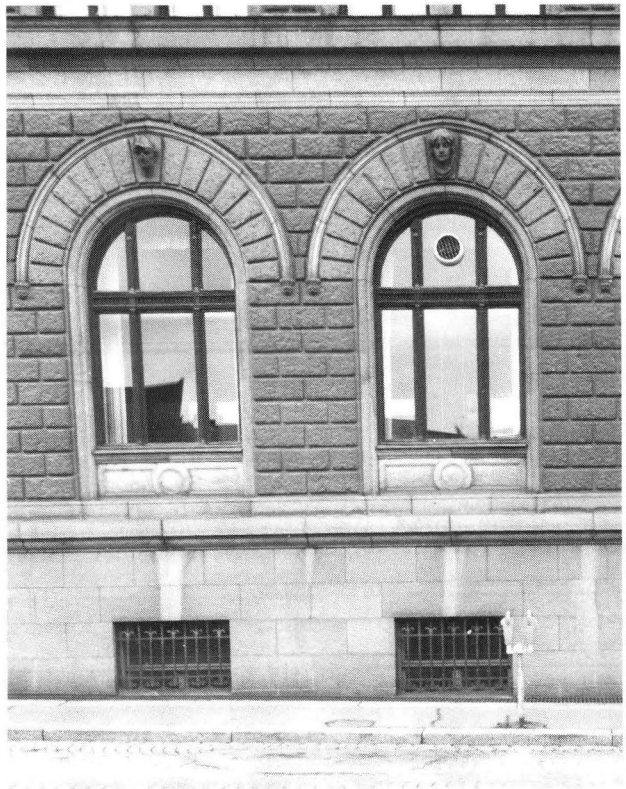
113. Harald Olsen, Glassmagasinet, Stortorget 10, Oslo. 1897-1901. (Photo SR)



114. Harald Bødtker, Den Norske Enkekasse, Keysers gate 8, Oslo. Elevation 26. 3. 1898. Oslo, Bygningskonstrollens arkiv. (Photo Oslo Bk)

will probably concentrate their principal interest on the façades." He saw the starting-point of the "Romanesque-Gothic transitional style" in national motifs, without mentioning modern precedents. According to the same writer, the Brumunddalen stone was especially successful. It presented an alternative, which the architects had long waited for, a variety somewhere between hard rocks such as granite and syenite and soft stone such as soapstone. Its colour is variable, a fact that gives Brumunddalen sandstone precedence over most other Norwegian stones, which are often somewhat dull in colour. The writer hoped that the experiment would turn out well, so "that there will soon be better times for this handsome and expressive material."[70]

Not all reactions were equally favourable. *Teknisk Ugeblad* was vigorously contradicted by a correspondent to a daily paper who rejected Hansteen's approach to the material. The rustication of the first storey, the correspondent wrote, has in an artificial manner been given a coarseness which is natural, not to sandstone, but to granite, if this rock is treated in a rational way. The correspondent also took exception



115. Harald Bødtker, Den Norske Enkekasse. 1898-1900. Detail of facade. (Photo SR)

116. Carl Michalsen, Ove Andersen's House, Tordenskjolds gate 1, Oslo. 1899. (Photo SR)

118. J.H. & F. Healey, Leeds Stock Exchange. 1873. From Klasen, *Grundrissvorbilder,* VI, fig. 538.

to the lining of the upper storeys where, contrary to aesthetic as well as to practical rules, the stones had been laid on edge instead of on their natural beds. The *Teknisk Ugeblad* critic hastened to explain his views. As for the simpler, technical question of the method of laying the stone, he agreed in principle with his opponent, but he defended the solution applied in this special case, since the denseness and homogeneity of Brumunddalen stone permitted it to be laid either way. As for the more complicated question of the texture, the *Teknisk Ugeblad* critic defended the architect's right to treat every material so as to give it life and varia-

117. Henrik Nissen, O.B.H. Haneborg's House, Karl Johans gate 2, Oslo. 1897-1899-1900. (Photo SR)

119. Kristen Rivertz, Marmorgården, Riddervoldsgate 3, Oslo. 1897. (Photo SR)

tion, as long as this does not constitute a direct conflict with the material itself or an attempt to imitate another. And is the rough surface more natural to granite than to sandstone?

> The truth is that here in Norway we have begun to use granite with a rock-faced cleavage reminiscent of sandstone or limestone treated in the rustic manner. Therefore, if this theory is applied in all its rigour, the conclusion could just as well be the opposite, or a ban on using granite, not sandstone, in this manner.[71]

This argument, of course, is justifiable on historical grounds. As a declaration of principle, moreover, it illuminates romantic tendencies after the turn of the century. Although it was admitted that "each stone variety should be employed in accordance with its nature", architects reserved themselves "that freedom of movement which is essential if architecture is to be saved from becoming a dry art form constrained by pedantic rules."[72]

In some respects, then, the stone movement followed the same pattern in Norway as it did in Sweden. In both countries the ideal of truth to material was first adopted by historicist architecture, and in both countries the search for a contemporary idiom was begun by looking towards Britain and America for inspiration and models. The older, historicist tradition also existed side by side with more recent attempts to define a "modern taste." In Christiania Ove Ekman continued to build profusely decorated marble façades long after Kristen Rivertz had made rock-faced stone a self-sufficient aesthetic device, just as in Stockholm elaborate style exercises existed side by side with "rational" rubble exteriors with little or no ornamentation.

A similar pattern is to be seen in Finland, too. But here the economic basis was narrower, the building industry undeveloped, and the sheer amount of building projects incomparably smaller than in Christiania, not to speak of Stockholm. Moreover, a building boom that had begun in the 1880's was followed by a recession in 1892-1894; by the middle of the 1890's, that most critical phase in the development we are studying, building activity in Helsinki had sagged to minimal.[73]

In the early years of the decade builders in Helsinki were praised for their open-handedness with regard to

120. Kristen Rivertz, Sontum-gården, Grensen 5-7, Oslo. 1899-1901. (Photo SR)

121. Waldemar Hansteen, Centralbanken for Norge, Tollbugata 20, Oslo. 1900-1903 (from the corner to the main entrance); 1905-1906 (four window bays to the left). (Photo SR)

the decoration of urban architecture: ''foundations and mouldings of granite, ornaments of plaster of Paris or cement and polished columns of the handsome Hangö granite nowadays adorn the façades of our buildings.''[74] But in the year of the 1897 Stockholm exhibition a correspondent naming himself ''Konstvän'' (''Amateur of Art'') attacked the Finnish architects for their negligence of proportion and their propensity for meaningless plaster ornaments.

> How far behind is not our architecture that of Sweden! The buildings along Strandvägen in Stockholm are truly magnificent; but what can we show? The ''palaces'' in Norra Esplanadgatan! Buildings that may at the first glance look ever so decorative, but on closer inspection prove to lack all solidity and almost every trace of real beauty.

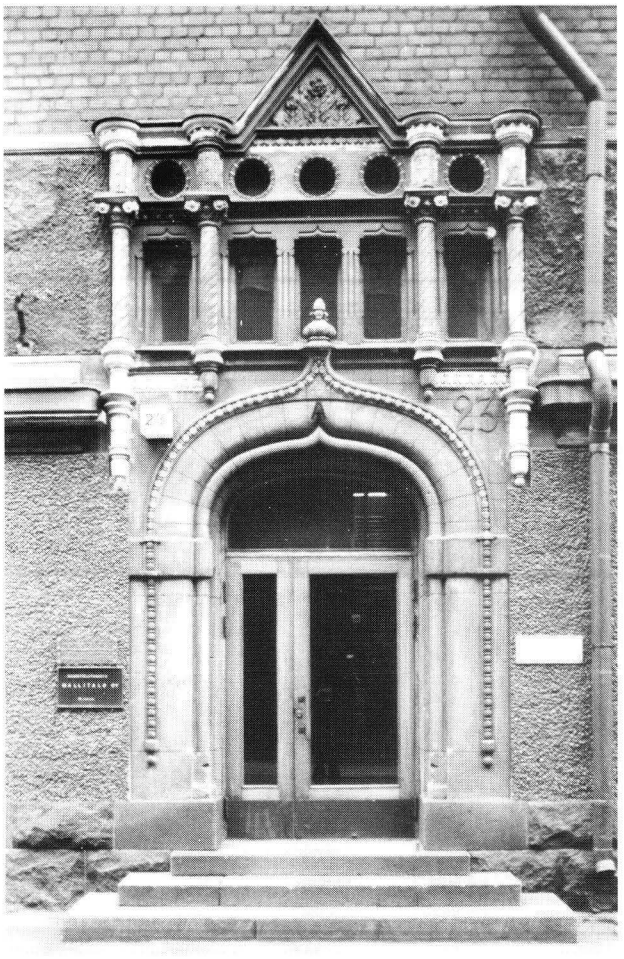
''Konstvän'' regretted that the term ''Renaissance'' was profaned by being connected to this awful architecture. Not that a return to the past was to be desired; the best new buildings are those which have a character of their own and which cannot be directly connected with any specific historical style.[75]

''Konstvän's'' attack called the architect Jac. Ahrenberg to the defence of his profession. The comparison with Strandvägen in Stockholm is unjust. Twenty years ago Strandvägen did not yet exist, only a row of coal-shacks and sheds; the fine, modern buildings that we see today were built within a limited space of time, according to an excellent building code, by architects with a common educational background. ''The Swedish architects have had the most handsome materials and technically skilled workmen at their disposal, whereas we have had durable but ugly bricks and incompetent workers.'' Moreover, the Swedes have had much more contacts with England. In this way they have received direct impulses from the English reform movements, whereas we have committed ourselves to Germany. In contrast to the Swedes

> We cannot adopt the French or English style of architecture; it is a noble old style based on treating materials such as limestone, sandstone, granite and marble. It might have been possible for us to stick to the Italian brick style, but unfortunately we have chosen Germany for our mentor in everything.[76]

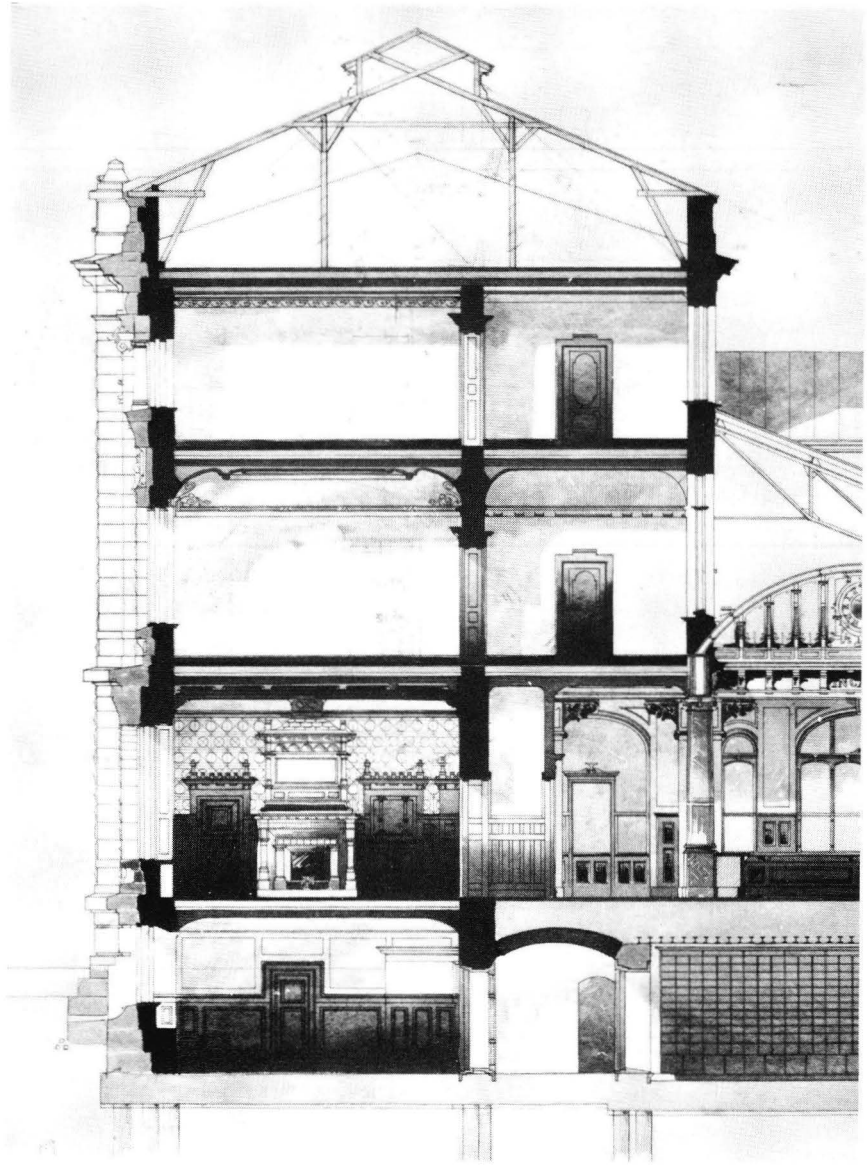
An illustration to Ahrenberg's argument is provided by the Argos House in Helsinki (Fig. 76). Here a piece of Strandvägen had been transplanted to Finnish soil, but the materials had also had to be imported together with the design. The only freestone available in quantity in Finland was soapstone, and for this material Karl Hård af Segerstad designed Clasonesque details for a redbrick block of flats in Helsinki (1899; Fig. 122).[77]

Compared to Norway and Sweden there was a lag of more than ten years before Finland received its first building with a complete façade of natural stone. This was the head office of Suomen Yhdyspankki - Föreningsbanken i Finland (1896-1898; Fig. 123-124). The building was planned by Gustaf Nyström, a Vienna trained architect in the academic tradition, and the first holder of the chair of architecture in the Polytechnic in Helsinki. In 1896 Nyström presented his first elevation to the board of the bank, and at about the same time he discussed the possibility of a stone façade with representatives for Ab Granit; however, Nyström's estimate of the cost was considered too low by Ab Granit and the matter was allowed to rest for the time being.[78] At one stage the possibility of making the façade of Gotland limestone seems to have been contemplated,[79] but in the autumn of 1896 agreement was finally reached with Ab Granit. The foundation stone was laid in February 1897, and in December Nyström demonstrated the façade to the Architects' Club. In May, 1898 the the bank moved into its new premises.[80]



122. Karl Hård af Segerstad, Falken, Albertinkatu/Albertsgatan 23, Helsinki. 1899. (Photo SR)

123. Gustaf Nyström, Suomen Yhdyspankki — Föreningsbanken i Finland, Helsinki. 1896-1898. (Photo in the Archive of SYP—FBF)



124. Gustaf Nyström, Section of the façade of SYP—FBF. August 1896. Archive of SYP—FBF. (Photo Wulff Kopio)

125. Waldemar Aspelin, Nordiska Aktiebanken, Viipuri—Viborg (today Vyborg, USSR). 1898-1901. (From Karsten, 1936, p. 39)

126. Waldemar Aspelin, Helsingfors Sparbank, Fabianinkatu/Fabiansgatan 15, Helsinki. 1900-1902. (Photo SR)

The red-brown Hangö granite was employed in real blocks, with a depth of 30-45 cm or in parts almost half the wall thickness (Fig. 124). A certain variation was achieved by the use of select details in grey granite and through contrasts between hammer dressed and tooled surfaces. The contract provided for certain simplifications of the main elevation: thus animal heads in the capitals should be replaced by simpler forms more suitable to granite. "The working drawings shall be made so as not to make the execution of the work in granite all too difficult. Thus surface ornaments shall generally be executed in low relief against intaglio background or else as gravure (whereby the ornament is incised into the surface of the stone)." A number of sculptured details were to be carved of softer material of the same colour.[81] Despite these modifications, the delivery did not give Ab Granit much profit, a fact of which its directors were aware when signing the contract; nonetheless they accepted the terms in the conviction that "it was to the advantage of the firm to promote the spread of this type of construction."[82]

By contemporary critics Nyström's bank building was taken as a starting point for reflections on the value of true materials. The young architect Vilho Penttilä referred to recent developments in Scandinavia and Scotland, and hailed the Yhdyspankki building as a turning-point in Finnish architecture.[83] Another commentator, Bertel Jung, characterized the building as "one of the milestones in our stone architecture," but subjected Nyström's humanist idiom to a detailed and sharply critical scrutiny. His most important conclusion was formulated as a question:

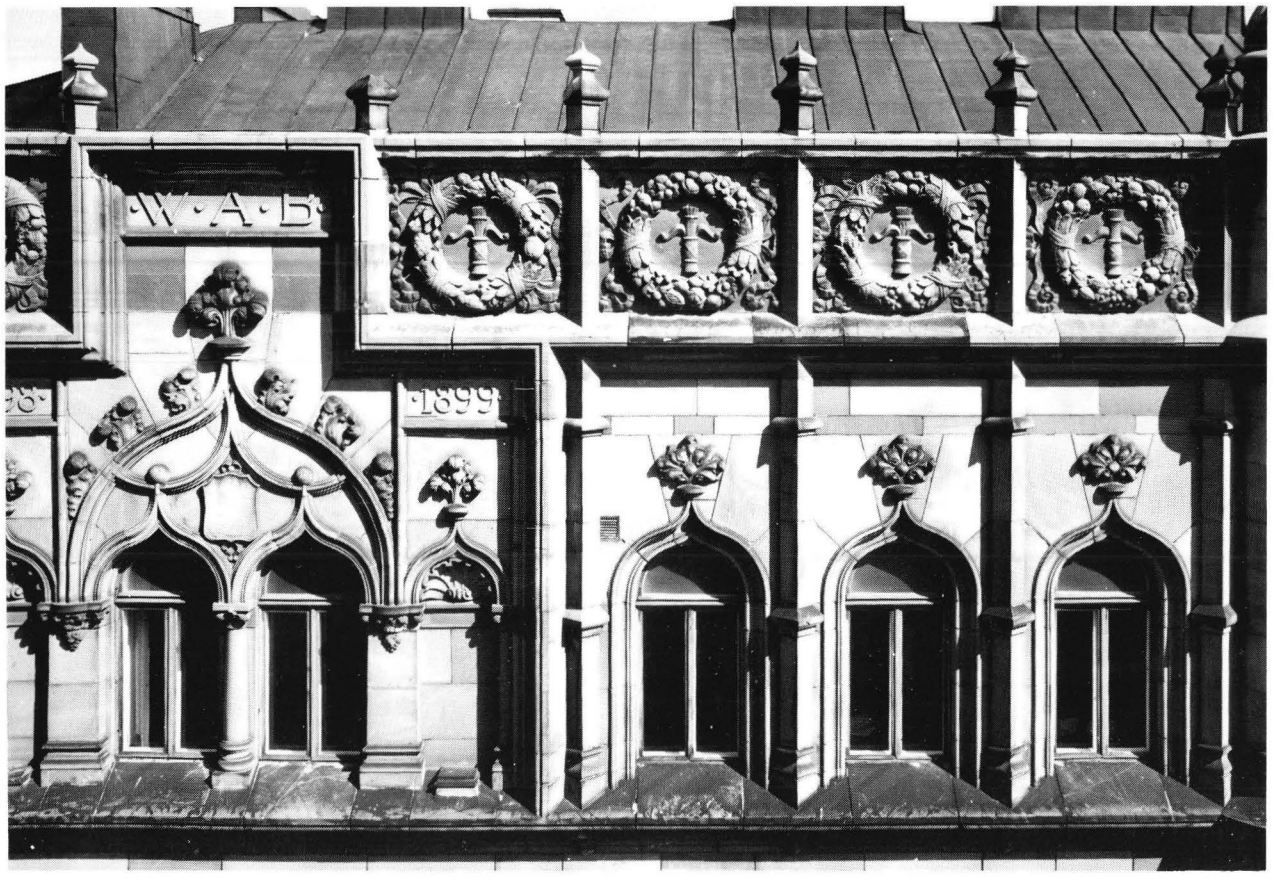
> The intractable nature of the material has, of course, made it necessary to give the details a simpler form than is customary in Renaissance buildings.

127. Grahn-Hedman-Wasastjerna, Wasa Bank, E.Esplanadi/S.Esplanaden 12, Helsinki. 1898-1899 (Photo N. Wasastjerna, SRM—FAM)

> No doubt the working out of the details has presented problems to the architect; yet it has also provided an inspiration to several new and interesting motifs. Certain details — or, rather, portions of the façade — which in my opinion have turned out less well, do indeed raise the question: is the Renaissance a suitable style for buildings of granite? My own answer to this question is that [. . .] more justice would be done to granite, both technicallly and aesthetically, if it were treated with more stylistic freedom than what is possible within the strict, academic Renaissance system.[84]

The reservations against the use of Renaissance forms together with granite were politely expressed in the case of Nyström's bank building. But as the practice continued, the critical tone also sharpened. In 1898-1901 a pompous head office for the Nordiska Aktiebanken was built in Viipuri/Viborg (today Vyborg in the USSR; Fig. 125), designed by Waldemar Aspelin; the granite parts of the exterior and the interior were delivered by Ab Granit.[85] In 1902 the architect and writer Nils Wasastjerna published a devastating appreciation of Aspelin's creation: ''The ancestors of the enormously expensive building are obviously to be found in Italian Renaissance palaces (Palazzo Strozzi, Palazzo Ricardi and others), but the degeneration is unmistakable.'' The architect had clearly wanted to suggest solidity and severity, but the result, he wrote, has been clumsiness and tediousness. The dark brown, polished granite colonnettes impressed Wasastjerna as particularly misplaced; in short, ''the exterior certainly leaves the beholder completely indifferent and unmoved.''[86] The building was presented as a warning example and a rhetorical contrast to another bank building in Viipuri/Viborg, the Kansallis-Osakepankki (Fig. 132- 133), which Wasastjerna hailed as a harbinger of a new era of architecture (cf. below). The vehemence of this attack is remarkable — in Norway Harald Bødtker's Widows' Fund building (Fig. 114-115), which is similar in conception and almost exactly contemporaneous, merely elicited faint praise. Nor are reasons for this hard to find. During these very years, Finnish architecture was entering a dynamic phase which made the historicist position appear more outdated than ever, even for bank buildings intended to express solidity.

In his next bank project, the head office of Helsingfors Sparbank (Fig. 126), Aspelin abandoned the Italian formula in favour of an idiom with Northern allusions; as a whole the composition is modelled on standard German *Geschäftshaus* façades. Aspelin presented his plans and elevations in November 1900. The question of the façade material inspired a lively discussion in the bank's administration. The *ad hoc* building committee had considered two possibilities, granite by Ab Granit or marble by Ruskealan Marmori Oy, and



128. Grahn-Hedman-Wasastjerna, Wasa Bank, detail. (Photo Kari Hakli, SRM—FAM)

the tenders submitted by these firms amounted to about the same; for this reason the matter was referred to the Board for decision. The Board decided to request expert reports on the durability of the Ruskeala marble from Wilhelm Ramsay, professor of geology, and J.J. Sederholm. Since the two experts opined that the material was acceptably resistant to frost and to the acid of the city air, a majority supported marble. Three members of the board dissented, arguing that "for this purpose granite should be employed as being both more durable and more appropriate."[87] The Savings Bank was admired for its façade material rather than for its architectural merits, for instance by the critic Gustaf Strengell. "Here the domestic marble makes an excellent impression; unfortunately the design does not raise itself above the level of mediocrity."[88]

In their search for an adequate idiom for the recently available stones, architects in Finland did not, any more than their colleagues in Norway, attempt any independent reassessment of the European heritage of styles. Finland had no I.G. Clason. But as we have seen, Clason's architecture was closely copied by the Helsinki firm Grahn-Hedman-Wasastjerna in the the Argos House (Fig. 76). In 1897-1899 the trio emulated another Clason work, the Hallwyl Palace (1893-1898; Fig. 90) in their building for the Helsinki office of the Wasa Bank (Fig. 127-128).[89]

In March 1897 the Wasa Bank bought a ground plot in the southern Esplanade in central Helsinki, and in November Knut Wasastjerna presented his first "sketch for a façade in Moric style."[90] In February 1898 tenders were invited from contractors. One of these was at the time building the Yhdyspankki-Föreningsbanken on a running account (Fig. 123). From recent experience the master-builder assumed that the façade stone would not be delivered in time, and for this reason he was unwilling to enter a contract-by-tender agreement, an apprehension that was to prove only too justified.[91] The facade was imported from Sweden, pink Orsa sandstone delivered by the Stockholm firm Ericsson & Kjellström, who had specialized in red sandstone. In June 1899 all the façade material had arrived and in the same month the premises were taken into use.[92] To the stone firm, however, the contract proved so difficult that when in September they were invited to submit a tender for the façade of Nylands Nation (Fig. 129), they politely but resolutely declined.[93]

Bertel Jung — who had questioned the Renaissance idiom of the Yhdyspankki-Föreningsbanken — was effusively enthusiastic over the Wasa Bank. He praised its source of inspiration, Clason and the Hallwyl Palace, and he used unqualified superlatives for its composition and noble material. "And one can hardly find words of praise for the discreet treatment of lines, surfaces and ornamentation which has given full justice to the fabulously handsome material." To the general

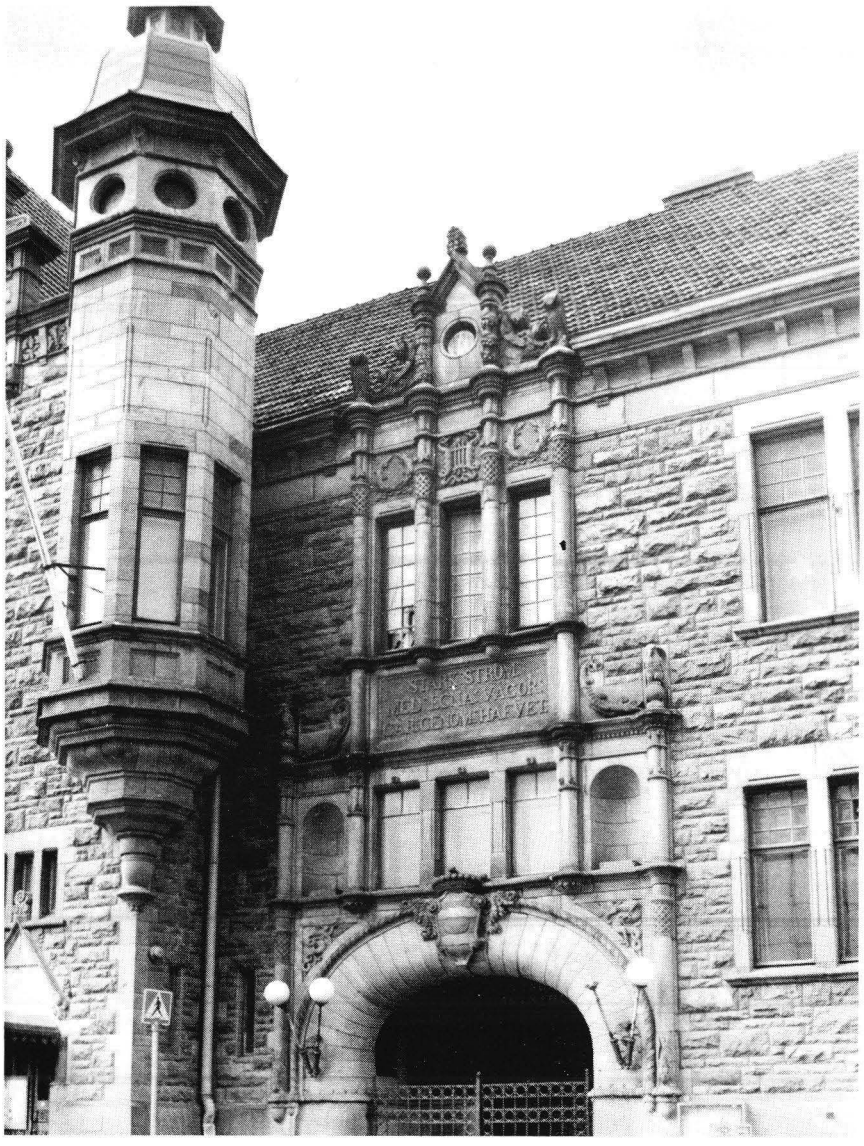
129. Karl Hård af Segerstad, Nylands Nation, Kasarminkatu/Kaserngatan 40, Helsinki. 1899-1901. (Photo Risto Kamunen, SRM—FAM)

public, however, the architecture of the Wasa Bank appeared difficult. The coupling of the windows and the absence of pilasters etc. on the intervening wall surface made many an onlooker associate it to prison architecture, Jung informs us.[94] Fifteen years earlier the Stockholm public had reacted in a similar way to the Thavenius Building (Fig. 62). "What sort of storehouse will this be?" people had asked then, finding that "the windows were too widely spaced, and the façade too sparsely decorated."[95]

The adaptation of the three storeyed Hallwyl façade for a five storeyed commercial building presupposed certain modifications. The plain windows of the first and third floor of the Wasa Bank tend to neutralize these storeys, suggesting that there are three really important levels. In order to counter-act the impression of height, the architects have resorted to a device reminiscent of the motif used by Gustaf Lindgren and Agi Lindegren in the Stockholms Handelsbank (1895-1896; Fig. 96): an elaborate arcade of closely set windows surmounted by a parapet, in the case of the Wasa Bank composed of fields emblazoning the Wasa sheaf (Fig. 128).

Like the Argos House, the Wasa Bank tended to support Jac. Ahrenberg's assessment of the situation in Finland: a more elaborate treatment of a façade, whether in French or English Gothic, or as in this case, Spanish Renaissance, seemed impossible in any domestic stone. There was, however, one exception to the rule: soapstone, which Karl Hård af Segerstad had already experimented with in his Falken in Helsinki (Fig. 122), and which the Geological Commission had recommended for articulate stone carving (Fig. 14). The Finnish Soapstone Co. had, moreover, been registered in 1899 (cf. above p. 44).

In 1899 Karl Hård af Segerstad was given another opportunity to use soapstone. Since the 1870's, Nylands Nation, the Association of Swedish-speaking students from the capital and the province of Nyland, had planned a building. After a complicated pre-history in several phases, a closed competition was won by Karl Hård af Segerstad in September 1898.[96] In its main

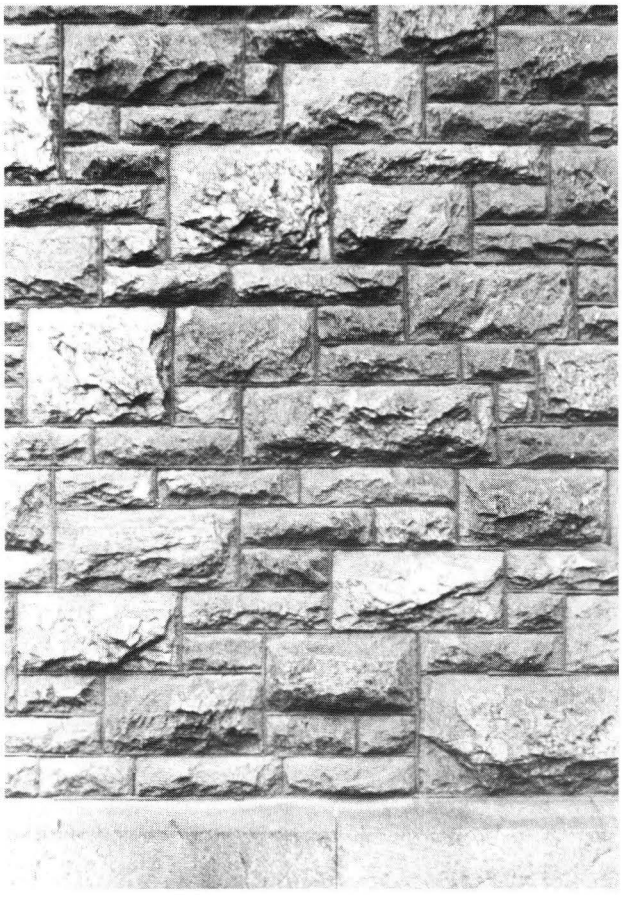


130. Karl Hård af Segerstad, Nylands Nation, detail. (Photo SR)

features, the Nylands Nation was built according to Hård af Segerstad's winning design; only the small gable on the right replaced a curved pediment in the first project (Fig. 129).

The façade material of the Nylands Nation was discussed at length in the various committees set up to conduct the building project. At an Association meeting in October, 1899, a motion from the floor proposed the use of "granite, soapstone or some other natural material;" the speaker referred to the recent current in architecture, according to which a building with a lofty purpose should have a more permanent facing than plaster or gypsum. The motion was unanimously adopted by the meeting.[97] This decision had, however, been anticipated by the architect's own inquiries, sent in the preceding months to various firms including Ab Granit, and in Sweden, Yxhults Stenhuggeri and Ericsson & Kjellström.[98] In November the alternatives had crystallized to two, granite or soapstone, and with a majority vote soapstone was finally chosen.[99] The pros and cons of both materials had then been discussed in much detail: on the one hand, soapstone had a dullish grey colour, but on the other, this soft material was better suited to the style of the façade, which would have to be simplified if granite was chosen. Decisive was the information supplied that rock-faced blocks of soapstone could be had in measures of 30×40 cm.[100]

The composition, as well as the details of Nylands Nation suggest inspiration in contemporary Scottish architecture, which was known to architects in Finland mainly through publications. The rubble wall (Fig. 131) does not live up to Scottish norms (disregarding, of course, the fact that this is a mere lining): there are, for instance, vertical joints with no less than five stones. Nylands Nation represents the historicist application of stone rationalism: the material was chosen after the elevation had been composed, instead of the other way round, and the details impress us as repetitions rather than inventions; the builders, moreover, resisted the idea of simplifying the architectural idiom to suit granite, a simplification that was by this time welcomed

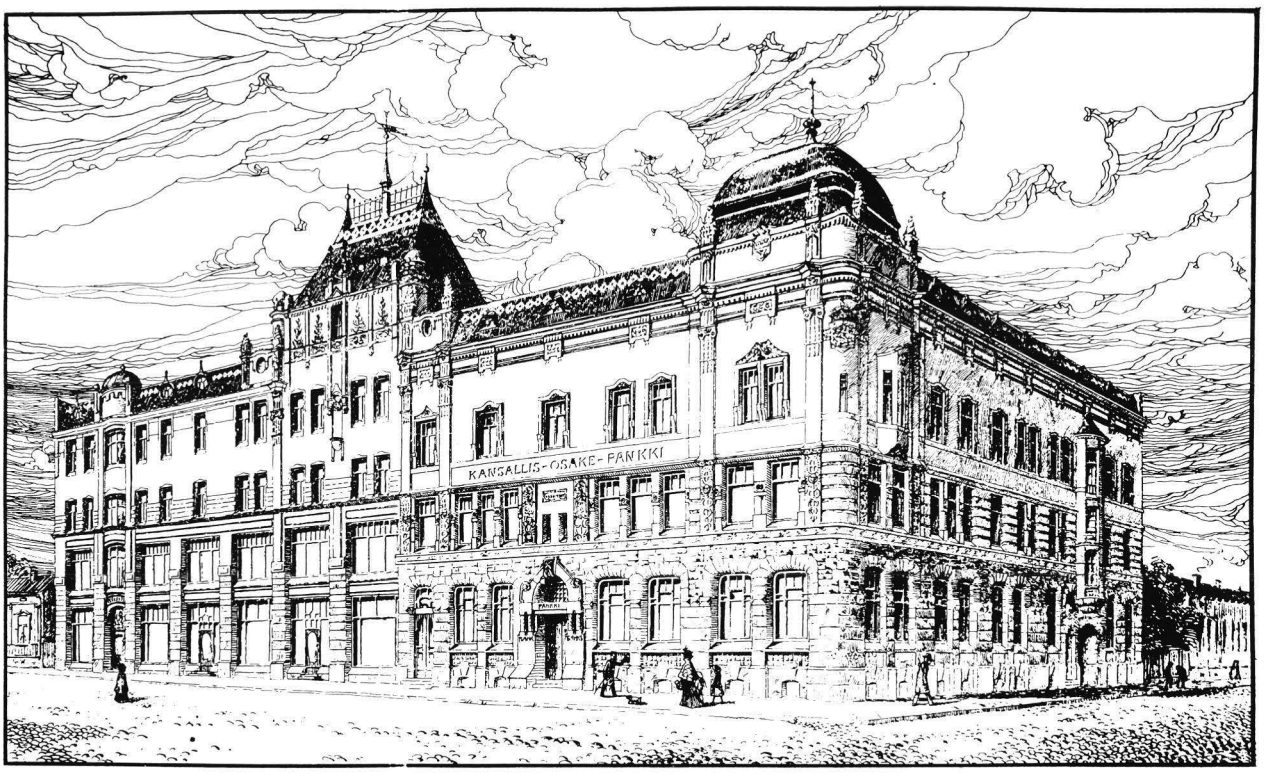


131. Karl Hård af Segerstad, Nylands Nation, detail of rubble lining. (Photo SR)

by many theorists and architects. Bertel Jung, the severe critic quoted several times already, called Nylands Nation "a rehash of old and well-known themes," contrasting it to the Polytechnics' Union inaugurated two years later (Fig. 205-206).[101]

Nils Wasastjerna saw historicism as definitely overcome by the trio Usko Nyström-Petrelius-Penttilä in their building for the Kansallis-Pankki in Viipuri (Figs. 132-133). "If Benedetto da Majano, Cronaca, Michelangelo or any other of the Renaissance masters could rise from his grave and be confronted with a building such as the Nordiska Aktiebanken [Fig. 125], he would certainly shrug off this architectural lingo, surprised that our architects find no more worthwhile things to do than to caricature Renaissance art; but in front of, for instance, the Kansallis-Pankki he would surely find that the building speaks a language unknown to him, the language of a new era. Nonetheless he would watch the building with interest and respect, trying to understand this new idiom."[102] What elicited the critics' admiration was the congenial use of material: the ground floor level was rusticated and lined with grey granite, whereas the upper storeys were delicately articulated in soapstone.[103] To a later generation of viewers the moderating influence of Viennese models is clearly perceptible; at the same time the Kansallis-Pankki with its thistle ornamentation already forms a mature example of national romantic architecture.

132. Usko Nyström-Petrelius-Penttilä, Kansallis-Pankki, Viipuri (Vyborg, USSR). 1900-1901. (Photo N. Wasastjerna, SRM-FAM)



133. Usko Nyström-Petrelius-Penttilä, Kansallis-Pankki, Viipuri. From *Rakentaja,* no. 12, 1901, pl. XV.

8. MONUMENTAL ARCHITECTURE

> There is one good thing, which the recent trend has brought about: nowadays monumental architecture is no longer thinkable in imitated materials — as it was in the period when the Royal Library, this otherwise handsome and noble work, was built. This is already an important gain for our city and our country.[1]

These words were written by Gustaf Lindgren on the occasion of the great Scandinavian Exhibition in Stockholm 1897. They certainly held good for Sweden, where vast public buildings such as the Royal Opera House (Fig. 136-137) and the National Bank with the Parliament Building (Fig. 138-140) were under construction or nearing completion. The Nordic Museum — which was situated on the Exhibition grounds — had been built as far as the central part (Fig. 135), and the portion completed so far was temporarily integrated with the Exhibition architecture.

Lindgren's words also applied to the situation in Norway, where the National Theatre (Fig. 145-146) and the Christiania Court of Justice (Fig. 71) were under construction. In Finland, on the other hand, depressed economic conditions and the primitive level of the stone industry long precluded the use of natural stone, even for monumental architecture. In 1890 both the House of the Estates and the Finnish State Archive had been built with façades of painted plaster according to the designs of Gustaf Nyström, the architect whose Yhdyspankki-Föreningsbanken was to become a paradigm. In 1899 Nyström's bank building was referred to by the Finnish Board of Public Buildings in an application to the Senate. Now that private buildings began to have granite instead of plaster façades, it was argued, a museum for the nation's priceless collections should not be in an inferior position. A solid material, moreover, would also give the building a "dignified and monumental character" (Fig. 155-156; cf. below p. 146).

In Sweden the first public building since the National Museum to receive a façade of natural stone was the Nordic Museum, Nordiska Museet, in Stockholm (Fig. 134-135). The campaign for a new, adequate building for the museum began in the early 'eighties. An international competition, held in 1883, failed to yield an acceptable design. Instead, the energetic founder and leader of the museum, Artur Hazelius, proceeded to work out plans in collaboration with Magnus Isaeus, who was a member of the board of the Museum. Isaeus died in 1891, and the planning was thereafter entrusted to I.G. Clason, who in the same year produced plans

134. I.G. Clason, Design for the Nordiska Museet, Stockholm. Drawing by Gust. Améen. From *Förslag till byggnad för Nordiska Museet,* 1891, pl. 2.

135. I.G. Clason, Nordiska Museet, entrance. 1892-1907. (Photo SR)

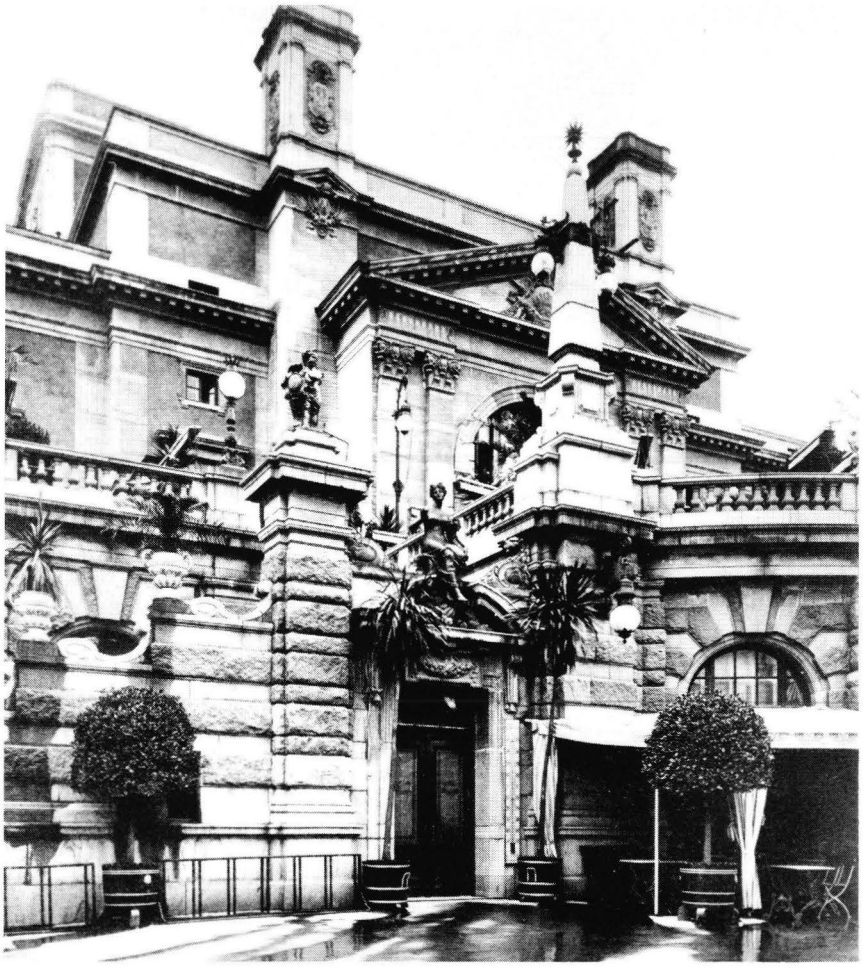
and elevations for a castlelike edifice with a rectangular court and corner towers.[2] Aided by an assistant, Gustaf Améen, Clason published his project in a folio volume with heliogravure illustrations (Fig. 134). The general effect is reminiscent of Netherlandish Renaissance architecture, although certain motifs allude to the Swedish national heritage, notably the corner towers modelled on Gripsholm Castle. The publication states that "The building is planned to be executed in brick; its lower part is to be clad with granite up to and including the first cordon moulding, that is, to a height of c. 5 metres."[3] Clason's choice of style and his elaboration of individual motifs was clearly determined by the material at his disposal. A few years earlier, he had successfully employed a similar solution in the Bünsow house (Fig. 63).

At the same time, however, the possibility of using stone instead of brick was investigated. In November, 1891 the Museum building committee received a detailed report on the resources of Roslagen sandstone, which had been prospected for this purpose by the geologist Eugène Svedmark. The report stated that after centuries of utilization, the stone was no longer easily found in larger blocks. "Since, however, so called rubble ("nubbsten") of small dimensions is envisaged for the building of the Nordic Museum, I do not hesitate to state [. . .] that *the resources of suitable sandstone are fully sufficient.*"[4] In February, 1893 the Board applied for royal permission to proceed with the first phase of the project, the western Main Hall (the only part ever carried out), and in April the permission was granted.[5] But even before the permission arrived, contracts were signed with three Roslagen entrepreneurs undertaking to deliver sandstone.[6] Until 1907, when the building was finally completed, Clason submitted elevations to fit his reduced Museum pro-

136. Axel Anderberg, The Royal Opera House, Stockholm. 1891-1898. (From a heliogravure by Chr. Wastphal, ÅAK)

ject.[7] But he did not apparently regard the choice of sandstone instead of brick as requiring any substantial adjustments. This attitude seems typical of the earlier phases of the stone movement, and it can be observed in other cases of the last-minute change of façade materials.

The Royal Opera House in Stockholm (Fig. 136) was planned during the same years as the Nordiska Museet. The old Opera House built by Gustaf III had become too small, and it was regarded as outdated, technically as well as from the safety aspect. In the 1880's several proposals had been presented for the extension and remodelling of the Opera; after an unsuccessful competition the matter had reached an impasse. But in 1889 a Consortium was established, and from now on the project was carried on as a commercial venture and



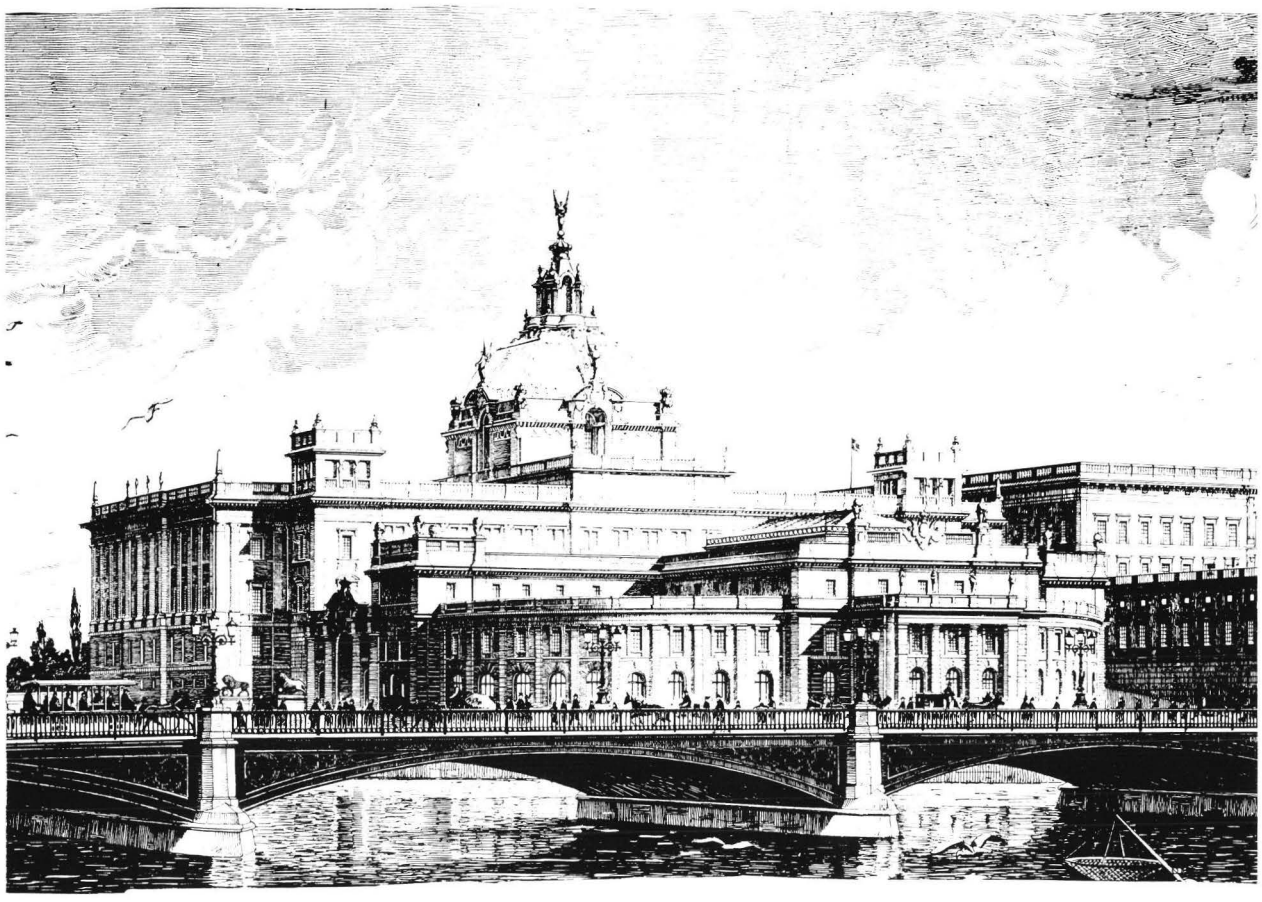
137. Axel Anderberg, The Royal Opera House, entrance to the Opera Tavern. From *Operabyggnaden i Stockholm,* 1898, pl. facing p. 44.

with professional efficiency.[8] The planning was given to Axel Anderberg, who submitted his designs for approval in 1890; the construction was begun in the following year, and the building was completed in 1898. The campaign had been conducted with extraordinary prudence, leaving a surplus which could be used for furniture and for the support of the opera company.

Although economy was thus exercised, genuine or at least "solid" materials were used in the Opera House. In the exterior, the stated intention to subordinate the architecture to that of the the nearby Royal Castle provided a convenient reason for using tinted plaster for the wall surfaces.[9] I.G. Clason, who was himself a member of the Consortium's expert panel, suggested that granite would have been preferred for the entire façade if this had been economically feasible.[10] As built, the Opera House has Norrtälje granite in the first floor only, Öland limestone for the window dressings, pilasters, balustrades etc, and Yxhult limestone for the upper mouldings.[11] For the rusticated ground level Anderberg is reported to have wanted red sandstone; since the availability of this variety in the required quantity was uncertain, the Consortium had the resources prospected,[12] apparently with a disappointing result. O.A. Busch, the project co-ordinator and editor of an illustrated volume published for the inauguration, was pleased to note that out of 60 different contractors involved only two were foreign, the Ankerske Marmorforretning supplying marble for certain interior details, and C.Wienberg in Copenhagen, "who in his capacity as the owner of a limestone quarry in Öland still delivered a Swedish material, worked by Swedish workmen." Otherwise the Opera House was built almost exclusively of Swedish materials.[13] The result bears the mark of a corporate project; Anderberg served as the willing instrument of the Opera Consortium, and he made no attempt to formulate original solutions. The competent use of a Renaissance idiom in a Semperian variant answered his level of ambition (Fig. 137).

The nearby building complex for the Parliament and the Bank of Sweden, the so-called *Riksbyggena*, offers several parallels to the Opera project. Thus for the Riksdagshuset building stone was also used in combination with brown tinted plaster, again with the Royal Palace as a pretext. As in the case of the Opera House, the plaster was a substitute for the whole stone alternative. As late as 1898, less than two years before the this extensive façade work was completed, the possibility of replacing the plaster with natural stone was still keenly explored.

Riksdagshuset was seen as a visible manifestation of



138. Aron Johansson, Design for the Riksdag building (back left) and State Bank (front right). 1894. From Aron Johanssen, *Förslag till Riksdag- och Riksbanksbyggnader,* 1894, pl. [4].

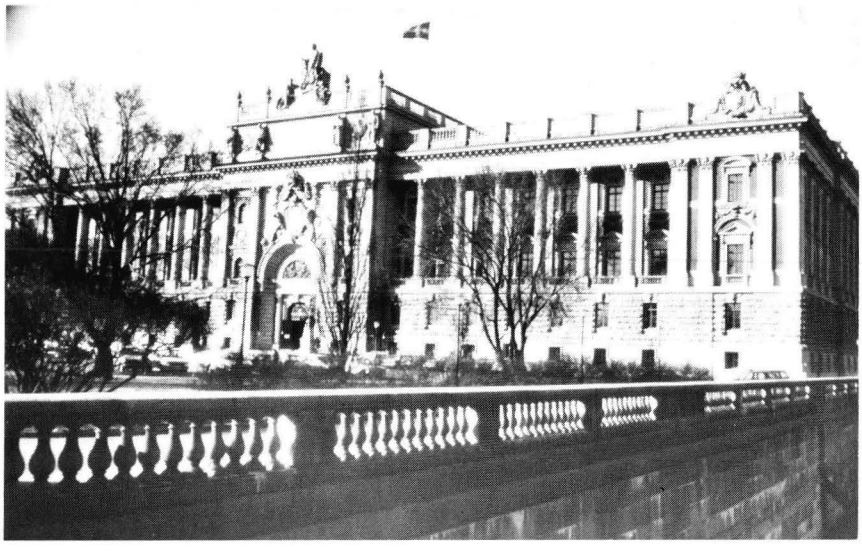
representational democracy, and for this reason the proponents of the project regarded the site on Helgeandsholmen adjacent to the Palace as the only acceptable alternative. A decisive turn in the long prehistory of the *Riksbyggena* occurred in 1888, when the Diet decided to go on with the plans for the disputed site. An earlier project by the head of the Swedish Board of Public Buildings, Helgo Zettervall, was revised, and Zettervall and his young assistant Aron Johansson were commissioned to work out new designs. In 1892 Zettervall resigned, and Johansson was given sole responsibility for the project. A publication with plans and perspective views appeared in 1894 (Fig. 138). From this basis the project proceeded with successive modifications, the most important being the omitting of the cupola. The Parliament building was built in 1897-1905 and the Bank in 1898-1906.[14]

Aron Johansson's creation became the target of a continuous flow of criticism and invectives, from his colleagues as well as from the press and the public. We recall that Lundbohm criticized the haphazard procedure adopted for the choice of materials for the *Riksbyggena*. Instead of first ordering plans and elevations, and then chosing the stone (as frequently happens with private projects, and now also with the *Riksbyggena*), the state should begin the planning of important monumental buildings with a survey of available materials.[15] Lundbohm's objection was more than justified. In the one page explication in Johansson's *Förslag till Riksdags- och Riksbanksbyggnader på Helgeandsholmen* the façade materials are summarily specified as natural stone (granite, limestone and sandstone) except for the plastered wall surfaces between the pilasters.

At the first meeting of the Building Commission in January 1895 one member presented a list of 20 points that the commission had better clarify. The first two were "What stone is to be used for the coating of the outer and inner façades?", and "To what extent shall natural stone be employed for the outer and inner façades?" No regard was then paid to the initiative, although it appears that the two firms that ultimately were to deliver the façade stone had already submitted preliminary tenders based on general drawings on a small scale.[16] But a little later the baron B.A. Leijonhufvud presented a work schedule, which entailed, among other things, that elevations of the stone portions of the façades should be required as a basis for negotiations with stone firms. In May, 1895 Leijonhufvud had arrived at the conclusion that tenders based on the general drawings must, of necessity, be unreliable.

> The ornamentation of the façades of the Riksdagshuset is composed in the so-called Baroque style. Characteristic of this style is the employment of bent lines and curved forms with garlands, festoons, caryatides, figures, the rich ornamentation of doorways and window openings, and a profusion of delicate mouldings.
> Opinion may certainly be divided on whether the employment of Baroque ornamentation was the best possible choice for the Riksdagshuset. In any case it is evident that these numerous delicate ornaments will prove costly, and that their execution will require much time, all the more so, since the material to be used will consist of our intractable granite, sandstone and limestone.[17]

Leijonhufvud suggested simplifications. After all, he reminded the members, almost everything is made by hand in the stone firms; the three years allotted to the construction of the walls and their coating may easily extend to four of five. In the autumn the committee still deferred a decision on what stone to use. The architect members Aron Johansson and F.G.A. Dahl were required to calculate the amount of stone needed. Johansson's and Dahl's estimate was presented in March 1896, and in July that year no less than fifteen tenders



139. Aron Johansson. Riksdagshuset (Parliament Building), Stockholm. 1894-1906. (Photo Rolf Nummelin)

140. Aron Johansson, Riksdagshuset (right) and Riksbanken (left) with the passage forming an extension of Drottninggatan. (Photo ca 1910; ÅAK)

were discussed in two meetings. "With regard to construction," Johansson recommended the tenders that included pilasters, columns and cornices of granite and surrounds of freestone. Again the deliberations of the committee seemed to tend towards a combination of Norrtälje granite and Hoburg limestone.[18]

In August 1896 the assistance of Hjalmar Lundbohm was summoned. Johansson, Leijonhufvud and Lundbohm travelled together to Gotland to inspect the limestone *in situ*. Lundbohm arranged the stone to be tested in the Chalmers Institute of Technology in Gothenburg, and he made a careful study of the medieval churches, where Hoburg stone had been employed, and where it had been exposed to weathering for six centuries.[19] In November, finally, the committee was prepared for a decision which followed a tendency perceptible right from the beginning: reddish Norrtälje granite with similarly reddish Hoburg limestone. Lundbohm opposed the idea of using Gotland limestone at all, since he doubted its durability. A tender by Kullgrens Enka proved to be more than 1/8 higher than the one submitted by the Norrtelje mekaniska. The committee appreciated the high quality of the light grey Malmön granite; still, it was more expensive, whereas "according to the expert members of the committee, the employment of the reddish Norrtälje granite could be regarded as fully justified from an aesthetic point of view."[20] Despite Lundbohm's misgivings, Hoburg stone was contracted for the details; at the time it was also decided to use Graversfors granite for the cornice and entablature.[21] In October 1898 the question of using rubble ("nubbsten") instead of plaster was brought up, and in the spring of 1899 the committee investigated the cost of hammer-dressed Hoburg rubble, comparing samples of stone and plaster. After further deliberation and consultation with experts, the proposal was finally rejected in April, 1899.[22] By the end of the year 1900 the façade stone of the Riksdagshuset was practically complete, and three years later the granite of the State Bank was in place. The whole Riksbyggnads project had a sequel typical of the stone boom period: the Norrtelje mekaniska stenhuggeri had, to quote their own words, "contracted the Riksdagshus work for the definite purpose of becoming pioneers in the field of Swedish granite for monumental buildings." Insufficient capital, rising costs etc. had upset the original calculations and the firm therefore applied for an extra payment of 45,198 crowns — or almost as much as its capital at the time of the contract.[23]

As pointed out by Lars-Olof Larsson, the granite of the Bank façade (Fig. 141) may have certain national overtones while at the same time drawing on the monumental tradition from Gottfried Semper (cf. Fig. 7).[24] Basically both the Opera House and the Riksbyggena represent an academic, historicist use of stone. This is not primarily a value judgment. From the historicist point of view, the employment of true materials meant that the cheap imitation was replaced by the noble material imitated; the original form was once again united to the original matter. Since most of the motifs drawn from the major periods in the history of architecture had originally been conceived in stone, there was no need for reshaping them now that they once again were combined with their original material. In the case of granite, it was true, the material did seem to impose new demands on the form, but only in a restrictive sense, and not as a positively formative factor. Thus the hardness of granite necessitated the simplification of Renaissance ornaments; but to the historicist mind it did not suggest the invention of novel forms. The idea that new forms, too, could be sought to fit the material, belongs to another line of thought.

141. Aron Johansson, Riksbanken. 1898-1906. Detail. (Photo Per Bergström)

The dynamic interplay between material and form became evident in the Dramaten (The Royal Dramatic Theatre) in Stockholm (1902- 1908), built by a consortium formed in the preceding year. The building was designed by Fredrik Lilljekvist, who a little earlier had made imaginative use of marble and limestone in his own house (1896-1897; Fig. 102) and unornamented limestone in his Drottninggatan block of flats (1898-1900; Fig. 103). In 1901 Lilljekvist submitted his first projects for the theatre. The principal composition with a central projection and pavilions, as well as the distribution of the windows were already formulated in the early elevations, where the figural frieze also occurs. Lilljekvist's starting-point was a classicist one: originally, the central projection had a triangular pediment with columns *in antis*, and the pavilions had corresponding pediments with pilasters on their gables (Fig. 142).[25] Viewed along the Strandvägen, the Dra-

142. Fredrik Lilljekvist, Dramatiska teatern (Royal Dramatic Theatre), Stockholm. Design 1901. Riksarkivet, Stockholm. (Photo RA)

143. Fredrik Lilljekvist, Dramatiska teatern. 1901-1908. (Photo SR)

matic theatre appears with the massive Sjöqvist Building (cf. Fig. 100) in the background; the classic features were clearly intended to set the temple of drama apart from the urban ambiance. For a façade of this character the appropriate material must be marble, or if such could not be had, a light coloured limestone.

The theatre consortium made use of the expert advice of I.G. Clason, Carl Möller and Gustaf Wickman — all of whom also happened to be experts on building with stone. An estimate of 1901 had calculated with 210,000 crowns for the stone coating. In the following year the sum had risen to 310,000 for limestone; then the price of white Ekeberg marble was also quoted (420,000).[26] Investigations had shown limestone to have less desirable properties and everyone seemed to agree with Lilljekvist that marble was the best choice. This was the opinion of Clason, Möller, Wickman and a geological expert, Professor Gerhard Holm, who was most enthusiastic.[27]

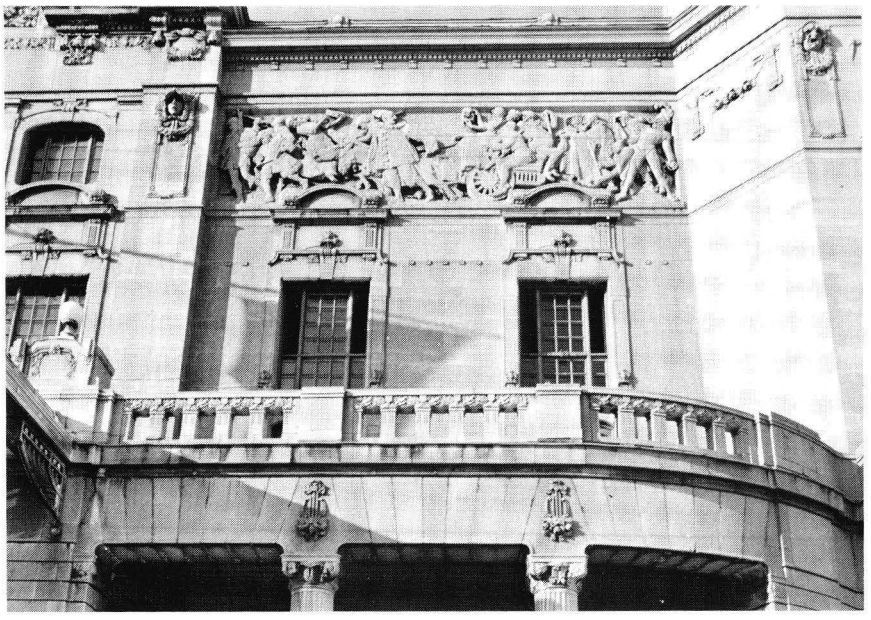
Tenders were received from eight firms, most of them offerring marble; a few also gave quotations for granite. Lilljekvist's own comments on the offers reflect his original intentions:

> I may thus, as I have done earlier, most strongly recommend Ekeberg marble as being the stone variety which would be best suited for the building and which would give it the artistic character demanded by its function.[28]

Ekeberg marble is, he admitted, the variety requiring most work, but if worked by a competent firm such as Grafversfors, too many delays might be avoided. Lilljekvist expressed his disdain for granite: the light grey Malmön granite delivered by Kullgrens enka "is monotonous and lifeless, and lacks patina; if granite is to be used, the ornamentation must also be treated in a cruder manner." A combination of granite and marble must be categorically rejected; only if absolutely necessary a solution with the first floor in granite and the rest in limestone might be considered. Red granite or dark grey Finnish soapstone were also out of the question "since the building must have a light and vivid colour."[29]

The Ekeberg marble was, however, to prove costly. The original estimate was doubled and the consortium had to pay over 600,000 crowns for the façade. As a consequence, the last years of the building operation were marred by accusations, explanations and recriminations circulating among the builder, architect and supervisor of the works.

Still, the associative value of the material overruled all hesitation. Originally conceived as a classicist marble structure, the Dramatic Theatre was, step by step, reworked into a "contemporary" composition with delicate, shallow modelling. At one stage the pediment with columns was evened out to a relief with pilasters, and the Baroque features of the façade were discreetly



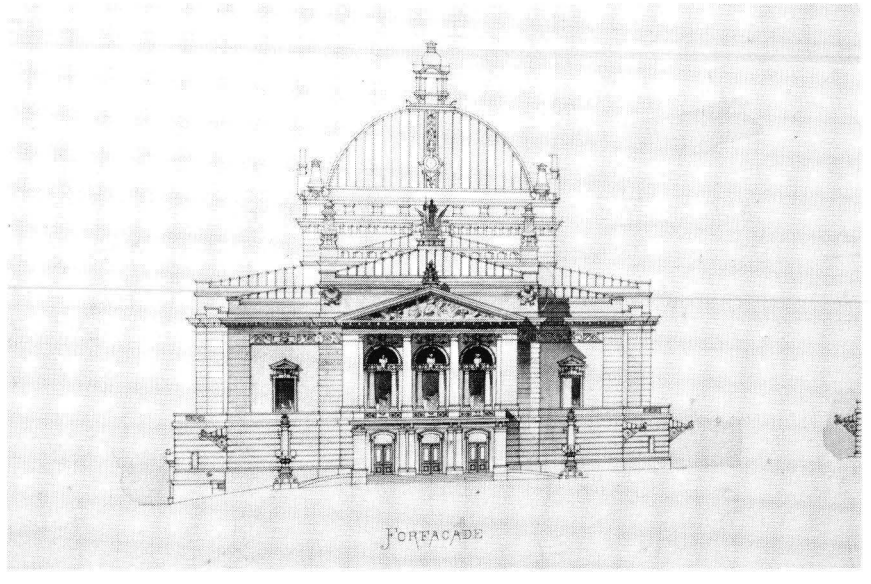
144. Fredrik Lilljekvist, Dramatiska teatern, detail. (Photo SR)

emphasized. Finally the frontispiece was dissolved into an open design, where the original conception was faintly reflected in the *antae* and a narrow, oval fronton, which was almost concealed by Carl Milles's sculptural group (Fig. 143). The relief frieze by Christian Eriksson was integrated with the architecture by letting the window pediments merge with the figural strip. All this takes place on the precise, smooth marble surface built with alternating binders and slabs, contrasting against the rebated surface of the ground level (Fig. 144). Three years earlier, I.G. Clason, advisor to the theatre consortium, had pointed the way in his von Rosen palace (Fig. 97), the first building to have a facade of Ekeberg marble, and a model that Lilljekvist seems to have returned to as he was reworking his initial, classicist project.

*

In Norwegian monumental architecture natural stone was long used in combination with brick or tile; a tradition which had its roots in the vigorous rationalist movement in the middle of the century. The Court of Justice by H.J. Sparre (1895-1903; Fig. 71-72) and Kunstindustrimuseet by Bredo Greve and I.O. Hjorth (1897-1904) are instances of the historicist use of combined brick and stone; but within this broader tradition there were other strains, too. In his Historical Museum (1897-1902) Henrik Bull transformed a red brick *Rundbogenstyl* project executed by a prematurely deceased colleague into a full-fledged Jugendstil complex with yellow tiles and heavily modelled granite.[30]

To some extent the widespread use of brick was also a matter of economy. Up to the stone boom in the mid-'nineties, an all-stone facade for a vast public building would have been looked upon as a luxury and as an

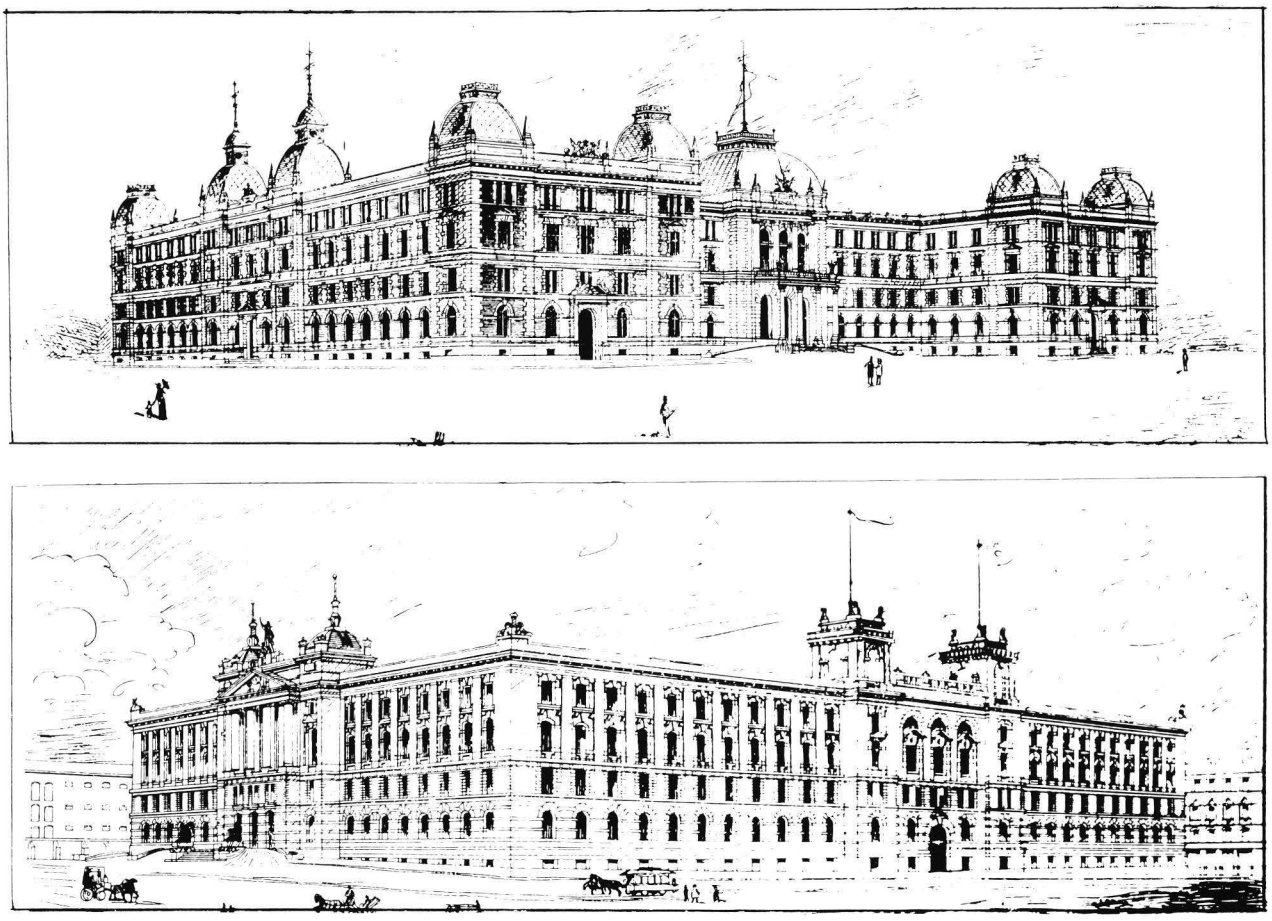


145. Henrik Bull, Design for the National Theatre, Oslo. 1890. Norges Arkitekturmuseum, Oslo. (Photo SR)

146. Henrik Bull, The National Theatre, Oslo. 1891-1899. Porch. (Photo SR)

impermissible spending of public funds. Yet time was working in favour of stone. After a competition in 1889-1890 Henrik Bull was entrusted with the planning of the National Theatre in Christiania.[31] His studies for the project show that he would have used as much stone as possible; in the elevation of 1890 (Fig. 145) the entire ground level is planned as rebated rustication, the frontispiece in smooth stone and the quoins with smooth or rusticated ashlar — at some stage rustication has been summarily indicated on the quoin just left of the central projection. Only small portions of the wall surface were planned for brick or some other less expensive material. But in the end most of the ground level rustication had to be left out, on the upper level the stone quoins were also replaced by brick, and brick was allowed to become the predominant material. As if to compensate for these cuts in the original scheme, Bull decided instead to execute the ground floor pillars and columns in a heavy rustication with deep rebates in the grey granite (Fig. 146). The emphasis on material and textural effects already seem to burst the rules of academic architecture; iconographically speaking the motif is a romantic overstatement, and it was understood as such by at least a few contemporary observers.[32]

The decisive turn to an idiom based on stone texture, took place in the most extensive monumental project of the period, the Government Building, of which the first — and only — stage was realized in 1901-1904. After decades of discussions and two competitions (1887-1888 and 1892) a compromise was reached. An H-shaped project by Stener Lenschow was combined



147. Designs 1891 for the Regjeringsbygningen (Government Building), Oslo. Above Stener Lenschow, below Henrik Bull. Published in *Teknisk Ugeblad* 1892, pl. 1.

with a rectangular project by Henrik Bull (Fig. 147); in 1898 the execution of the project was left to the latter.[33]

The jury of the 1897 competition already criticized the competitors for their indifference to Norwegian building materials. Only three entrants had tried to meet the obvious requirement that domestic materials should be used as much as possible; all the rest (24 entries) had used forms that require an execution in plaster or cement. "This must be considered unfortunate, both because of the character of the building in question, and because of the influence that it will exercise upon the development of our national architecture."[34] When the 1892 jury estimated the building costs, it postulated that the façade was to be clad with brick in combination with dressings and mouldings of masonry.[35]

The whole project was, however, allowed to rest until 1898, when a grant was appropriated for the erection of the southernmost stem of Lenschow's H-plan. On October 11, 1901 Henrik Bull submitted an important revision of the plans: instead of brick and stone the architect proposed that granite be employed for the entire façade. According to his estimate this would mean an extra cost of merely 27,000 crowns as compared to the total cost of 1,347,000 crowns. He referred to the flourishing of the Norwegian stone industry, an industry deserving support, since it played such an important role for Norwegian architecture and building technology. As for the Government Building itself, Bull wrote:

> It is clear that the employment of stone for the revetment of all the street façades will enhance the monumental effect of the building compared with the brick facing envisaged so far. The architectonic serenity attained through the employment of natural stone will become all the more apparent when the whole complex is completed.[36]

Bull's revised project from 1901 (Fig. 148) is an important document of the formative mechanisms of the stone movement. The intractable granite provided Bull will a welcome pretext for freeing himself from the historicist legacy. The whole array of traditional motifs was left out, ostensibly for reasons of economy, but in the last resort because it offered him a way out from historicism to a "national" idiom based on textural effects with a suitable admixture of Jugendstil.

The Budgetary Committee of the Norwegian *Storting* deprecated the fact that drastic alterations to the

148. Henrik Bull, Revised design for the Government Building. 1901. (From Pedersen, 1967, p. 117)

building programme were introduced at such a late stage; yet there was no reason to delay the project. The Budgetary Committee therefore supported "this 'national aesthetic' improvement of the original project." They also accepted the economic arguments. Since Norwegian brick was not good enough, the façade would in any case have had to be clad with imported material. "The Committee therefore agrees with the architect in finding it unnatural that our country, which is so rich in stone, should rely on foreign import and use a building material, which cannot bear comparison with our own natural stone, neither from a practical nor from an aesthetic point of view."[37]

As the Government Building began to take shape (Fig. 149), a critic in *Teknisk Ugeblad* hailed its architecture as a manifestation of ideas and aspirations that had recently begun to occupy the minds of Norwegian architects. So far these tendencies had been expressed in words only — not least in *Teknisk Ugeblad*, the writer added. Now Henrik Bull had given these ideas concrete substance, "breaking with outworn traditions and harking back in a national spirit, not so much in the distribution of the masses and the main proportions, where the restful and harmonious Renaissance form is left untouched, but in the details, in the ornamentation and partly in the use of the materials." A step has been taken in the transformation of "the principal forms of the Renaissance in a national spirit, a transformation which must be further intensified and stamped with our specific Norwegian character and artistic mode of expression in order to make it a basis for a national architecture."[38] Björn Sverre Pedersen, who has discussed this passage at length, suggested that the anonymous writer was H.J. Sparre, who was then the editor of *Teknisk Ugeblad*.[39] If this is correct, Sparre did indeed show an open mind; across the street his own, traditionally Neo-Baroque Court of Justice was nearing completion (Fig. 71), and he must have been aware of the fact that his work would immediately become a symbol of a past phase in Norwegian architecture.

In November, 1906, Henrik Bull gave a lecture on his work to the Architects' Section of the N.I.A.F. He emphasized the significance of the decision to employ granite; this gave the building a monumental character. The decision was an encouragement to the Norwegian stone industry. Bull also commented on the textural effect: he had deliberately used granite from different quarries in the Christiania region, and "mixed the different colour nuances in an irregular way, in accordance with old custom."[40] Bull's lecture was followed by a lively discussion. The Chairman of the Architects' Section was Waldemar Hansteen, who himself had just completed his Centralbanken (1900-1903, 1905-1906; Fig. 121). Hansteen congratulated Bull on "this extraordinarily monumental solution" of his task and pointed to the Government Building as an example of how "our old national art may work in concert with our modern architecture." A less polite contribution was made by an indignant harbour engineer, who had been compelled to move from his spacious office on the former premises to a cell with makeshift partitions in the new building. Did Bull know what the Regjeringsbygningen had cost a square metre? Or what the cost per square metre was compared with that of a block of flats, or, for that matter, the former premises of the Board of Harbours? Bull confessed that he had never calculated the cost per square metre. The engineer also wanted to know whether the stone work had been executed with machine tools or whether it was

149. Henrik Bull, South wing of the Regjeringsbygningen (all built). 1901-1904. (Photo SR)

handmade — ''many of the ornaments and figures shown impressed him as real works of art.'' To this Bull answered that the stone details had been made from models. All ornaments were cut by ordinary workmen, the figural parts in co-operation with trained ornamental carvers. Bull was hopeful about the future; ''our stone-cutters are capable of becoming fully qualified ornamental carvers'' if only given enough tasks. The best men were those that had learnt their trade from their fathers; about pneumatic tools Bull knew little, but he had a vague idea that such tools might indeed have been used.[41]

Neither were all critics enthusiastic about the Regjeringsbygningen. In 1907 Bull was awarded a prize for this work, but the awarding jury's reasoning was surprisingly critical. They found ''the rubble (raakop) of the façades unnecessarily emphasized.'' Nor did the lavish use of natural stone quite harmonize with the function of an office building, at least not in a country with Norway's level of economic development. In a comment on the award, *Teknisk Ugeblad* was even more severe, rejecting the notion that national architecture can be created by reiterating national motifs in a domestic material (cf. above p. 50).[42]

When the competition for the Bank of Norway was announced in 1900, natural stone was stipulated for the façades; as far as possible Norwegian materials were to be employed.[43] No less than 62 projects were submitted. The winners of the first and second prizes were invited to revise their projects, and in the end the project by I.O. Hjorth was adopted.[44] Norges Bank was completed in 1907. The façade is clad with dark grey syenite from Larvik, worked to rock-faced ashlar with narrow rebates marking the varying heights of the courses; the variation is also enhanced by the random mixing of ashlars of slightly different shade. The texture of the stone forms the principal means of expression which stresses the monumentality: the ''commercial'' allusions of the continuous verticals is counteracted by the vast expanse of rough stone surface and the aqueduct-like solidity of the arcades (Fig. 150). *Teknisk Ugeblad* welcomed the monumental application of the stone in the Norges Bank, but commented on the lack of local flavour; the anonymous critic would have liked some definite link between the architecture of this new building and the old Christiania architecture preceding it on the same site and generally to be seen in this characteristic neighbourhood in Christiania.[45]

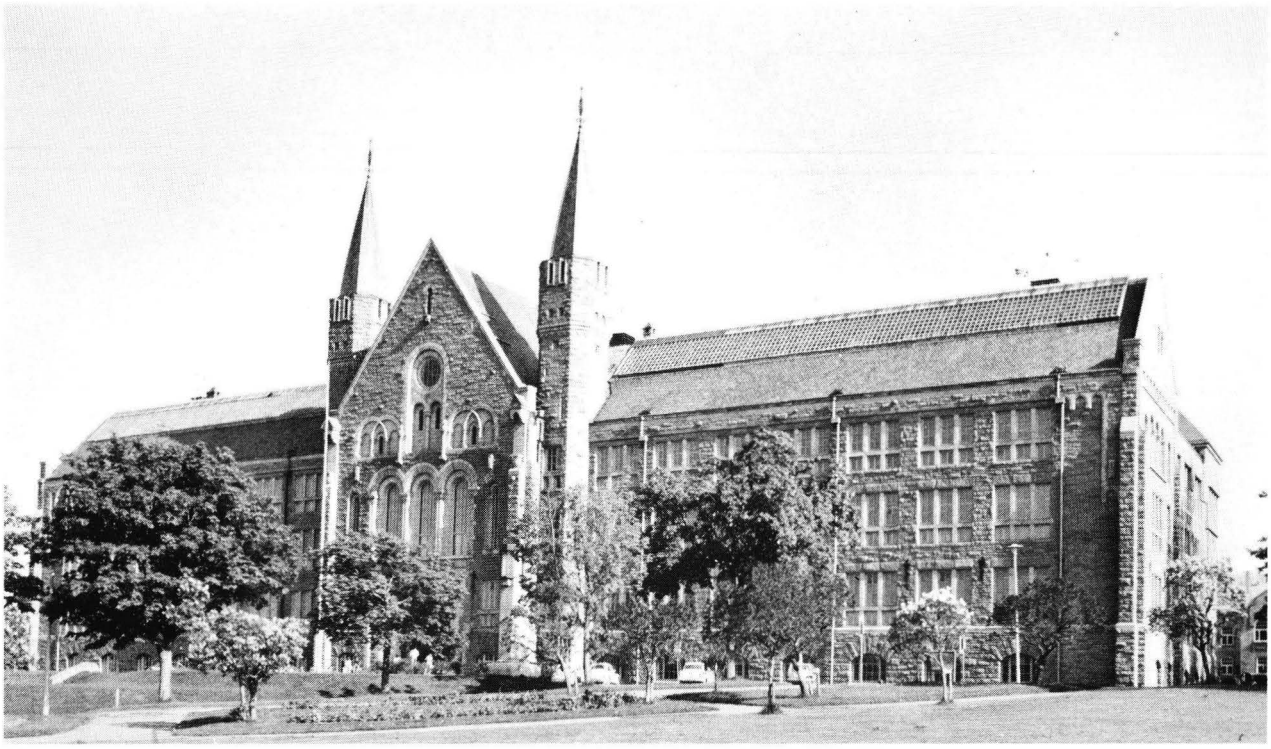
The 1901 competition programme for the next project of national importance, the Technical University of Norway in Trondheim (Fig. 151-152), gave rise to a discussion of principles: if one could not afford a complete stone facing, in what manner was it then permissible to economize? The rules of the competition stipulated that the façades were to be clad with natural

150. I.O. Hjorth, Bank of Norway (Norges Bank), Oslo. 1901-1907. (Photo SR)

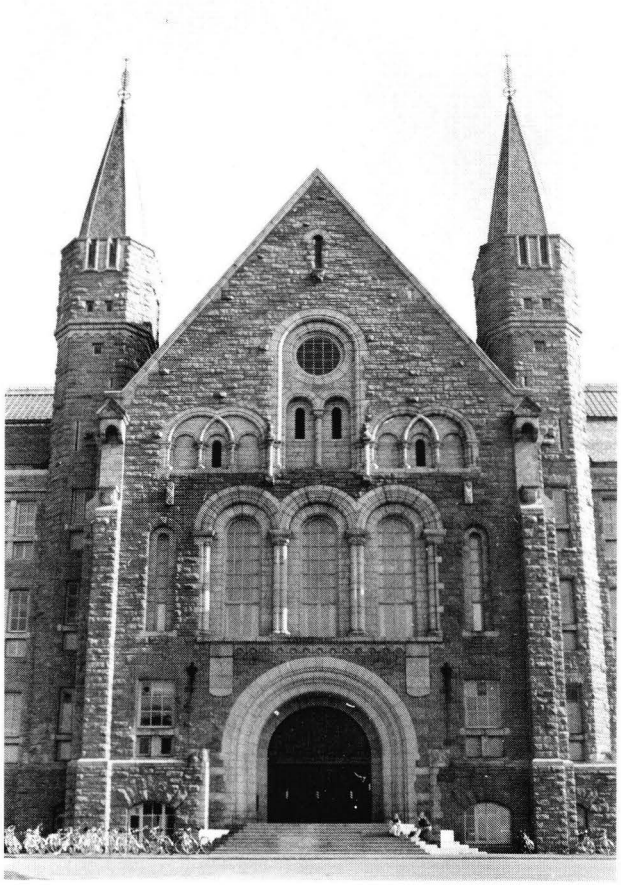
stone, with a sparing use of dressed stone for cornices and the like; the jury "did not, however, wish to exclude proposals for other ways of treating the façade. Walls facing inner courts and parts of the complex that after a later extension will cease to be exterior façades, may be treated with plaster."[46] A correspondent in the daily *Morgenbladet* attacked this stipulation, which seemed to him "like a revenant from that age of falseness which is not yet a past era in Norway." The jury, he wrote, seemed to have forgotten the important role played by inner courts in all true architecture. *Teknisk Ugeblad*, however, defended the stipulation, haughtily reminding the *Morgenbladet* correspondent of the fact that "experts have a more correct and a more profound grasp of the issue."[47]

The projects were published in 1902, and in the same year the winner of the third award, Bredo Greve, was given the commission.[48] A critic in *Teknisk Ugeblad* felt doubtful about Greve's combination of Gothic and Romanesque elements, but expressed his approval of the lively silhouette of the project (Fig. 151-152). Many of the other entries showed a more consistent application of Romanesque forms, in itself a good thing, "since this style suits our materials with the heavy granite in the main expanse of the surface, and soapstone in the relatively few parts that are ornamented — and richly ornamented." As a proof of the modern relevance of the Romanesque, the critic referred to the successful American school, "the most original and the most unprejudiced among the modern movements of architecture."

In contrast to the Gothicizing trend, this Romanesque inspired movement may be characterized



151. Bredo Greve, N.T.H. (Norges Tekniske Høiskole), main building, Trondheim. 1901-1910. (Photo SR)



152. Bredo Greve, Central part of the N.T.H. main building. (Photo SR)

> as an architecture of surfaces. Here the handsome, natural material with its rough rock face, confers upon our architecture a stamp of vigour and originality, which may well be said to be in tune with our nation's character and artistic mode of expression.[49]

These words about the role of American models were not written about Greve's project, although they apply to it better than the *Teknisk Ugeblad* writer did, perhaps, realize at the time. The central Romanesque façade with its wide entrance arch and high gable, set against a wide, rectangular façade and joined to this with octagonal towers, represents a symmetrical blow-up of Richardson's Billings Memorial Library (1883-1886; Fig. 153), illustrated in *Neubauten in Nordamerika* in 1897. Up to that year, as it happens, Greve still worked within a highly conventional frame of reference, as evidenced by his and Hjorth's Neo-Baroque Kunstindustrimuseet project.

In his own presentation of his N.T.H. complex, Greve dealt mostly with the function and the disposition of the buildings. The architectonic articulation was hardly mentioned, and the rubble bond for the main façade was according to Greve chosen for reasons of climate and building construction.[50] Yet we know that the architect was not unsensitive to the details of the masonry, where the place of each stone almost seems to have been weighed individually (Fig. 151-152). By

153. H.H.Richardson, Billings Memorial Library, Burlington, Vermont. 1883-1886. From *Neubauten in Nordamerika,* I, 1877, pl. 129.

his side he had an elder colleague of his, Andreas Bugge, who was also a qualified craftsman. Bugge had gained further experience of stone construction during his time as a leader of the Rønvik campaign (1895-1902; see below p. 159), and he also chaired the 1904 committee for the promotion of stone construction (above p. 38). Ingrid Pedersen has summarized the co-operation of the two architects, writing that "if Greve was *the composer* of the N.T.H. façade, then Bugge was *the virtuoso, the conductor*, who conducted the orchestra of masons and bricklayers when it was built."[51] According to Pedersen, Bugge spent his evenings and free time designing the pattern of the stones in order to achieve the correct rhythm and coloristic effect. Typically, this important monumental building in Trondheim did not receive a façade of local stone. The granite came from Idefjorden, by the Swedish border, delivered by N.S. Beer & Co.[52]

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In the field of monumental architecture, the emancipation from the historicist aesthetics of stone can be followed in Finland in two projects: the official proposal for the Historical Museum in Helsinki (Fig. 154-156; abandoned in favour of the alternative project by Gesellius-Lindgren-Saarinen, Fig. 194-198) and the winning entry for the competition of the National Theatre in Helsinki (Fig. 157-163). As in the case of the Swedish and Norwegian instances dealt with above, we have two types of monumental buildings especially favoured by the nineteenth century. But the parallelism is far from complete. In Finland we have no contemporaneous monumental buildings with stone façades built for the government, diet or state bank. The government (the Imperial Senate for Finland) had a vast Empire style complex begun by Carl Ludwig Engel in the 1820's and successively expanded, the State Bank resided in a building from 1882, and the House of Estates had been completed in 1890, several years before any architect could realistically consider using stone instead of plaster. A competition in 1908 for a new parliamentary building had no practical consequences, as the whole project was abandoned for political and economic reasons. The building for the Diet (1926-1931) had to wait until Finland had gained independence.

The idea of a Finnish National Museum harks back to the 1860's, but only after the founding of the Finnish Archaeological Commission in 1884 did the planning enter a concrete phase.[53] In 1889 the Finnish Board of Public Buildings presented a project for a museum building, the elevation of which was signed by the Director of the Board, Sebastian Gripenberg. As was to be expected, the official project was conventional to the point of obsolescence: a symmetrical, Neo-Renaissance block with a Tuscan portico and other Classicist motifs intended to link its architecture to that of the Empire Style centre of Helsinki.[54] Two years later Gripenberg and his collaborator, Magnus Schjerfbeck, produced a new, considerably simplified version (Fig. 154). The material envisaged for the new version was still plastered brick — anything else would have been out of the question with the financial limits set for the task.

In the meantime, a new site had been allotted to the Museum. The new site was more spacious and permitted a longer façade. A new revision was presented in 1899; by this time, however, recent developments had brought the question of the material into a different perspective. The architect now in charge of the Museum

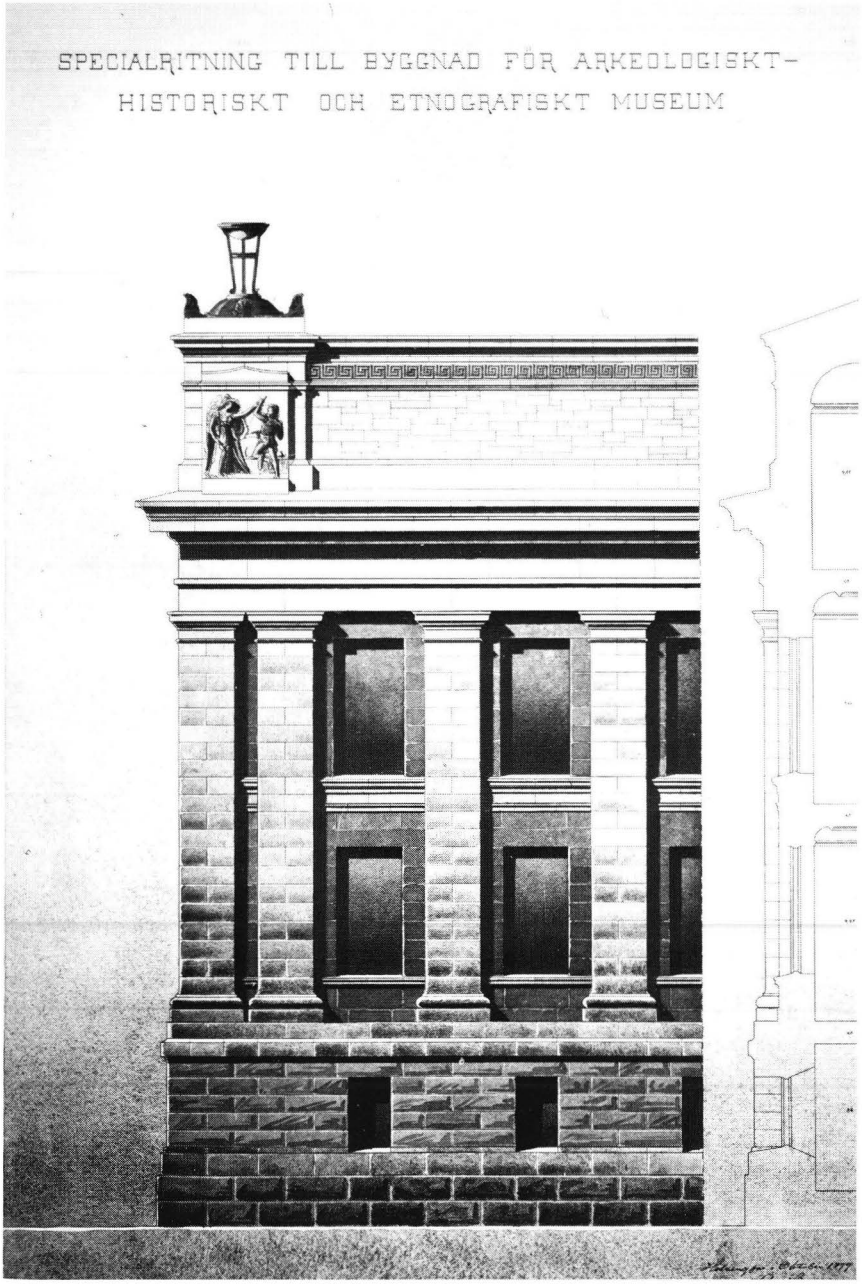
154. Sebastian Gripenberg & Magnus Schjerfbeck, The second, revised design for the Museum of Archaelogy, History and Ethnography. 1891. The National Archives, Helsinki. (Photo VA)

project was Hugo Lindberg, who had made his study trip to Scotland in the summer of 1898, and who published his articles on the Scottish granite techniques while working on the Museum project. In January, 1899 the Board of Public Buildings submitted an application to the Imperial Senate for Finland. Here reference was made to ''the powerful movement in architecture'' which insists on natural materials and which welcomes the resulting simplification of the forms as a natural consequence of the choice of the material.

> Repercussions of this movement can be observed even in our distant country, as evidenced by the building activity of the last few years. In a bank building completed last summer, the inhabitants of our capital have had an opportunity to see the immense and monumental effect produced by a façade built of a natural material. Under these circumstances it may reasonably be argued that a national museum, intended to house the precious and irreplacable collections of our cultural heritage, should not be in a less favoured postion than certain private buildings. The Museum ought to be built in the most solid material that can be had; this would also give it a dignified and monumental character. In this respect our Finnish granite offers every advantage, and the Board therefore ventures to stress the desirability of executing the exterior façades of the Museum in this material. Moreover, the Roman Doric style, which is proposed for the building, is eminently suitable for the purpose, provided only that certain modifications required by the material are made. The façades facing the court could be treated with plaster.[55]

In February, 1899, the Senate issued its approval and instructed the Board of Buildings to work out complete plans and elevations ''with regard also to the construction of the exterior façades in granite.'' The defini-

155. Sebastian Gripenberg & Hugo Lindberg, The official design for the Museum of Archaeology, History and Ethnography. Elevation, September 1899. The National Archives, Helsinki. (Photo VA)



156. Sebastian Gripenberg & Hugo Lindberg, Design for the Museum of Archaeology, History and Ethnography. Special elevation, October 1899. The National Archives, Helsinki. (Photo VA)

tive delineations (Fig. 155-156) were submitted in December the same year. Even now the Director of the Board — a little anxiously, it seems — appealed to the Senate not to let the increase of the building costs deter from employing a natural material for the façades. Once again he repeated that a monumental building such as this should be given ''the character of solidity, dignity and simplicity that can be achieved only by treating the façade in the proposed manner.''[56]

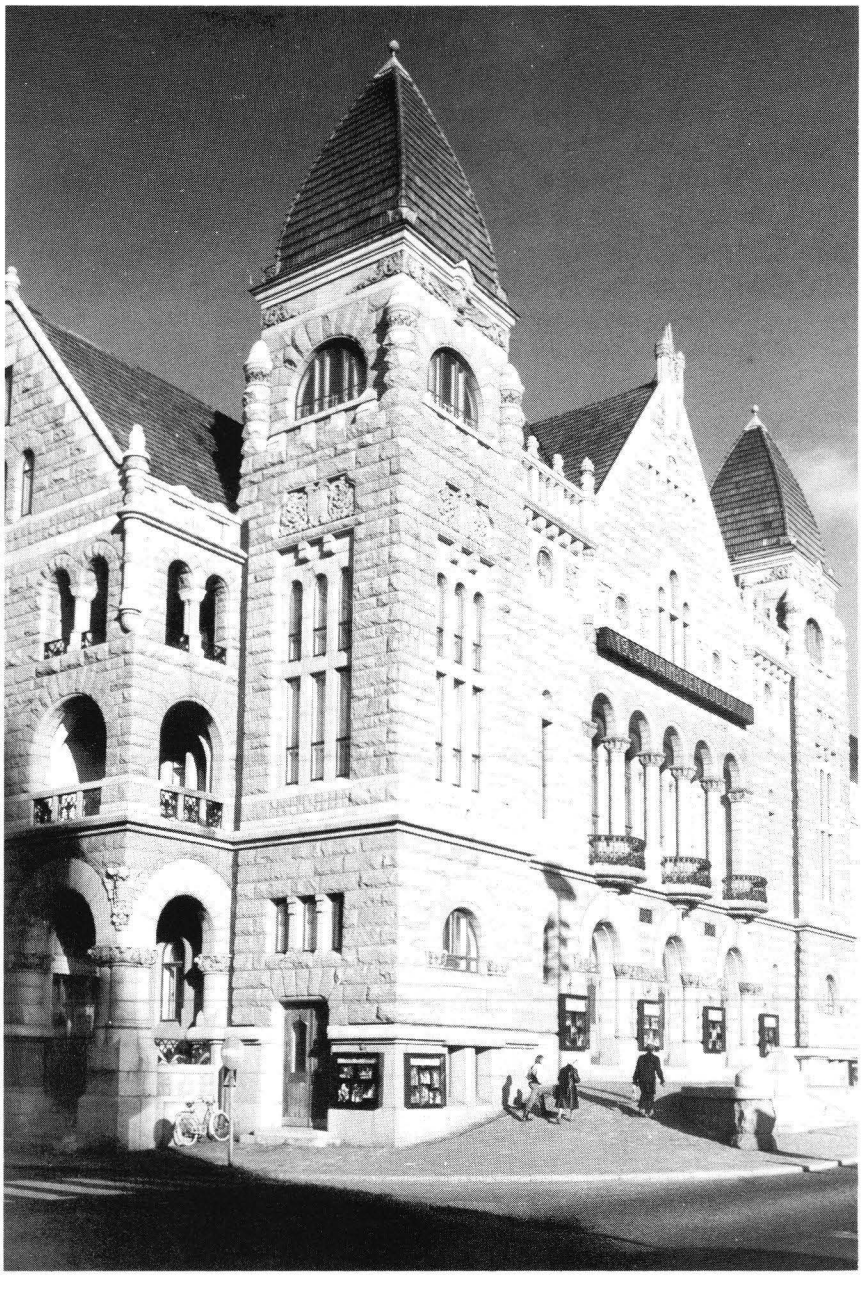
The bank building referred to in the application quoted above was Yhdyspankki-Föreningsbanken (Fig. 123), designed by Gustaf Nyström. Nyström was also a member of the Archaeological Commission, where he argued against the ''palace'' design of the official project and so contributed to the subsequent course of events (see below p. 174). After a volte-face of the Archaeological Commission the offical project was rejected by the Senate in May, 1900, and the Archaeological Commission was requested to make preparations for an architecural competition, which was announced in the following year. Ostensibly a conflict between two different museological doctrines (the ''palace'' versus the ''agglomerate'' composition), the critical issue was, nonetheless, the style of the building. The official project was regarded as obsolete by its victorious opponents, to whom a competition based on a free composition seemed to give promises for the birth of a national style. The parallel to Aron Johansson's contemporaneous Riksdagshus project is obvious, although the latter was actually built and so became a target for the contempt and derision of generations of architects and critics.

The final drawings signed by Sebastian Gripenberg and Hugo Lindberg in September and October 1899

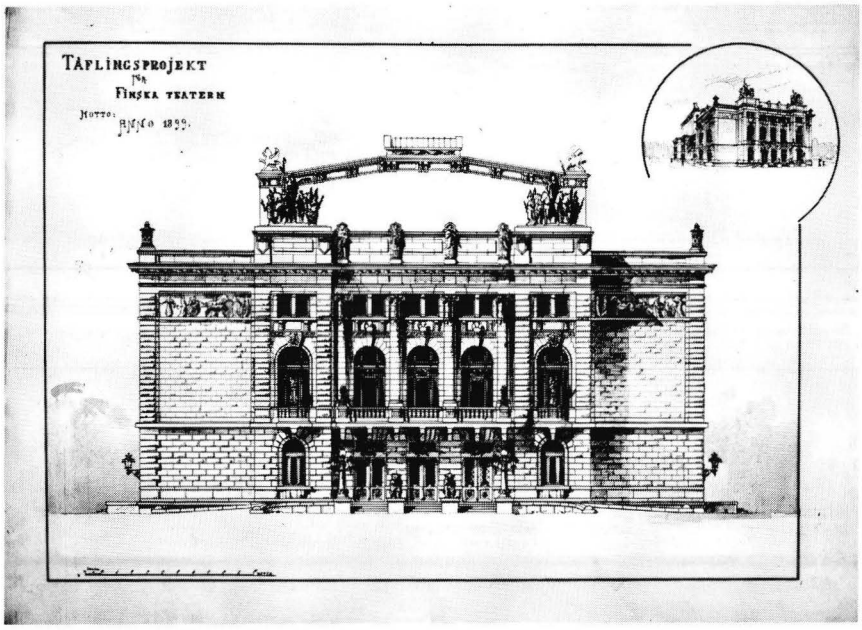
(Fig. 155-156) do in fact show less ''modifications required by the material'' than the application sent to the Senate would lead us to expect. The only subtantial cut is the exclusion of the metopes and triglyphs. Still, the severity of the façade illustrates Lindberg's ideas about the need of avoiding lively articulation when working in granite (see p. 51, above). An almost touching feature is the strip of rubble bond in the attic storey of the Museum project (Fig. 156); although having warmly recommended squared rubble in his various articles, Hugo Lindberg was not himself given an opportunity to put his theories into practice.

The second project to bring out the issue of stone and monumentality was the competition and the building of the Finnish National Theatre in 1898-1902 (Fig. 157). This enterprise was administrated by a limited company formed for the purpose. In 1897 the architect Onni Törnqvist (since 1906 Onni Tarjanne) was commissioned to design the building proper. After having made sure that the plans received from Tarjanne were usable, the builders arranged a competition for the main façade of the theatre.[57] This was in October, 1898. The competition rules did not specify the material: ''The façade may be planned for native natural stone, plaster or brick, or for a combination of two or more of these.'' The competitors were free to make minor adjustments to Tarjanne's plans, and they were also free to add ''smaller towers or pediments.''[58]

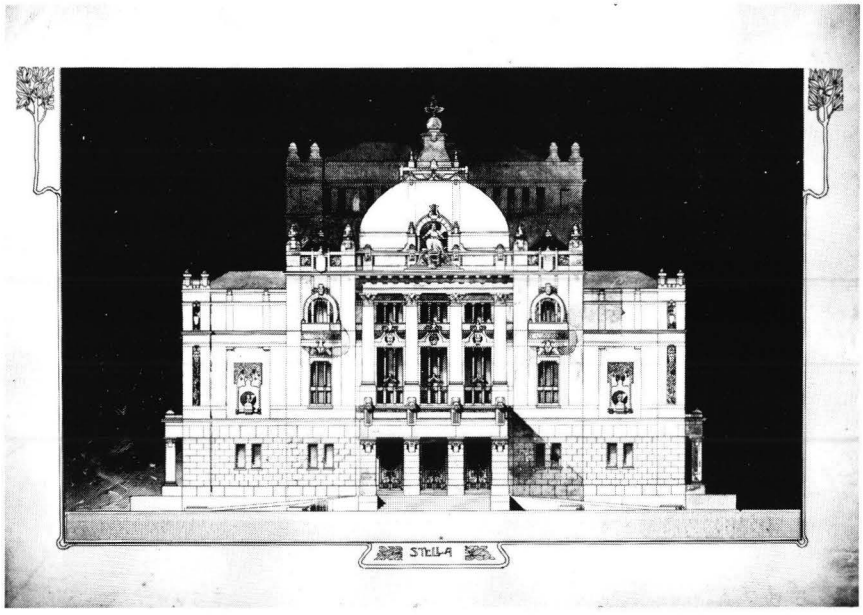
The outcome of the competition was published in January, 1899. The first prize was awarded to Jarl Eklund, who was at the time still an architectural student. The second prize went to the firm Gesellius-Lindgren-Saarinen. An additional prize was awarded to the firm Grahn-Hedman-Wasastjerna. As pointed out by Jor-



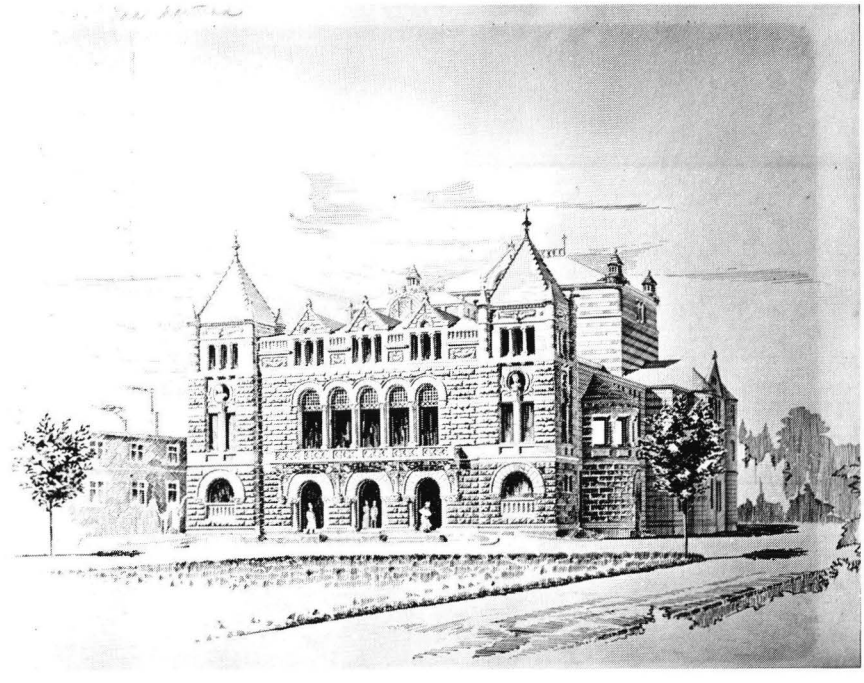
157. Onni Tarjanne (until 1906 Törnqvist), Suomen Kansallisteatteri (The Finnish National Theatre), Helsinki. 1899-1902. (Photo SR)



158. Jarl Eklund (''Anno 1899''), 1st Prize winning entry for the façade of the Finnish National Theatre. 1899. Helsingin Teatterimuseo, Helsinki. (Photo SRM—FAM)



159. Gesellius-Lindgren-Saarinen (''Stella''), 2nd prize winning entry for the Finnish National Theatre. 1899. Helsingin Teatterimuseo. (Photo SRM—FAM)



160. Onni Tarjanne, Early sketch for the Finnish National Theatre. Ca 1898. Coll. Soina Tarjanne, Helsinki. (Photo Kari Hakli).

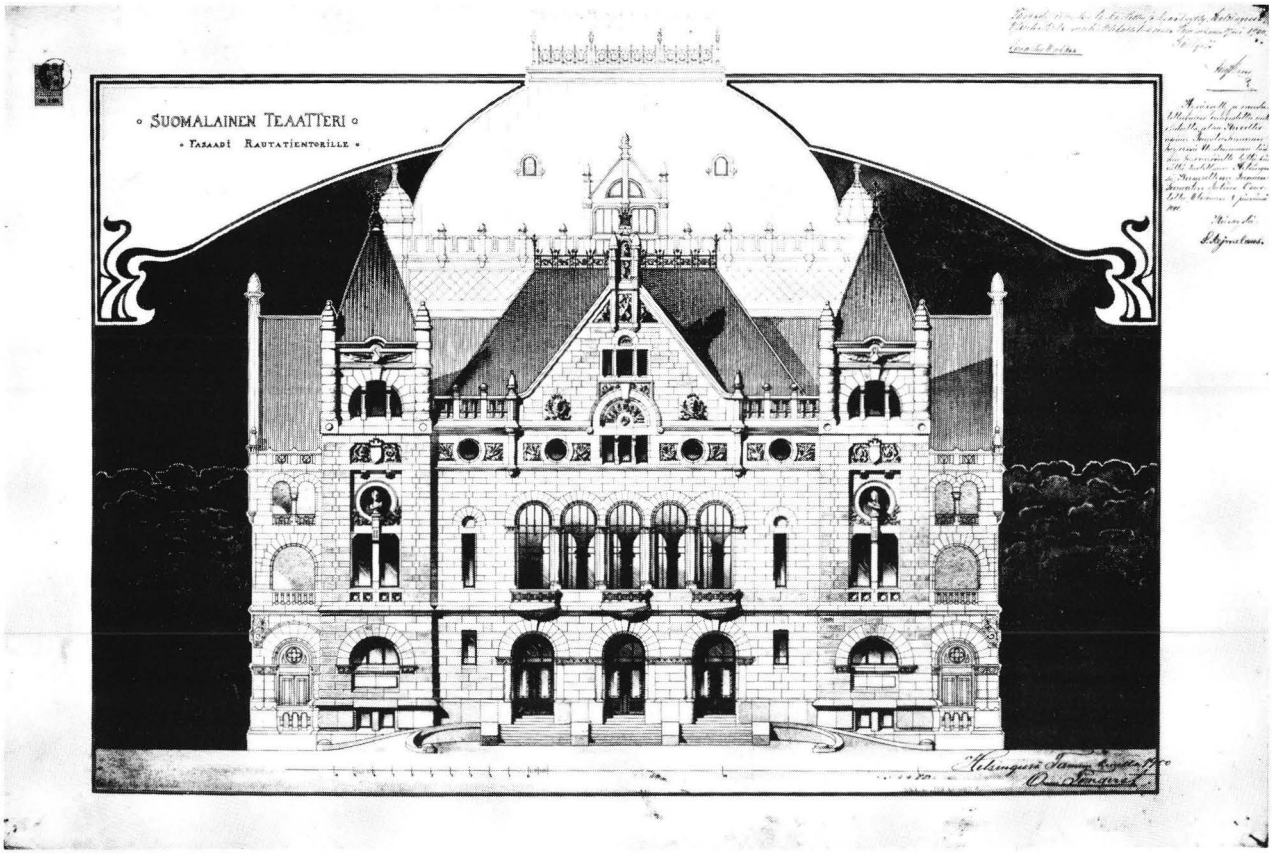
ma Kolmijoki, who has given the competition entries a thorough analysis, Eklund's project had assimilated elements from Anderberg's Opera as well as from Viennese Neo-Renaissance formulas transmitted through Gustaf Nyström (Fig. 158).[59] In contrast to Eklund's academic historicism, the design of the Gesellius-Lindgren-Saarinen firm (Fig. 159) represents an attempt to use a contemporary idiom, in this instance Viennese Secessionism;[60] two years later Fredrik Lilljekvist was to use a similar solution in his project for the Dramatic Theatre in Stockholm (Fig. 143-144).

In the end the theatre building company decided to resort to their own architect. Tarjanne had, perhaps as early as 1898, made a tentative sketch for the façade (Fig. 160), which was based on Richardsonian Romanesque in its composition as well as in its details and its treatment of the stone. From this basis Tarjanne developed the official elevation in January 1900 (Fig. 161). Here the central part was emphasized by means of a single, tall gable and a steep roof. In his review of the building, Jac. Ahrenberg gave a convincing derivation of the considerations guiding Tarjanne to his final conception. The site required a strong accent, and at the same time the huge superstructure to be built above the stage threatened to dwarf the façade. A classical front with predominantly horizontal lines was therefore out of the question. The least expensive way of creating a steep silhouette was to include towers and gables.

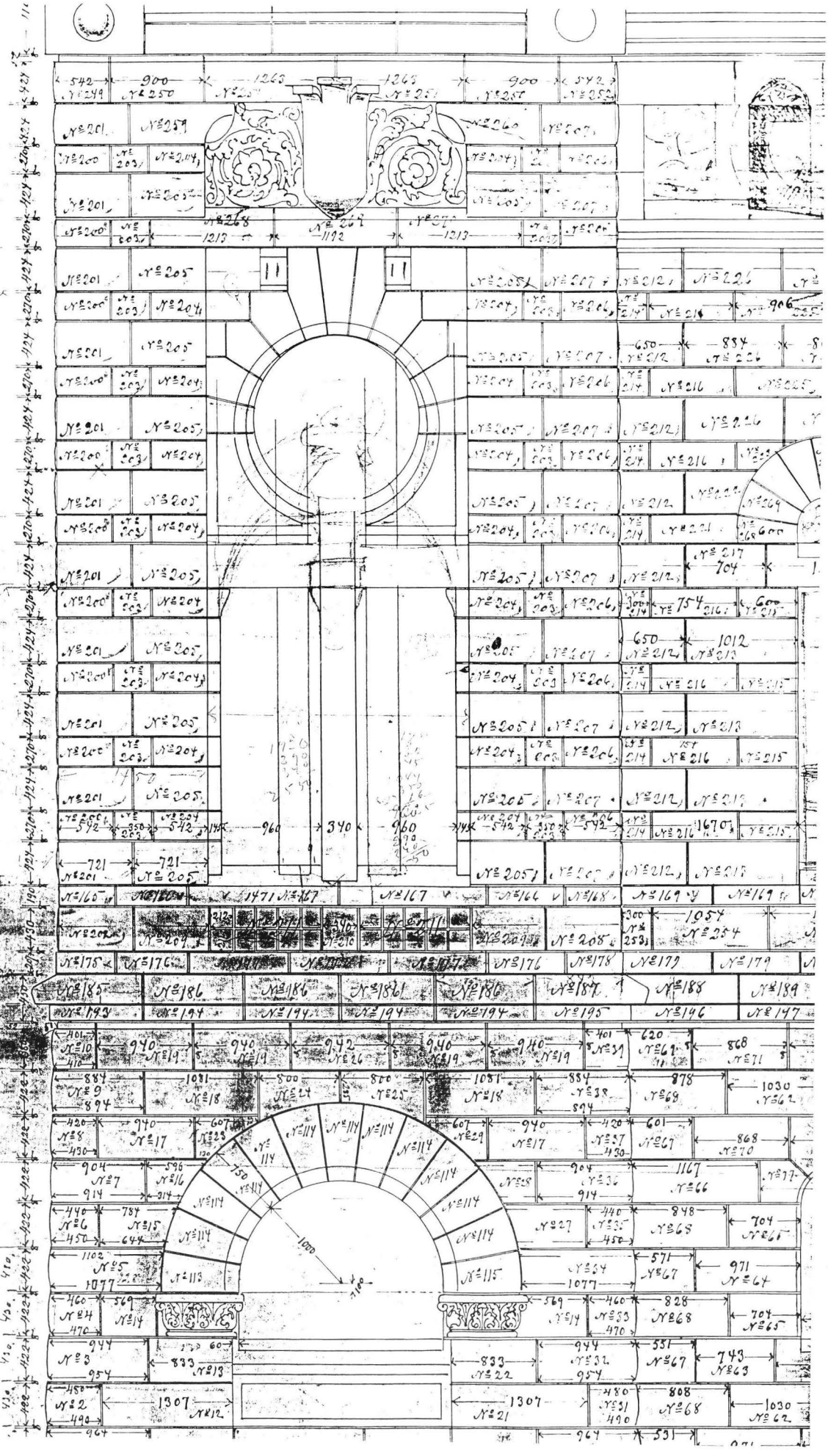
> Yet another crucially important circumstance had to be taken into account. It was taken for granted that the new building would have to be built of genuine materials. This meant that the classical forms had to be rejected, since whatever the order used, columns with appropriate mouldings would necessarily have raised the building cost to a prohibitive level.[61]

Given these premisses, Ahrenberg argued, the solution was given: what he somewhat inexactly referred to as "the new English conception of the Romanesque style;" other commentators were clearly aware of the connection with American architecture and Richardson.[62]

The deliberate and careful treatment of the stone of the National Theatre impressed professional critics as well as commentators in the daily press. The granite was delivered by Finska Stenindustri-Suomen Kiviteollisuus in blocks of given sizes (cf. Fig. 162), which were dressed on the site. A coarse grey variety was used for the rock-faced parts and a fine-grained granite for the column shafts, voussoirs and mouldings. The details were cut in soapstone (Fig. 43, 163), and came from Finska Täljstens Ab; in the interior the main stair-



161. Onni Tarjanne, The Finnish National Theatre. Elevation, January 1900; official approval 8. August 1900. Archives of the Finnish National Theatre (Photo SRM-FAM)



162. Working drawing for the Finnish National Theatre. Ca 1901. Archives of the Finnish National Theatre. (Photocopy)

163. Onni Tarjanne, The Finnish National Theatre. Detail of Eastern tower. (Photo SRM—FAM, Kari Hakli)

case was built of Ruskeala marble.[63] The three main stones of Finland had thus come into use in the National Theatre: granite, soapstone and Carelian marble. If the form was thus imported (and recognized as such), the materials were at least national (and recognized as such). Both in Finland and Norway native rocks in combination with Richardsonian Romanesque formed the stepping-stone to the coveted national style.

9. NATIONAL ROMANTICISM: FROM ORNAMENT TO TEXTURE

In the history of architecture the term "National Romanticism" seems to have been used mainly in connection with Scandinavia and Finland, where it has been applied to certain trends around the year 1900. The representatives of the movement did not call themselves "National Romantics," neither did others at the time refer to them by that name. The word "national," of course, was frequently used, but the second part of the expression seems to have been introduced by a later generation; as a contrast to the "graceful" classicism of the 1920's and the functionalism of the 1930's, the concept clearly had a derogatory connotation. With the increasing scholarly interest in the period around 1900, the term "National Romanticism" came to be used as a neutral category of style, although there was general agreement that it should not be applied mechanically to the phenomena that happened to lie within the chronological limits.[1] Ulf G. Johnsson has discussed the term in the Swedish context, and suggested a useful definition:

> The most essential element of the architecture of National Romanticism is [. . .] the aspiration to create an artistically structured environment, which has a personal stamp, and which is liberated from every form of stylistic eclecticism. From the early 'nineties the national romantic movement inherited its insistence on the truth to the material, but to the moral value of the true material it added a symbolical value, an expressive quality which resided

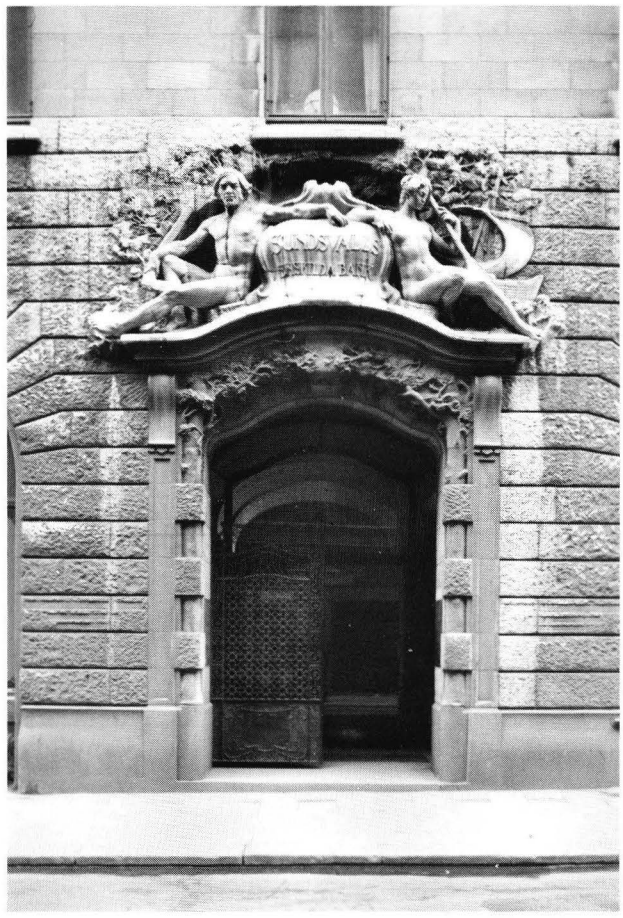
164. Gustaf Wickman, Skånebanken, Stockholm. 1897-1900. (Photo SSM)

in the very material itself, and which was enhanced by the awareness that this material had grown on Swedish soil, or formed a part of Swedish rocks; and that it had been shaped and fitted in place by human hands.[2]

As has been shown in Chapter 4, regional variation was an important element in Swedish discussions on national form. National architecture should be characteristic not only of the whole country; it should also be organically linked to the particular region or district for which it was shaped. In Spain the architect I.G. Clason had admired the variety of architectural forms resulting from the properties of granite and freestone, just as the geologist Hjalmar Lundbohm had enjoyed the changing architectural scenes when traversing the geological regions of the British isles. Applied to Swedish conditions the travel experiences of these (and several others), meant that a national architecture in Sweden could and should present a similarly varied appearance, all the more so since the historical heritage seemed to point in the same direction. Gotland limestone had offered the medieval stone masons and sculptors a medium for almost infinite detailing, whereas Närke limestone excluded all finer work. In the eighteenth century the magnificent red Övedskloster sandstone had been employed for precise articulation, whereas the Roslagen sandstone had been used when unadorned masonry was all that was required.

As pointed out by Fredric Bedoire, the Övedskloster sandstone in Gustaf Wickman's Skånebanken (1897-1900; Fig. 164) serves to underline the opulence of Scania, otherwise represented through the exuberant vegetative ornamentation and the sculptor Christian Eriksson's allegorical figures.[3] The Baroque quality enhances the effect — somewhat curiously, the Baroque had at this time begun to assume national overtones in Sweden. *Teknisk Tidskrift* wrote that the Skånebanken does not actually represent a new style or even show "any hitherto unknown formal motifs"; a new style cannot be born without new materials or new methods of construction. But within the given limits, Wickman had managed to introduce a feeling of novelty, which is irresistible even if one disregards "the charm of the stone material." It is as if the building had a heart beneath the stone, reminding us that "we live in a modern community with 300,000 inhabitants and that Scania is a mighty prosperous and thrifty part of our [...] country"[4]

However, technical considerations and the economic realities of the stone trade did not always favour consistence in geological symbolism. When the Sundsvallsbanken built its Stockholm office in 1900-1902 (Fig. 165) Ekeberg marble was chosen, although the connotations of this material were hardly adequate for the northern severity of the Norrland province, where the bank had its head office.[5] Instead, the ornamentation



165. Gustaf Wickman, Sundsvallsbanken, Fredsgatan 4, Stockholm. 1900-1902. (Photo SR)

was made to define the bank's identity. The fundamental principle of Art nouveau and Jugendstil is here applied in a national and local context — the principle, according to which, ornaments should be created completely anew with a starting-point in nature. The allegorical couple, again a work by Christian Eriksson, is set against a background of pine ornaments, whose twisted forms, somewhat incongruously, symbolize the timber that forms Sundsvall's main source of wealth.

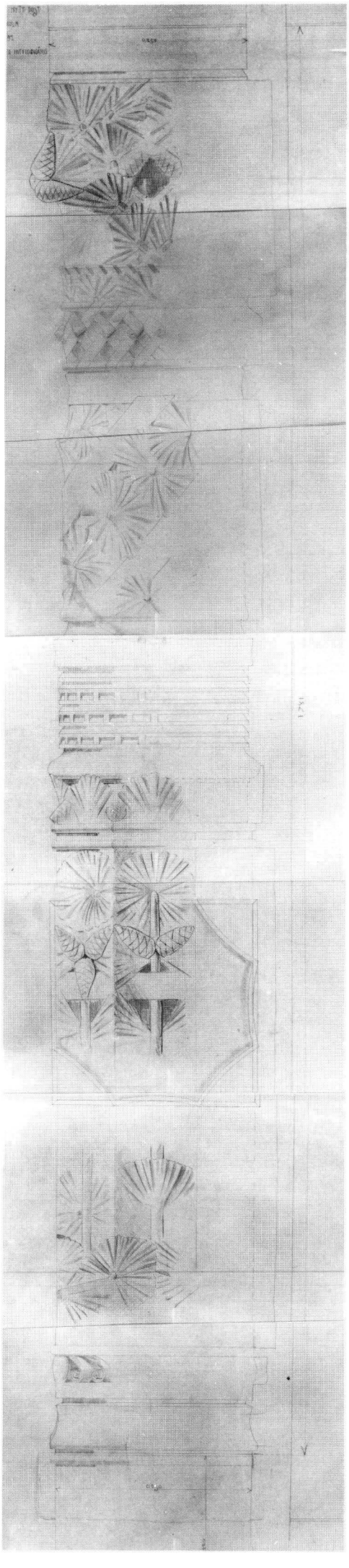
The intimate connection between form and material was clearly brought out in Ferdinand Boberg's Central Post Office in Stockholm (1898-1903; Fig. 166-167). The plans were executed by F.G.A. Dahl, and for the elevations a competition was arranged in 1897. Five Swedish architects were invited to take part in the façade competition, which was won by Boberg; his design was officially approved by His Royal Highness in 1898.[6] For reasons of economy, the façades were partly to be coated with brick. The prize-winning design was also simplified, but even so the estimate threatened to exceed the available funds. In June, 1899, Boberg was instructed to review the question of the material. His report is an illuminating document of the interplay of material and form, and therefore deserves to be quoted at some length.

166. Ferdinand Boberg, The Central Post Office, Stockholm. 1898-1903. Central doorway. (Photo SSM)

Boberg introduced his report by stating that although a public building of the type in question cannot make claims to the highest order of monumentality, its stone portions form an important element and have to present a solid appearance. This required a material that could be quarried in blocks of considerable size, which, again, ruled out most of the commonly available freestones such as the ones quarried at Yxhult, Hällekis, Roslagen etc. The available varieties, Boberg went on, were therefore granites, Gotland, Ekeberg and Portland limestones, and an assortment of sandstones, notably those from Övedskloster and Orsa. Granite was ruled out, since there existed no varieties of this rock which could "submit to the detailing which is indicated in the officially approved elevations." The same applied to many sandstones, nor did the suggested limestones, according to Boberg, lend themselves to delicate articulation. Ekeberg marble would do, but it was apparently not quarried in sufficent quantity. Portland stone, as such suitable and probably less expensive than any other usable material, "has the drawback of not being Swedish," which Boberg assumed would be an obstacle for an institution built by the state. There remained two varieties: Övedskloster sandstone and Orsa sandstone, Boberg wrote,

> ...and of the two, I should personally prefer the *Orsa* stone, since it was on this basis that I composed the elevation of my original competition entry, both with regard to form as well as colour. I have no reason to modify this composition; on the contrary, I should still like to see it consistently realized.[7]

Boberg referred to the reductions of the ornamentation, which he had made already, and his conclusion had the flavour of an ultimatum. If, as a result of the tenders to be invited from certain stone firms, further essential reductions had to be made in his designs, then the approved drawings should be discarded altogether and be replaced by "new elevations of an entirely different character."[8] Nonetheless, Boberg had to make new modifications in the details. Hjalmar Lundbohm



was also consulted and wrote two separate reports on the Orsa and Övedskloster stones, both of which he recommended with the proviso that all consignments must be carefully inspected in the quarry. In the end Övedskloster stone was chosen on the basis of a tender from the Copenhagen firm Carl Wienberg. However, despite all control measures, a number of stones began to scale off after the first winter and had to be replaced by the contractor.[9]

According to the contract, the decoration should be sculpted after the blocks had been fitted in place; further, "all ornate parts must be executed with every conceivable distinctness and finesse." Working drawings (Fig. 167) as well as models were given to the craftsmen. The final effect was almost reminiscent of openwork ivory or lace. On each side of the doorway Boberg has introduced figurative panels, suggesting the elaborate pictorial friezes for which the medieval churches of Gotland are famed.

Compared with the assured elegance of Wickman and Boberg, the first Norwegian attempts to unite form and material into national symbols appear almost naïve. Bull's revision of the Regjeringsbygningen project in 1901 (Fig. 148-149) and Greve's NTH entry of the following year (Fig. 151-152) year were both hailed as national in character, a form of praise that had also been bestowed on a slightly earlier Richardsonian building, Hansteen's Centralbanken (Fig. 121).

However, the first serious attempt to introduce national motifs into a monumental stone façade had already been made by Henrik Nissen in his Christiania Savings Bank (1899-1901; Fig. 168-170). Nissen had won a competition restricted to three senior Christiania architects. According to the rules of the competition, the façade should be a combination of brick and natural stone — still, we recall, a valid alternative in Norwegian architecture around 1900. But Nissen insisted on natural stone, a demand that resulted in lengthy negotiations with a reluctant building committee. The architect presented alternative drawings for soapstone, white marble and granite.[10] Finally it was decided to have granite as the principal material, with ornaments of soapstone, and column shafts of white marble.

Nissen's attempt to break loose from the humanist tradition was tentative and cautious. The circular arches contain decorative allusions to the Romanesque, hailed as a national style in contemporary Norwegian debate. The dragon panels below the columns are yet more explicit, and as an afterthought Nissen added dragon's heads in the Ionian capitals (Fig. 170).[11] A critic in *Teknisk Ugeblad* praised the treatment of the materials,

167. Ferdinand Boberg, The Central Post Office. Working drawing for the columns above the entrance (cf. Fig. 166). Postmuseum, Stockholm (Photo SR)

168. Henrik Nissen, Christiania Savings Bank, Øvre Slottsgate 3, Oslo. 1899-1901. (Photo SR)

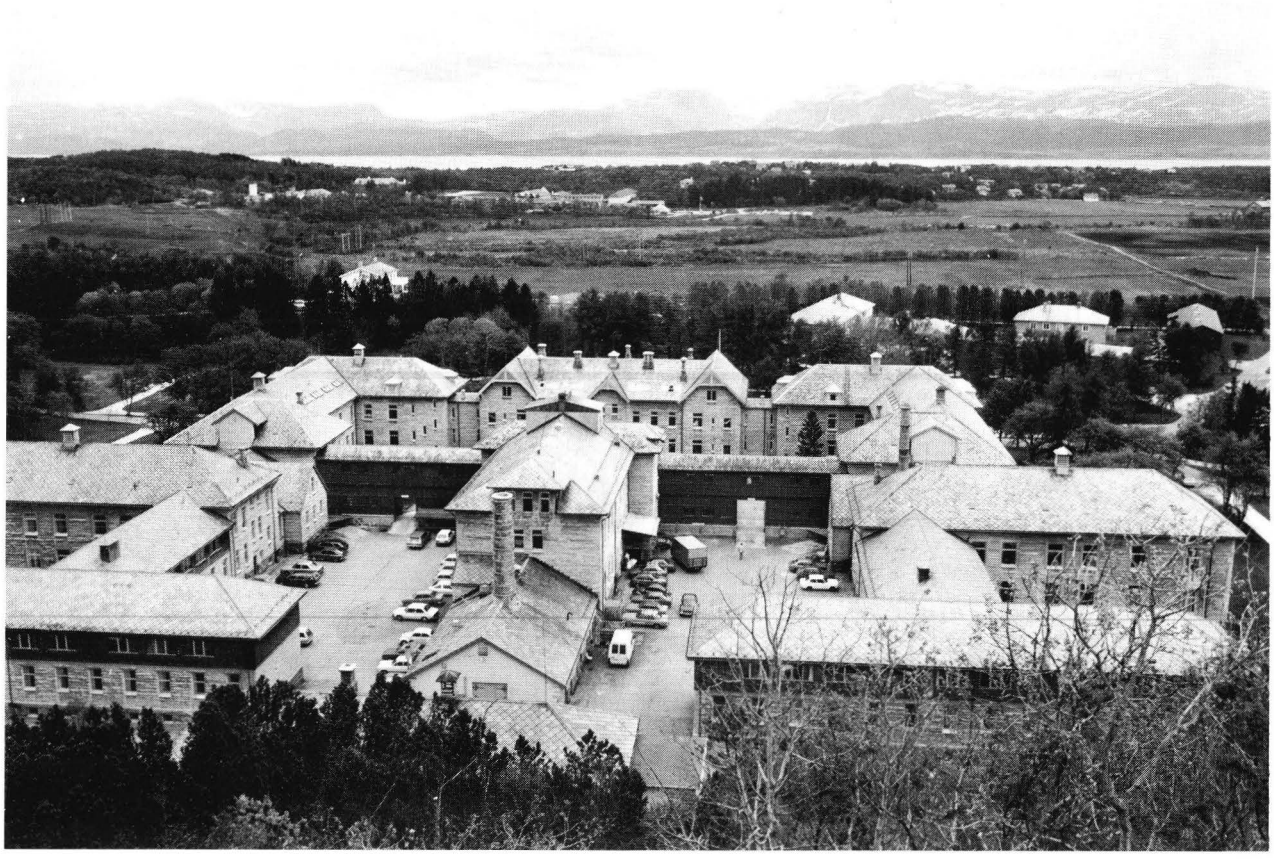
169. Henrik Nissen, Christiania Savings Bank. Detail. (Photo SR)

170. Henrik Nissen, Christiania Savings Bank. Detail. (Photo SR)

especially the rustication, "which is the treatment that brings out the best in this otherwise somewhat dull (livløs) stone." The national motifs of the decoration were characterized as a bold but relatively successful experiment.[12] That Joh. Meyer, the proponent of wooden *Dragestil* should welcome Nissen's attempt to introduce dragons in stone, might have been taken for granted, even though Nissen himself felt doubtful. "Where is the national idiom to be found?" the latter had asked in 1901, arguing that the precedent of the major medieval monuments of Norway gave insufficient guidance to a modern architect working with stone.[13] Even before the Savings Bank had been completed, Henrik Thrap-Meyer had poked fun at one-piece Norse dragons sawed out of marble (see above p. 49).

As early as 1896 Herman Major Schirmer had called for a national style that "does not merely sit in the clothes, but in the body itself" (see above p. 48). From that point of view an aspect other than the superficial ornamentation proved fruitful and inspiring: the rustication admired by the *Teknisk Ugeblad* critic had a freshness which had not been seen before in a building. The stone of the Savings Bank was not hammer-dressed, but literally rock-faced, that is, left with the cleavage completely untouched; some of the half-holes of the wedge are even left visible (Fig. 169). Norwegian architects were beginning to discover what Ruskin had preached forty years earlier, when he wrote that stones had better be left as they came from the quarry: "There is also a magnificence in the natural cleavage of the stone to which the art must indeed be great that pretends to be equivalent."[14]

A major inspiration to the younger generation of Norwegian architects was given by the Rønvik Asylum in northernmost Norway (Fig. 171-172). Designed in 1894 by Lars Solberg, the building was begun in 1895.



171. Lars Solberg, Rønvik Asylum. 1895-1902. (Photo Riksantikvaren, Oslo, J.Chr. Eldal)

At the suggestion of Adolf Schirmer, the asylum was built of the local marble which was quarried from a nearby *fjeld* owned by the marble entrepreneur Erik A. Gude. Three stone saws working with steel wire were installed in the quarry, and the operation was conducted under severe climatic conditions; the work could proceed only during the short summers, and even then bad weather periodically hampered the construction work. The first building was completed in 1898, and the whole complex was taken into use in 1902.[15]

The Rønvik Asylum was built under the direction of Andreas Bugge, who was a qualified mason as well as an architect; we recall that on completion of the asylum he was chosen to lead the work on the NTH building in Trondheim. In 1901 Bugge took part in the discussion about standard sizes of rubble blocks (see above p. 38). He was all for using rubble and other minimally worked bonds, but he questioned the concept of introducing standard sizes. Standardization has a stifling influence on the architect's individuality, he argued; there was also a danger that it might lead to the same kind of repetitiveness that stamps the plasterer's ornaments. But above all, Bugge's experience from Rønvik spoke against standardization. The marble used for the facades of the asylum was schistose, that is, layered in thicknesses varying from 8 to 50 centimetres. This convenient characteristic was utilized for the construction, and the stone was laid into the wall in lengths and heights "as it cleft in the quarry (Fig. 172)."[16]

172. Lars Solberg, Rønvik Asylum. Detail. (Photo Riksantikvaren, Oslo, J.Chr. Eldal)

To Bugge and his young audience this was no mere technical matter. It was a fundamental principle pertaining to national architecture. The rocks of "Old Norway", the *fjeld,* should be used, unadulterated (uforfalsket):

> When speaking of "unadulterated" I do *not,* of course, mean that the architect should submit himself *entirely* to the caprices of nature. But *to a certain extent* he should do so. He must use the various rocks with understanding, employ them according their specific properties; if the architect does so, then we shall no doubt have more use for our "Old Norway."[17]

Like Ruskin, Bugge thought that the artistic value of ornamentation was not worth the money spent on it. "It must be possible to create impressive façades *by a harmonic combination of differently coloured stones and by means of the simple architectural forms characteristic of the stone employed.*" In Rønvik Bugge used marble of different colour (lemon, green and red),[18] but he envisaged other combinations including e.g. soapstone. Such combinations would "without much working result in façades answering to our nature and to the taste of our nation."[19]

At last, it seemed, the key had been found to the problem of a national style. There was no longer any need to worry about the scarcity of suitable historical models, as the more academic architects used to.[20] The domestic stones formed a sufficient vocabulary, and their specific texture, cleavage and colour, a sufficient syntax, on which to found a truly national idiom.

In Norway the last years of the 1890s saw the culmination of a wave of speculative building that had gained momentum in the middle of the decade. The intensity of the boom can be followed in the dates of commercial projects beginning with the Backergården (Fig. 106) and ending with the Centralbanken (Fig. 121) in Christiania. But this "jobbetiden" was followed by a general recession, which struck hardest, perhaps, in Bergen.[21] During the very first years of the century attention was therefore focussed on vast public projects: the Rønvik Asylum, the Government Building (revised in 1901), the NTH in Trondheim and important churches in Christiania and elsewhere. In monumental architecture a national style was no doubt beginning to emerge, but would there ever be a chance to adapt the new principles on a broader scale?

In 1904, however, the town fire of Ålesund changed the situation altogether. A town with 12,000 inhabitants had to be rebuilt, according to a new town plan and with a ban on timber construction which had until then formed the main building method in smaller and

middle-sized Norwegian towns. By August, 1904, the town architect of Ålesund had had to cope with among, other things, 200 applications for building permits. In order to ease his burden it was decided to create a new office, that of building inspector. Henrik Nissen was nominated to this post, and the fact that one of the most renowned architects of the period was in charge of the scheme contributed decisively to the high level of the architecture of this rebuilt provincial town.

The rebuilding of Ålesund has been treated by Helga Stave Tvinnereim in a monograph, which is basic for all further discussion on the subject.[22] In the present context it will suffice to consider the scheme against the background of the stone movement and the search for a national idiom based on the characteristics of the material rather than historical associations.

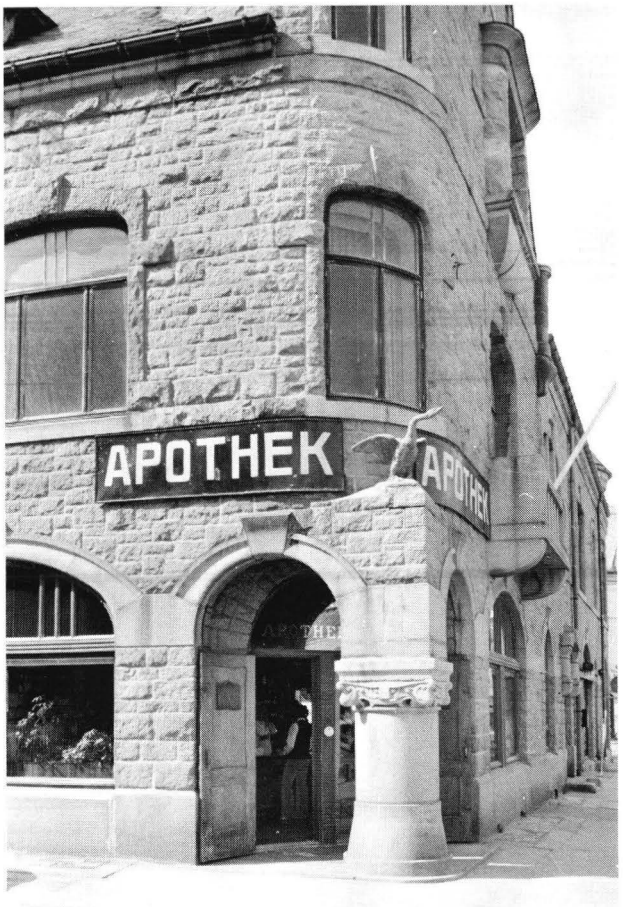
Only a part of the buildings in Ålesund were built with stone façades. A more extensive use of this material would obviously have been impossible for technical and economic reasons. By 1905-1907, moreover, plaster — if used in a straightforward manner — had again become a serious alternative. In a farewell address, which he gave on leaving Ålesund in Ocotber 1906, Nissen emphasized that a plaster façade could be far superior to the most elaborate stone façade.[23] Last, but not least, the question of moisture in stone walls had become topical at the time; both in Norway and elsewhere, numerous buildings that had been erected in the preceding years, had proved extremely problematical in this respect. The rebuilding of Ålesund gave a fresh turn to this discussion, with several writers recommending extreme caution in the use of stone for façades.

Kristen Rivertz and Heinrich Jürgensen, who belonged to the most prolific designers of commercial architecture in the period (cf. Fig. 45, 119-120), planned the building for the Norges Bank in Ålesund (1905; Fig. 173), which already forebodes the return to Classical themes in the next decade, although the principal reason for the cubic symmetry may have been the architectural iconography favoured by the state bank since the 1900 competition. The surface forms an almost pedagogical exercise in granite working, with the obvious contrast between the dressed stone and the rubble bond. A similar use of granite rubble was at the same time employed in two other bank buildings by H.S.B. Fürst.[24]

The Norges Bank is normally seen in the same perspective as another building of the same reddish granite, the Svane Apoteket by Hagbarth Schytte-Berg (1905-1907; Fig.173 and 174). Schytte-Berg had two years earlier completed one of his major works, the Fagerborg Church in Christiania (Fig. 243) where he had shown his interest in a type of ''picturesque'' church design which was at this period associated with England. The Svane Apoteket also contains discreet allusions to the same tradtion (cf. Fig. 118), although the muscular appearance of the corner column and the ground floor window mouldings have a Jugendstil quality.

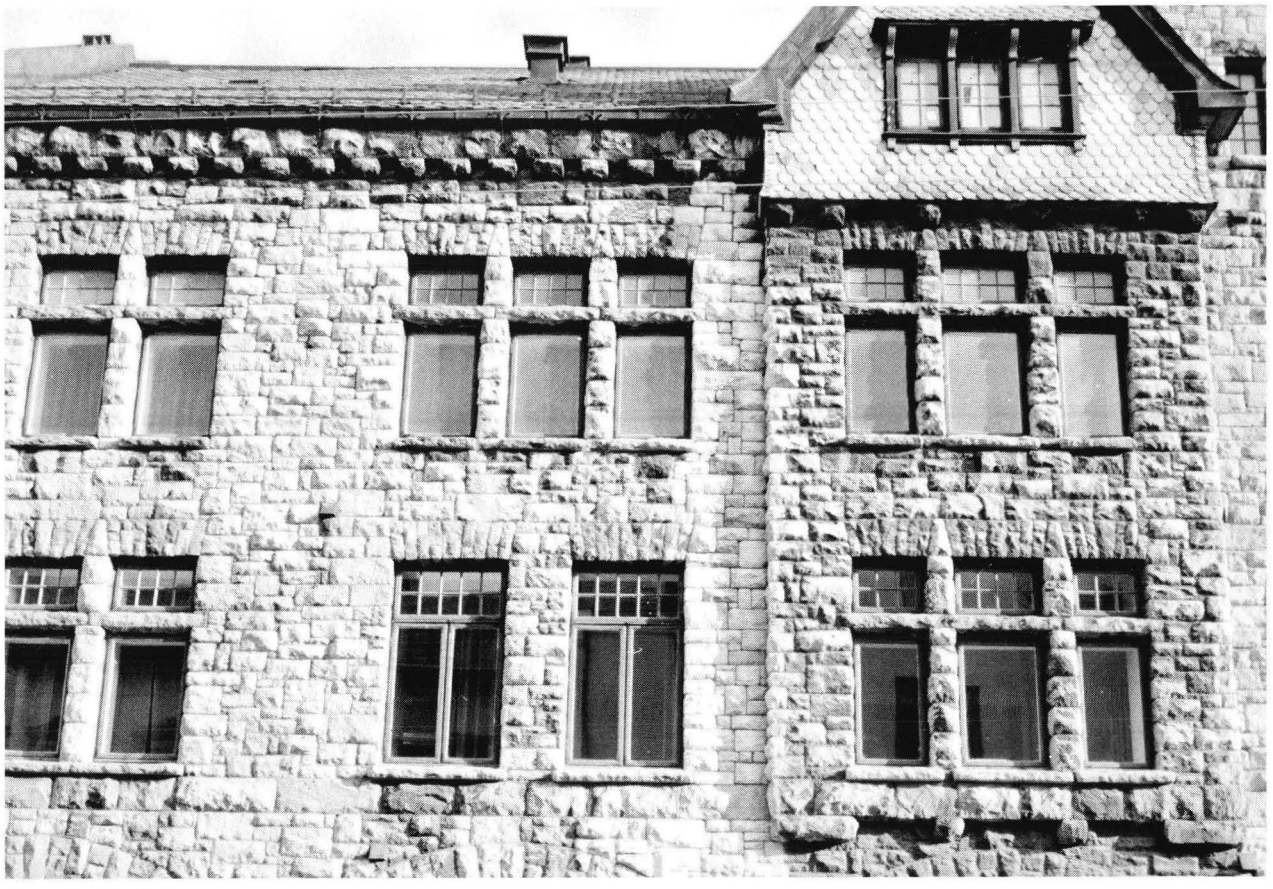
The most conspicuous façades in Ålesund are to be seen in a group of buildings clad with a local marble, which was also employed in the town church (Fig. 249-250). Carl Michalsen, another prolific designer of Christiania commercial buildings, planned the block of flats in Kirkegata 19 together with A.C. Dahl (1906; Fig. 175-176). The composition of this building does not signal any decisive advance from the architect's Christiania architecture around the year 1900 (cf. Fig. 116). In his Ålesund review Henrik Nissen regarded the effect of the material as somewhat heavy and the colours as restless; yet he believed that the building would prove important for the future.[25] Nissen's flattering forecast was probably motivated by the total absence of ornamentation in Kirkegata 19: here the whole effect is based on texture and colour, nothing else. The facade may, indeed,

173. H. Jürgensen & K. Rivertz, Norges Bank, Ålesund. 1905. (Photo SR)



174. H. Schytte-Berg, Svane-Apoteket, Ålesund. 1905-1907. (Photo SR).

175. Carl Michalsen & A.C. Dahl, Kirkegata 19, Ålesund. 1906. (Phot SR)



176. Carl Michalsen & A.C. Dahl, Kirkegata 19. Detail. (Photo SR)

177. Karl Norum, Notenesgate 9, Ålesund. 1906-1907. (Photo SR)

be seen as an implementation of the national aesthetics advocated by Andreas Bugge. Michalsen and Dahl have readily accepted the intractable nature of the material, which seems to have resisted the mason's tools; the cornice, in particular, conveys an impression of stubborn wildness. From a purely formal point of view this Norwegian building does not differ essentially from what had been accomplished several years earlier in Sweden by Lilljekvist (Fig. 103) and Hallström (Fig. 104). Yet these two Swedish examples were never seen as particularly "national" in character — on the contrary, Lilljekvist's Drottninggatan 76 was classified as American-

178. Karl Norum, Notenesgate 9. Detail of corner. (Photo SR)

179. Johan Osness, Trondhjems Handelsbank, Søndre gate 15, Trondheim. 1906-1907, extension 1916. (Photo SR)

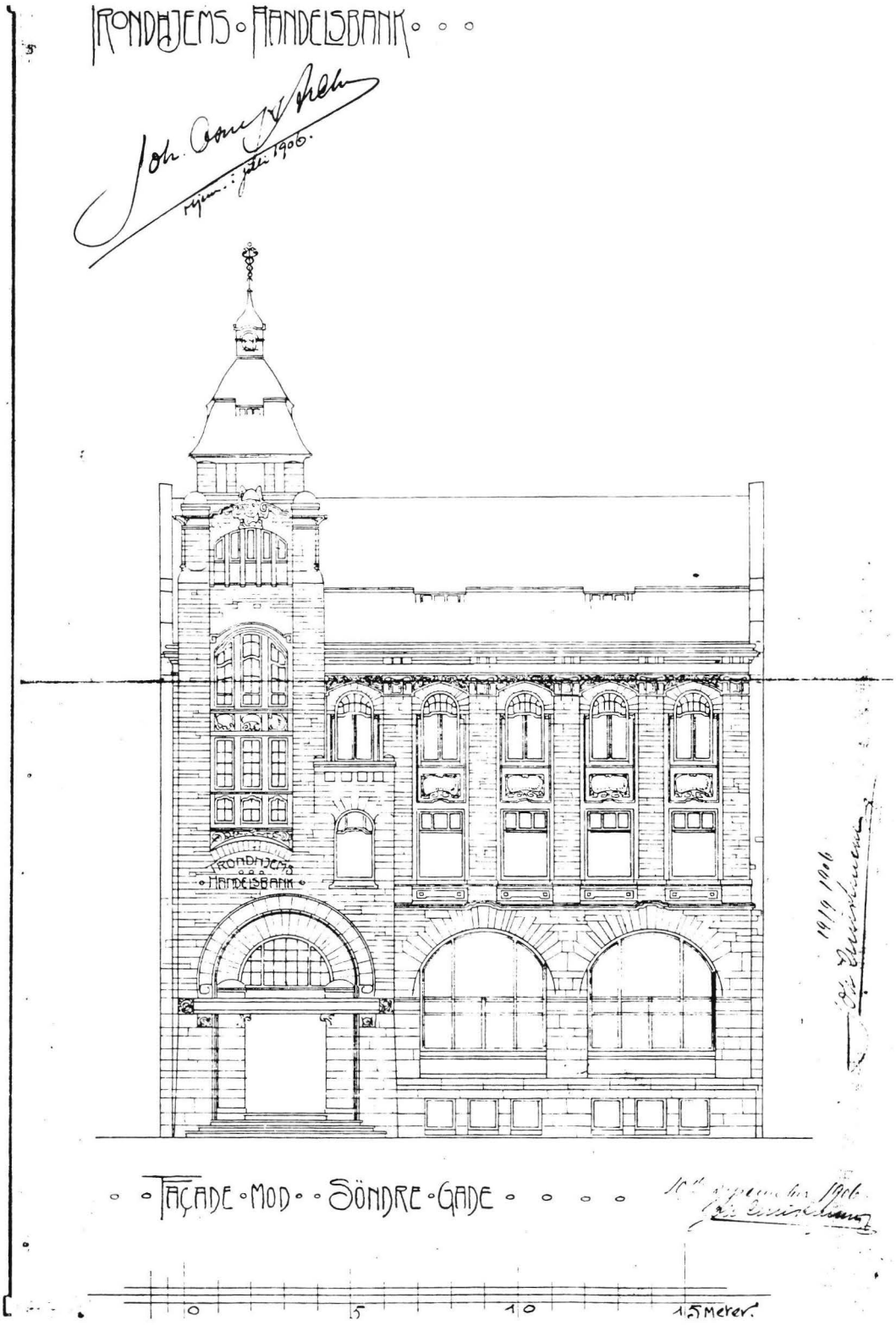
inspired. Like any other architectural device, then, the deliberate suppression of ornament and enhancing of texture could assume different meanings, depending on the context.

The Trondheim architect Karl Norum, who belonged to an older generation, harked back to the Norse "dragon style" in his commercial building in Notenesgate 9 (1906-1907; Fig. 177-178). But even here the ornamentation is concentrated to one point, and the streaks of colour in the marble tend to drown the linear pattern of the ornament.

During four intensive years from 1904 to 1907 Ålesund became both an experimental workshop and a meeting-place for architects of different generations. It is thus striking that several established, senior architects let themselves be carried along in the attempts to create a modern, nationally valid and coherent environment in Ålesund.

It seems as if this interaction served as a catalyst for the national romantic trends in Trondheim. The vast rock-faced rubble surfaces of the NTH, begun in 1902, were greeted as true expressions of the Norwegian national character ("vor nations naturel og kunstneriske udtryksmåde", see above p. 144), but at the same time the American sources of its rubble Romanesque were clearly recognized. In Ålesund, it seemed, Norwegian architecture had taken yet another step towards artistic independence.

In 1906 the Trondheim architect Johan Osness designed the main office of Trondhjems Handelsbank, which is today regarded as "perhaps the finest example of Norwegian rubble architecture."[26] Before this commission Osness had made tentative use of rusticated stone and dragon style ornamentation in his E.C.Dahl Foundation (E.C. Dahls fødselsstiftelse; 1903-1906). Osness also became involved in the Ålesund scheme,



180. Johan Osness, Elevation for Trondhjems Handelsbank, signed July 1906. Bygningskontrollens arkiv, Trondheim (Photocopy N.T.H., Institutt for arkitekturhistorie)

although in the end his contribution there did not amount to much; it seems as if he was the one to profit from the contact. Osness's first design for the Trondhjems Handelsbank (July, 1906; Fig. 180) looks as if he had leafed through Seemann's *Moderne Fassaden* of 1901 or similar publications: fanciful pilaster strips, shallow floral ornamentation next to the eaves and between the window rows. The wall surface is marked as rubble bond. Although this design had official approval, the façade as actually built was considerably modified by Osness: the floral decoration and the pilasters were discarded, which gave the wall surface a unified appearance. The tower design was also altered — perhaps Osness came to regard its Richardsonian

181. Thomson & Sandilands, Architects, Public Hall, Springburn. From *Academy Architecture and Architectural Review*, 17, 1900[1], p. 112.

appearance as a little worn-out by this time, or perhaps he regarded a richer articulation essential to compensate for the exclusion of the wall ornamentation. Whatever his reasons, the helmet was given a Baroque contour enhanced by rounded gables (Fig. 179); such towers were not uncommon in European architecture at the turn of the century (cf. Fig. 181). The aesthetic effect of the whole rests on two elements: the asymmetrical composition and the rough texture of the sandstone rubble, which extends even to the mullions of the tower windows. Unfortunately this overall effect became muted by the extension designed by Osness in 1916.[27] In any case the development of the Handelsbank project illustrates the basic pattern of National Romanticism, that is, the conscious emancipation from ornament and the systematic search for textural effects based on the material itself.

The eloquence of stone is also manifested in a slightly later building in Trondheim. If the Handelsbanken had low shifts creating a horizontal pattern, Jakob Holmgren's commercial block in Søndregate 22b (1907-1908; Fig. 182) received its bulky appearance from the intractable marble. This romantic effect contrasts with Holmgren's otherwise conventional design, which represents a compilation of clichés current in Norwegian commercial architecture since the "jobbetiden." Holmgren's interest in stone materials lasted over the culmination of the stone movement, and as late as 1912 he went to Scotland to study building construction.[28]

The heyday of Norwegian National Romanticism is sometimes referred to as "råkop-perioden" ("the rubble period").[29] To all intents and purposes, granite rubble became the official language of the public architecture of Norway, a development which was due mainly to two architects: Henrik Bull and Holger Sinding-Larsen. Henrik Bull's revised design for the Government Building (1901; Fig. 148-149; cf. Ch. 8) was one landmark in this development. The man to complete the process was Holger Sinding-Larsen, whom we remember as an advocate of the British connection in Norwegian architecture. As early as 1894 Sinding-Larsen had revised his original design for the Oslo-Vålerengen church (Fig. 240-242), replacing its brick coating with a "Scottish rubble bond." Sinding-Larsen's church was greeted as a new departure in Norwegian architecture when it was completed in 1902; in that same year the architect went abroad together with W.C. Brøgger and two other professors to study zoological museums. The study tour was part of a project initiated in 1899, when the Norwegian Storting appropriated a planning grant for the University Museum of Natural History. Sinding-Larsen submitted a proposal involving several separate buildings to be erected in Tøyen in the eastern part of Christiania.[30] The first to be built was the southern half of the Zoological Museum (1904-1908); the remaining half was never added. In Fig. 183 the western façade of the Zoological Museum forms the background to a granite bust of W.C. Brøgger; its pendant, the southern half of the Geological Museum was built according to the general plan in 1911-1917. Both these buildings were clad with rubble of brownish granite from Grorud, situated a little northeast of Tøyen; a building for the Botanical Museum built in 1913 received plastered façades.

From the artistic point of view Sinding-Larsen's Tøyen complex was hardly a success. *Teknisk Ugeblad* thought that the Zoological Museum looked "somewhat heavy and gloomy."[31] But Sinding-Larsen became the architect of the University, much to the chagrin of his architect colleagues, who insisted that the University should arrange open competitions for its major building projects. In 1908 Sinding-Larsen's

182. Jakob Holmgren, Søndre gate 22B, Trondheim. 1907-1908. (Photo SR)

presentation of his design for the University Library was followed by very outspoken comments from members of the profession. Kristiania Arkitektforening (The Christiania Association of Architects) published a demand that a competition be arranged for the University Library, but to no avail. Sinding-Larsen's building which was to be completed six years later, was characterized as representing "a kind of less successful University style."[32]

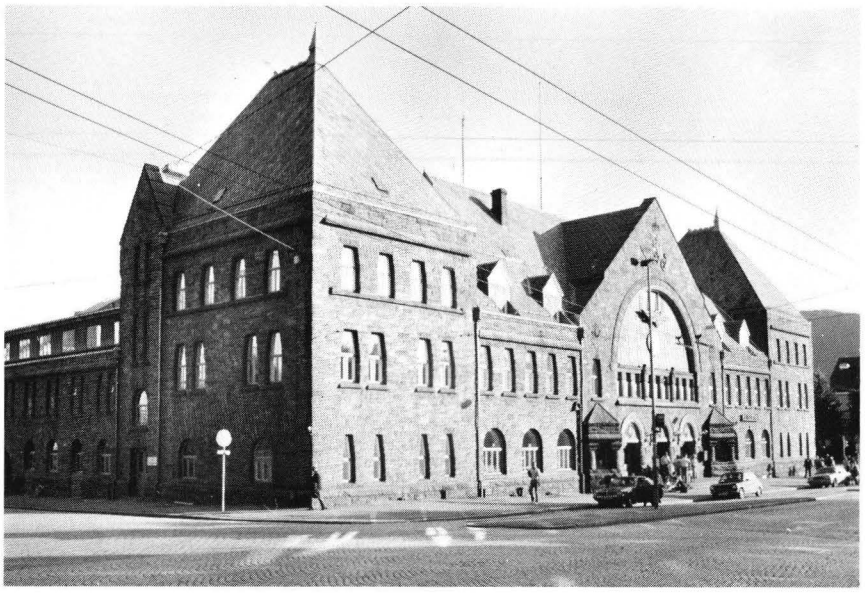
The architectural officialdom of Sinding-Larsen and his patrons in the University was repeatedly contrasted against a building project where no less than three competitions were arranged: the Public Library of Bergen (Fig. 184).[33] The competition was finally won by Olaf Nordhagen with a design that underwent successive simplifications until it was finally completed in 1917. Nordhagen's basic concept, a medieval palace with Romanesque windows and flanking towers, was gradually given the matter-of-fact appearance of the realized design, where the arcaded windows and apsidal staircases survive as relicts of the earlier versions.[34] Nordhagen received the same prestigious award for his Bergen Library as Bull for his Government building (see above p. 142). In their decision the jury commended Nordhagen for the utter simplicity of his Library: "One senses that the architect has been influenced by the character of our simple, medieval stone buildings, especially the churches, where the effect derives from the proportions, the treatment of the material, and the colours, and only to a lesser extent from the details."[35] Nordhagen seems never to have considered using irregular rubble of the type that had already become commonplace by 1906. Instead he made a point of the restricted economy, using a bond of regular coursed small stone, almost reminiscent of a brick revetment. In 1911 further praise was lavished on Nordhagen's project, which was characterized as a breakthrough in Norwegian architecture, "a building that was Norwegian in spirit and truth." The same writer in *Arkitektur og dekorativ Kunst* also pointed out that the influence of Nordhagen was felt in several subsequent competitions.[36] Be that as it may; at least in the adjacent Bergen Railway Station (1909-1913; Fig. 185) Jens Z. Kielland does not seem to have paid much at-

183. Holger Sinding-Larsen, The Zoological Museum of Oslo University. 1904-1908. In the foreground a bust of the geologist, Professor W.C. Brøgger (by Sigurd Nome and Jo Visdal). (Photo SR)

tention to the future neighbour of his creation. Despite its Jugendstil windows, the station stands out as a late descendant of Richardsonian Romanesque; nor does the treatment of the stone differ from what was customary at the time.

In Finland the development from ornament to texture may be said to have taken its beginning in two buildings: Tarjanne's National Theatre (Fig. 160-161) and in the Finnish pavilion for the 1900 Paris Exhibition by Gesellius-Lindgren-Saarinen (Fig. 186). In Tar-

184. Olaf Nordhagen, The Public Library, Bergen. 1906-1917. (Photo SR)



185. Jens Z. Kielland, Railway Station, Bergen. 1909-1913. (Photo SR)

186. Gesellius-Lindgren-Saarinen, The Finnish Pavilion, Paris 1900. (Photo SRM—FAM)

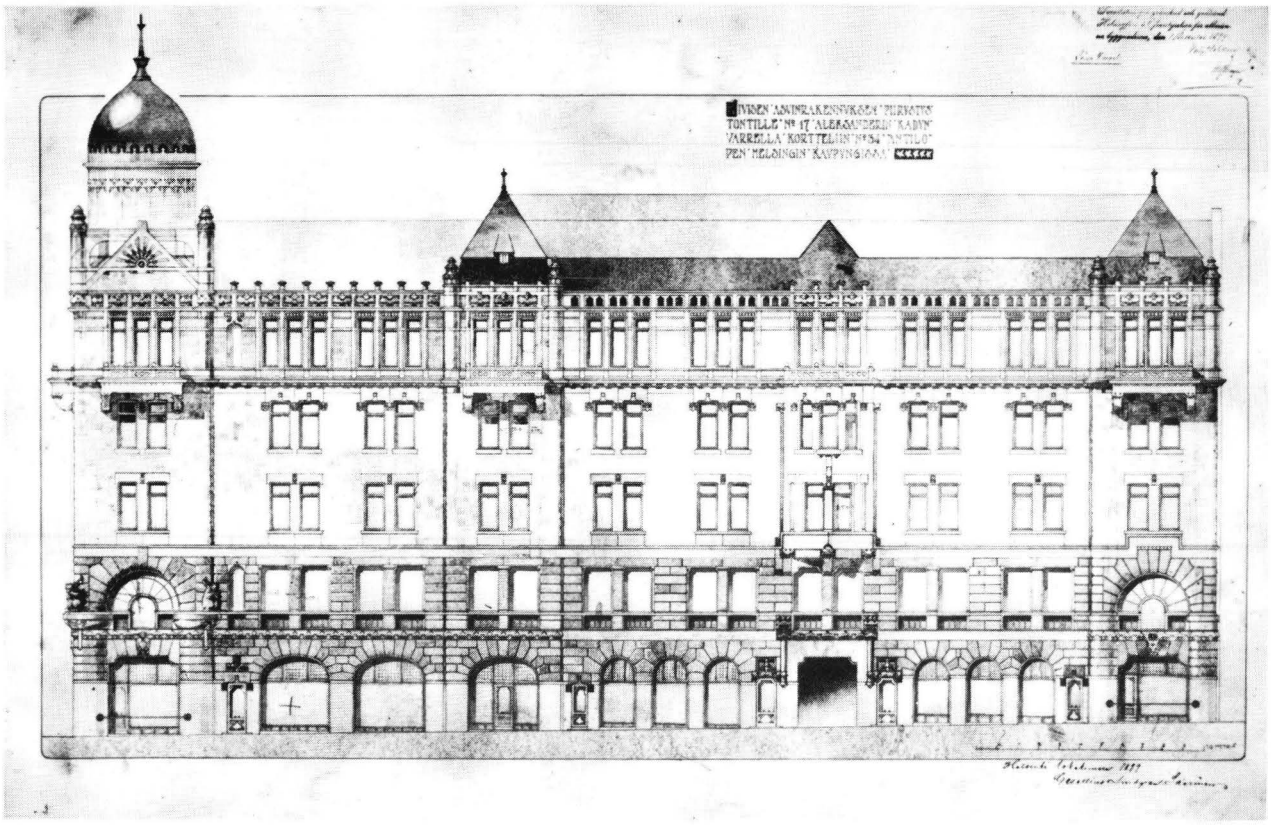
187. Gesellius-Lindgren-Saarinen, The Pohjola Insurance Company, Helsinki, Aleksanterinkatu/Alexandersgatan 44. 1899-1901. (Photo HKM—HSM)

janne's Theatre the decorative motifs were still derived from a historical repertoire: Romanesque and vernacular Renaissance foliage and animal motifs. But the typical Finnish stones, soapstone and granite, as well as the rustic treatment of the latter, gave a hint of the expressive possibilities inherent in the material and the texture as such.

When the competition for the Paris pavilion was announced in the summer of 1898, the rules stipulated that the light construction of iron and plaster of Paris was to be given "the appearance of a homogenous, fireproof material." "It is envisaged that the building will have portals on each side, one of granite and the other of soapstone. For this reason it is to be desired that the façades are designed in a style which is determined and characterized by this material."[37] The pavilion was planned as a national manifestation, and it is significant that the competition rules did not explicitly use the term "national style", only implicitly defined this as a function of the material chosen. The Saarinen firm's winning entry,[38] not unexpectedly, featured an irregular rubble bond. As actually built, the plaster surface was patterned in imitation of dressed, not rockfaced stone (Fig. 186), a solution which may have been motivated by practical and economical considerations rather than by any deliberate choice. The asymmetrically placed portals were recognized as being "after American models."[39] Their decorative articulation, however, was based on Finnish nature: fir cones, foxes, squirrels etc. The stone was not only a national symbol, but also signalled an export article. In the interior the Finnish Geological Commission arranged an exhibition showing the country's stone resources, and samples of the Finnish stone industry were conspicuosly displayed in the centre of the interior hall.[40]

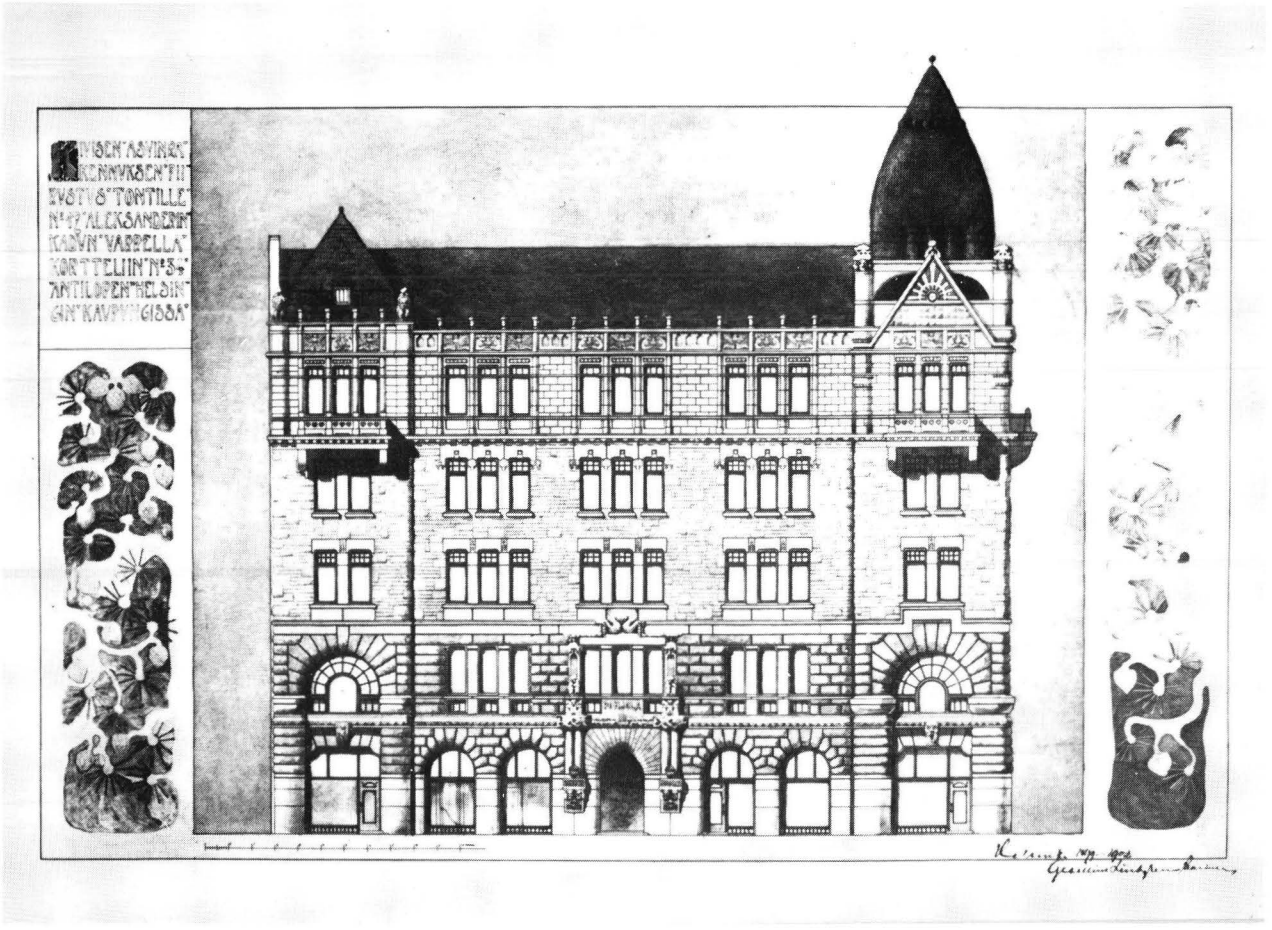
Like many other key works in the development of National Romanticism, the Pohjola Building (Fig. 187-193) is, essentially, a façade, an architectural screen applied to a building block conceived independently of it. In the spring of 1899 the Pohjola company arranged a competition; the street façades would have to be of granite or some other Finnish stone. The jury divided the prize sum evenly between four entries which they considered equal; two others were given extra awards.[41] It was decided to use the plans of one of the four, a project by Ines and E.A. Törnwall. To these plans the firm Gesellius-Lindgren-Saarinen, who had received one of the extra awards, was commissioned to compose the necessary elevations.

Gesellius-Lindgren-Saarinen's elevations were signed in October 1899 (Fig. 188), and they were approved in November.[42] This version had rusticated ground and first floors. The fifth storey was richly decorated with shafts, tracery, parapets and finials, a device used in



188. Gesellius-Lindgren-Saarinen, Pohjola. Elevation signed October 1899. Pohjola Insurance Company. (Photo Wulff kopio)

189. Gesellius-Lindgren-Saarinen, Pohjola. Elevation facing Mikonkatu/Mikaelsgatan. Signed 1900-1902. Pohjola Insurance Company (Photo Wulff kopio)



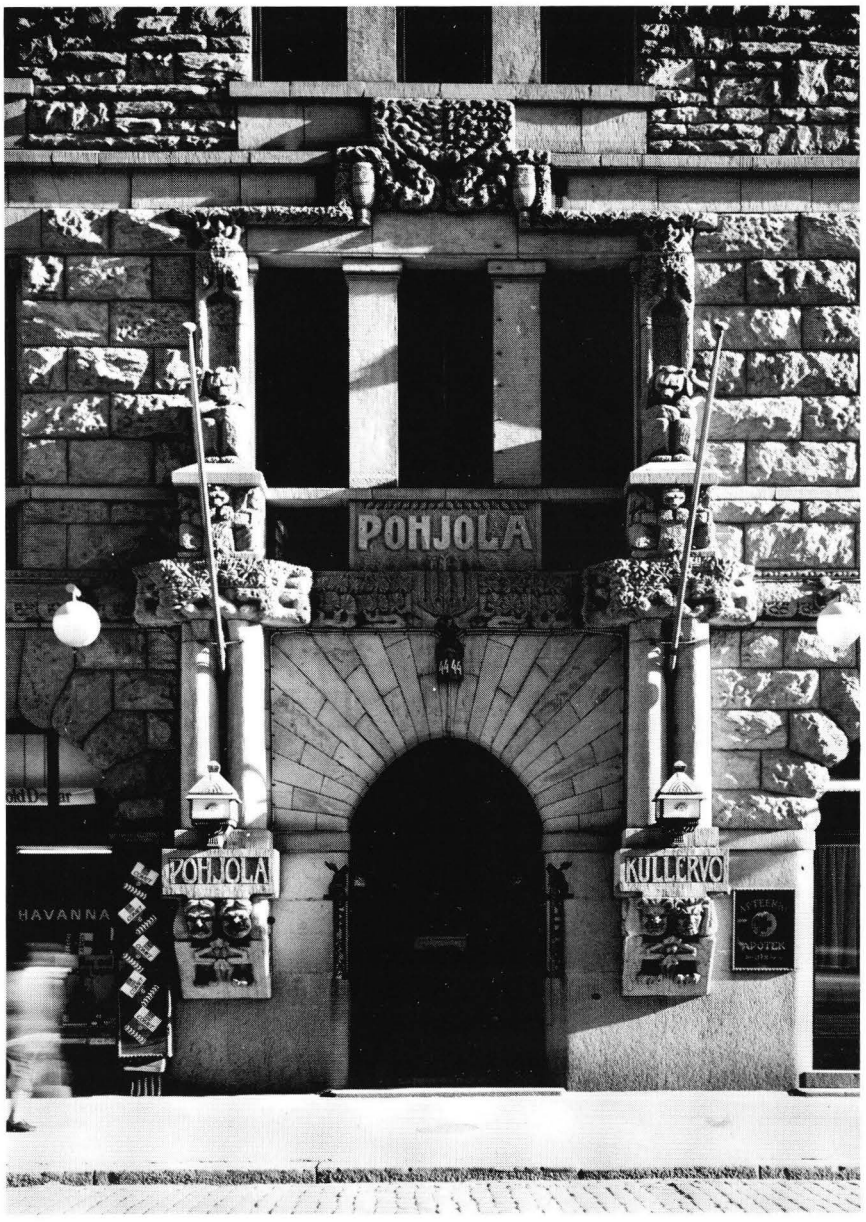
190. Gesellius-Lindgren-Saarinen, Pohjola. Elevation facing Aleksanterinkatu/Alexandersgatan. Signed 1899-1902. Pohjola Insurance Company. (Photo Wulff kopio)

Stockholm architecture in the 1890's, and introduced in Helsinki by Grahn-Hedman-Wasastjerna in the Wasa Bank, which had been completed in June 1899 (Fig. 127-128). At this stage the masonry above the first two storeys was planned to be dressed smooth. Work was started in the beginning of the year 1900. During the building operation details such as the shape of the tower were modified. The rubble wall was given renewed attention; it proved that Finska täljstens Ab was willing to deliver soapstone for the main part of the façade. The effect of rubble-like bonds was tried out in a set of elevations dated — presumably *ex post facto* — ''1900-1902'' (Fig. 189-190).

The end result was an essentially eclectic creation, embodying elements from elegant, ''Spanish'' commercial architecture (the top floor tracery etc.; even the composition of the main doorway), American Romanesque (the tower with its corner turrets and diapered gable; the heavy rustication) and Continental Jugendstil (the lintels; the heavy corner column; the final version of the helmet). In order to fuse these disparate elements into a unified whole, Gesellius-Lindgren-Saarinen employed the same ornamental vocabulary as they had used in Paris: plants and animals from the Finnish flora and fauna which are ingeniously integrated into the framework of traditional architectural members and motifs (columns, imposts, tracery etc.). Texture no doubt plays an important role in this façade, but only with the help of an array of supporting ornamentation. The Saarinen trio had still some way to go before they were prepared to let the stone speak for itself.

Contemporary commentators frequently returned to this issue. In his inauguration speech Sebastian Gripenberg praised the ensemble of material and ornamentation:

> And now you will certainly ask me in what style the building is built. All the innumerable people who have stopped in front of this exterior to watch, to appreciate, to admire and to criticize, all these people have agreed in saying: ''We have never seen anything like this before.'' And they have been right, since there is indeed nothing like this in our country or elsewhere. The style has been called Finnish Naturalism; this term is as good as any other, because the salient feature in this building is that every material speaks its own, natural language, and that the ornamentation is based solely on themes derived from the Finnish flora and fauna — and all this in a manner that bespeaks



191. Gesellius-Lindgren-Saarinen, Pohjola. Main entrance. (Photo SRM—FAM, Kari Hakli)

> of the extraordinary and original gifts of the architects. [. . .]When we look at the enormous stones of the façade, our thoughts wander to the heights of Koli, on the shore of the glittering waters of Pielinen [. . .] It is evident that our own Finnish style has not yet been created by this single attempt to treat domestic materials and domestic motifs in an independent manner. But to Finnish art this is nonetheless a source of great satisfaction; this originality is also acknowledged abroad, as evidenced by the attention shown the pavilion of our artists in the Paris exhibition.[43]

Jac. Ahrenberg, the architect and writer, also appreciated the fundamental approach. He identified the ultimate sources of the Pohjola building as American and English. "It is artistically based on three cornerstones: simplicity, respect for the material and the stylization of the realistic motifs employed." He noted the utter simplicity required by "the veristic school": mouldings consisting merely of horizontal slabs. Ahrenberg was impressed by the vigorous rustication: "These arches and these masses of stone symbolize, as it were, the raw, untouched substance from which the smoother surfaces, the finer forms and the rich plant and animal ornamentation is growing up." He approved of the ornamentation (cf. Fig. 191, 193), but he found the masks abominable: "Veritable idiots' faces, without a trace of comic or humour (Fig. 192)."[44]

Today it is difficult to imagine the impact made by the Pohjola building. Crowds of people watching and discussing the details of the building were a common sight in the spring of 1901. "Hardly any one passes it with indifference, our gazes are drawn upward, expressing curiosity, surprise, or delight. This is no doubt the most popular building in Helsingfors," Bertel Jung reported in the same issue of *Teknikern,* where Ahrenberg published his appreciation. He ascribed its popu-

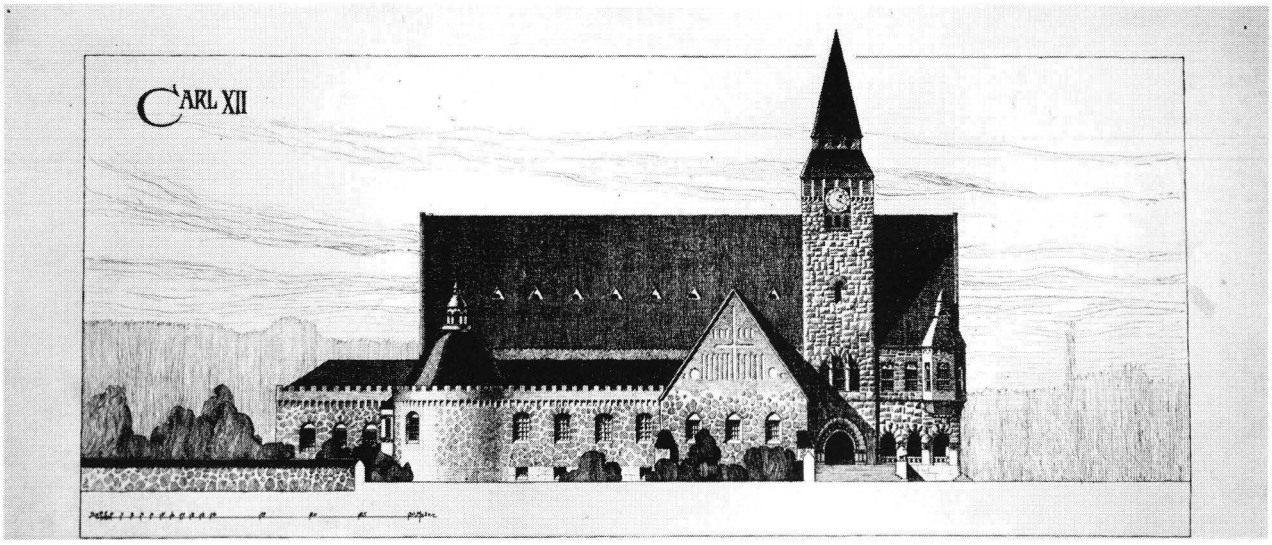
larity to the combination of a noble material and an imaginative stylization. One of the points of the artistic effect was the deceptive simplicity: as the beholder approached the façade, he discovered ornaments in the most unexpected places (cf. Fig. 193). But nonetheless Jung found it hard to follow the architects all the way. Ornaments should both adorn and explain, that is, they should in a symbolic manner clarify the function of the architectural members. In a façade compostion as simple as this, it might seem superfluous to explain each member by means of ornaments applied to them, Jung argued. But if the ornaments are used for decoration only, then they should have at least some connection with the significance of the building. Of course, the bear might be used, since it figures in the logotype of the Pohjola firm; but repeated together with other animals such as squirrels, foxes, birds etc. it assumes a quite different meaning. Left to guess the destination of this building on the basis of the ornaments only, one should probably think of a zoological museum. "Seen as a zoological and botanical picture-book in stone, these façades are perspicuous, enjoyable and amusing, but I demand something more than this empty ornamentation from artists as gifted as the architects of this building."[45]

As a means of indicating national identity in architecture, ornamentation was becoming increasingly problematic. Recent developments in Austrian, German, Belgian and British architecture and design stressed the non-representational elements of ornament, and the whole concept of ornamentation was becoming redefined and even questioned. If ornamentation had to be used more sparingly, this left two avenues open for the architects who still wanted to express themselves in a "national style": a cautious return to historical models and an added emphasis on the material, its texture and its associative values. Both these means of expression became important in the Gesellius- Lindgren-Saarinen project for the National Museum of Finland.

In May, 1900, we recall, the official museum project had been turned down by the Senate of Finland. Instead the Archaeological Commission was instructed to arrange a competition. Before the decisive meeting, Senate members had received copies of an illustrated pamphlet *Vårt Museum,* where the advantages of the "agglomeration system" of museum architecture were persuasively argued. The Musée Cluny in Paris and the Germanisches National Museum in Nuremberg were mentioned as instances of old buildings rebuilt for museum use. New buildings erected specifically for museum use such as the Zürich Landesmuseum and the Munich Bayerisches Nationalmuseum were described and illustrated in *Vårt Museum,* which was concluded with an account of an imagined visit in the future National Museum of Finland. The museum envisioned consisted of an agglomeration of buildings crowned by a "greystone church in Gothic style and an old-fash-

192. Hilda Flodin, Pohjola. Main entrance masks. Soapstone. 1901. (Photo HKM—HSM A. Pietinen)

193. Gesellius-Lindgren-Saarinen. Pohjola. Detail of soapstone rustication with fir-cone border. (Photo SRM-FAM, Risto Kamunen)



194. Gesellius-Lindgren-Saarinen, "Carl XII", principal project for the National Museum of Finland. 1902. National Archives, Helsinki. (Photo VA)

ioned tower reminiscent of the towers of our medieval castles." The entrance was marked by a turret. "The tiny, carved blocks of the portal, with the most wonderful reliefs of Finnish soapstone, contrasted against the rusticated granite surrounding it," the text went on. Once inside the imaginary building, the visitor entered the first section, where archaistic forms suggested the prehistoric period. The walls were built of shapeless granite boulders piled one upon another, the piers consisted of enormous monoliths of the same material etc.[46]

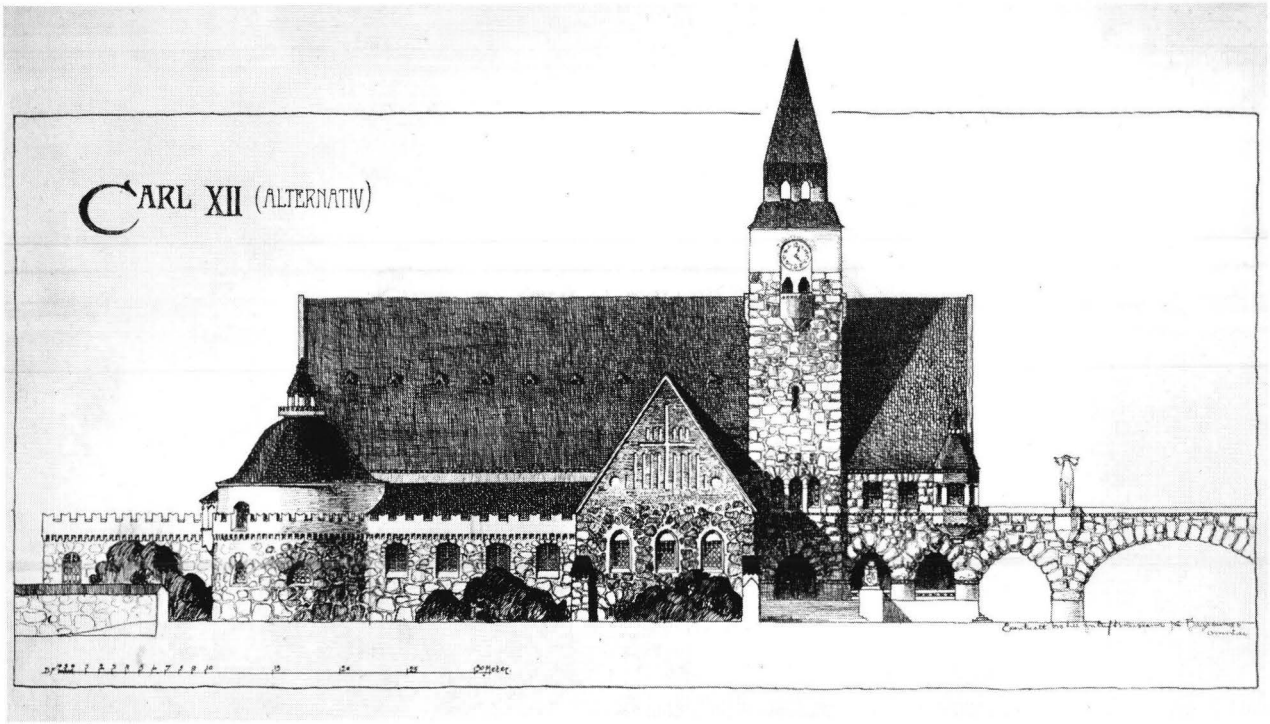
The museum project was seen as a chance to develop the long- cherished national style. The daily *Nya Pressen* published a letter by "a Finnish architect in Paris" who envisioned a sacred grove of the Finnish people with picturesquely grouped houses, built over a long period. We do not yet have a national style, but perhaps it will emerge after a few decades, so that extensions might one day be built without recourse to forms imported from Tuscany. "It must certainly be possible to use granite in a less expensive and a more attractive way than what has been done in the proposed façade (Fig. 155-156). I just happen to have in front of me a picture of Saint Germain, and I cannot help thinking how much closer to the goal we would be if we used this façade composition as a norm instead of the dull antiquity."[47] Gustaf Strengell, later to become a proponent of rationalism, let himself be carried away by the general enthusiasm. "It is as if the grey granite rocks themselves demanded a style of their own, as strong and magnificent, but at the same time, as simple and honest they are themselves," he exclaimed in a contribution to the museum debate.[48]

But when the competition was announced in March, 1901, it contained no restriction as to the material of the façades, which was left to the competitors' own choice. In September, 1902, the result was published. The first prize was awarded to Gesellius-Lindgren- Saarinen's "Carl XII," which was submitted in two versions, the principal project (Fig. 194) and an alternative version (Fig. 195).

The Saarinen trio had made full use of the two means of expression mentioned above. Historical motifs and textural effects were used in such a way as to strengthen one another; ornamentation played no appreciable role in the project. The alternative version (Fig. 195) is the "stronger" one, and the more disciplined principal project was clearly submitted as a safety measure in case the alternative would prove too strong. Together with a bridge leading to a projected open-air annex, the entrance arches form a wildly primitive arcade, reflecting the romantic spirit of *Vårt Museum*. The tower, the "church" with its ornamented brick gable, and the "castle" with its partly plastered round tower display variations of cyclopic greystone bonds used in Finland from the Middle Ages to the Renaissance. The stones are made to tell the story of Finnish culture from the earliest times to recent historical periods.

Compared with the alternative version, the principal project (Fig. 194) makes a more moderate use of texture. The tower and the wall right of it are in squared rubble, and the cyclopic bonds of the historical buildings have been standardized. These modifications have been carried through at the cost of associative value and even historical plausibility — there existed no historic building in Finland which had walls of squared rubble or of any bond even faintly reminiscent of this Scottish-American technique.

However, the prudence of presenting a more restrained version soon became obvious. The competition jury had two foreign members, the Dane Martin Nyrop and Isak Gustaf Clason. With the consent of the other members they appended a comment of their own to the report. Nyrop and Clason considered a project submitted by Grahn-Hedman-Wasastjerna as the



195. Gesellius-Lindgren-Saarinen, ''Carl XII'', alternative project for the National Museum of Finland. 1902. National Archives, Helsinki. (Photo VA)

196. Gesellius-Lindgren-Saarinen, The National Museum. Elevation 1904. The National Board of Antiquities, Helsinki. (Photo MV)

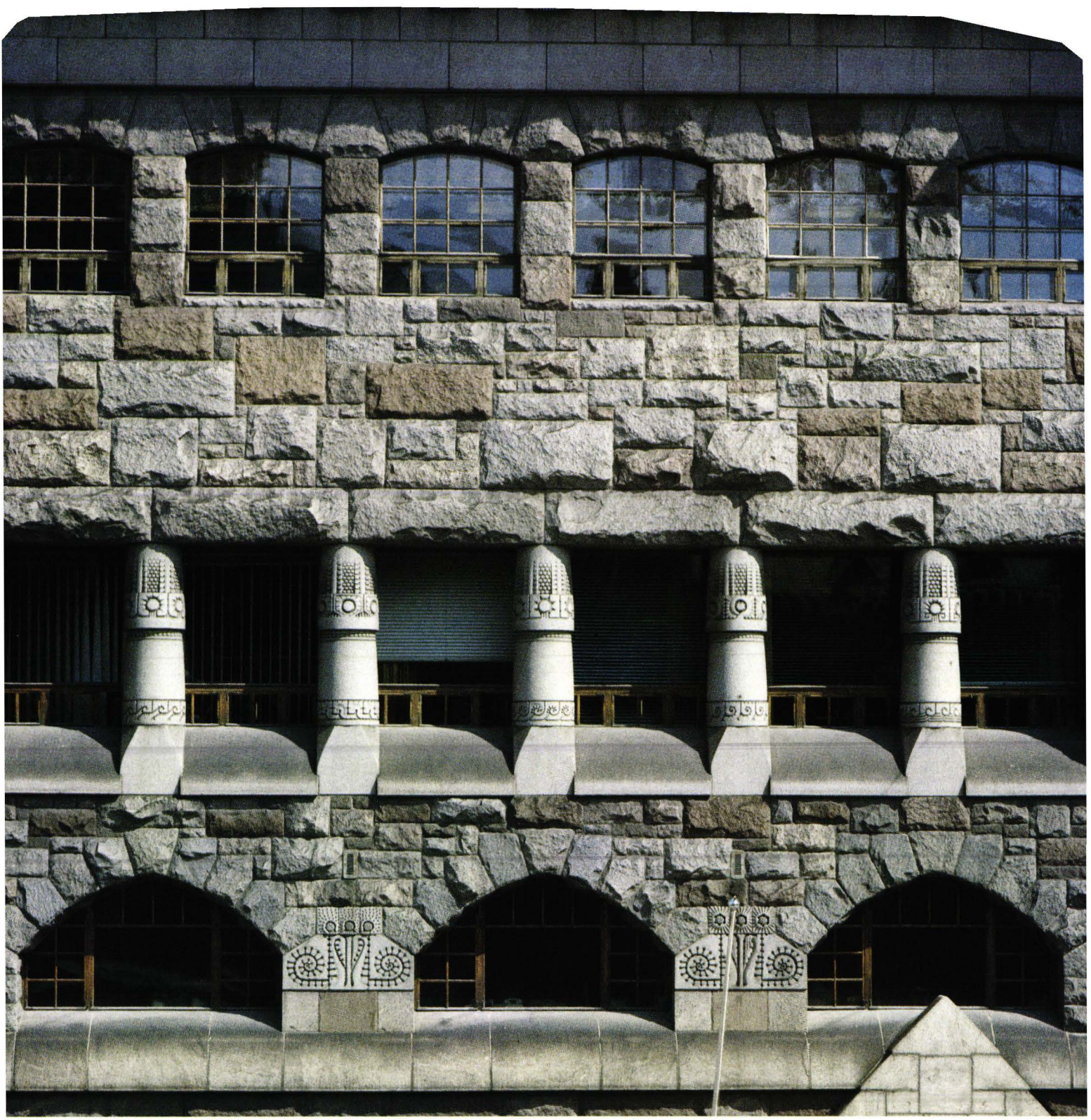
197. Gesellius-Lindgren-Saarinen, The National Museum of Finland, Helsinki. 1904-1910. (Photo HKM-HSM, C.Crünberg)

most mature solution (the project was not entirely unlike Clason's own Nordiska Museet, Fig. 134). However, they appreciated the fact that the Gesellius-Lindgren- Saarinen entry was "more consonant with the artistic movement, which is at present emerging in Finland." For that reason they did not propose another order for the prize winning entries, but uttered serious words about the Scylla of modernism and the Charybdis of archaism. When used in a contemporary building, national motifs had to be modified. The older the motifs, the more they had to be transformed:

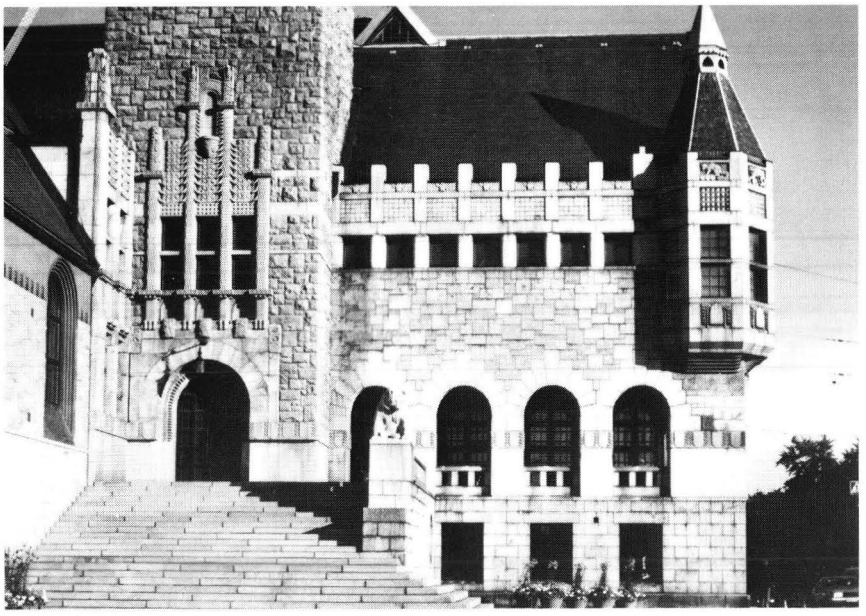
> In a contemporary building coarse cyclopic walls cannot be combined with such indispensable things as rainwater pipes, weather-proof windows with modern fittings, electric light etc.; if employed in all their primitive rawness, such walls will necessarily produce a disharmony which cannot be softened by giving all these modern installations a rough and coarse shape. The disharmony can be removed only by ennobling the old-fashioned and coarse architectural details.[49]

One can feel the hurt sensibility of I.G. Clason behind these words. Even in the principal project the boulder arcade and the tripartite window by the entrance made a barbarian impression, and the jury was unanimous in regarding them as "rough and coarse," and in need of being "ennobled in their forms."[50] In the definitive elevation of 1904 (Fig. 196) the boulder arches were tidied into a precisely cut arcade, and in the realized building the portion to the right of the tower was executed in smoothly dressed rubble (Fig. 197-198). The primitive tripartite window was remodelled into a Viennese flavoured composition. The cyclopic bonds of the church and the castle were finally standardized into squared rubble.[51] The textural effects were thus toned down, but ornamentation was not for that reason allowed to expand; on the contrary the architects resisted suggestions to use old Finnish decorative patterns in the architecture.[52]

In 1904 the architectural firm made an estimate for the museum building, where the stone was calculated to cost 121,550 marks. The façade contract was given to Finska Stenindustri Ab, who delivered light grey Uusikaupunki (Nystad) granite for the purpose. From 1906 an extensive correspondence attests to the difficulties with deliveries, detailed working drawings and strikes. Finska Stenindustri complained that they had to wait for working drawings, and the architects defended



Lars Sonck, The Helsinki Telephone Company. 1904-1905. (Photo P.O. Welin)

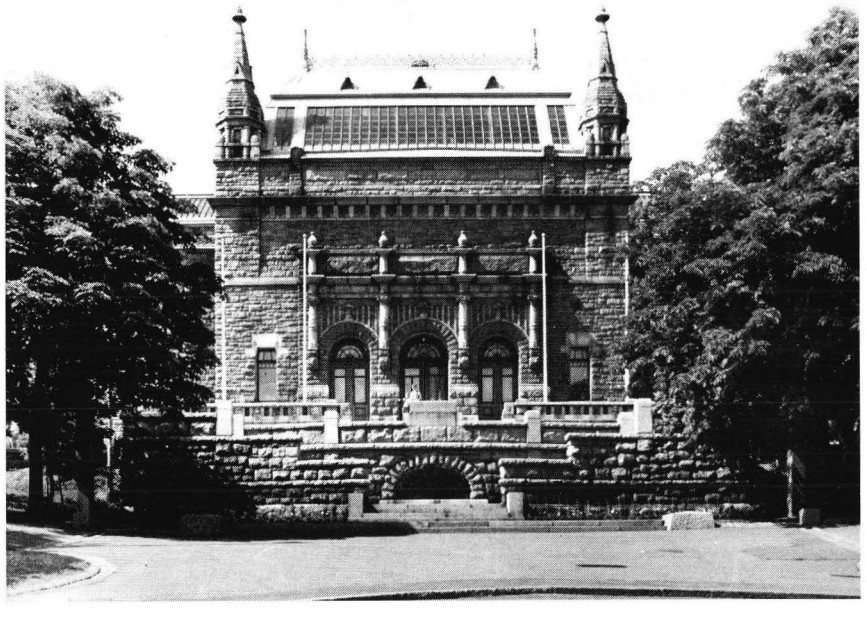


198. Gesellius-Lindgren-Saarinen, The National Museum. Entrance. (Photo P.O. Welin)

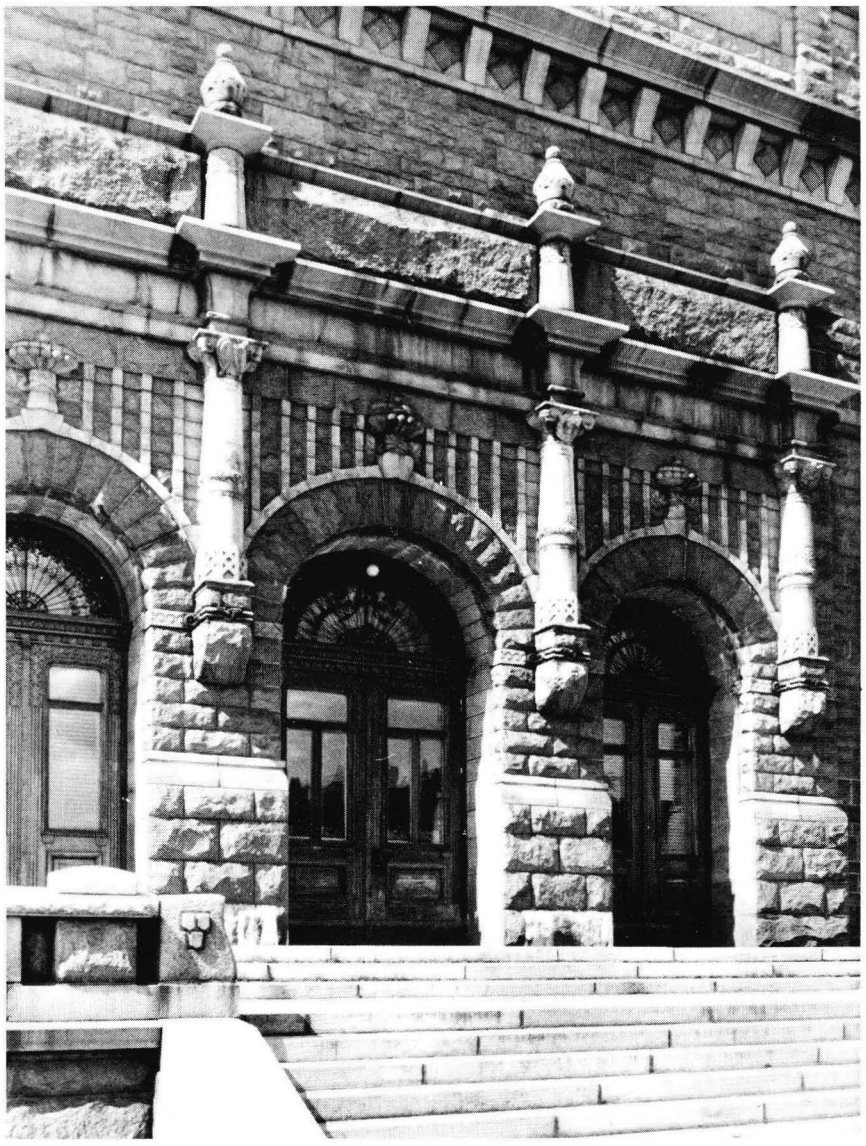
themselves by claiming that the contractor was just making up pretexts to explain delays in stone deliveries, a pattern of events which is by now familiar to us from similar vast undertakings. The soapstone employed for ornamentation was delivered by Finska täljstens Ab; one of the ornament sculptors was a Norwegian brought to Finland by that firm in 1899. The building was completed in 1910, but opened as a museum as late as 1916.[53]

The first Finnish museum to be built expressly for that purpose was the Art Museum in Turku (Åbo). After an invited competition in two stages (1900), Gustaf Nyström was entrusted with the task of planning a building for the Art Society in Åbo and the local Art School.[54] The competition rules had defined genuine façade materials as "desirable." Four years earlier Nyström had designed the pioneering Yhdyspankki-Föreningsbanken, but a Neo-Renaissance structure was now out of the question. A more contemporary idiom had to be found; moreover, Nyström was aware of the fact that he was competing with several of his former students, young architects who had a more direct feeling of what was in the air.

In Nyström's winning project "För de fria konsterna" the façade was symmetrical, a natural solution, since the site was on a hilltop at the end of a long street perspective. To counteract the regularity, Nyström added picturesque details, such as turrets, doorway



199. Gustaf Nyström, The Art Museum, Turku/Åbo. 1900-1904. (Photo SR)

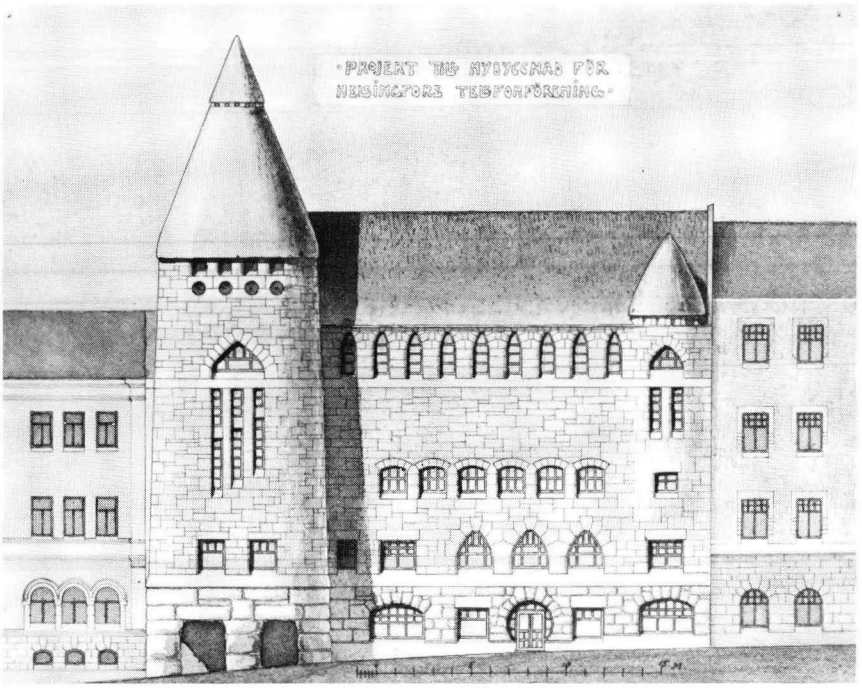


200. Gustaf Nyström, The Art Museum, Turku/Åbo. Entrance. (Photo SR)

decoration etc. According to the work specification, the ornamental details were to be executed in sandstone or soapstone; the surfaces could be treated either with tinted plaster or yellow bricks. For the tinted plaster he referred to the Royal Castle and the Opera House in Stockholm. Nyström also submitted an alternative variant ''Ver sacrum'', which had resulted from his wish to build the museum of Finnish granite. He had in mind reddish granite from the Kakola hill in Turku and the white Uusikaupunki (Nystad) stone, of which the latter was marketed as rubble in the capital at a very reasonable price. The ornamentation would be reduced to a minimum, but the wall surfaces could be enlivened through the use of rubble in two different colours.[55]

The jury combined Nyström's projects. It praised the façades of the plaster-or-brick project ''För de fria konsterna'' for being ''simple and very well suited for a natural material, since most of the surfaces are almost even and designed to impress by their proportions and through their material; the ornate details have been concentrated to the area around the main entrance and they can easily be executed in e.g. soapstone''[56] In the second phase of the competition and in his final elevations Nyström complied with the jury's decision. At a later stage the rich decoration surrounding the entrance was simplified to suit granite: in a frieze originally reserved for portrait medallions granite blocks with fresh cleavage were inserted instead (Fig. 199-200).

Much care was devoted to the choice of material. In October, 1900, the building committee for the Museum inspected samples of granite from Turku (Åbo), Hanko (Hangö) and Uusikaupunki (Nystad). Finally a reddish stone from the city itself was chosen.[57] The specification of the rubble lining was extremely detailed. The depth of the stone was to be 150 mm with binders extending 300 mm into the wall. The horizontal and vertical faces of each stone should be at right angles with the façade plane. At any time the builder was



201. Lars Sonck, The Helsinki Telephone Company. Preliminary design 1903. Helsingin Puhelinyhdistys—Helsingfors Telefonförening. (Photo SR)

entitled to control this by the following test: if randomly chosen blocks were piled to a height of two metres, they should form an even and vertical façade surface.[58] The work was supervised by Gustaf Nyström's brother Alexander Nyström, who had himself studied Scottish building methods in 1896 (cf. above p. 64).

In December, 1900, Herman Gesellius published a sharp attack on Nyström's project: behind this mechanically conceived structure he could find no soul. ''The plan has been drawn with cold calculation, the elevation has been constructed by an unloving hand.''[59] Gesellius's judgement was influenced by the nervous atmosphere surrounding the question of the National Museum which was being prepared by the Archaeological Commission during the same autumn. In any case it shook the confidence of the academic architect Nyström, whose choice of the rough variant of granite architecture for the final building seems a little forced.

The idea of employing granite of different colours was not put into practice in Nyström's Museum. A little later, however, another architect, Lars Sonck, began to experiment with colour effects. In December, 1901 Sonck completed his final drawings for the church of St.John in Tampere (Tammerfors), and in the rubble pattern of the elevations he introduced delicate variations in tone. A few weeks before this Sonck had made his first contacts with the Helsinki Telephone Company, which was planning to build a new main building. In 1903 Sonck submitted a preliminary project (Fig. 201) to the Company Board, which requested him to rework the elevations.[60] In 1904 his revised project was approved and the Board began to discuss the façade material; one possibility which was brought up was to employ granite of different colours from Uusikaupunki (Nystad). It does not appear from the minutes who first suggested the idea. Most probably it emanated from Sonck, who acted as the supervising architect of the Telephone Building and who had just been using granite of varying colours in his Church of St.John in Tampere (Fig. 279- 280). The red and grey granite rubble was ordered from Finska stenindustri, whereas the Finska täljstens Ab and a local firm delivered the dressed and ornamented parts.[61]

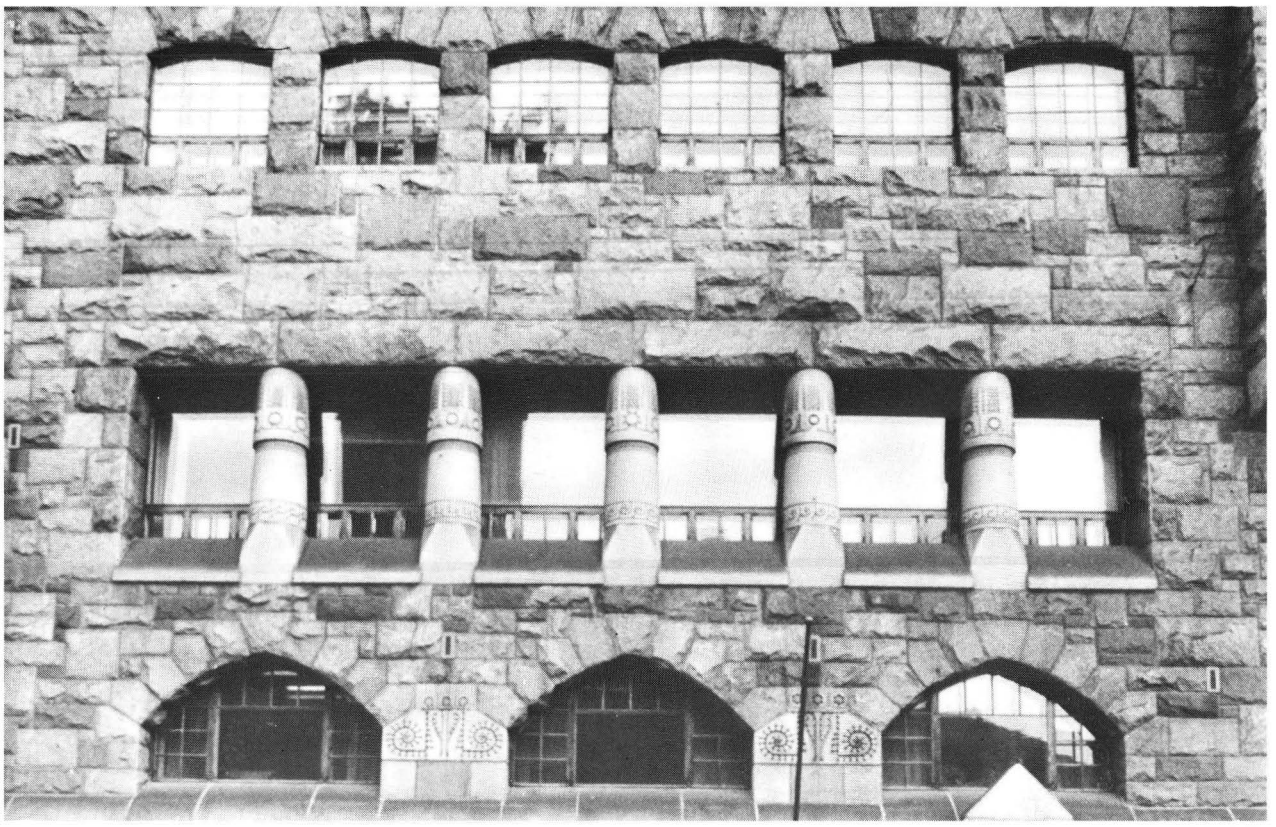
Sonck's Telephone building retains a Richardsonian character in its composition and proportions — there are reminiscences of Franklin MacVeagh House in Chicago, which was excellently illustrated in *Neubauten in Nordamerika.*[62] But in its details the realized building is a highly personal creation. Sonck's use of different colours is no end in itself but a device used in combination with another new feature: the unusally large size of the stones. In the first sketch (Fig. 201) we can already sense the architect's fascination with the size of the stone. The foundation of the tower was originally designed to extend over the pavement. Passers-by would thus have walked through a primitive structure built of large blocks and lintels; in the end, however, this plan was rejected by the city Magistrate. But in the final solution (Fig. 202-204) the lintel theme has been made a *leitmotif* of the façade. The lintels in the second-storey appear like a prehistoric entablature supported by sturdy pillars with primitive, incised figures; the vertical joints above each column are sealed by large blocks, enhancing the illusion of the

202. Lars Sonck, The Helsinki Telephone Company. Korkeavuorenkatu/Högbergsgatan 35. 1904-1905. (Photo HKM—HSM Roos)

shafts performing an enormous work (Fig. 203). The piers between the windows in the fourth storey continue this movement, and the voussoirs radiate towards the string course, spreading, as it were, the supporting thrust to the peaceful, beautifully dressed surface of the uppermost stone courses. The different colours enhance the size and individual existence of the stones, thus contributing to the pathetic drama that the architect stages before our eyes. To Sonck the rubble pattern was no mere texture, no uniform revetment to be ordered by the square metre, but a means of expression which should be fully effective even when the building was seen at a distance.

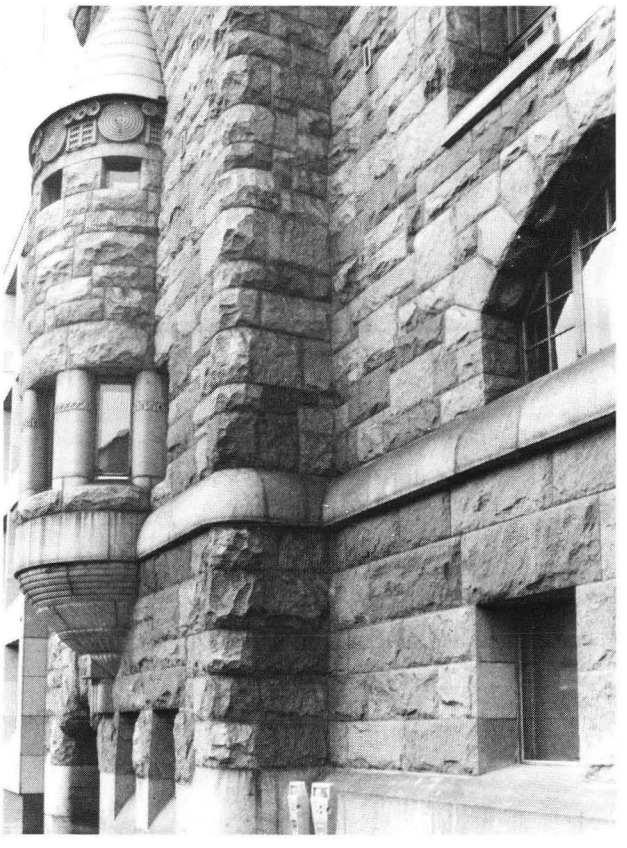
Sonck's approach is unique in Finnish National Romanticism. The individuality of the building blocks was never an issue for Saarinen and his partners, nor did such architects as Lindahl and Thomé ever see the rubble surface as anything more than a texture. They, too, interspersed their façades with large-size stones (Fig. 206, 210), but only as accents giving variation to the surface, not as vehicles of meaning. The intention of Sonck escaped even J.J. Sederholm, the geologist, who was such an astute observer of the aesthetic nuances of stone. The variegated appearance of the old churches of Finland had a natural explanation, he argued, and it was therefore satisfactory from an aesthetical point of view. A moderate variation of colour, such as may occur in quarries, might also add life to a stone wall. But Sonck's idea of blending a reddish local stone with the even, light grey granite of the Tampere Church was more than Sederholm could take. This was not picturesque, but spoilt the appearance of the stone. ''A mixture of different stones, such as is at present attempted in the building of the Telephone Company of Helsingfors will, I think, certainly be regarded as too variegated to harmonize with the grave character of granite.''[63]

In Finnish architecture the most consistent development from ornament to texture can be observed in the work of Karl Lindahl and Valter Thomé. In the autumn of the year 1900 the Union of Polytechnical Students decided to build itself a house. A limited company, ''Sampo'', was formed, and after two competitions in 1901 the architectural firm Lindahl & Thomé was



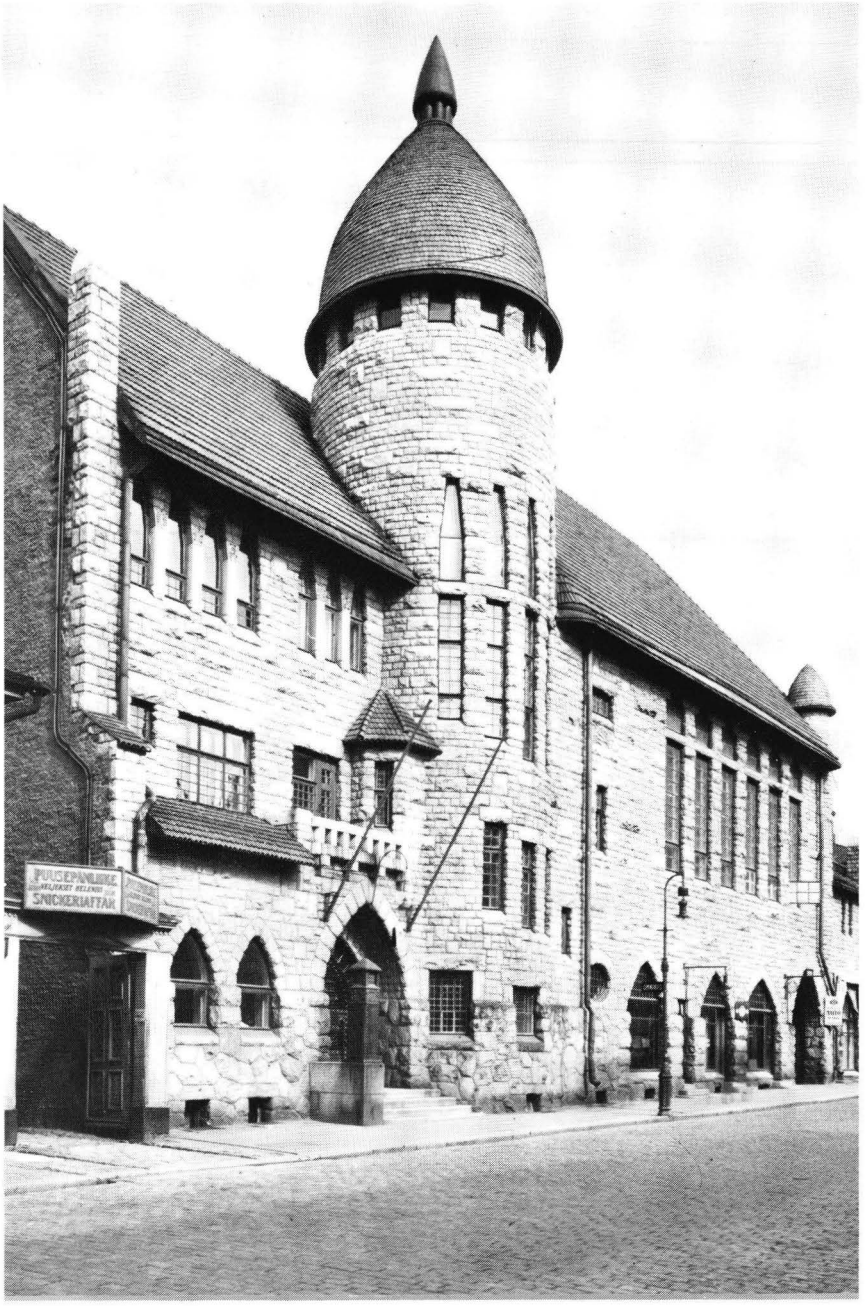
203. Lars Sonck, The Helsinki Telephone Company. Detail of lintel trabeation. (Photo SR)

204. Lars Sonck, The Helsinki Telephone Company. Detail of bay. (Photo SR)



finally entrusted with the planning of the Union. Several simplifications and reductions were made in the plans, and in April, 1902 the board of Sampo resolved that the façade was to be executed in plaster. However, at a board meeting in June, 1902, Hugo Blankett of Finska stenindustri Ab demonstrated samples of granite from Uusikaupunki (Nystad). He claimed that the façade could be lined with this stone at a total cost of 5,000 marks. However desirable such a façade might be, the Board found themselves committed to their earlier decision; otherwise the building would become too costly. "The location of the building by a narrow street was also regarded as a weighty reason."[64] But Blankett had his way, and in the autumn of 1902 the minutes of the Sampo company record transactions with Finska stenindustri Ab. In April, 1904, the board had to face the regrettable fact that the estimate had been exceeded, "to a large extent owing to the granite façade." Nothing was to be done except to apply for a cash credit loan in some bank.[65]

The Polytechnical Students' Union, "Poli," represents the final, textural phase of National Roman-

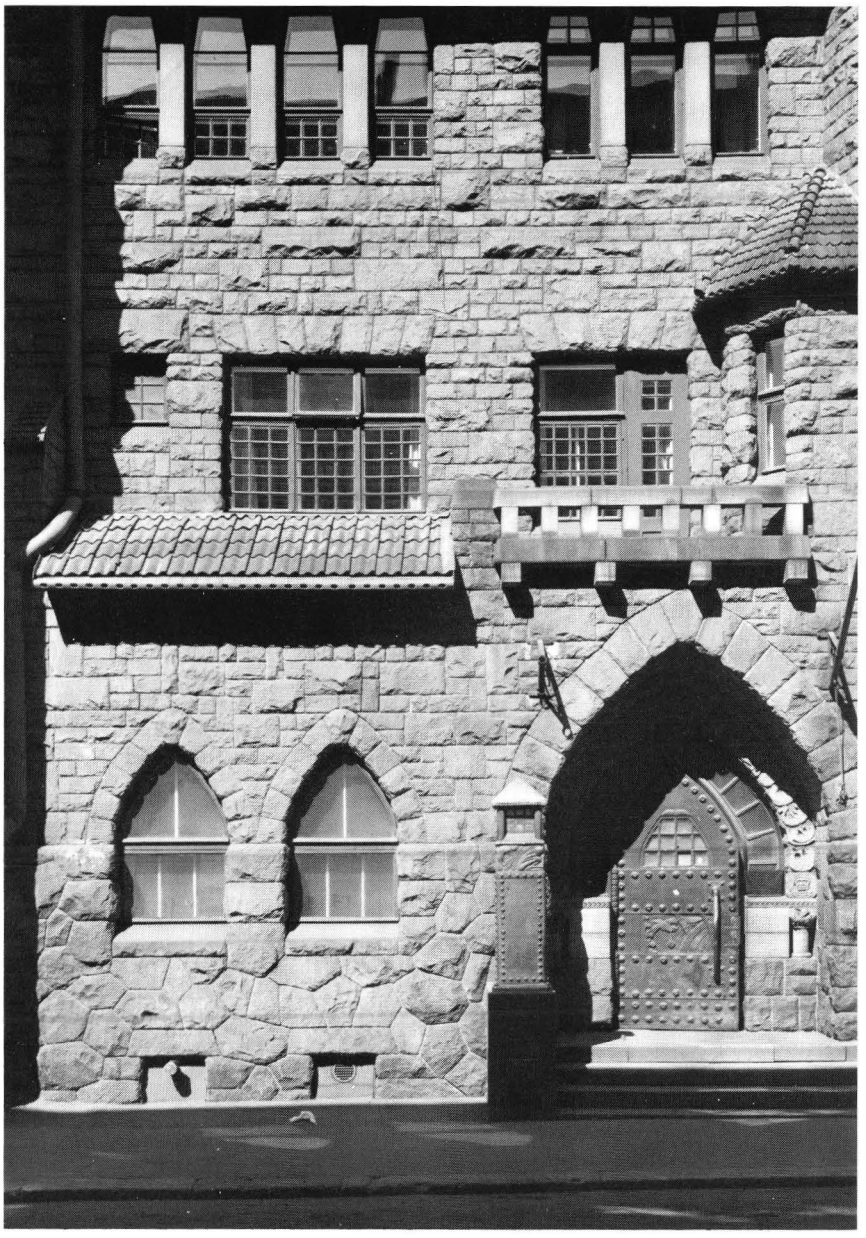


205. Karl Lindahl & Valter Thomé, The Polytechnical Students' Union, Lönnrotinkatu/Lönnrotsgatan 29, Helsinki. 1901-1903. (Photo HKM—HSM, Olof Sundström 1930)

tic stone architecture, or, to be more exact, a commercially standardized version of that phase. In its composition and main motifs the Poli follows commonplace solutions current in Jugendstil blocks of flats. What gives the building its distinctive character is the stone coating, which seems, as it were, draped over its surface. The only ornaments, the soapstone reliefs of the entrance arch, are concealed in the shadow of the porch, but the abstract pattern of the stone contains variations with a decorative effect. Thus the foundation has a cyclopic bond, the flat wall has squared rubble with occasional large blocks, and the tower is coated with rubble laid in regular courses, also interspersed with large blocks (Fig. 205-206).

The Poli received a mixed reception, not least among the technical students.[66] Bertel Jung called it "the first true representative of 'the new style'," the modern style about which so much had been said, but of which we have seen so little.

> A wide, fateful breach has been shot into the old wall, now we do no longer have to write and discuss; now the stones speak themselves. Is it a coincidence that it had to be the polytechnic students who first tore the bonds of conservatism? Is not the Polytechnic the institution of the twentieth century, its characteristic intellectual centre, which more than the University understands its own time, which looks forward and to life itself, whereas the University relies on past times? Is it a coincidence



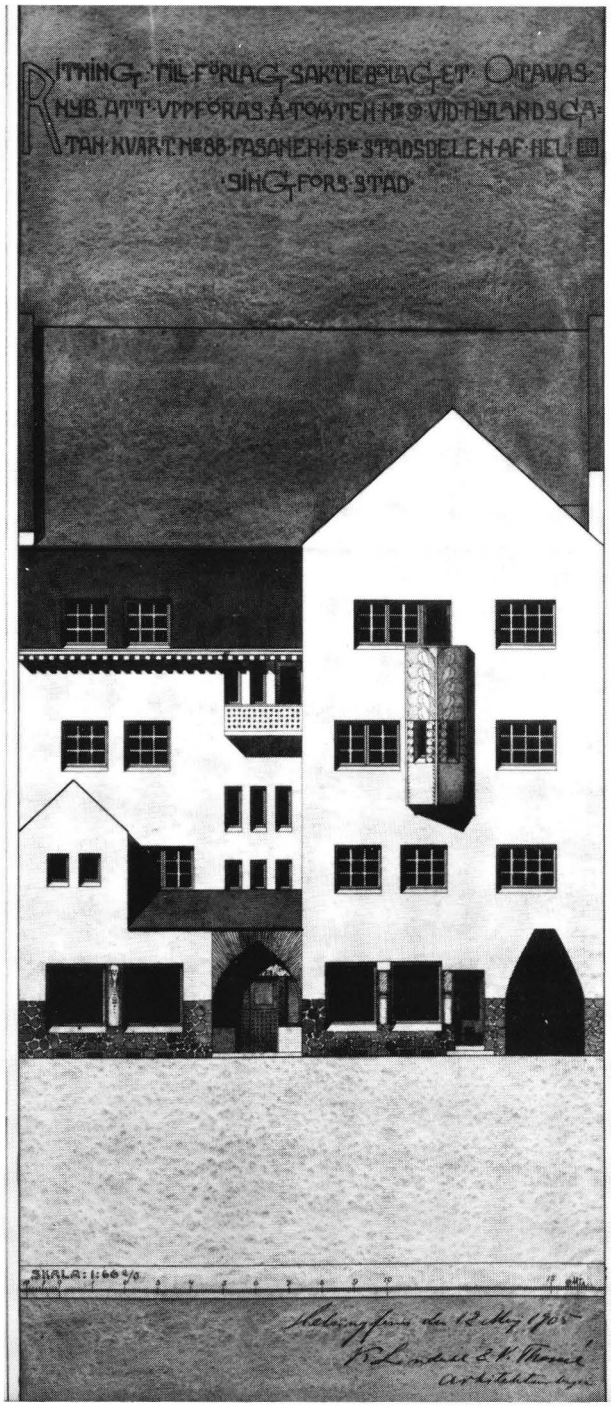
206. Karl Lindahl & Valter Thomé, The Polytechnical Students' Union. Detail of façade (Photo SRM—FAM, Kari Hakli)

> that Nylands Nation (Fig. 129-131) became a rehash of old and well-known themes, whereas the house of the Polytechnical Union boldly, almost defiantly, strides forward with forms that are new throughout? These two buildings for related purposes represent, not only the University and the Polytechnic, but that reproductive architecture which has dominated the nineteenth century, and the productive architecture which we hope will characterize the coming decades.[67]

Today it may seem peculiar that an archaistic building such as the Poli could impress contemporary observers as a harbinger of a new age and as a true representative of the technical profession. But the line of thought can be understood if we see it in its context: at last all ornamentation had been abandoned in favour of texture and modelling. "All mouldings, columns, consoles and the other means of expression earlier regarded as indispensable have now vanished completely from the façade. The coarsely worked granite surfaces, interrupted by the window openings are instead allowed to appear in all their simplicity."[68]

Other critics pointed to the contradiction between the archaic form and the modern function of the Poli. The arcade reminded Jac. Ahrenberg of the medieval town wall of Visby and the primitive forms recalled the old castles of Finland. In an urban context such forms are misplaced: "The medieval castle by the city street is not the correct expression for the house where the pioneers

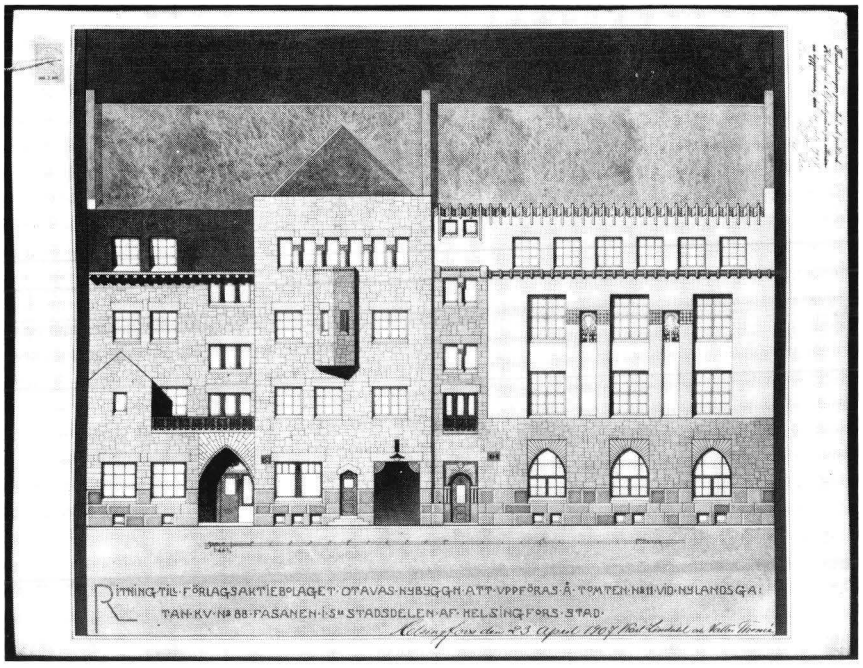
207. Karl Lindahl & Valter Thomé, The Otava Building, Uudenmaankatu 10-12, Helsinki. 1905-1906/1909. (Photo 1915, Archive of Otava)



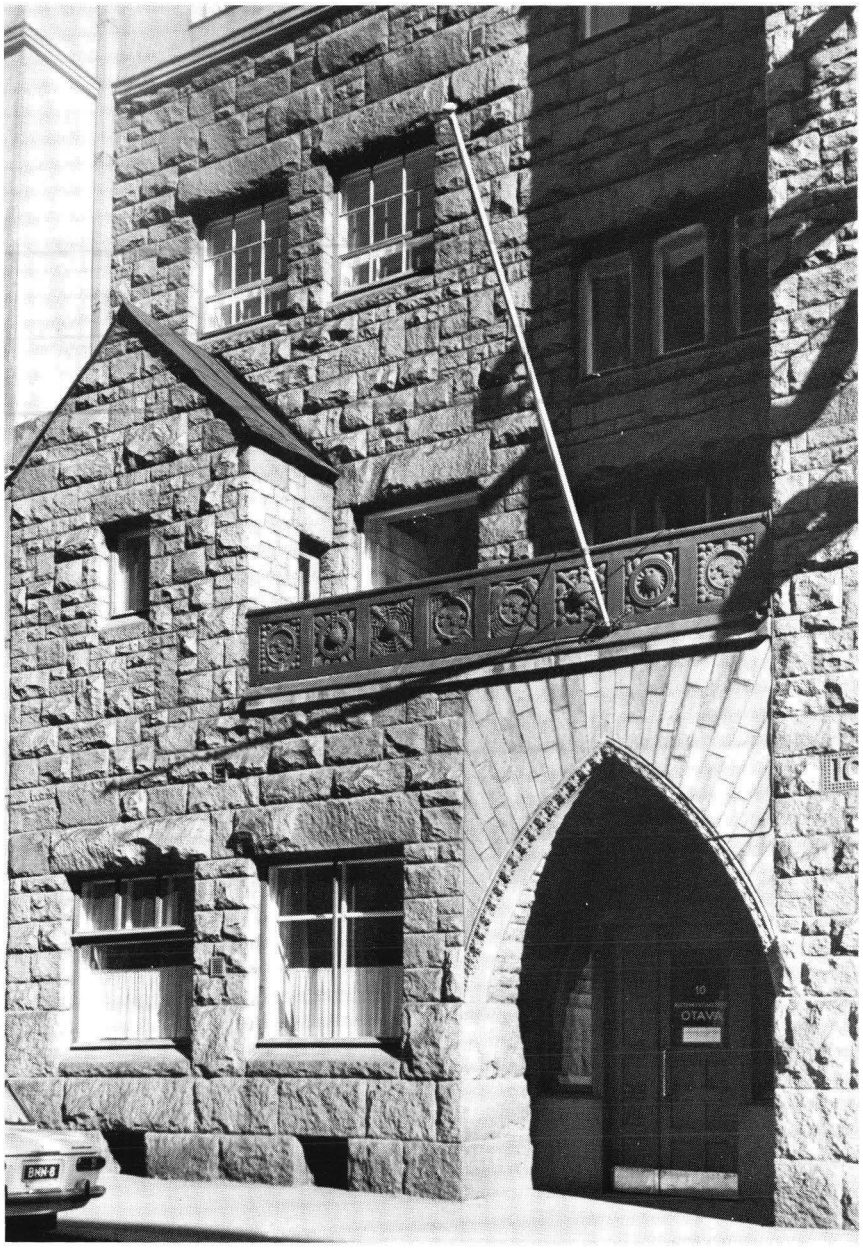
208. Karl Lindahl & Valter Thomé, Otava. Elevation signed May 12, 1905. Archive of Otava. (Photo Otava)

of technical knowledge arrange their festivities [. . .]''[69]

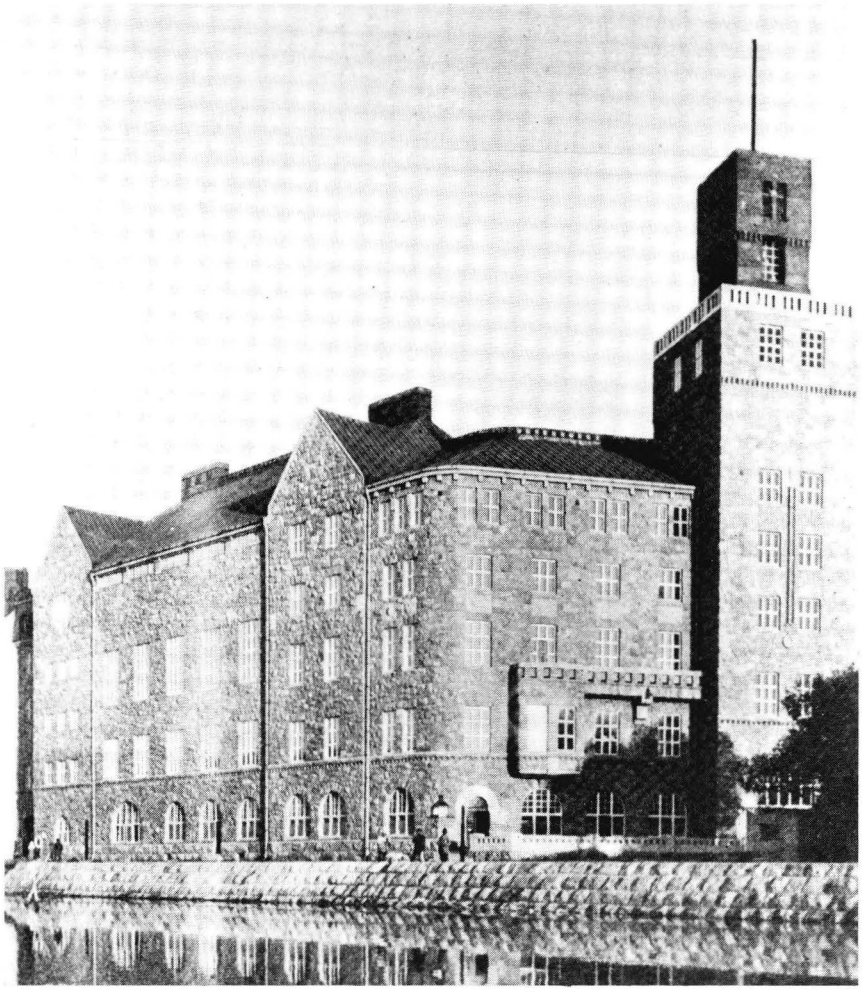
Another project of Lindahl & Thomé, the office building of the publishing firm Otava (Fig. 207), was also affected by the intervention of Hugo Blankett. The official elevation for the Otava building, which is dated May 12, 1905 (Fig. 208), shows a plain plaster façade. The main elements of the composition are the same as in the left-hand half of the Polytechnical Union (Fig. 205), except that the tower has been replaced by a gable. However, two days before the date of the elevation, or on May 10, Valter Thomé had been present at a board meeting, which ''after a lengthy discussion'' decided to accept an offer for a stone façade from Finska stenindustri Ab; granite would not, it was assured, prove much more expensive than plaster.[70] Why the original design, despite this change of plans, was nonetheless submitted to the authorities is not clear. Probably the builder and the architect wanted to get their building permit as soon as possible, knowing that later on a change of plans would be easy to get passed. The delivery contract with Finska stenindustri Ab was approved on June 5, 1905, and a year later a revised elevation showing a rubble surface was submitted to the building authorities.[71] The building was almost completed in November 1906, when Otava bought the neighbouring site, and commissioned the architects to plan an extension.[72] This they did, adding a wing which completed, as it were, the rephrasing of the Polytechnical Union (Fig. 209). The end result was a building where the extension was only partly lined with stone and the articulation kept at a minumum; the absence of copings gives the small gable to the left the



209. Karl Lindahl & Valter Thomé, Otava. Elevation of extension signed 23 April, 1907. Archive of Otava. (Photo Otava)



210. Karl Lindahl & Valter Thomé, Otava. Detail (Photo SRM—FAM, Risto Kamunen)



211. Karl Lindahl, The Workers' Association (''The House of the People''), Helsinki. 1905-1908. From E.V. Hänninen, *Torpista kivitaloon,* 1908, p. 17.

appearance of a garden shed. In general, the picturesque, softer forms have been disciplined by Viennese geometricism, which seemed appropriate in the original plaster version (Fig. 208) but which results in a certain tension with the texture of the rubble.

The builders of the Poli, ''with its façade of Finnish granite,'' saw a deep symbolism in the fact that its foundations were laid directly ''on the bedrock, the Finnish granite.''[73] The symbolism became even more concrete in Karl Lindahl's next project, the Workers' Association in Helsinki (1905-1908; Fig. 211-212). In 1905 Lindahl had won the competition for the ''House of the People,'' and in June, 1906 the Association approved his elevation.[74]

The building site for the House of the People was hilly, and the disposal of ca 8.300 cubic metres of blasted stone presented a problem. At the same time the granite proved to be of excellent quality in the deeper layers, and the possibility of using it for the façades was discussed in the building committee. With façades of granite the workers' centre could compete with the most impressive buildings of central Helsinki. On the basis of an estimate by Lindahl the building committee decided to have the street façades clad with granite quarried on the site.[75] The quarrying and the working of the stone was commenced in 1906, and the walls began to rise in the following spring — grey granite walls fraught with meaning (Fig. 213). Even the name of this hilly workers' district seemed significant. Kallio (Finnish) and Berghäll (Swedish) means rock, or rocky hill, and from this bedrock the abode of the oppressed was defiantly growing. The stone had assumed a new meaning: granite had come to symbolize not only a ''national character'' but the strength and pride of the indomitable working class. As the official historiographer of the project put it:

> The higher the walls rose, the more numerous groups of curious people there came to watch. Puzzled onlookers wondered what a granite palace

had to do so near Sörnäinen [Sörnäs; the workers' district]. A few envious people were so galled by the sight that they exclaimed: "Bah, such splendid stone for those louts!" But the workers smiled contentedly when they heard and recounted such utterings.[76]

The People's House was inaugurated in October 1908. Ten years later this granite stronghold was shelled in the Finnish Civil War, and the proud tower partly destroyed.

212. Karl Lindahl, The Workers' Association. (Photo SR)

213. The building site of the Workers' Association: the working of the stone. From Hänninen, p. 25.

10. CHURCHES: STONE FOR ETERNITY

Sweden

One would, perhaps, think that in church architecture honest stone, brick and timber construction were always so prevalent as to make demands for true materials superfluous. This is, however, only partly true. Ever since the Middle Ages plaster and paint had been used for imitating stone and other genuine materials, for creating what nineteenth-century architectural moralists called ''deceits''. Plaster had been used not only for weather protection but also for concealing the stone underneath. With the advent of Neo-Classicism even simple parish churches were felt to need a coating to cover the irregular cyclopic bonds which were the only stone walls that rural communities could afford. In Norway and Finland, as well as in the northern half of Sweden, timber was often employed instead of stone, but here, too, the protective coating was used for concealment and imitation. Thus the exterior panelling was made to emulate the forms of stone architecture.

Still, it is true that the honest use of stone was never completely forgotten. In the early nineteenth century even Neo-Classical churches could still be built in cyclopic bond without any coating. With the rationalistic movement in the beginning of the century red brick *rohbau* became another honest alternative. Red brick could also be used in combination with stone, a method which was used by Carl Georg Brunius, the *rohbau* pioneer in Scania. Brunius's parish church in Torrlösa (Fig. 214; 1838, built 1844-1849) is a Neo-Romanesque structure with its walls erected in cyclopic bond of medieval type and mouldings in red brick.[1]

Brunius had considerable difficulties in obtaining approval for his project from the Överintendentsämbetet, the Board of Public Buildings of Sweden. The Board also frequently intervened in questions concerning the building material. Thus, in 1863 it objected to the use of brick for details in the parish church of Västra Frölunda in present-day Gothenburg, a project by J.A. Westerberg and James Souttar (the latter, we recall, was the architect of the English Church in Stockholm, Fig. 16-17). The main building material of Frölunda church (Fig. 215) was granite in cyclopic bond, and in accordance with the order from the Board of Buildings, the quoins were made in sandstone instead of brick.[2]

In the 1860s and the 1870s uncoated stone walls in cyclopic bond became increasingly common in Swedish country churches. Sometimes their construction was carried out as communal projects with each farm of a village contributing a specific amount of stone.[3] The Board of Buildings did not specifically encourage the use of natural stone, but in accordance with its charter, the Board did what it could to promote solidity and sound methods of construction. Its officials included A.T. Gellerstedt and F.W. Scholander who had both received lasting impressions from the mid-century discussions on true materials. In 1887 Helgo Zettervall, the Director of the Board, issued a booklet containing general instructions for church building based on the principles laid down in German protestant architecture.[4]

In Germany the rules for evangelical churches had been formulated in two important meetings, the con-

214. C.G. Brunius, Torrlösa Church. Design 1839, built 1844- 1849. (Photo ATA, H. Edestrand)

215. J.A. Westerberg & James Souttar, Västra Frölunda Church. Elevation 1863. Riksarkivet, Stockholm (Photo RA). The tower was built with a spire.

ferences in Dresden of 1856 and Eisenach of 1861. The rules promulgated in Dresden made no mention of the building material, whereas the so called Eisenacher Regulativ contained a whole paragraph on the construction: "The church building requires *a durable material* and a solid execution without deceptive plastering or coating." This is required by the dignity of the church building, which is to last for centuries, the Conference ruled. A solid construction of brick, fieldstone or ashlar in appropriate masonry, moreover, was to be preferred to plastered facades when the maintenance costs were taken into account.[5]

The architects of the Board of Buildings frequently remodelled the projects submitted by the parishes, but the need to exercise utmost economy precluded complex forms and detailed working of the stone. Perhaps the first Swedish church to display a richer articulation in natural stone was the church of Åtvid, planned by A.E. Melander in 1879 and completed in 1883 (Fig. 216, 217).[6] In the preceding year Melander had won the competition for the church of St. John in Helsinki, an elaborate Neo-Gothic red brick structure, and his Åtvid project is clearly conceived as brick, not stone architecture. Apparently it came as a surprise to the Board of Buildings that the church had been built of blue-grey slate with quoins and mouldings of brick. The structure was officially inspected on October, 5, 1883, and in the inspection report the façade material is listed among several other discrepancies. Thus the spire had been built of masonry, but despite this additional weight the wall of the lower part of the tower had been left a mere 3 ½ ft. thick. The report was quoted at length on the official copy of the elevation (Fig. 217).

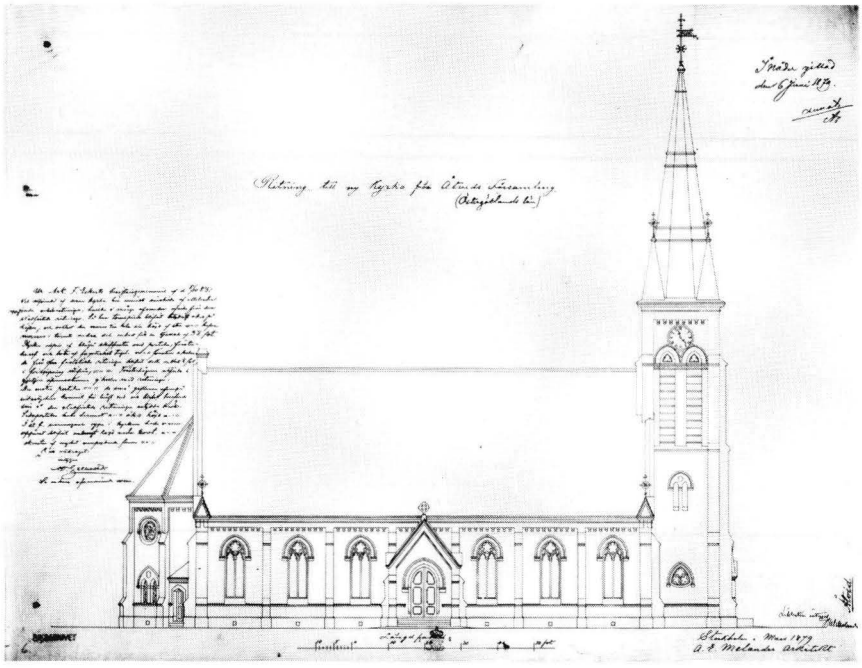
A somewhat different pattern can be observed in

216. A.E. Melander, Åtvid Church. 1879-1883. (Photo ATA)

Tranemo (Fig. 218), designed in 1881 by Emil Langlet, the architect of the Storting building in Oslo. Langlet was an almost fanatic proponent of central churches,[7] and in Tranemo he succeeded in obtaining approval for a building of this type which was generally resisted by the Board of Buildings. The question of material, however, became complicated in a way which casts an interesting light on the various attitudes to stone, brick and plaster.

Originally, Langlet had planned the church for brick, and his drawings for this material were enclosed with the application submitted to the Board of Buildings. But the application concerned a stone building, which occasioned the following correspondence. In April 1881, F.W. Scholander wrote:

> The parish has been informed of the fact that greystone construction is unsuited to a project which is as complicated as this, both because the work will not be reliable unless it is carried out with particular care, and because, if properly maintained, it will hardly become less costly than brick construction. Notwithstanding, the parish has declared that it will persist in its intention.[8]



217. A.E. Melander, Åtvid Church. Elevation, March 1879. Riksarkivet, Stockholm (Photo RA)

218. Emil Langlet, Tranemo Church. Elevation 1881. Riksarkivet, Stockholm (Photo RA)

The reason for this persistence was simply that all the stone required had already been transported to the building site. Langlet, moreover, had declared himself willing to revise his plans in accordance to the new situation. In Scholander's opinion it would in any case be inappropriate for another architect to interfere with the original architect's intention.[9] Langlet submitted a slightly revised elevation, where the cyclopic bond was sketched in the ground floor wall (Fig. 218).

However, the inferior quality of the local stone thwarted the architect's plans to leave the walls uncoated with pointed joints. Nor was this the sole reason. "The decision to apply plaster with a simple ashlar pattern instead of merely pointing the wall seems to have been partly occasioned by the view that the latter treatment is in some way vulgar; at least this opinion has persisted in this parish," Langlet explained to the Board of Public Buildings, as he afterwards applied for approval of the change of plans. He added that at least the socle had been constructed of large, regular stones with pointed joints.[10] In Tranemo, then, public opinion was unprepared to accept the novelty of a cyclopic wall plain and simple. Nor does the architect seem to have fought for the idea, which was not even his from the outset.

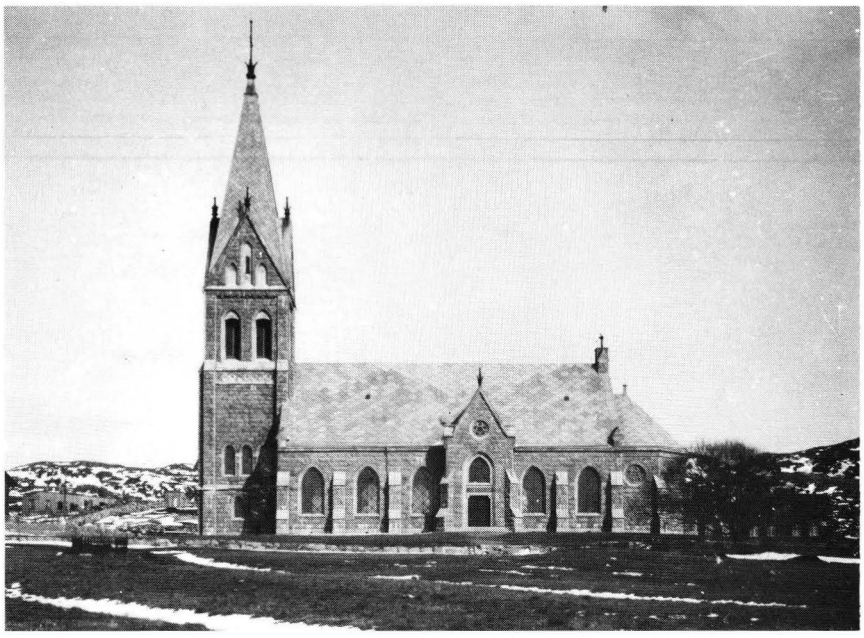
Meanwhile, a new tradition of stone architecture was beginning to take shape in the granite district in Bohuslän and Halland. The emergence of this local tradition is connected with the name of Adrian Peterson (1835-1912), an architect active in and around Gothenburg.[11] As early as 1877 Adrian Peterson's project for the church of Askum received official approval, and it was completed two years later.[12] The octagonal plan of Askum represents a type current in the middle of the century, and it seems that Peterson did not return to the formula later on. The walls were built of large granite ashlars, and the decoration was kept at a minumum. The window dressings are plain and the severe forms of the porches are wholly congenial with the material (Fig. 219).

Peterson's vast output comprises some forty churches, most of them on the West Coast of Sweden. While it is obvious that the use of granite in his churches was inspired by the spectacular development of the stone industry on the West Coast, the majority of Peterson's churches seems to have been built of granite supplied, not by the big firms, but by local people and farmers.[13] Peterson's work has a vernacular character; his standard solutions remained unchanged over the years. He had received a formal training, first at the Chalmers Institute in Gothenburg and later for Scholander in the Academy of Art in Stockholm; nonetheless his architectural idiom has a certain naïve quality.

What stylistic development there is to be seen in Peterson's churches, indirectly reflects the development of the stone industry on the Swedish West Coast. One side effect of the stone boom during the 'eighties and 'nineties was the emergence of a numerous class of stone cutters who could be recruited for church building. The development of stone working techniques also raised expectations; the severity of his early churches such as Askum (Fig. 219) was replaced by somewhat more articulate forms during the 1880's, for instance in Grebbestad (1885-1892; Fig. 220), where the Board of Buildings reworked Peterson's drawings. As actually built, however, mouldings and other articulation of the wall surface were again left out.[14]

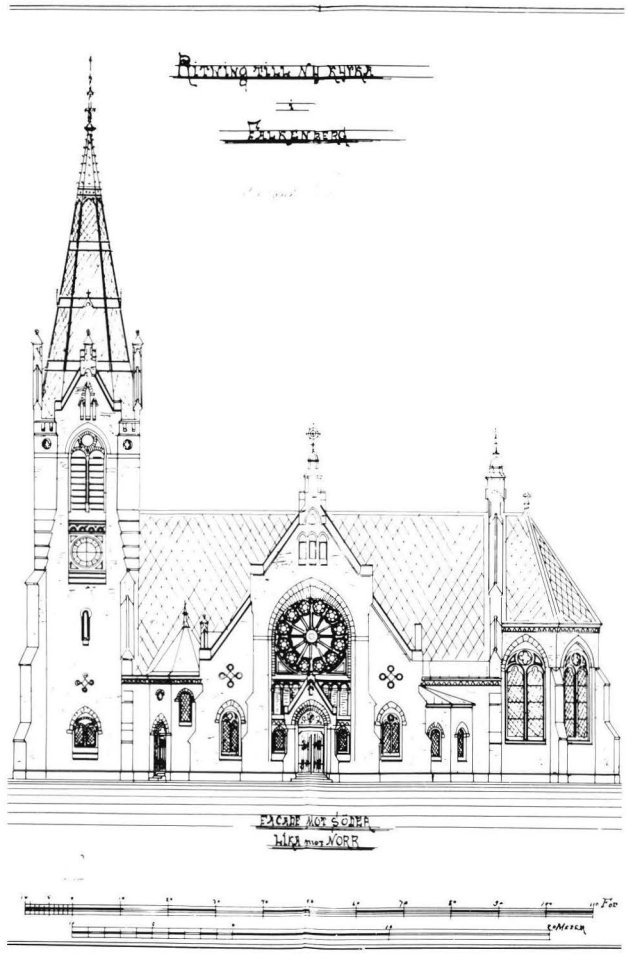
219. Adrian Peterson, Askum Church. 1877-1879, consecrated 1880. (Photo ATA)

Peterson's provincial status is frequently reflected in the documents concerning his numerous projects. The Board of Buildings seems to have made a distinction of genre between rural and urban architecture, ranking the Gothenburg architect among the practitioners of the former. When Adrian Peterson planned a new church for the town of Falkenberg in 1890, the Board architect Ludvig Peterson introduced a number of improvements of portals etc., adding in a memorandum that only the most necessary revisions had been made (Fig. 221). Actually, he wrote, entirely new drawings ought to have been made "in order to bring about a temple worthy of a town."[15] The Falkenberg church was built in granite. Adrian Peterson convinced the parish that "such a construction is very impressive and will also cost less to keep in repair."[16] A piece of incidental poetry, recited at the consecration of the



220. Adrian Peterson (with revisions by the Board of Buildings), Grebbestad Church. 1885, 1888, completed 1892. (Photo ATA)

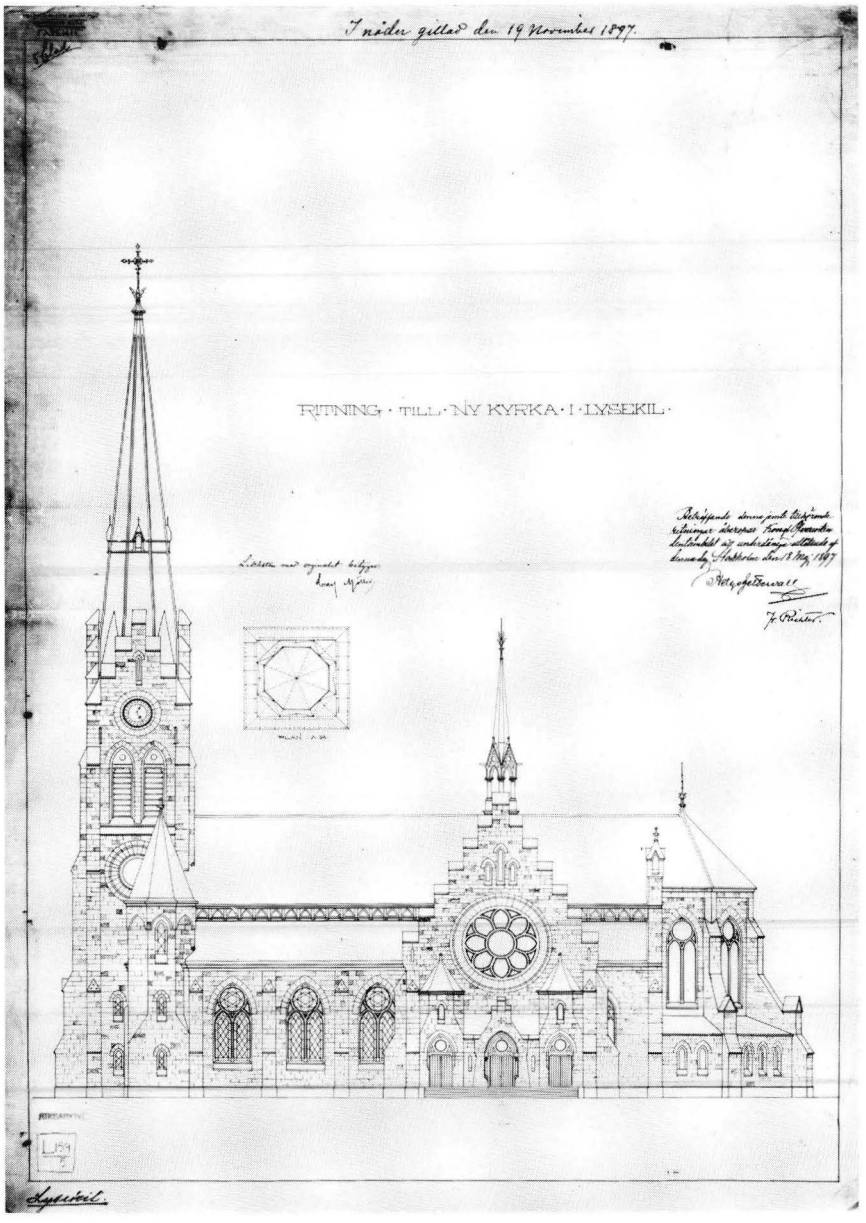
church in 1890, stressed the symbolism of the material, the fact that the temple "was chiselled out of the rock."[17]



221. Adrian Peterson (with revisions by Ludvig Peterson), Falkenberg Church. Elevation 1890 (detail). Riksarkivet, Stockholm (Photo RA)

The material was also conspicuous in Peterson's most ambitious project, the large church of the fishery town of Lysekil (1897, built 1899-1901; Fig. 222). A certain Dr. A.H.Malm, fisheries inspector in Lysekil, had visited Aberdeen and become impressed by the granite architecture of that city. On returning home Malm proposed that a new church be built for the town. His suggestion was not accepted at the time, but in 1895 a building committee was nominated with Dr. Malm as its chairman.[18] Adrian Peterson's project was criticized by Carl Möller in the Board of Buildings for "its heavy system of stepped gables, applied with tiresome consistency." The motif had better be replaced with something less heavy and costly, and the Board enclosed proposals for giving the exterior a less monotonous appearance.[19] The church was built in reddish granite from various quarries in Bohuslän. Apart from its size, the church was designed to impress by its degree of articulation. "In this part of the country there are, to be sure, other granite churches which have been built during the last few years, but the church of Lysekil is the only one to have the slenderest parts, such as the tracery, the cornices and the mouldings executed in granite. Even abroad, it seems, the only parallels are to be found in Scotland."[20] The difference in status between urban and rural church projects is reflected in the fact that few of the leading architects of the mainstream bothered to offer their services to small rural parishes. The difference between the fee customary for such tasks and the fees current in urban building was also significant.

Among the architects dealt with in Chapters 6-9 above, Isak Gustaf Clason designed a new church for the parish of Södra Kedum in Västergötland in 1887, that is, during the same period that he drew the façades of the Bünsow House (Fig. 63). At this time the com-



222. Adrian Peterson, Lysekil Church. Elevation 1897. Riksarkivet, Stockholm. (Photo RA)

bination of brick and stone appeared as the most natural solution, and that was indeed the choice of material that Clason opted for in this case, too.[21] Ludvig Peterson, who beside his private practice held a position in the Board of Public Buildings, revised many church projects *ex officio*. In some cases he had to start from the beginning, as in Lommaryd in the province of Småland. Here the Board of Buildings rejected the design submitted by the parish and entrusted Ludvig Peterson with the task. Peterson produced designs for a building of granite with mouldings and the upper part of the tower of brick; these were approved in 1888.[22] Two years later it was decided to build the entire tower of granite. At this stage Peterson proposed that granite be used throughout, "which no doubt would add to the unified appearance of the church." As realized, Lommaryd church was built of red and grey granite wedged from erratic blocks with the socle and simple mouldings of dressed grey granite (Fig. 223). The building was consecrated in 1894.[23] A third of the leading architects of the period, Ferdinand Boberg, made use of the much discussed Närke limestone when he was commissioned to design a church for Skagershult in that province (Fig. 224). The façades of Lommaryd lack all decoration, and Boberg's attention to the purely textural effect of the material already points forwards to the aesthetics of National Romanticism.

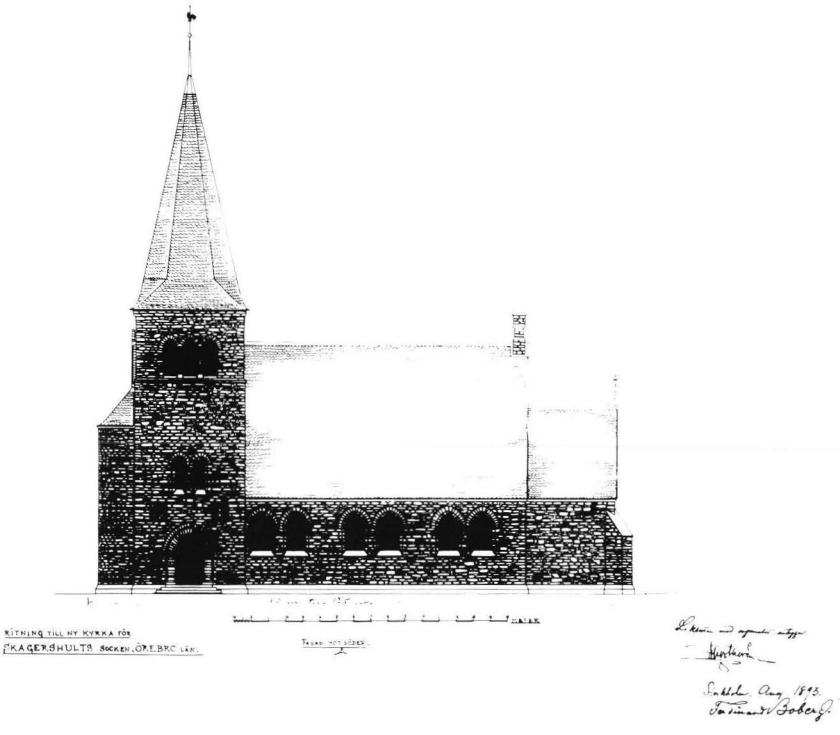
Last-minute changes of material was a phenomenon occurring in church building as well as in speculative commercial architecture, where stone façades served as status indicators. Since the 1890's the private sector in fact exerted a mounting pressure on the public sector, which followed suit in employing prestigious facade materials. Thus, the rubble coating of the Government Building in Oslo was recognized by contemporary observers as a symptom of the "jobbetiden" spirit, and in Finland the Museum project was revised to answer the new standards set by a recent bank façade. In Stock-

223. Ludvig Peterson, Lommaryd Church (province of Småland). 1888, 1890-1894. (Photo ATA)

holm one of the most prestigious church projects of the period, Oscarskyrkan (Fig. 225-226), was revised with explicit reference to the increasing use of solid materials in contemporary private architecture.

After a competition in 1896 the Oscarskyrkan was built according to the winning project by Gustaf Hermansson.[24] The competition rules had required the church "to be built on a socle of granite with brick as its main material and its various details of limestone or sandstone." "Plastered surfaces should not, on the whole, occur in the exterior."[25] Hermansson complied with this stipulation. His principal elevations of 1896 showed a rather dry, Neo-Gothic structure with slender, sharply delineated forms. However, shortly after having submitted his principal plans to the building committee, Hermansson offered to work out alternative elevations for façades in natural stone. In December 1896 it was decided to get estimates for, on the one hand, sandstone, and on the other, a combination of sandstone and limestone.[26] A year later the adviser of the Building Comittee, Professor A.T. Gellerstedt, was officially invited to comment on the possible change of façade materials, whereupon he emphasized that the project must be reworked and that several parts of the design have to be replaced by other solutions.[27] In 1898 the Building committee decided to use marble:

> In a period when more solid materials such as granite, sandstone and limestone are being more and more used for the construction of private buildings in our capital, a similar solution would be appropriate for a building of the monumental character which should mark a church building. The correctness of this view would hardly be questioned by any one.[28]



224. Ferdinand Boberg, Skagershult Church. Elevation August 1893. Riksarkivet, Stockholm (Photo RA)

225. Gustaf Hermansson, Oscarskyrkan, Stockholm. Competition 1896, built 1897-1903. (Photo SR)

In the same year Hermansson submitted his revised elevations, which were almost identical with the ones designed for brick. He simply replaced the brick with ''råkopp,'' a bond somewhere between rustic ashlar and regular coursed rubble. Otherwise the alterations concerned the form of the upper string course and some windows.[29] In the final result (Fig. 225-226) Hermansson's basis in brick architecture is obvious. The walls have an insubstantial flatness, on which the stones appear as if reduced to brick size (which, of course, they are not). The dressed quoins, strings, turrets and pinnacles are still of a type suited to enframe brick surfaces. For emphasis and contrast with the hammer-dressed surface, the dressed portions would have had to have been more clearly differentiated; that is, some would have had to be more emphasized, others reduced and a few left out altogther. A reworking along such lines was, in all probability, what Gellerstedt wanted in his report, but which for unknown reasons he did not ultimately insist on.

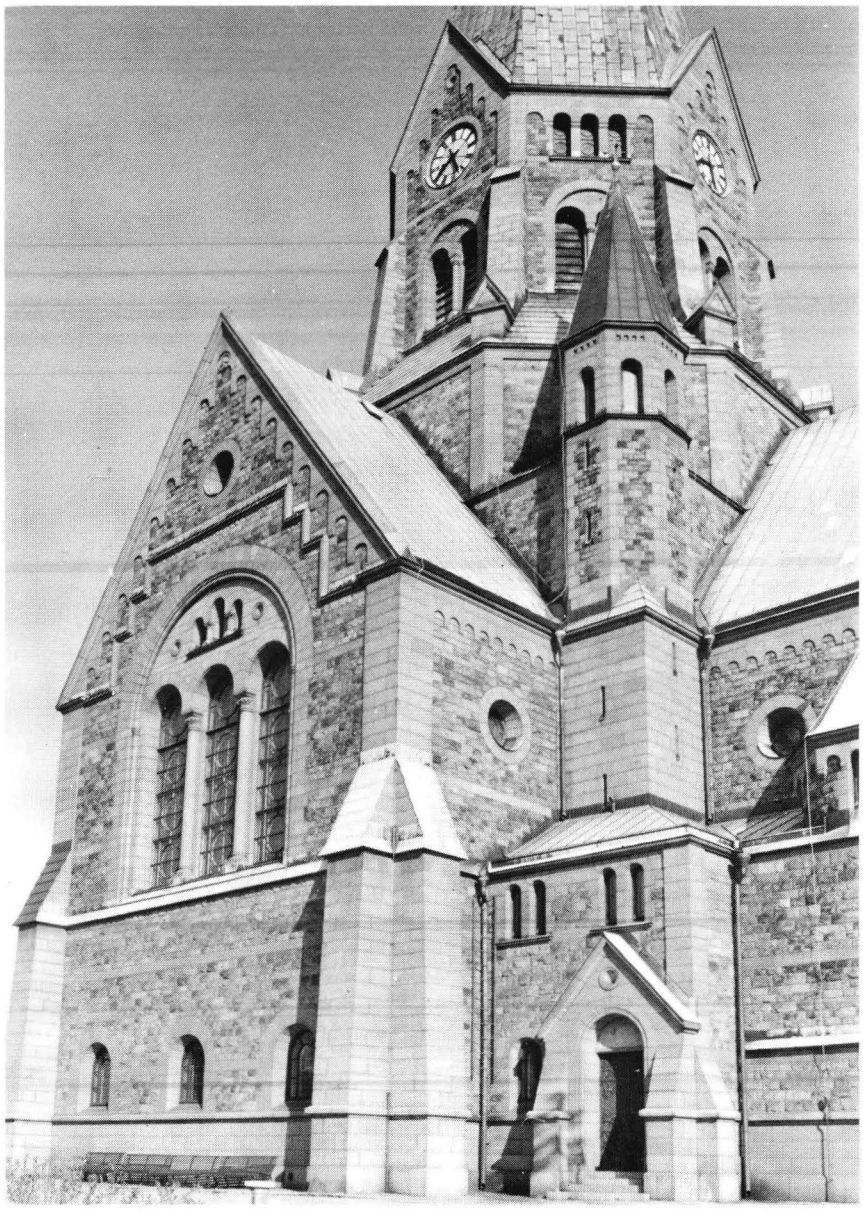
The building of Oscarskyrkan turned out to be a lengthy affair, beset with adversities. Two varieties of crystalline limestone, ''marble,'' were ordered from Anderssons Mekaniska Stenhuggeri in Stockholm. Both came from the same quarry in Kvinnerstorp in Närke: a reddish stone for the coarse surfaces and a white for the dressed details. The contractor had, however, undertaken the delivery without making sure that there was enough stone of both kinds, and it soon proved that the reddish one occurred in an insufficient quantity. Anderssons Mekaniska applied for permission to deliver white stone instead of red for the upper

226. Gustaf Hermansson, Oscarskyrkan. Detail. (Photo SR)

part of the wall, but their proposal was turned down. Then the contractor proposed that rubble (''nubbsten'') be used instead of hammer dressed ashlar (''råkopp''). The Building committee — who contemptously referred to the rubble as ''paving stone'' (''gatsten'')[30] — had finally to accept the fact that the desired variety was simply not to be had. In the end smaller stone and more irregular heights had to be used in the remaining parts of the coating. Ironically, this irregularity gives variation to a surface which otherwise lacks character (Fig. 226).

Eventually, the stone firm's inability to deliver the material according to contract proved unacceptable. The building committee first referred the differences to arbitration, but finally it took legal action. A 64-page dossier with the documents in the case, which appeared in 1900, gives an illuminating sidelight to the realities behind one of the monuments of the stone movement in Nordic architecture.[31] The Oscar church was finally consecrated in 1903.

Gustaf Hermansson's next major church project in Stockholm, the Sofia Church (1899; 1902-1906; Fig. 227), shows that the architect had learnt his lessons. The Sofiakyrkan was also the result of a competition (1899) with rules stipulating brick façades. Again the first prize went to Hermansson, and again the material was changed from brick to stone. In 1900 a committee was nominated to study the question of facade materials, and on its recommendation the parish decided that a combination of granite and sandstone was to be used. The dressed granite came from Vätö and the main surfaces were coated with Roslagen sandstone which was by this time well known in Stockholm (cf. e.g. Fig. 88, 100, 101,135).[32] This time, however, Hermansson



227. Gustaf Hermansson, Sofiakyrkan, Stockholm. 1899; 1902-1906. (Photo SR)

took American Romanesque as his model, and in that way secured a safe transition from brick to stone: the dressed granite is sufficiently powerful to enframe the Roslagen stone whose variegated colour gives variation to the regular coursed masonry.

Contemporary with this building is another Stockholm church with a strong British and American flavour, Carl Möller's Stefanskyrkan (1901-1904; Fig. 228).[33] This is, perhaps, the first church building in Sweden to have a rubble façade, in this case of limestone. Möller was the architect of numerous red brick Neo-Gothic churches and he was generally conservative in his architectural outlook. At the same time he had taken an interest in American stone building, as evidenced by his building for the Workers' Institute in Stockholm (Fig. 65), and this interest accounts for the relative ease with which he handled the material in the Stefanskyrkan. Möller has dispensed with all unnecessary quoins, bands and string courses, and the only dressed parts are the copings. The sculptural forms of the tower already show inspiration in Jugendstil design.

The influence from American stone forms became even more conspicuous in a contemporary church project in Gothenburg, the Vasakyrkan (1901; 1904-1909; Fig. 229) by Yngve Rasmussen. In 1901 the result of a competition was regarded as inconclusive, and three of the submitted entries were reworked for further consideration. The Gothenburg architect Rasmussen was commissioned to revise a project in Romanesque style submitted by Emil Hagberg. Rasmussen's reworking was preferred by the Building committee "mainly because the Romanesque church would receive a façade coating of natural stone, whereas the façades of the Gothic church (the alternative revised project) would

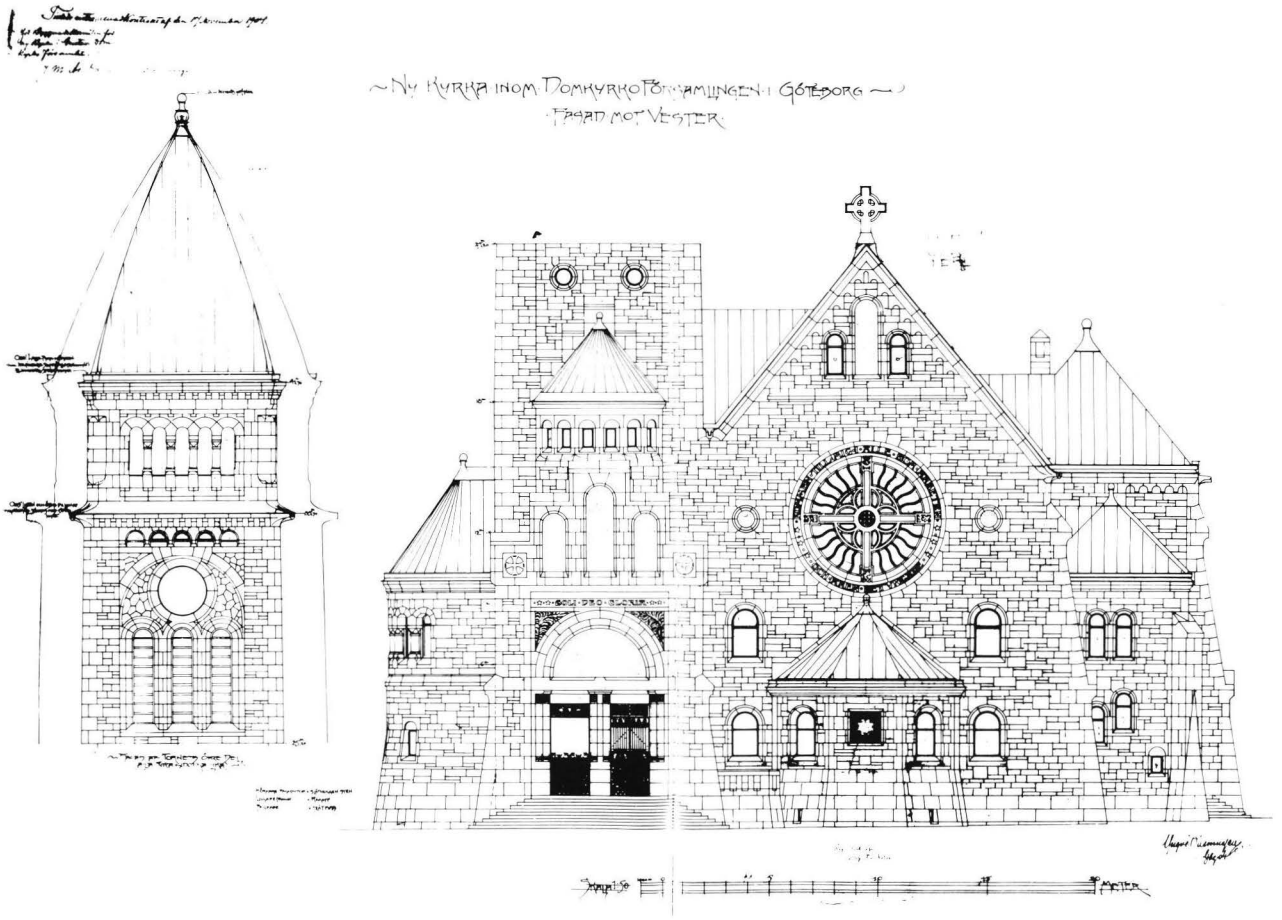
228. Carl Möller, Stefanskyrkan, Stockholm. 1901-1904. (Photo SR)

be coated mainly with brick." A Romanesque-styled building in granite or limestone, especially the former, would be more solid and hence less expensive to keep in repair. The committee's conclusion is worth quoting:

> Add to all this the fact that natural stone will give to the church a solid and dignified appearance appealing to our sense of beauty. To a certain extent the committee has also been led by its conviction that it would be desirable to build a church in an architectural style different from the Gothic, which has been the predominating style in these parts as well as elsewhere in our country.[34]

This rare passage verbalizes a line of thought which was more often implied that expressed: although a genuine and honest material, brick does not convey an impression of solidity but associates rather to a worn tradition in the Gothic style. In contrast, natural stone

229. Yngve Rasmussen, Vasakyrkan, Gothenburg, Competition 1901, built 1904-1907. (Photo SR)



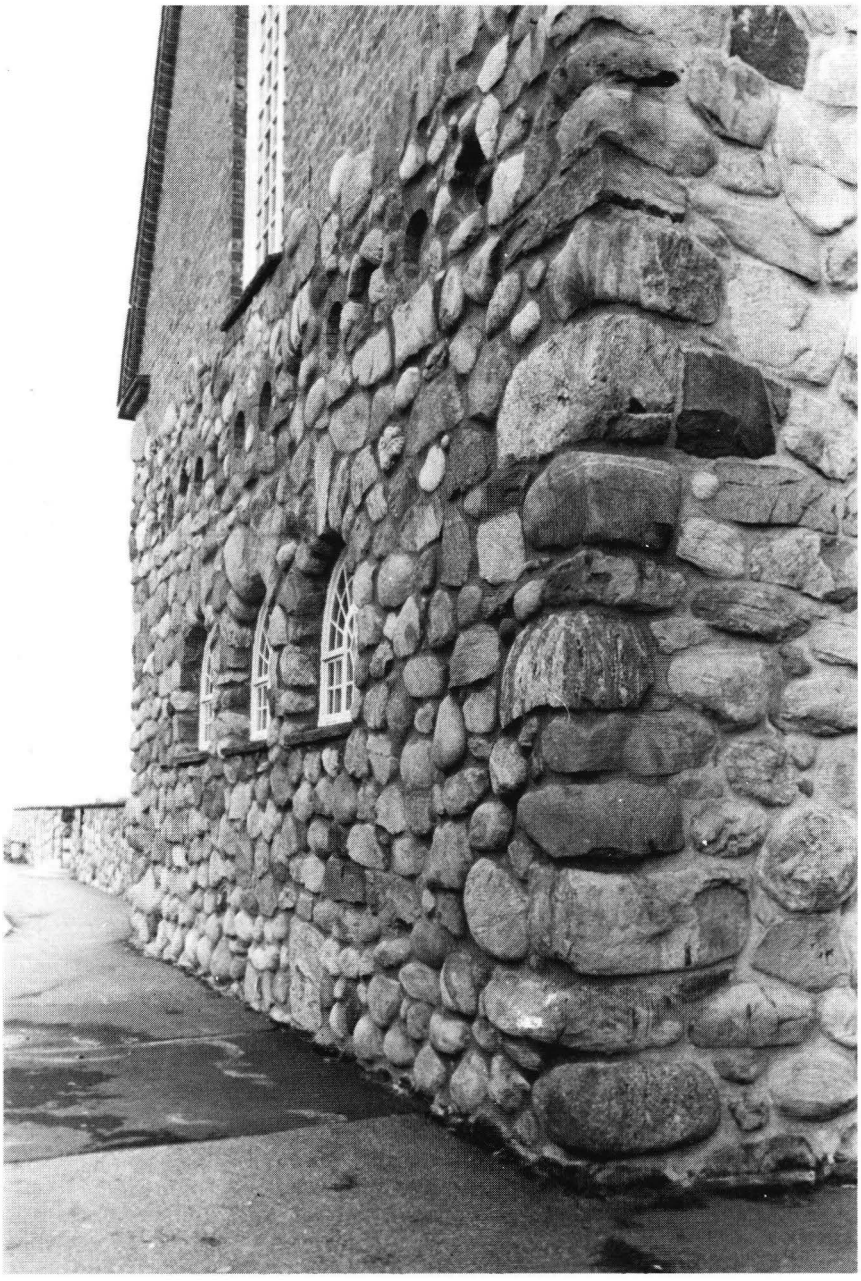
230. Yngve Rasmussen, Vasakyrkan. Working drawing 1904. Gothenburg, Kyrkonämnden. (Copy Kyrkonämnden)

is solid and congenial with the Romanesque idiom that presents itself as a modern alternative.

Rasmussen's Vasa Church was clearly the result of frequent study of *The American Architect and Building News*. The bond was carefully delineated in his principal elevations approved in November 1903,[35] and in the following year the architect made working drawings, which were not adhered to in detail (Fig. 230). The specification for the stone work contains detailed instructions for the treatment of the material. Thus the surface of the rubble "must not be too much worked, but show fresh and distinct cleavage."[36] The light brown granite was delivered by Uddevalla Mekaniska Stenhuggeri - Hebbel & Co. Established in 1904 this firm had taken over the quarries of the originally German firm Kessel & Röhl;[37] its dealings with the Building committee for the Vasa church display the familiar pattern of controversies, arbitration etc.[38]

Rasmussen's conservative and cautious treatment of the stone was rational rather than romantic. It was only a mere three years earlier than the winning project of the 1907-1908 competition for a church for the district Masthugget in Gothenburg. Although mainly built in brick Sigfrid Ericson's Masthuggskyrkan in Gothenburg (1908; 1910-1912; Fig. 231) represents the climax of the National Romantic stone architecture of Sweden. Nowhere else in the Nordic countries do we find boulder architecture of this kind. Six years earlier Gesellius-Lindgren-Saarinen had tried a similar solution in connection with the Historical Museum competition, but a jury with Nyrop and Clason as members had condemned their "primitive rawness" (cf. p. 176, above). Yet from the technical point of view the boulder architecture represented a rational solution. The site of Masthuggskyrkan is unusually exposed to wind and rain, and in the planning particular attention was paid to this aspect.[39] Boulders bedded in strong cement with joints several inches wide was a solution as good as any to the moisture problem that had become acute in brand new granite churches from the far end of the Gulf of Finland to the North Sea coast of Norway.

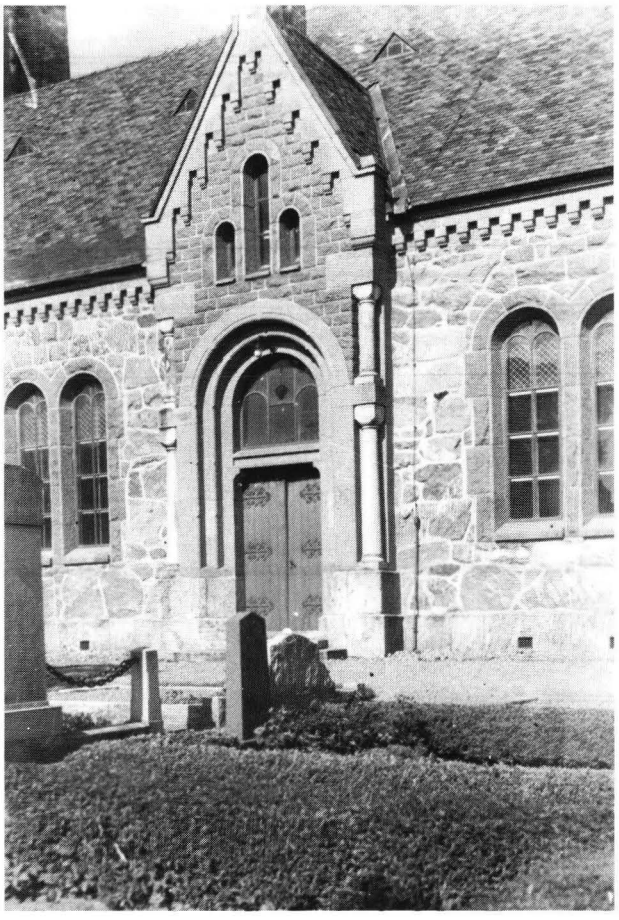
The boulders of Masthuggskyrkan, formed in the Ice Age and shaped during thousands of years by the sea waves, are symbols of the Swedish soil and, moreover, easily recognized as such by every literate Swede remembering his prep school lessons in geography. In other cases the various meanings associated with stones and rock are difficult to assess in retrospect. One side effect of material rationalism is to be seen in the changing values in matters of restoration. In the course of



231. Sigfrid Ericson, Masthuggskyrkan, Gothenburg, Competition 1907-1908, built 1910-1912. (Photo SR)

a few decades basic attitudes to material seem to have undergone a radical change. To conceal the beauty of stone behind plaster, or to spoil the texture of wood with paint was becoming almost morally reprehensible. From this valuation there was only a short step to the next stage: the correcting of the misdeeds of our forefathers.

In the 1880's it had proved impossible to persuade the parishioners of Tranemo to build their church with bare cyclopic walls; two decades later we come across cases where the plaster coating was removed from stone walls that were never intended to stand exposed. This happened in Gärdhem, a church built by F.W. Scholander in 1876-1879. In 1909 the plaster — which had, it is true, tended to come down — was removed. The joints of the irregular masonry were pointed, and the cornice, copings, window mouldings and porches originally executed in brick were built anew in granite (Fig. 232).[40] The crazy pattern of the wall had assumed a value of its own, not least owing to similar restoration works conducted in medieval churches. We do not know how many medieval churches were treated in a similar fashion in the heyday of stone romanticism. In Sweden the most conspicuous case was the removal of the original *medieval* plaster from the interior of the Birgittine mother church at Vadstena in the 1890's, perhaps the most disastrous of all ''restorations'' inspired by the stone movement in Swedish architecture.[41]



232. F.W. Scholander, Gärdhem Church, 1876-1879. (Photo ATA). State after the removal of the plaster coating in 1909. During the same restoration the brickwork porches, portals and window mouldings were replaced with granite.

Norway

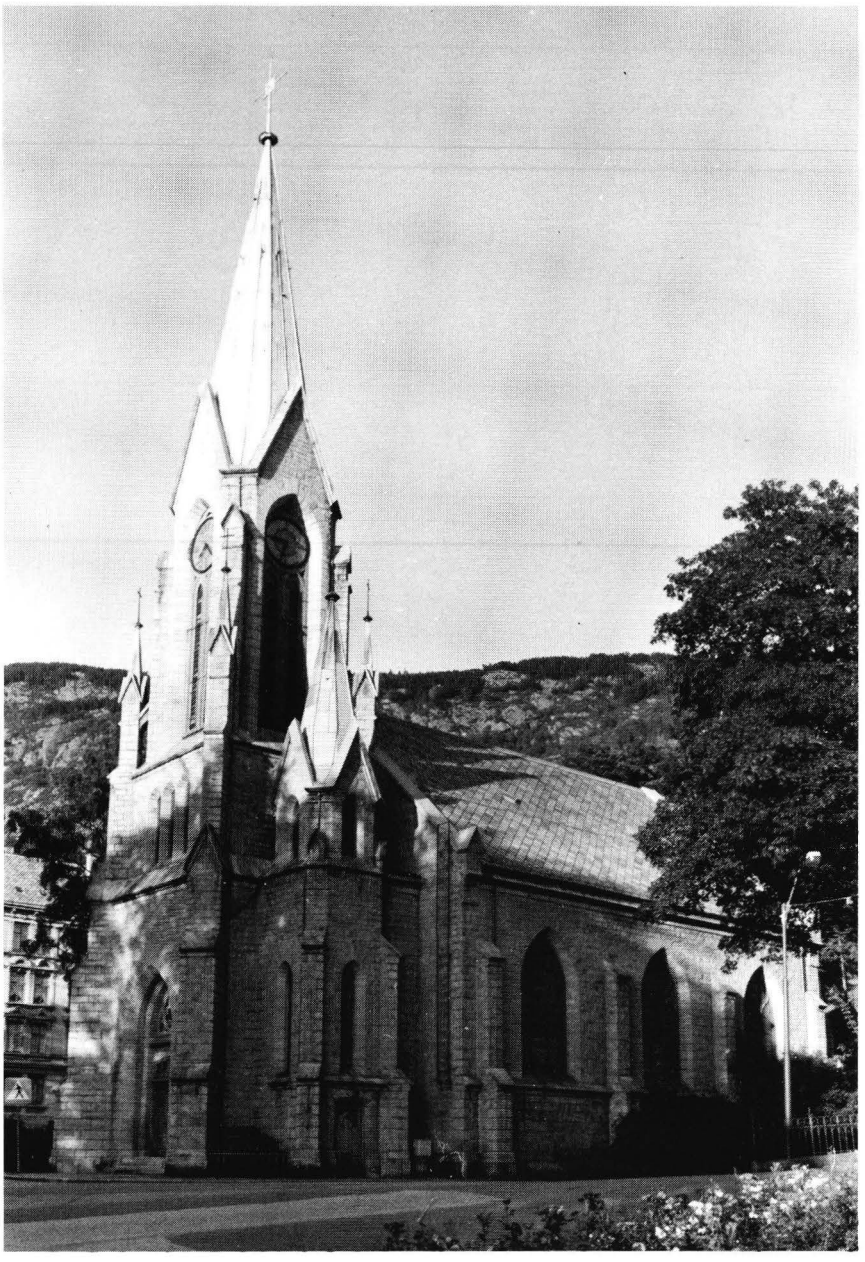
Ever since the turn of the century Ernst Norgrenn's "handsome, small Sandviken Church in Bergen" (Fig. 233-234) has been given the honour of being the first church of modern Norway to have façades of natural stone.[42] Sandvikskirken was built in 1879-1881, and it is thus contemporary with Melander's Åtvid church in Sweden. Like the latter, it may also have had precursors dating from the middle of the century. Thus H.E. Schirmer's Havsten church (near Trondheim; consecrated 1857) is built of fieldstone with simple mouldings of dressed granite; however, we do not know for certain that this is the original state of the walls, which may once have had a plaster coating removed in some later "restoration".[43] Be that as it may; in any case the choice of material in Sandviken reflects mid-century rationalist ideas about solidity and beauty.

A decade before Norgrenn was engaged for the Sandviken project, the question of a church for the western part of Bergen was studied by a committee nominated in October 1869. On the committee's agenda was the material, a question which was studied very carefully. The committee had considered the possibility of using soapstone, which would "further the handsome appearance and the solidity" of the church; however, it had not succeeded in ascertaining whether soapstone could be had at a reasonable distance and cost. But there were other possibilities. The committee had requested the advice of the Town Engineer, who had reported that a "greystone wall" will not become more expensive than brick. Regular ashlar was out of the question, but a bond with even courses, continuous horizontal beds, and tolerably vertical side-joints could well be had; in his report the Town Engineer referred to a local industrial building with this bond. "With such walls the church will probably get a handsome exterior and more solidity than with brickwork, and for this reason the Committee has felt it should recommend greystone."[44] When eventually built, Johanneskirken (1894; H.M. Backer) received a facing of brick, not stone. But these discussions prepared the ground for the Sandviken project which was initiated in 1876.

In August 1876 two of the members of the earlier committee studied the question of a church for the Sandviken district and arrived at the same conclusion with regard to the building material.[45] Later that year Norgrenn and three other architects were invited to submit projects for a church of greystone. Norgrenn was entrusted with the task in 1879 and the church was completed two years later.[46] Although greystone was chosen for reasons of solidity and handsome appearance, the forms of Norgrenn's church betray their starting-point in Neo-Gothic brick architecture. In 1871 the architect had built a brick church in Bragernes in southern Norway, and in 1876 this building was explicitly mentioned as a suitable model for the Sandviken church.[47]

With the various church building projects of the 1880s, the terminology and concepts relating to building materials seem to have become more precise. Until this period the main distinction had been made between timber (træ) and stone (sten). Stone could mean both brick (mursten, tegl) and natural stone (naturlig sten, brudsten). The last term did not as such say anything about the final treatment of the exterior surface; normally, stone churches were coated with plaster. Gradually, however, echoes from the contemporaneous debate on true materials made themselves felt in the vocabulary of Kirkedepartement bureaucrats, town officials and church dignitaries. But it proved difficult to find unequivocal expressions.

Thus, when the competition for a new church for the parish of Ilen in Trondheim was announced in 1884 the programme stipulated "rough hewn greystone" (rå tilhuggen gråsten). *Teknisk Ugeblad* took exception to this vague terminology, which had caused confusion in professional circles. Apparently, the commentator wrote, this was to be understood as stone which is squared but which does not have rectangular faces. Some readers had taken the stipulation to refer to rustic

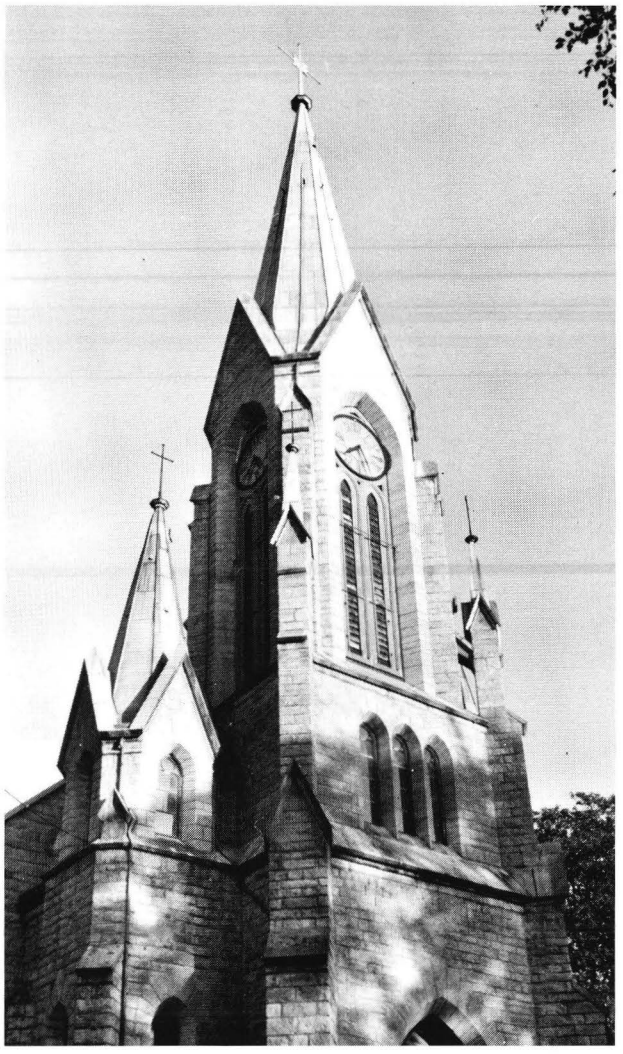


233. Ernst Norgrenn, Sandviken Church, Bergen. 1879-1881. (Photo SR)

ashlar. ''This assumption is hardly correct; the expression is, however, so vague that it requires further explanation.''[48] When the submitted projects were studied by the jury, it proved that most of them exceeded the cost specified.[49] In the end the commission was given to the architect Eugene Sissenère, whose final drawings after several reductions and simplifications were passed in 1887.[50]

Ilen church was completed in 1889 (Fig. 235). The tight budget and the intractability of the stone compelled the architect to economize with the articulation. The only luxury he permitted himself was to differentiate the ashlar into the picked main surfaces and dressed parts in the quoins. Compared with Sandviken church, Ilen is indeed very simple. Not that models for such severity were lacking. Karl A. Jaehn's authoritative book on evangelical churches, which had appeared in 1882, called attention to the possibility of articulating the roof (Fig. 236).[51] To concentrate the decorative elements to the roof with its relatively inexpensive materials was an ingenious way of compensating for the minimal articulation of the stone.

Around Trondheim the architect Carl Johan Bergstrøm planned three churches with stone façades, Rissa (1884-1888; Fig. 237), Melhus (1888-1892; Fig. 238) and Orkdal (1888-1893; Fig. 239). In the case of Rissa the correspondence between the parish, the diocese and the ministry was marred by the ambiguity of the terms. The parish wanted to save money by borrowing drawings for a ''stone'' church. The diocese was thus left to wonder ''whether the church was to be built of natural stone or brick,'' and decided that ''natural stone'' was meant.[52] In 1884 we hear of drawings by Bergstrøm. In an expert report on his project the



234. Ernst Norgrenn. Sandviken Church. Spire. (Photo SR)

''greystone wall'' is already mentioned in terms suggesting that the elevations did indeed presuppose masonry; by now, the parish had finally decided what material to use, emphasizing that greystone was readily available.[53] In Melhus there was some altercation between the proponents of a less expensive timber building and those preferring stone. The terminology, however, was clear from the beginning, and in 1888 an application was sent to the Kirkedepartementet with Bergstrøm's principal drawings for a ''greystone church,'' by which term was now meant a building with stone walls.[54] In Orkdal, too, some parishioners would have preferred a timber church, but it was decided to build a stone building according to a design submitted by Bergstrøm in August 1888.[55]

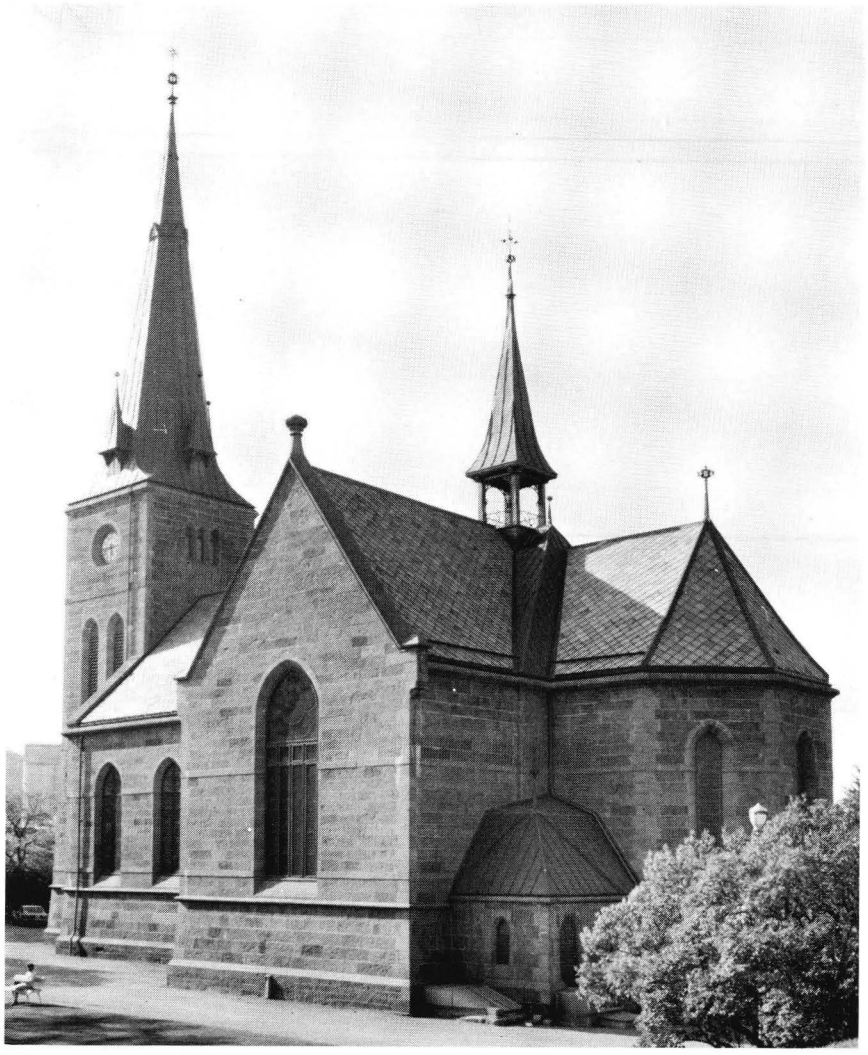
These provincial precursors of Bergen and Trondheim were known and discussed in the Norwegian capital, where the development of stone architecture can be followed in a series of competitions for city churches.[56]

In the 1890's three new parishes were founded in a belt around Christiania: Frogner, Fagerborg and what was at the time called Oslo. Here a few words of explanation may be called for since the history of Oslo had a bearing on the architecture of its church. The parish of Oslo comprised the site of the old Norse capital until a fire in 1624; after the fire the capital was moved westwards by the Danish king Christian IV and named Christiania. When Christiania was renamed Oslo, the old parish of Oslo was renamed Vålerengen. For the sake of clarity we shall here use the name Vålerengen only.

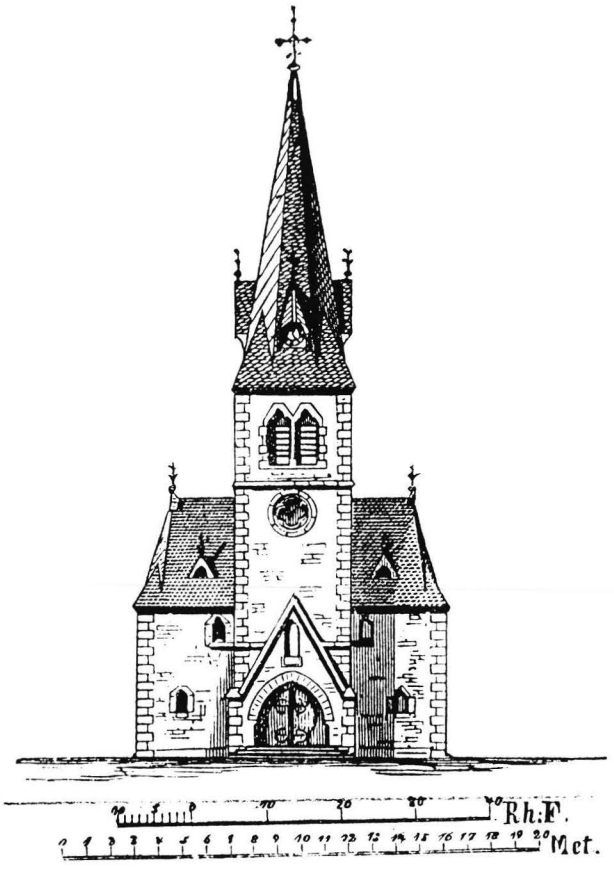
The competition for the Vålerengen church was announced in the spring of 1893. The programme stipulated that granite be used as much as possible, but since the building costs had to be kept low, plaster and brick were also permitted. The first prize was awarded to the two architects Heinrich Jürgensen and Holger Sinding-Larsen. Their project (Fig. 240) was praised for its successful allusions to the ''historical traditions of Oslo, this old town, which through the centuries has played such an important role in our history.'' For this reason it was natural that ''the successful project should draw upon motifs from England, that is, the very country, with which in earlier times we maintained such profitable contacts, and which has exerted a most important influence on our early architecture.''[57] Sinding-Larsen also wrote about the connections with England, arguing that Norse architecture had reached its proudest achievements in harmonious interaction with English and Norman art; the period of decay had followed under Danish and German domination (see above p. 62).

The Vålerengen project was to undergo several revisions before it was completed in 1902; the realization of the plans fell on Sinding-Larsen alone.[58] The competition entry had façades of brick and stone, but in 1894 Sinding-Larsen left out all the visible brick, which he believed ''would give the whole a rather different, more unified appearance than was the case with the earlier mixture of masonry and brick.'' He also suggested that the spire be built of stone.[59] For the stone surface he proposed a ''c. 15 cm thick facing in *Scottish rubble.*''[60] In the course of the 'nineties the building programme was debated in the municipal council. Some wanted to abandon the idea of stone for the spire, at another occasion the whole rubble facing was in question.[61] In 1899 tenders were invited for the rubble, for which Sinding- Larsen appended specifications (Fig. 241). Finally grey granite was brought from Idefjorden.

The change of plans in Vålerengen parallel the revision of the Oscarskyrkan programme, undertaken more or less at the same time. But in contrast to Gustaf Hermansson, Sinding-Larsen reworked his project with a view to the new material: the tower was made lower, the spire was modified to suit granite, and in the gables and façades Sinding-Larsen left out copings, horizontal bands etc. (cf. Fig. 240 and 242). Nor did Sinding-



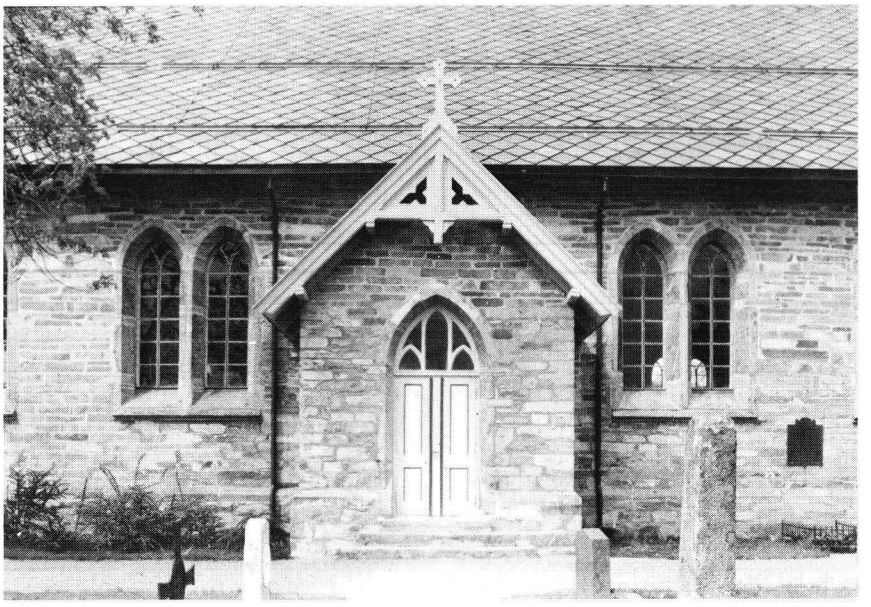
235. Eugene Sissenère Ilen Church, Trondheim. Competition 1884, built 1887-1889. (Photo SR)



236. The church of Malsfeld. Illustration in K.A. Jaehn, *Das evangelische Kirchen-Gebäude,* 1882, fig. 77.

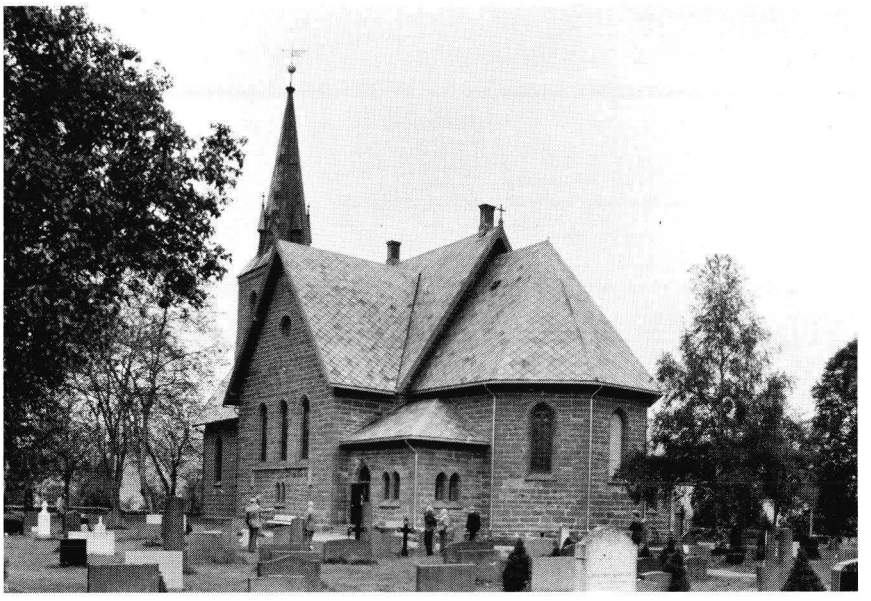
Larsen's Neo-Romanesque idiom need much revision to fit the new ideals formulated by a critic praising his creation in *Teknisk Ugeblad:* ''It seems to us that such a use of Romanesque forms is the most natural and successful movement in our circumstances — both when we regard our domestic stone materials and when we consider the national characteristics and development of our people.'' The critic contrasted the novelty of Sinding-Larsen's approach with the more traditional conceptions of style and material exemplified by Sandviken in Bergen (Fig. 234) and ''a small church in Trondheim'' — evidently Ilen (Fig. 235).[62]

In the next competition, that of Fagerborg in 1899, the programme included the worn phrase that the competitors were to ''pay maximum attention to our domestic materials.''[63] More than 50 entries were submitted. The first prize went to Hagbart Schytte-Berg; no second prize was awarded. The verdict caused a protest by the young architects, whereas the conservative

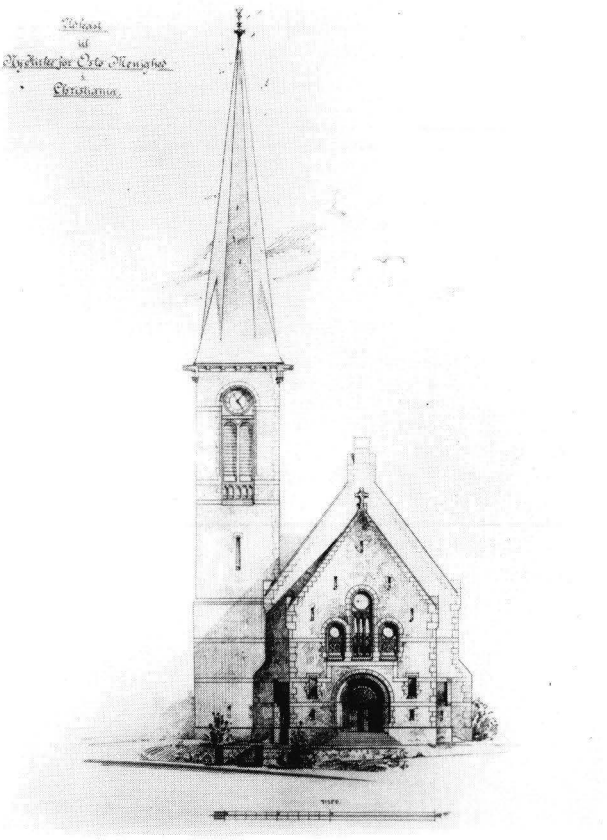


237. C.J. Bergström, Rissa Church. 1884-1888. (Photo SR)

238. C.J. Bergström, Melhus Church. 1888-1892. (Photo SR)

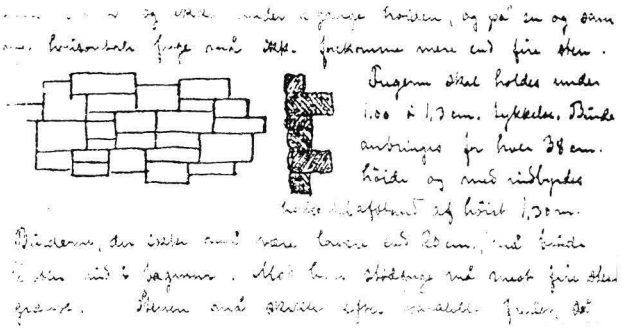


239. C.J. Bergström, Orkdal Church. 1888-1893. (Photo SR)



240. Heinrich Jürgensen & Holger Sinding-Larsen, Design for Vålerengen Church, Oslo. 1st Prize in competition 1893. From *Norsk Teknisk Tidsskrift* 1893, plates.

Thrap-Meyer defended the jury's decision. Thrap-Meyer rejected the concept of a national, Norwegian stone style based on Romanesque or in general historical models. ''We should have no more renaissances — what we need is a *naissance.*''[64]

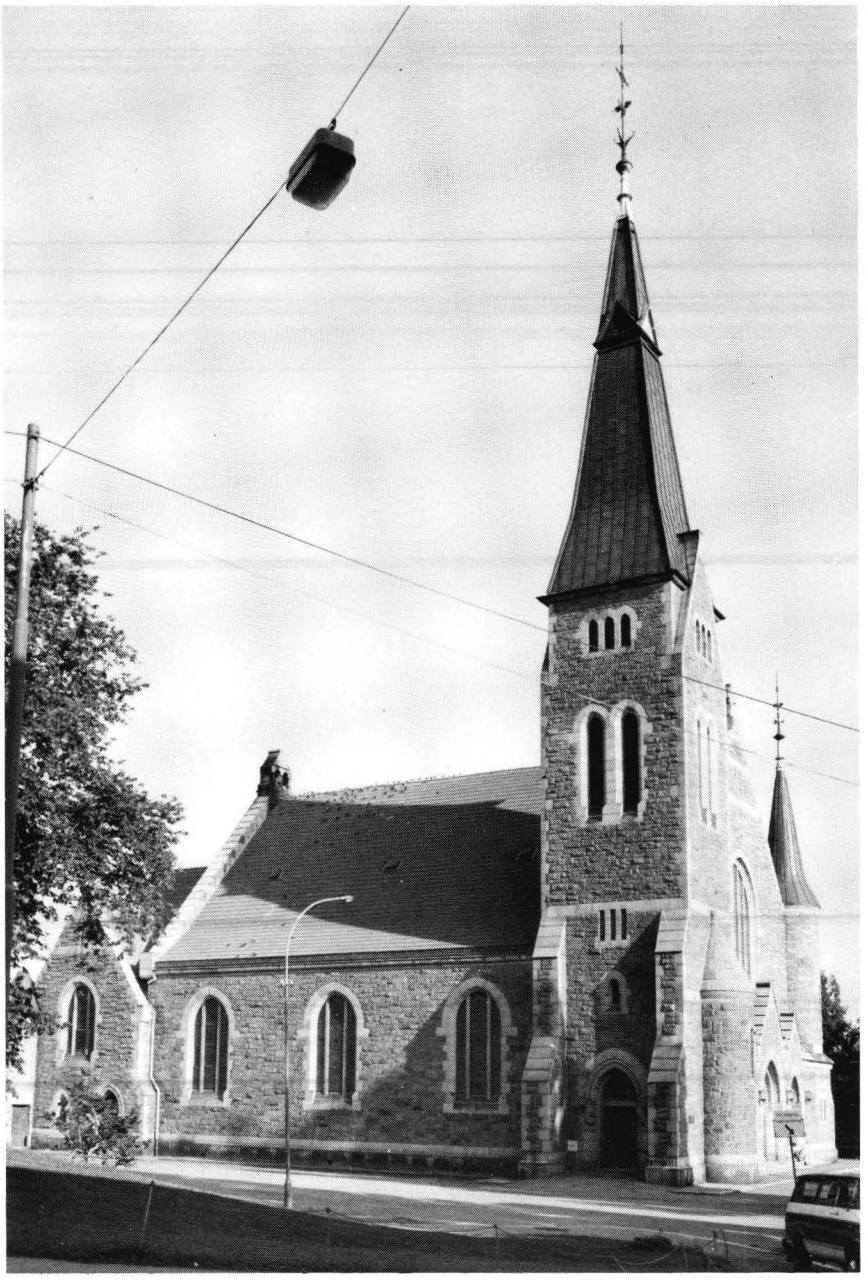


241. Holger Sinding-Larsen, Specification for tenders for Vålerengen Church, 28. 10. 1899. Oslo, University Library, Håndskriftsamlingen, H. Sinding-Larsen MS fol. 1575D, p. 4. (Photocopy Oslo University Library)

The reaction of the younger generation is not difficult to understand. To those who dreamed of a revival of Norse stone building based on Norman forms, the elegant Neo-Gothic style of Fagerborg must have meant a step backwards (Fig. 243). The anonymous critic in *Teknisk Ugeblad* (see above) had praised Vålerengen, not only for its national and English orientation, but for the *personal* diction of Sinding-Larsen. Fagerborg is impersonal in its academically competent handling of textural contrasts: rubble, dressed copings, bands and other fineries that Sinding-Larsen had once and for all dispensed with in Vålerengen. A writer in *Teknisk Ugeblad* praised Schytte-Berg's creation, especially his use of handsome roof tiles. He also commended the architect's handling of his medieval models; still the critic could not help reminding his readers that it was the Romanesque rather than the Gothic style that Norwegian architects should learn from.[65]

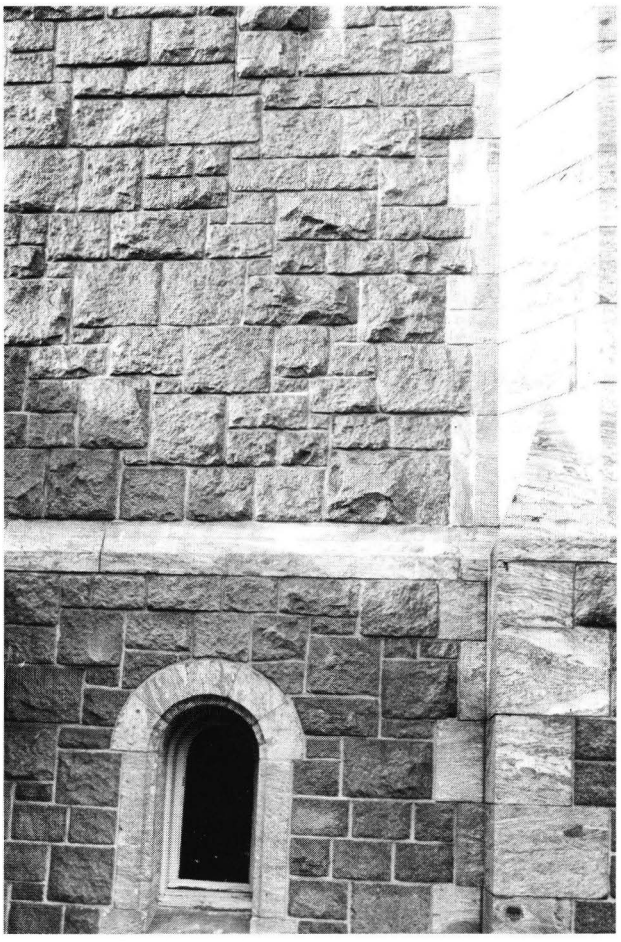
At the same time as Vålerengen and Fagerborg were

242. H. Sinding-Larsen, Vålerengen Church. 1894-1902. Damaged by fire in 1979, rebuilt. (Photo Riksantikvaren, Oslo)

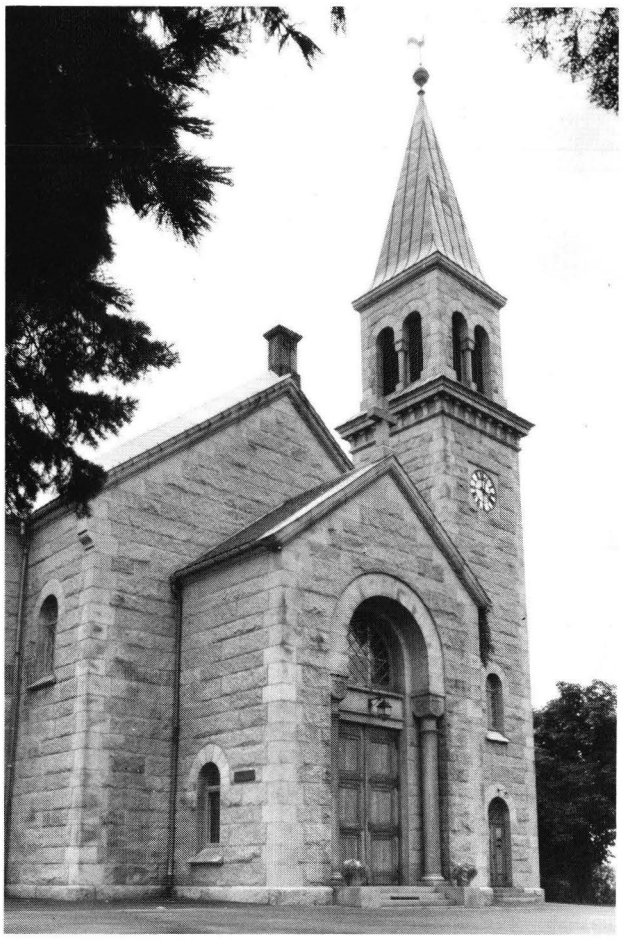


243. H. Schytte-Berg, Fagerborg Church, Oslo. Competition 1899, built 1900-1903. (Photo SR)

244. Alfr.Chr. Dahl, Vestre gravlund kapell, Oslo. 1899-1902 (Photo SR)



245. Alfr.Chr. Dahl, Vestre gravlund kapell. Rubble bond and quoin. (Photo SR)

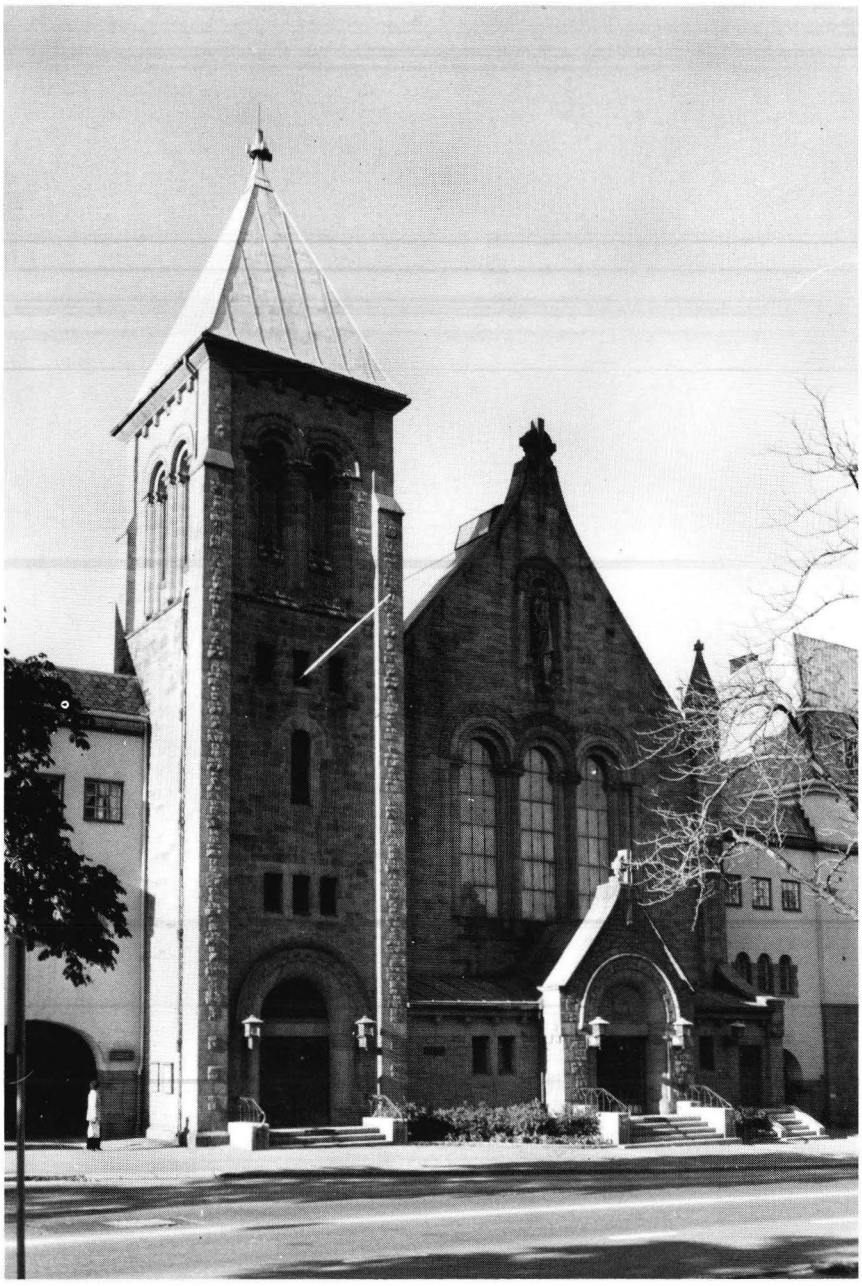


246. Harald Bødtker, Grorud Church. 1900-1902. (Photo SR)

planned and built, two other granite projects became topical: the Vestre gravlund kapell (1899-1902; Fig. 244-245) and Grorud Church (1900-1902; Fig. 246). In the former case a possible competition was discussed but deemed unnecessary; instead the commission was given to Alfred Christian Dahl who had already planned a building with its bases, quoins and copings of soapstone bordering plastered surfaces.[66] Having successfully countered various proposals to replace the soapstone with simpler materials, Dahl composed a new version where the plaster surfaces were replaced by granite in rubble bond (Fig. 245).[67] With its Richardsonian composition (see Fig. 153) Dahl's cemetery chapel forms a parallel to Bredo Greve's monumental NTH project (Fig. 151). No direct historical link can be documented between these contemporaneous projects; they rather serve to show the common basis of the various manifestations of the Norwegian *Kunstwollen* around the year 1900.

Harald Bødtker's Grorud church (1900-1902; Fig. 246) represents, perhaps, the most consistent application of the idea that Norwegian architecture must be founded on Norwegian stone in Romanesque forms. Bødtker was the head of the building department (''Bygningschef'') in Grorud, and in that capacity he was in 1900 asked to evaluate a church project by another architect, Halfdan Berle. He praised the project but recommended that the church be built of ''the durable and widely recognized building material: Grorud granite.'' It so happened that Grorud was one of the most important quarry districts in the vicinity of Christiania, wherefore Bødtker's idea was immediately taken to heart by the municipal council.[68] In November 1900 the council applied for permission to build their church of granite after new designs by Bødtker, who had been appointed municipal architect in Aker, the municipality to which Grorud belonged.[69] The large ashlars of the church and the finely worked details bespeak of the quality of the granite, a monumental architecture far removed from the textural effects favoured by architects in the Richardsonian tradition.

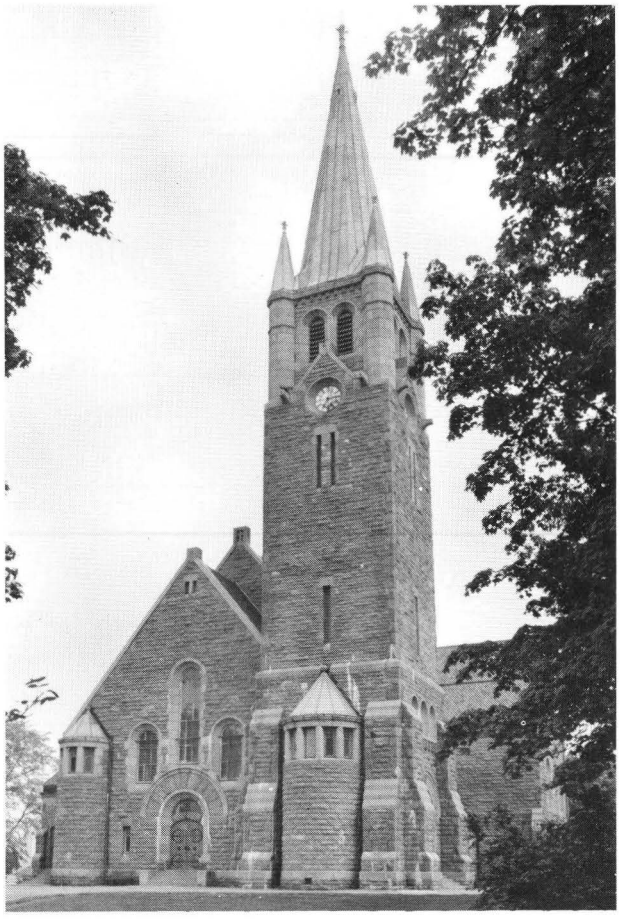
Meanwhile, the reorganization of the three sister parishes was implemented in Christiania. The building of the Vålerengen and Fagerborg churches had cost more than 600.000 crowns, a considerable sum, and the municipal council decided to economize. Unfortunately, the last church to be built, Frogner, happened to belong to a district which was commonly referred to as ''the West End of Christiania,'' while Vålerengen with its magnificent granite building was



247. Ivar Naess, Frogner Church, Oslo. Competition 1904, built 1905-1907. (Photo SR)

situated in the middle of a workers' district. ''Since both Vålerengen and Fagerborg had been faced with worked stone, it was impossible to make Frogner inferior — on the contrary, the location and the aristocratic site [of the church] required a more elaborate articulation.''[70] Nonetheless the matter was hotly debated in the municipal council, where frequent reference was made to the materials of the sister churches. The architect Chr. Fürst also submitted a proposal according to which Frogner church could be built of *Norwegian* brick or Brumunddalen sandstone.[71] The latter had recently become topical thanks to Hansteen's Centralbanken, which was nearing completion at the time (Fig. 121). A competition in 1904 was won by Ivar Naess, and the Frogner Church was built in 1905-1907 (Fig. 247). The placing of the church *in* the block resulted in a happy compromise: by building a mere screen it became possible to have a handsomely worked Norse Romanesque granite façade for this fashionable district at a lower cost than the granite structures of the other parishes.

In the provinces the ''rubble period'' (''råkopperioden'') in church architecture was initiated with Ole Stein's Lademoen Church in Trondheim (1900-1905; Fig. 248). In this case the competition rules explicitly required rock-faced or hammer dressed greystone for the walls and dressed stone for quoins etc.[72] However, the auspices for the competition were not the best possible, and *Teknisk Ugeblad* even issued a covert recommendation to boycott the competition.[73] The sum allocated for the building was too small, and five years after its inauguration moisture still made interior



248. Ole Stein, Lademoen Church, Trondheim. 1900-1905. (Photo SR)

decoration impossible, a consequence, it seems, of the rubble technique employed. The foundations soon also proved unreliable.[74] Stein had received his training in Berlin,[75] but the dominating style is nonetheless American in character.

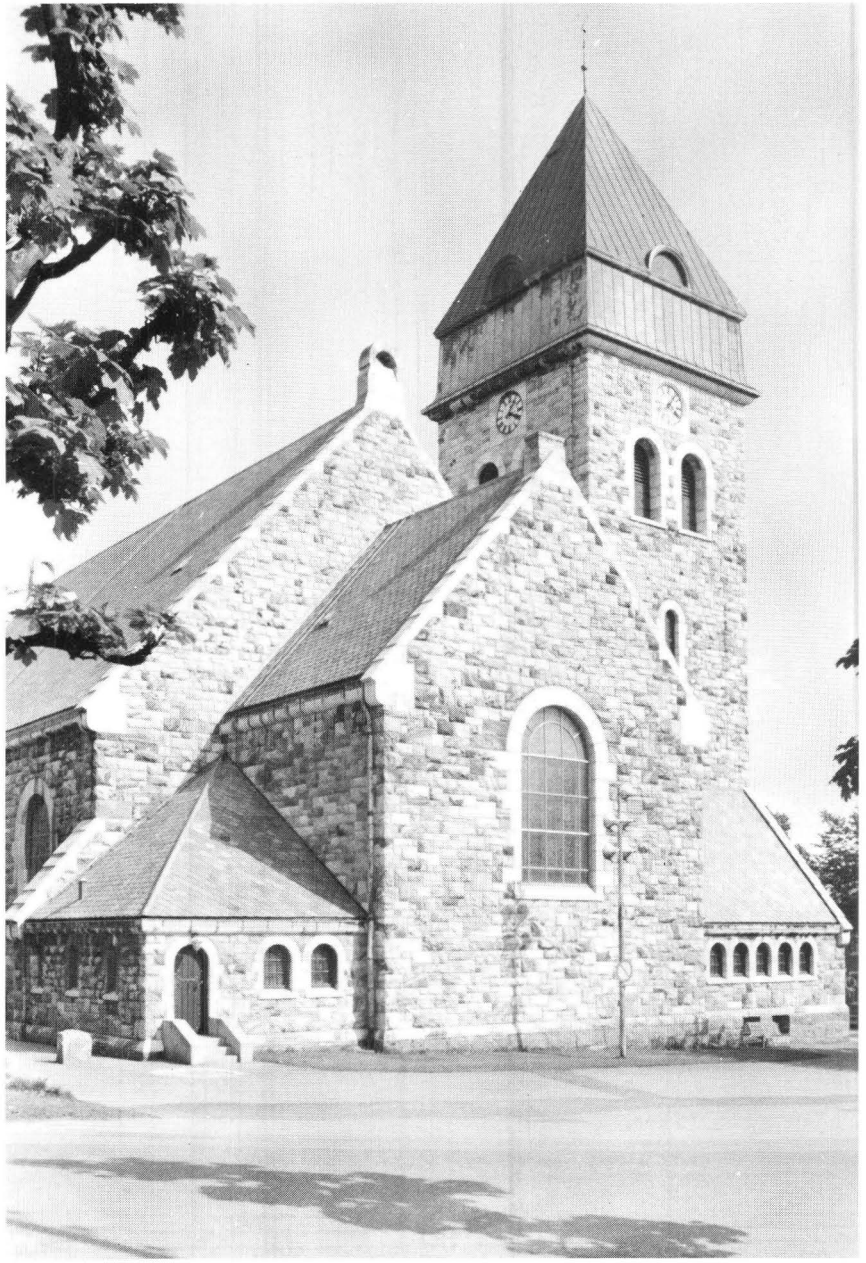
The moisture problems encountered in the newly built stone churches also played a prominent part in the discussions on the new church of Ålesund (Fig. 249-250). In the competition programme published in 1904 nothing explicit was said of the treatment of the wall surfaces. The cost of masonry and exterior plastering were quoted laconically, with the remark "that the climatic conditions of Ålesund are very humid and that the church will be exposed to a strong sea drift."[76] The first prize went to Sverre Knudsen, whose project was modified before the work started in 1906. Henrik Nissen, chairman of the jury as well as the building inspector, recommended the use of "Ålesund wall," a hollow wall of natural stone. This proposal was strongly resisted by the association of master bricklayers in Ålesund,[77] but nonetheless finally adopted. The outer wall was built of marble from a quarry not far from Ålesund. A little earlier the Norwegian Geological Survey had investigated this motley stone and found it very dense and resistant to moisture, better than the soft white marble employed for the copings and dressed parts. "For aesthetic reasons," the architect wrote, "I was never inclined to use this white marble."[77b] In Ålesund the variegated marble had been used earlier (Fig. 177-178), but Knudsen deliberately emphasized the variations of colour by means of a carefully executed rubble bond with strongly convex stone faces (Fig. 250).

The complete absence of ornamental elements in the church of Ålesund represents what we have seen as the consummation of National Romantic architecture, that is, the transition from ornament to texture. The forms are not based on historical models, but depend on the inherent properties of the material employed and on the function and circumstances of the building. There had been preparatory steps to this stage;[78] and the tradition can be followed back to the ascetic exterior of Sissenère's Ilen Church (Fig. 235). Outside the field of church architecture, Solberg's and Bugge's Rønvik Asylum (Fig. 171-172) formed an important precedent. Perhaps Knudsen's achievement is best defined by a comparison with Bødtker's Grorud (Fig. 246), in which the express purpose was also to celebrate a noble stone material, the Grorud granite. But while the latter forced granite into a style mould, Knudsen let the stone itself speak.

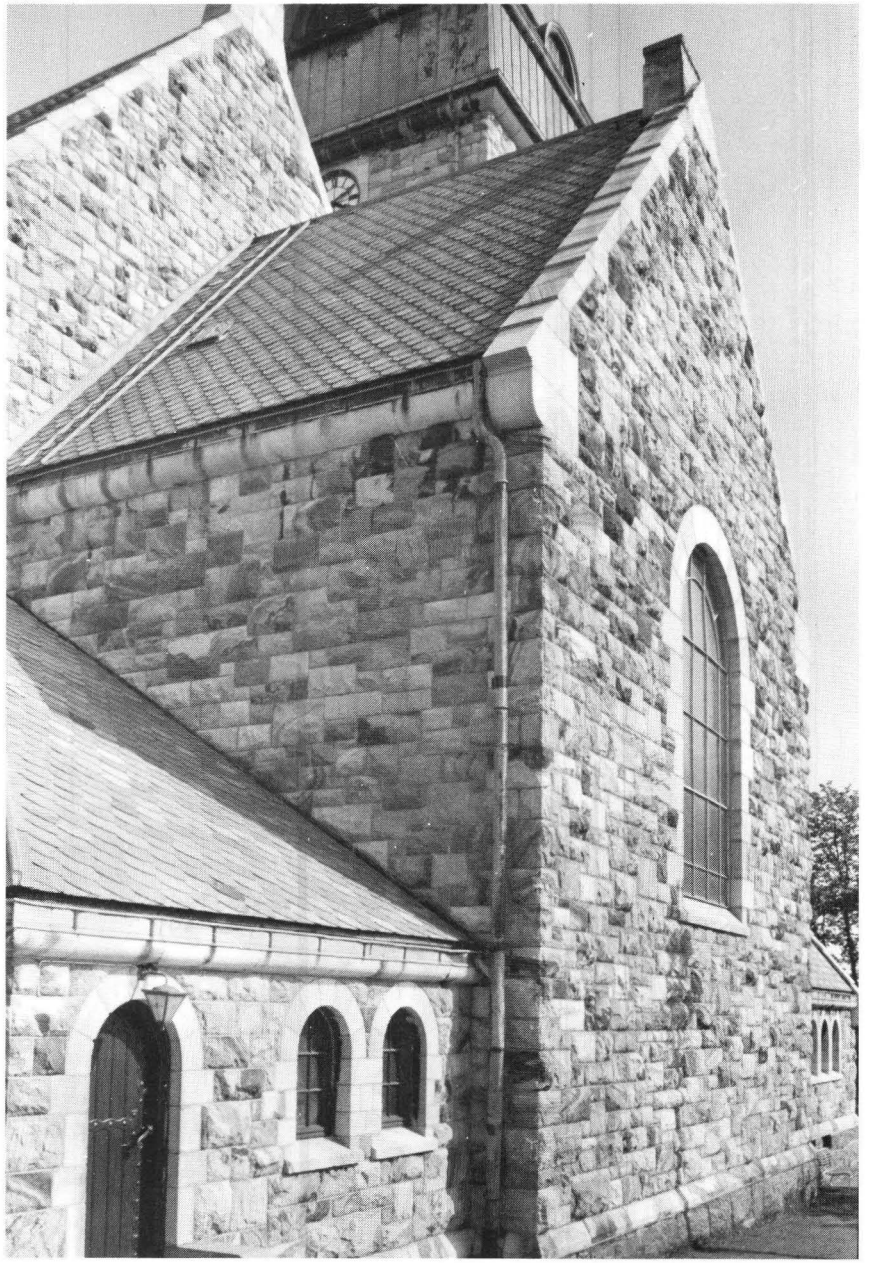
Finland

The Board of Public Buildings of the Grand Duchy of Finland was instituted by imperial decree in 1811. In the instruction for the Board several paragraphs were adopted from the Swedish Intendentsämbetet which until 1809 had supervised public building in the eastern part of the Swedish realm. One of the stipulations modelled on the earlier rules concerned the material of public buildings, among which churches were also included. In the second paragraph it was expressly said that "no public buildings shall hereafter be erected of wood, but be built of brick or other stone, depending on the local resources."[79] Exemption from this rule could be granted to poorer parishes, and in the nineteenth century such exemptions were frequently given. In Finland, as in Norway and Sweden "brick or stone" normally referred to the principal construction, not to the visible surface of the building. In Nordic usage "stone building" refers to a building which may or may not have a coating.

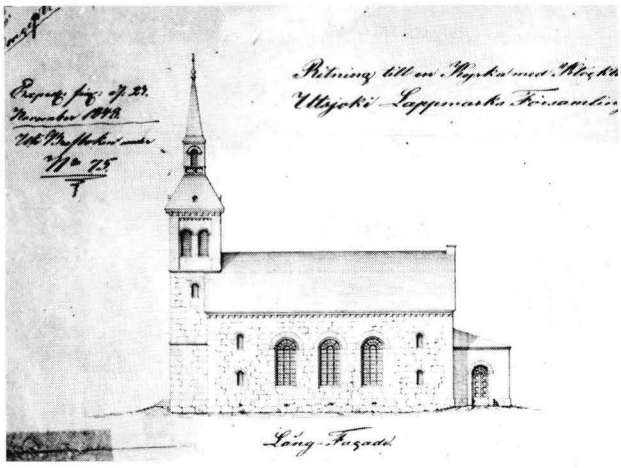
Churches with cyclopic walls had been built in Finland since the Middle Ages, and the tradition lived on into the nineteenth century. Material taken from a demolished medieval church was reused with approximately the same construction in the church of Uskela, built in 1831-1832 according to plans by the Board of Buildings.[80] Under the directorship of E.B.Lohrmann (1841-1865) several churches were built of uncoated stone as well as brick *rohbau*. Practical considerations



249. Sverre Knudsen, Ålesund Church. Competition 1904-1905, built 1906-1909. (Photo SR)



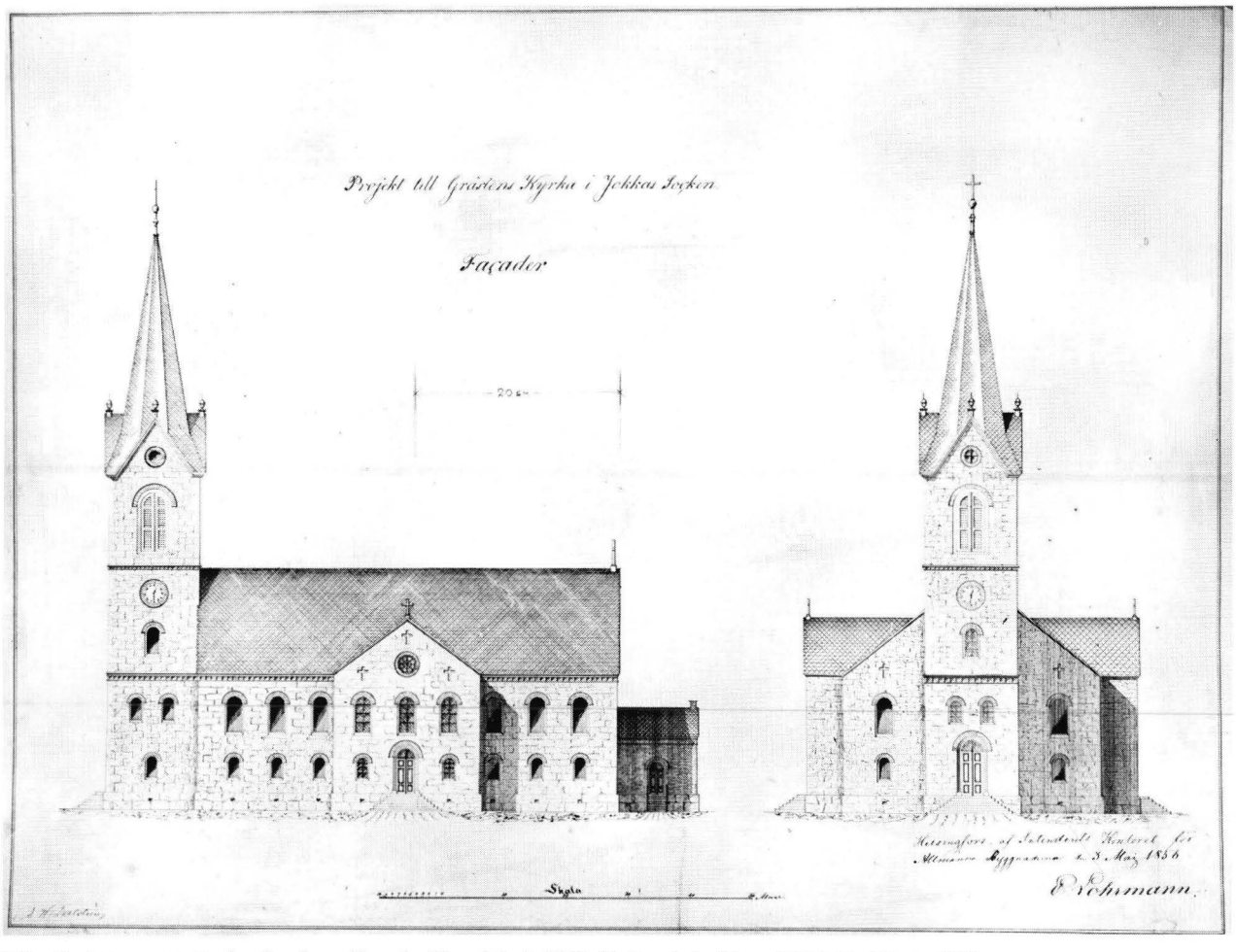
250. Sverre Knudsen, Ålesund Church. Detail (Photo SR)



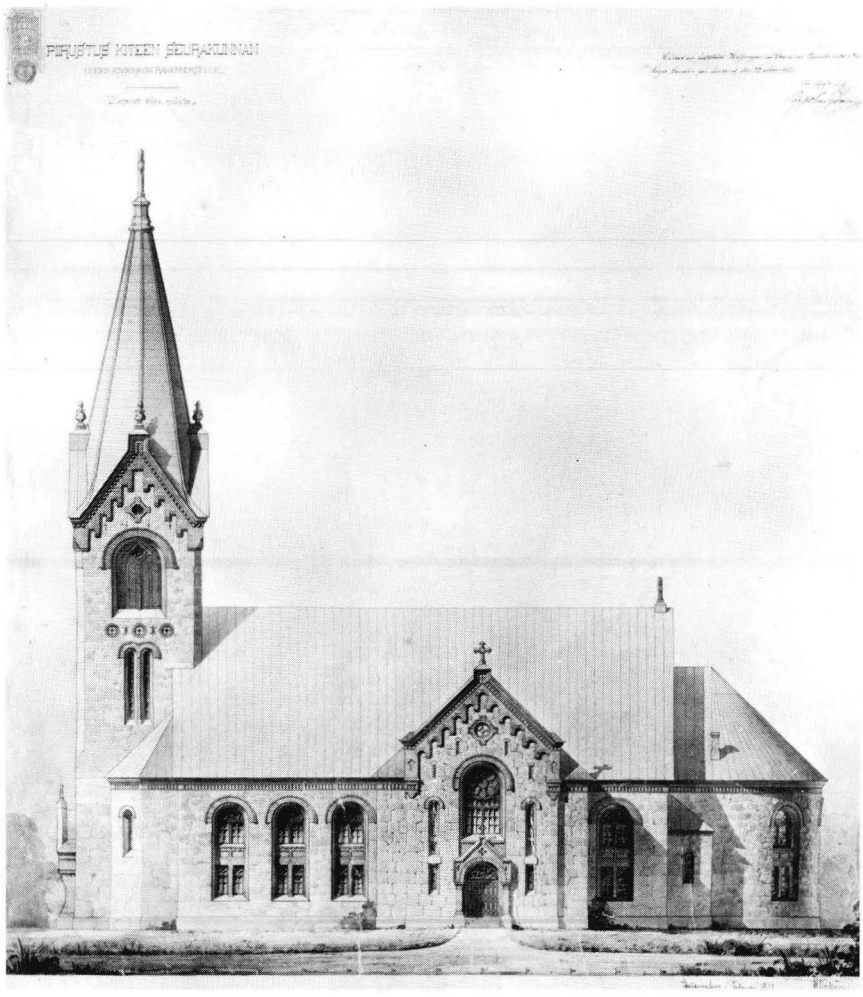
251. E. Lohrmann, Design for Utsjoki Church. 1848. Detail. National Archives, Helsinki. (Photo VA)

such as the resources of timber or of clay suitable for making bricks, were then as earlier decisive in the choice of materials, but other criteria were also used in the discussions. When Lohrmann designed a church for Utsjoki in Lapland (Fig. 251) he also referred to "the considerably greater dignity and solidity of a church built of stone" in comparison with a timber structure.[81] Utsjoki church was built of greystone with hood moulds of red brick. Another Lapland church, Sodankylä, was designed in redbrick but had to be built of stone, since bricks were not to be had at a reasonable distance; contrary to the specification its walls were whitewashed instead of being left uncoated.[82] In Juva (1856-1863; Fig. 252) the parson began to study the question of what material to use several years before work was begun on the church. On the behalf of his parish he applied for information on the difference in cost "between a church of brick and one of blasted stone, so as to be able to decide which material to use for the construction of the church."[83] The church was eventually built in stone with brick details according to a design by Lohrmann (Fig. 252).[84]

Ten years later we find the parishioners of Kitee discussing how to replace their church which had been destroyed by fire in 1876. As so many times both before and afterwards the dividing line between those who would prefer a stone church and the proponents of timber followed a social pattern. In the countryside, as a rule, the proponents of brick or stone comprised the parson, the civil servants, professional people or persons involved in trade and industry, and the important landowners, whereas the advocates of timber were small landowners, peasants and generally the less prosperous. The meetings dealing with building materials often ten-



252. E. Lohrmann, Design for Juva Church. Signed 3. 5. 1856. National Archives, Helsinki. (Photo VA)



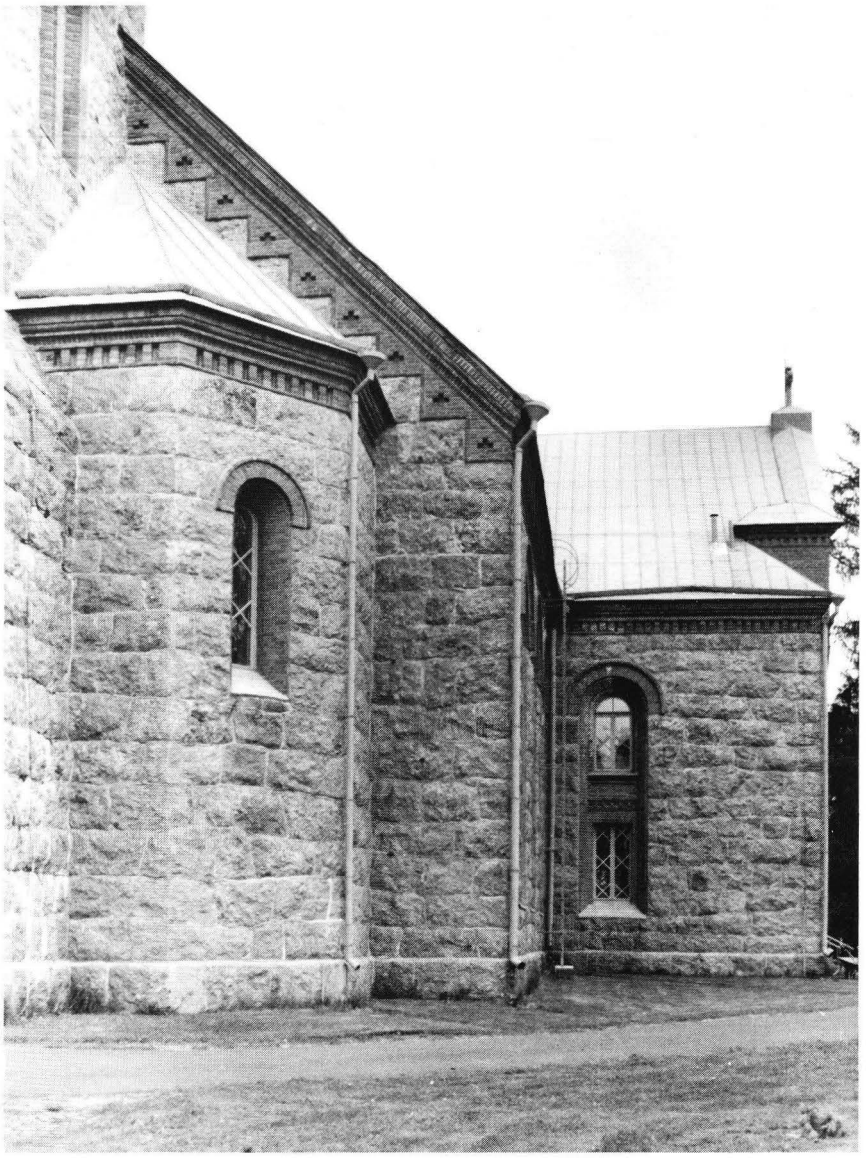
253. F.A. Sjöström, Design for Kitee Church. February 1879. Kiteen Seurakunnan arkisto. (Photo SR)

ded to become tumultuous, and the proceedings in Kitee were no exception to the rule.[85]

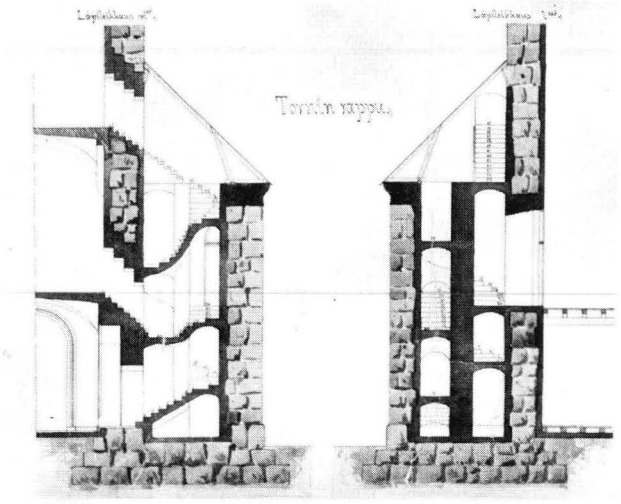
Among the alternatives discussed in Kitee were timber, brick, stone and, surprisingly, iron.[86] After much vacillation and repeated appeals to the Senate for permission to build in wood, the parish finally agreed to build their church according to a design by F.A. Sjöström (Fig. 253). Sjöström, a Neo-Renaissance architect active in the capital, had in this case chosen Neo-Romanesque in order to spare the parish extra cost and "since it is more suitable for stone, of which material the church is to be built." The walls were planned with an inner brick revetment to prevent dampness and cold.[87]

Structurally, Kitee church is a solid stone construction (Fig. 254). Sjöström's section (Fig. 255) shows a wall with a thickness of two stones, a mode of construction employed by nineteenth-century builders. Compared with the medieval technique known in Scandinavia as "skalmur," this has the advantage of being relatively thin; it thus requires less space, less material and less working time. Its main drawback is its behaviour with regard to moisture. The traditional double-shell construction had a kernel of loose and porous sherd rubble mixed with lime mortar, which served as an insulation and as a block to horizontal capillary cracks; the mere mass of the wall also evened out differences of temperature. In contrast, the thinner stone wall will inevitably have fissures serving as capillaries for rainwater. Built of heat-conducting granite without an insulating kernel, it will also further condensation, which takes place, not only on the inner surface, but frequently also *within* the wall, as humid air from the room penetrates into the wall. These disadvantages were, of course, known to builders, and as stone buildings became more frequent they were also discussed. But until the the turn of the century, when complaints became louder, they did not affect decisions about what building material to use; perhaps a certain amount of moisture was regarded as inevitable and negligible.

Finnish church building in the heyday of stone architecture was dominated by one architect, Josef Stenbäck.[88] Stenbäck had graduated at the Polytechnical Institute in Helsinki and afterwards studied at the Stuttgart Polytechnic in 1878-1880. He had also worked for F.A. Sjöström, the architect of Kitee Church.[89] Coming from a family with old ties to the church establishment, Stenbäck specialized in ecclesiastic architecture. His habit of serving both as the architect and as the contractor of churches in numerous towns and parishes irritated his architect colleagues, who went as far as to issue public protests against this practice. Even later



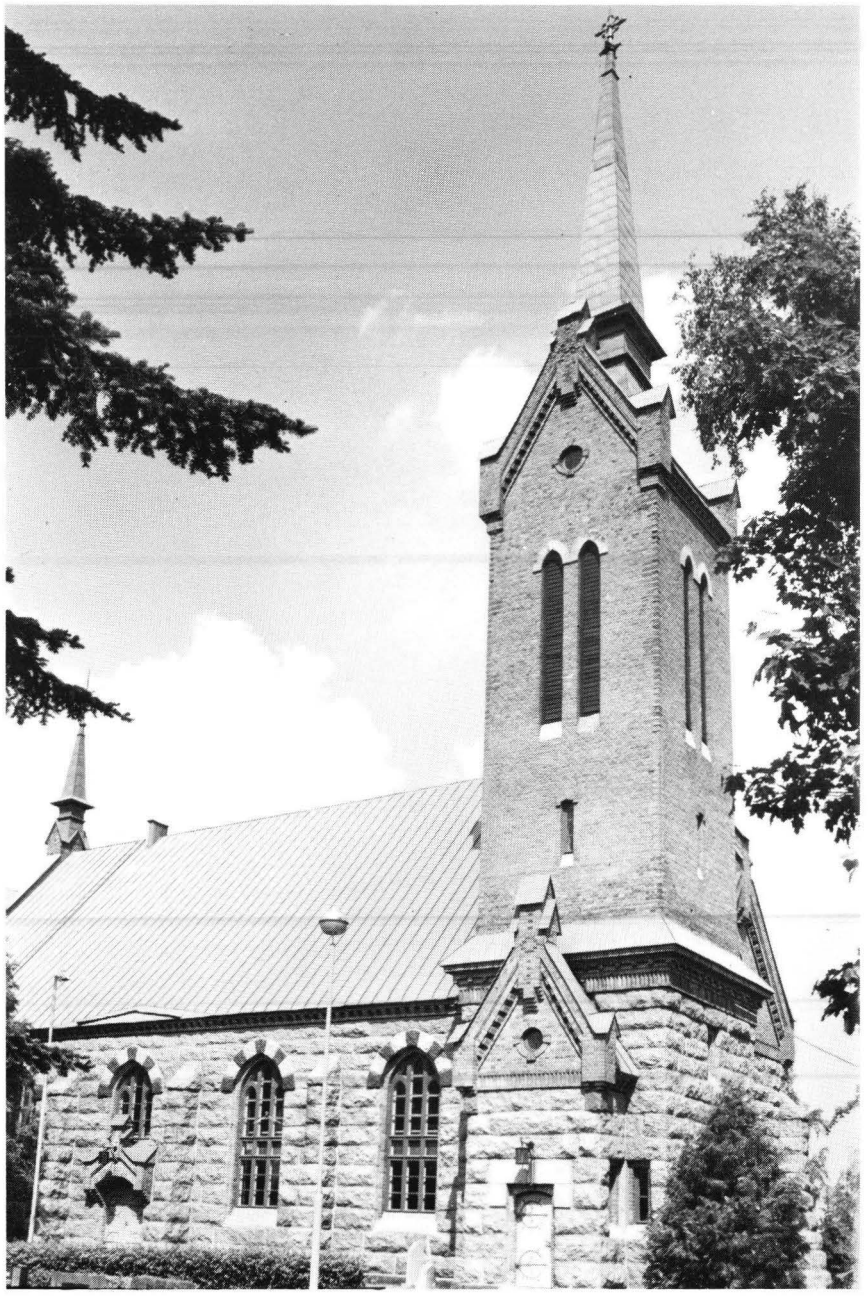
254. F.A. Sjöström, Kiteee Church. 1882-1886. SW corner. (Photo SR)



255. F.A. Sjöström, Design for Kitee Church, cross section. 1879. Kiteen seurakunnan arkisto. (Photo SR)

on, prejudices rooted in these early antagonisms have influenced estimations of Stenbäck's achievement.

In a lecture to the Technical Society in Finland 1885 Stenbäck argued for the necessity of regulations for the building of churches. His lecture also contains a plea for architectural truth, in the composition as well as in the materials of church buildings. He did not commit himself to any given historical style, but emphasized "the general principle that *durable* materials are to be chosen for buildings destined to symbolize the Christian faith." "If anywhere, *truth* is to be sought in a church building."[90] To the published version of his lecture Stenbäck appended full translations of the regulations adopted by the conferences in Dresden of 1856 and Eisenach of 1861; in the latter, we recall, one of the paragraphs stipulated durable material. Stenbäck's lecture met with no response in the Society. A



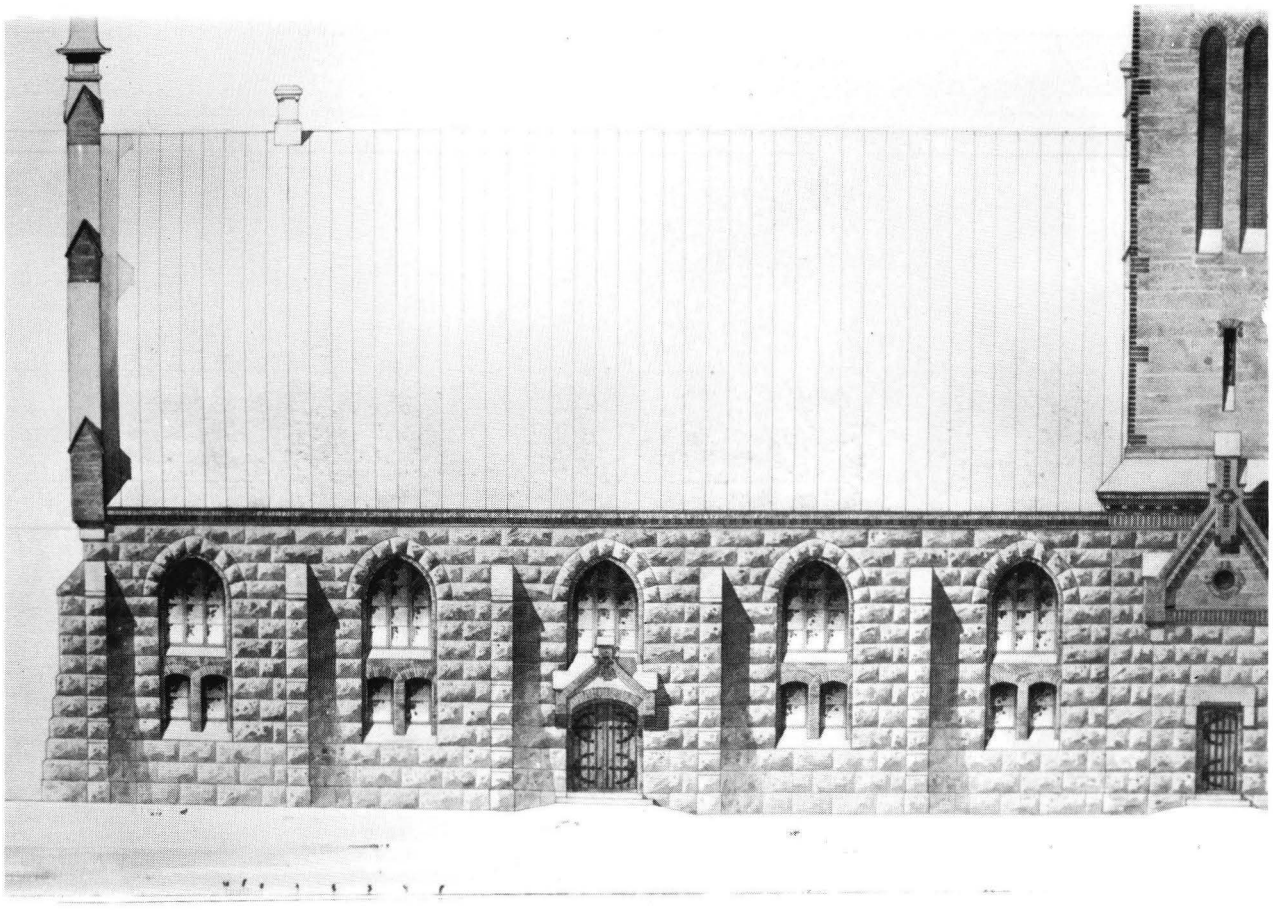
256. Josef Stenbäck, Eura Church. 1895-1898. (Photo SR)

committee was nominated to study the matter, and as was to be expected it concluded that no regulations were called for. At a following meeting Stenbäck made a last attempt to defend his views, and presented a formal proposal for a set of rules based on the Eisenacher Regulativ. In his fourth paragraph he even elaborated the short formula of his model:

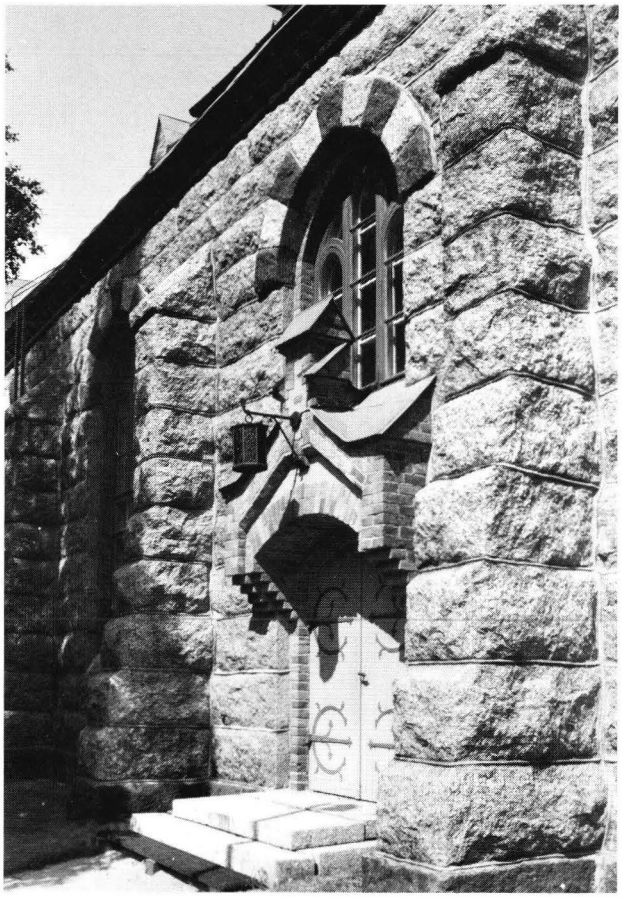
> 4. The *material* should, if possible, be of a *durable* nature. The construction and the decoration must be in accordance with the material. The imitation in wood of the forms of stone architecture, and other similar untruths, are therefore to be rejected.[91]

The haughty dismissal of his plea for church building regulations apparently spurred Stenbäck to practical work, and eventually he became Finland's most prolific designer of churches. Several of the principles formulated in his rejected proposal recur in an elaborated version in his privately printed brochures on how to build churches. These small booklets he used to distribute to prospective customers, in particular, in the rural parishes. Although having antagonized the Director of the Board of Public Buildings, Sebastian Gripenberg, and other officials in the same department, Stenbäck had little difficulty in securing official approval of his projects, and the tighter control exercised by the Swedish Överintendentsämbetet on church architecture had no counterpart in Finnish practice. In the basic question, the choice between wood and solid materials, the authorities were of the same opinion as Stenbäck.

Stenbäck's work comprises churches of timber, of brick and of stone; the two latter techniques occur side

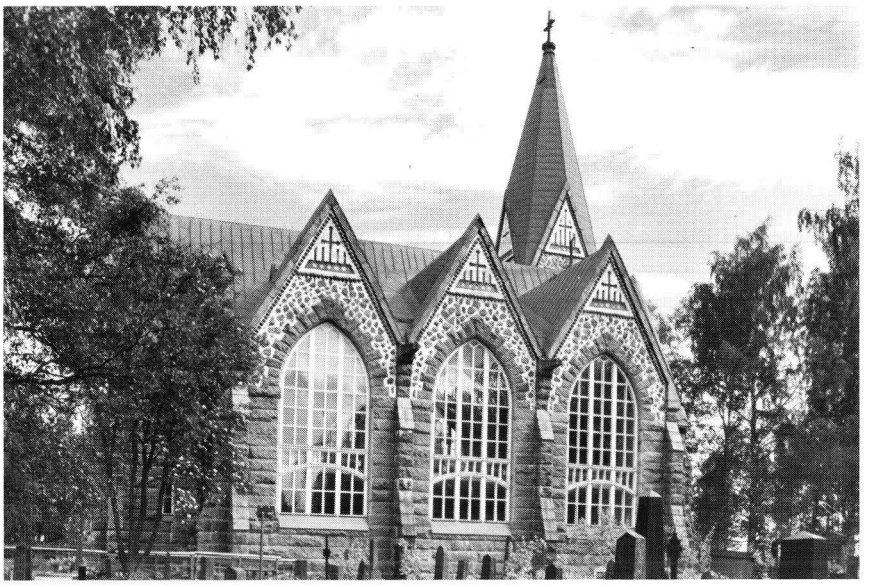


257. Josef Stenbäck, Design for Eura Church. Elevation (detail) 1895. Euran seurakunnan arkisto. (Photo SR)



258. Josef Stenbäck, Eura Church. (Photo SR)

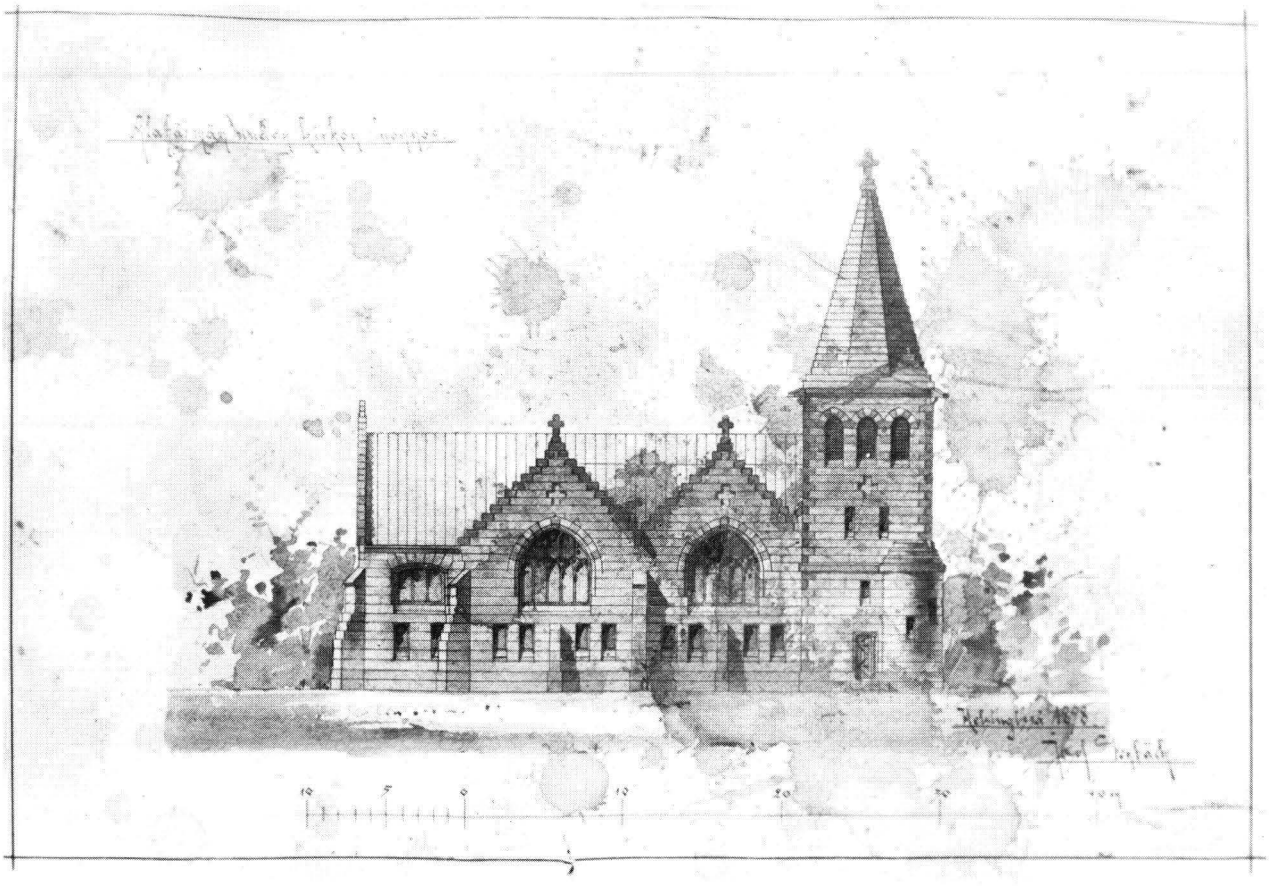
by side in his mature oeuvre. A key monument in his gradual transition to stone is Eura Church (1895-1898; Fig. 256-258), built in a combination of masonry and brick after much heated discussion in the parish council. In this case Stenbäck's principal argument for building in stone was economical: in the long run the wooden construction desired by many parishioners would prove more expensive to keep in repair. To prove his point he presented detailed comparative tables, in which, among other things, he calculated the depreciation of a stone church on the basis of 450 years.[92] The combination of materials in Eura had precedents in, for instance, Juva and Kitee. But at the same time it pointed to the future. It formed a parallel to developments elsewhere: in 1893 (a year before Stenbäck's first sketches for Eura) the Vålerengen competition presupposed a similar solution (cf. Fig. 240).In his elevation of 1895 (Fig. 257) Stenbäck presented the rustication of the stone façade with loving detail, and in the finished building the exterior is dominated by the rough granite surfaces (Fig. 258). The colour effect of the alternating voussoirs was added as an afterthought (cf. 257). The granite is rough-faced, worked with point and hammer. At this early stage it did not occur to the archi-



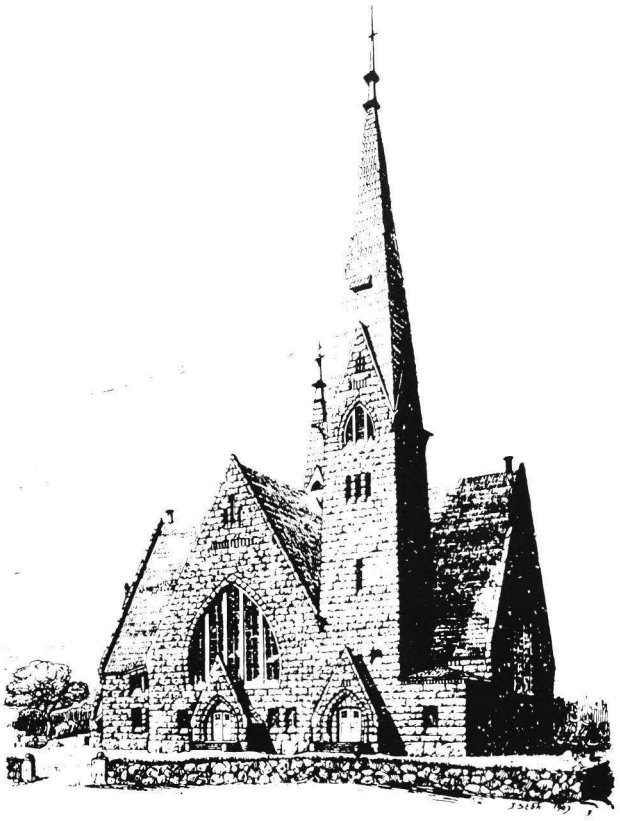
259. Josef Stenbäck, Alahärmä Church. 1898-1903. (Photo SR)

tect nor to the builder that a fresh cleavage may possess a value of its own. But there is no doubt that Stenbäck regarded Eura Church as a success, and that the effect of its granite wall inspired him to new essays in the same genre.

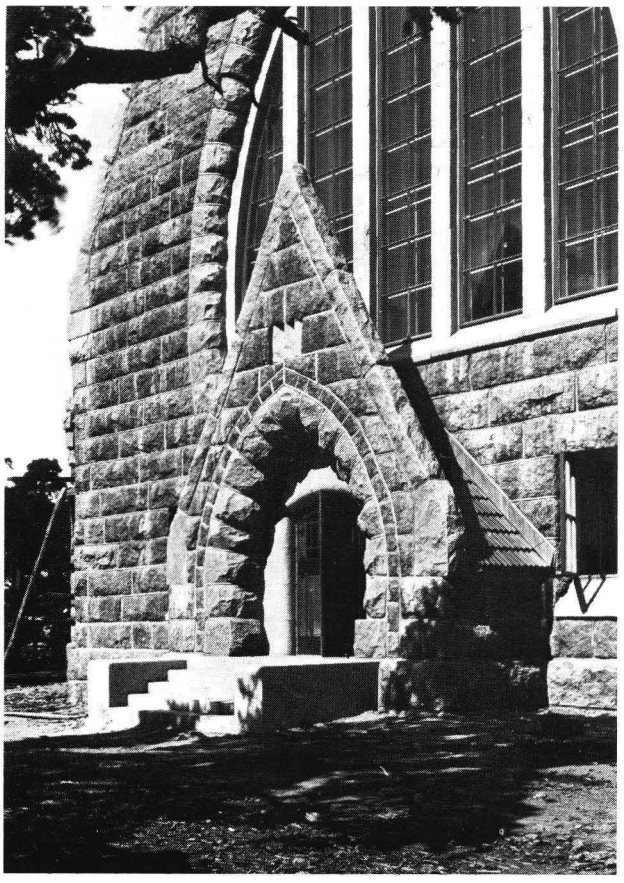
While the Eura church was under construction, Stenbäck gave a lecture to the Society of Finnish Technologists (Suomenkielisten teknikkojen seura) in October 1896. The lecture was first published in *Suomen Teollisuuslehti* and then reprinted in the architect's brochure on church building *Kirkkojen rakentamisesta* (On the Building of Churches) 1898.[93] Its title was "Should we



260. Josef Stenbäck, First design for Alahärmä Church. 1898. Alahärmän seurakunnan arkisto. (Photo SR)



261. Josef Stenbäck, Koivisto Church (today USSR). From *Arkitekten* 1904, p. 58.



262. Josef Stenbäck, Koivisto Church. 1901-1904. (Photo MV)

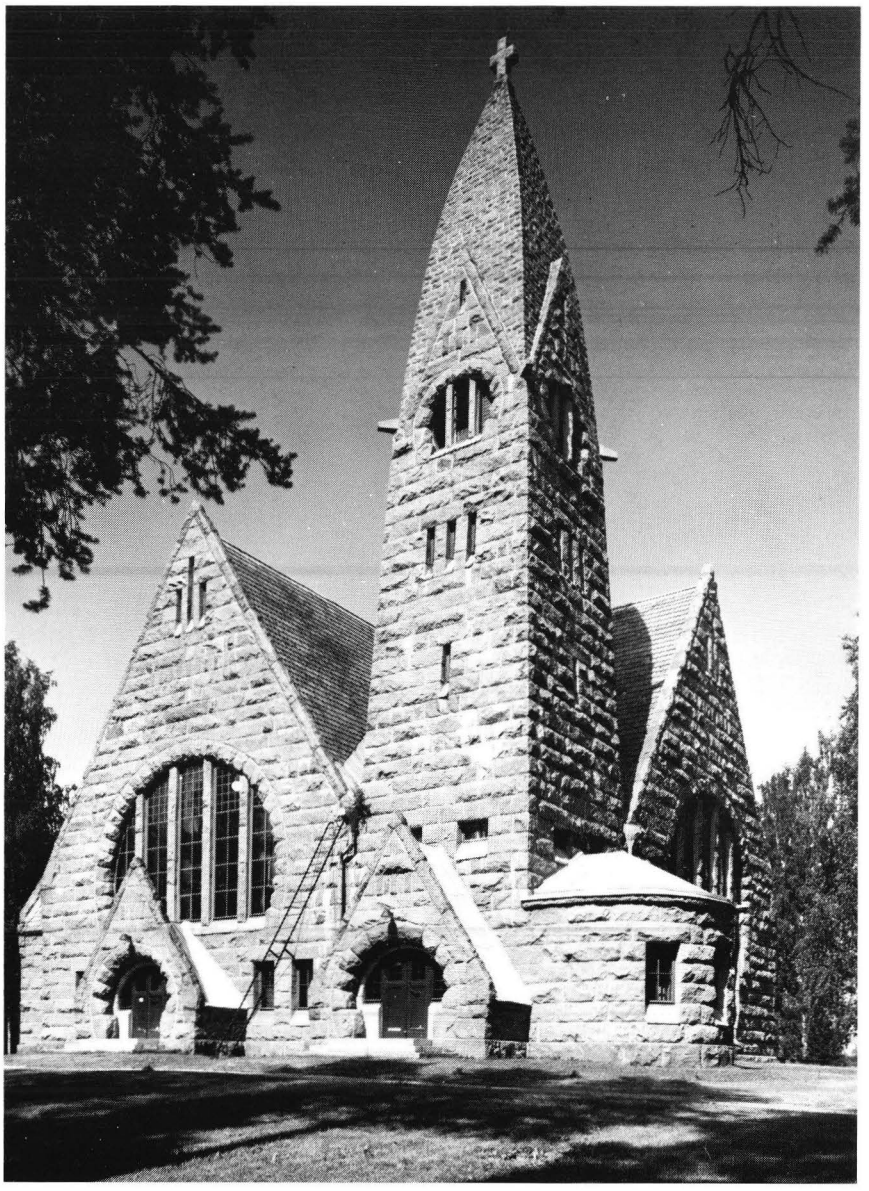
Build our Churches of Stone or Wood?'' and in the text he presented similar comparative tables as he had done in Eura. Stenbäck concluded his argument:

> Now, since there need be no obstacles of an economical nature, we may attach all the more weight to other, more weighty aspects. The destination and the idea of the church building require a building material which ought to approximate to the eternally permanent as far as this be possible with the help of temporal vehicles. And can one even compare wood to stone in this respect? Or take the architectural point of view: can a wooden church, however prettily decorated, bear comparison with a stone church, however simple, especially if the latter is of granite?[94]

The first edition of Stenbäck's brochure appeared as the architect was at the height of his career, with several parallel projects pending or already under way. When the next edition appeared in 1908, he had already experienced setbacks that made part of his argument outdated, and the section on stone construction was therefore left out. In an appendix to his pamphlet written in the following year the issue of material also plays a minor role.[95]

The first Stenbäck church to be built of granite alone was that of Alahärmä (1898-1903; Fig. 259). An elevation to the first design for Alahärmä shows a building with sturdy, Neo-Romanesque proportions and details (Fig. 260), but Stenbäck soon remodelled it in Neo-Gothic style.[96] Why? The answer appears from the gable decoration of the revised version. The steep roofs, the cyclopic walls and the blind tracery ornaments are motifs taken from the late medieval Finnish country churches, to which Stenbäck wished to allude.[97] Actually, these three acute-angled gables convey an almost pictorial effect, looking rather like three identical country churches marching abreast. Since Romanesque churches do not occur on the Finnish mainland, it would have been difficult to equip the first project with national allusions. We recognize the device; corresponding borrowings from the national heritage occured in Norwegian architecture, too — but with the difference that in Norway it was Romanesque forms which were regarded as national.

In Alahärmä Stenbäck also began to pay very careful attention to the textural effect of stone. On his first visit to Alahärmä Stenbäck went prospecting for suitable materials together with the parson and members of the building committee. Usable greystone was indeed found at a distance of a couple of kilometres from the future building site.[98] As for the actual treatment of the stone, we can also document a novel attitude. Thus a specification approved by the Church Council



263. Josef Stenbäck, Muuruvesi Church. 1901-1904. (Photo SRM-FAM Kari Hakli)

presupposed "that the face of the greystone is generally to be left unworked;" the formulation was probably Stenbäck's.[99] Although the stone faces were in fact rather carelessly picked next to their horizontal beds, at least some of the original cleavage was left untouched.

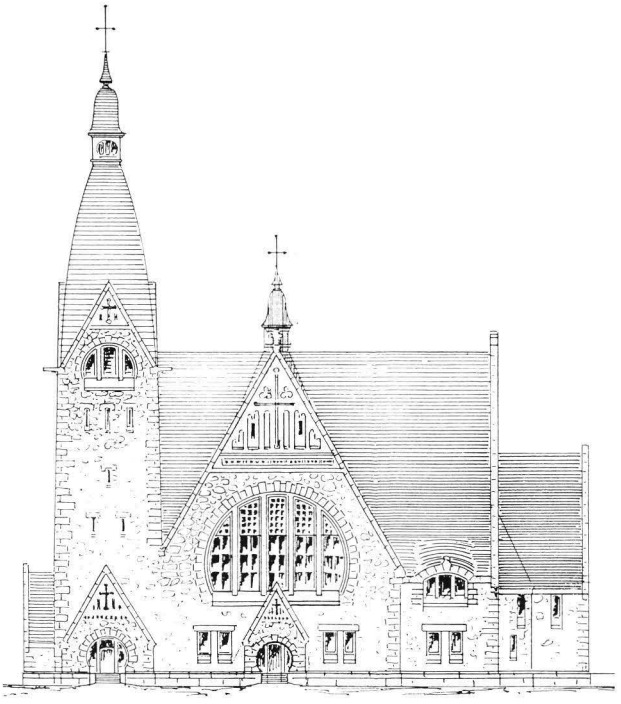
The climax in Stenbäck's development is represented by the church of Koivisto (1901-1904; Fig. 261-262) and its twin Muuruvesi (1901-1904; Fig. 263). The drawings for Koivisto were delivered by Stenbäck together with an explanatory note to the Building Committee.

> When you study my drawings, you will note that they differ from all churches that have been built to date in this country — and perhaps even abroad. The exterior is of an entirely novel type, which is based on the Gothic style, but which is entirely modern in its treatment [...] On the whole I have used as simple forms as possible; but this simplicity makes great demands on the quality of the work and the purity of the materials.[100]

Stenbäck, as usual, offerred to contract the building. In a letter to the parson of Koivisto he wrote:

> I know that it will cause me much care and worry; yet I am really eager to attack the granite — that noble building material, which I would rather see more widely used — and which will certainly become more used.[101]

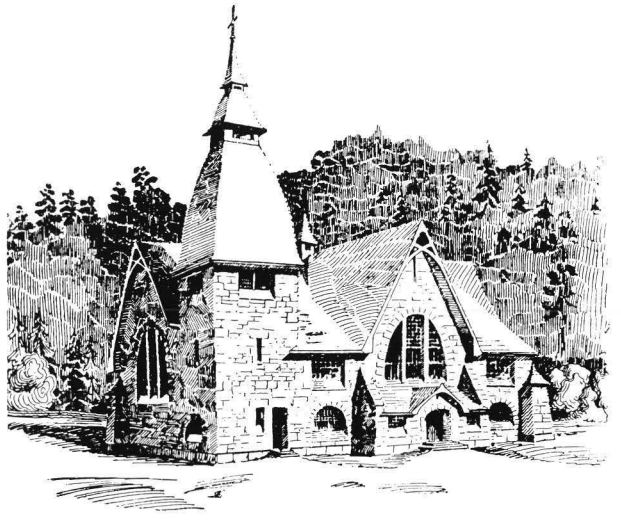
Stenbäck's intentions appear from his own comments. Granite is hard stuff; he who does not have plenty of money should refrain from decorating this material with flourishes. But if one tries to understand the material, quite handsome results may be had at a reasonable cost. "Are not these high gables, these vigorously rusticated walls, this simple, but lofty and slender tower monumental enough and worthy of their



264. Josef Stenbäck, Sketch for Muuruvesi Church. 1901. National Board of Antiquities, Helsinki. (Copy MV)

destination even without any cut ornaments?'' The stone employed in Koivisto was the famous and notorius *rapakivi* granite, which was quarried locally. The local brown-grey stone was combined with grey, fine grained granite brought from the region of Kuopio.[102]

Stenbäck's comment may be combined with a sketch of the Muuruvesi church, which he made as he was simultaneously planning the twin churches in 1901 (Fig. 264). Here he has still envisaged formal allusions to Finnish medieval architecture: blind tracery in the gables, cyclopic bond of the medieval type etc. But both in Koivisto and in Muuruvesi the ornamental motifs were ultimately discarded. Instead, the uniformity of the stone



265. Josef Stenbäck, Varpaisjärvi Church. From *Teknikern,* 1904, p. 198.

was emphasized, in Muuruvesi even by making the spire of stone (Fig. 263). Here the cleavage of the large blocks were also left untouched, a fact which has a considerable effect on the appearance and texture. Stenbäck had personally prospected the stone resources of Muuruvesi and hit upon ''the most wonderful light grey granite, equally cleavable in all directions.''[103]

Muuruvesi was part of a profitable scoop which Stenbäck made when the geographically extended but poor parish of Nilsiä was divided into three new parishes. Apart from Muuruvesi, he managed to secure the commissions to build the other two churches also, that is Varpaisjärvi (1901-1904; Fig. 265-267) and Nilsiä (1902-1906; Fig. 268-269).

In Varpaisjärvi Stenbäck was a little too sanguine in his prospecting for stone. In his first specification he planned to build the walls of regular coursed stone, but with courses of varying height; occasionally two stones could be laid to make up the entire height of the course.[104] As the stone resources after all began to look insufficient, Stenbäck came up with a modified proposal: a cyclopic bond (Fig. 267).[105] At one stage he also considered the possibility of using squared rubble (Fig. 265);[106] this is, strangely enough, the first instance of this bond in Stenbäck's work. Needless to say, he must long before have known the Scottish-American technique, which had been publicized in different contexts, but he had an apparent predilection for the heavy rustic bond with emphasized horizontal joints. In Varpaisjärvi a quite acceptable, dark grey gneiss-granite was, after all, found, which meant that Stenbäck could have it his way (Fig. 266).

A measure of the role of stone in Stenbäck's work is given by the fact that in Nilsiä it was first decided what stone to use, and only afterwards what the church would look like. Nilsiä is known for its light red, brilliant quartzite sandstone which was the obvious choice. ''The form of the church will be decided when preliminary drawings have arrived,'' the Building Committee resolved in 1902.[107] In the following year Stenbäck's drawings were approved, but as the contract was to be signed, a difficulty arose. Stenbäck had planned to use ''stone of irregular heights''[108] - or in other words a rubble bond (Fig. 268-269). The parishioners had not seen anything like that before. Feeling cheated, the Building Committee began to work for a revision of the approved plans and specifications. But again Stenbäck prevailed, and the church was built according to the original design.

The three churches in Muuruvesi, Varpaisjärvi and Nilsiä reveal Stenbäck's relative versatility; in the last case he could even offer the parish four different alternatives.[109] His sense of style was not subtle, but during his most productive phase in the early years of the century he successfully avoided repetition. In his search for variation, the material, or, in other words, the local stone resources, provided one of his most im-

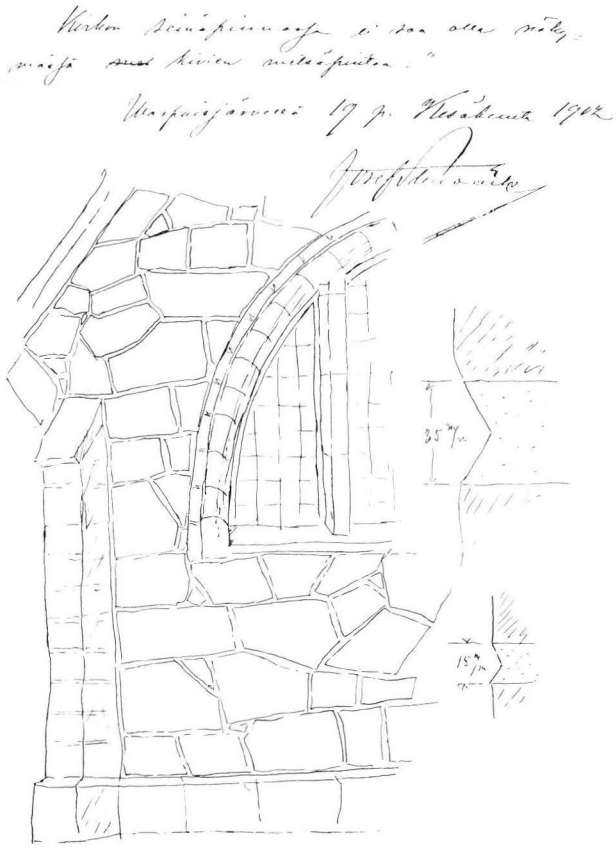
266. Josef Stenbäck, Varpaisjärvi Church. 1901-1904. (Photo SR)

portant sources of inspiration. Actually, Stenbäck's work fulfilled Hjalmar Lundbohm's strict demand that the material should be chosen first and the architectural form after that (cf. above p. 34).

Stenbäck's undeniable gift of making a virtue of necessity may be illustrated with a selection of his churches ca 1904-1910. In Pyhäranta on the south western coast (1904-1909; Fig. 270) he made use of the variety of colour in the granite which was partly quarried, partly cut from erratic blocks. The concept of using colour effects as well as the proportioning of the blocks seems inspired by Sonck's Telephone Company (completed 1905; Fig. 202-204). In his specification for Pyhäranta Stenbäck also used the term "squared rubble" for the first time, although the execution of the bond is far from orthodox.[110]

In Vuolijoki in the north of Finland there was no rock to be quarried and Stenbäck first planned his church (1905-1906; Fig. 271) with plastered walls. A sparse decoration cut from erratic stone was to emphasize the irregular contours that he had learnt from Jugendstil. The stone, however, proved better and more abundant than first believed, and Stenbäck used it to create the effect of a ginger-bread house. A little south of Vuolijoki, in Sonkajärvi, a dark, almost bluish gneiss-granite allowed him to play with colour contrasts against an almost white stone (1907-1910; Fig. 272). The building committee had rejected an alternative with "irregular" (cyclopic?) bond, and Stenbäck suggested squared rubble instead. In his specification Stenbäck provided for "occasional side-joints deviating from the vertical in order to produce a more varied appearance."[111] But apparently the building committee did not like the idea, and in the finished building the side-joints are strictly vertical.

To sell rubble walls to conservative parishioners was already a feat. In Nilsiä this "irregular" bond was strongly resisted, in Sonkajärvi, it seems, it was accepted only provided the side-joints were vertical. Stenbäck had learnt his lesson and when the parishioners of Luvia wanted an inexpensive church, he told them at a meeting that "he was capable of building a stone church with vertical joints of the same type as that of Sonkajärvi, of which drawings were exhibited."[112] The expression "stone church with vertical joints"



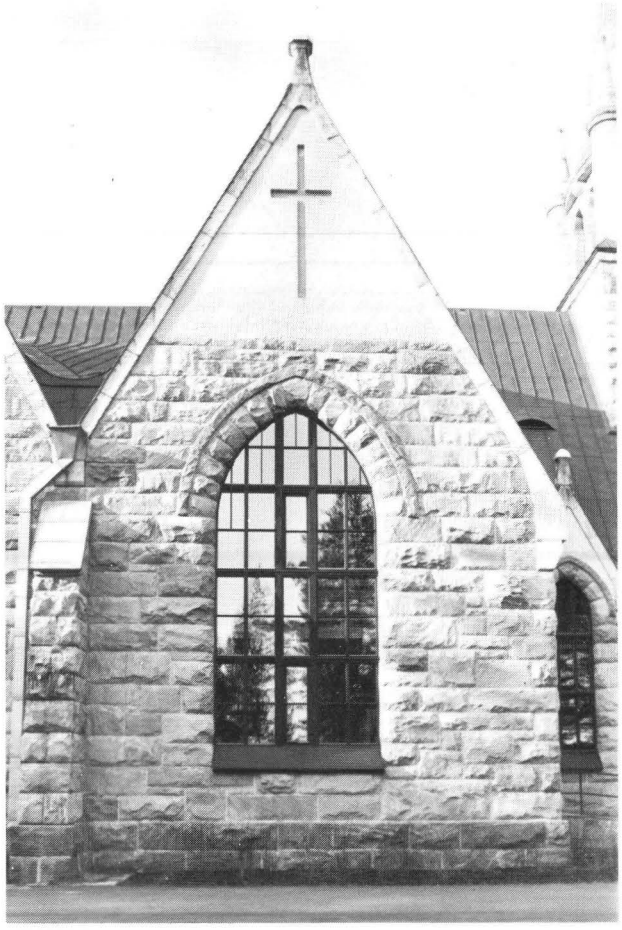
267. Josef Stenbäck, Proposal for cyclopic bond of Varpaisjärvi Church. Letter to the building committee. 16. 9. 1902. Varpaisjärven seurakunnan arkisto. (Photocopy)

268. Josef Stenbäck, Nilsiä Church. 1902-1906. (Photo SRM—FAM Kari Hakli)

(suorasaumainen kivikirkko) reveals something about the priorities among rural decision makers; to them irregular bonds were primarily associated with utilitarian buildings, not least their own cowsheds. In Luvia (1908-1910; Fig. 273) Stenbäck could employ a local material that had been recommended for use by J.J. Sederholm, the geologist, as early as 1898. In this region on the Finnish west coast a red to brown sandstone is found in erratic blocks. A similar sandstone occurs in the Gävle region on the Swedish side of the Gulf of Bothnia, and Sederholm referred to the successful utilization of this stone in Sweden. "It is a little hard to cut, but it would be very handsome if used in rubble architecture ('nubbstensarkitektur')."[113] For the first time this sandstone was used by Stenbäck in 1899. In that year he persuaded his patron, F.A. Juselius, to use it instead of German bricks for the Juselius Mausoleum, famed for its ill-fated frescoes by Gallen-Kallela.[114] Despite these negative experiences Stenbäck decided to give the sandstone a second trial in Luvia.

To Stenbäck squared rubble was what it had originally been: a method of saving material, work and money. Whenever the economy allowed, he seems to have preferred rockfaced ashlar. In Karuna (1908-1910; Fig. 274), one of his most successful works, he reverted to ashlar and he remained faithful to this bond in the stone churches that he built during his last phase, which falls outside the period now under discussion.

Stenbäck was early unfavourably compared to Lars Sonck, the master of the Church of St. John in Tampere.[115] Seen in an historical perspective Stenbäck's work had a breadth which his contemporaries failed to appreciate. Compared with church building in Sweden and Norway during the same period, Stenbäck's oeuvre impresses us as varied and imaginative. But from the artistic point of view, posterity has not

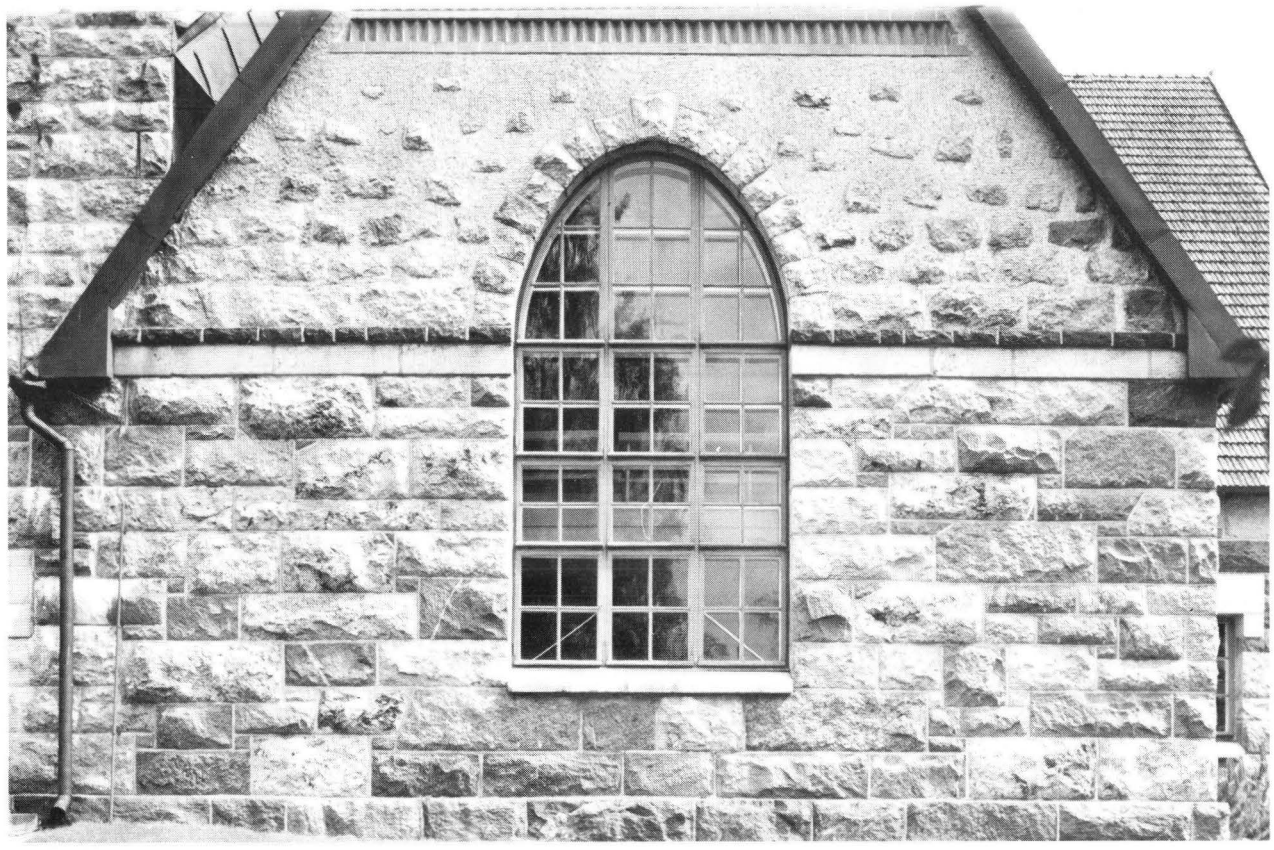


269. Josef Stenbäck, Nilsiä Church. S. wall. (Photo SR)

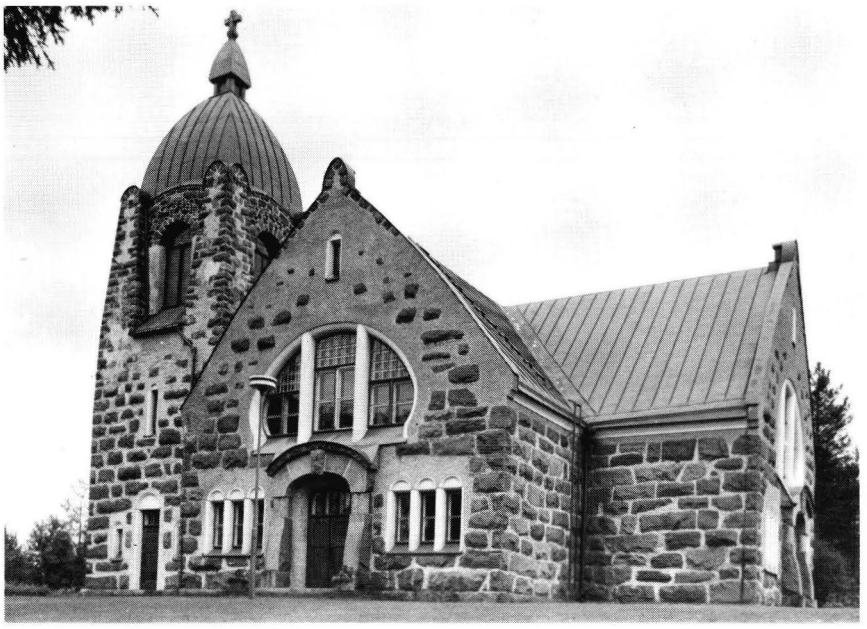
seen fit to revise the contemporary valuation of Sonck and Stenbäck.

In the work of Sonck, too, stone was more than a mere medium to be used together with other means of expression. It was a source of inspiration and an aesthetic end in itself to which other considerations had to yield. Sonck's career as a church architect started with a brick church, the St.Michael Church in Turku (Åbo), completed in 1905. In the 1894 competition for this church — where brick was prescribed —, Sonck's winning entry had stone façades. The jury, however, resolved that the entry nonetheless could be executed in brick, "without difficulty or greater expense"[116].

In the 1899-1901 competition for the new church in Tampere the material was specified as "brick, granite or both in combination."[117] At last, stone was sanctioned in the rules of an architectural competition, and the entrants made liberal use of the new-won freedom. One entry bore the code name *Louhos* (Finnish: "quarry"), another ("Metros") presupposed the use of unrealistic amounts of local granite, red Pori sandstone and Ruskeala marble, and yet another envisaged a tall Gothic structure with its soaring walls and gables of granite. Contrary to the stipulations, two projects suggested façades of soapstone and were for that reason discarded by the jury. Sonck's entry "Aeternitas" (Fig. 275) was chosen mainly for two reasons: its ingenious plan and its elevations "intended to be executed as

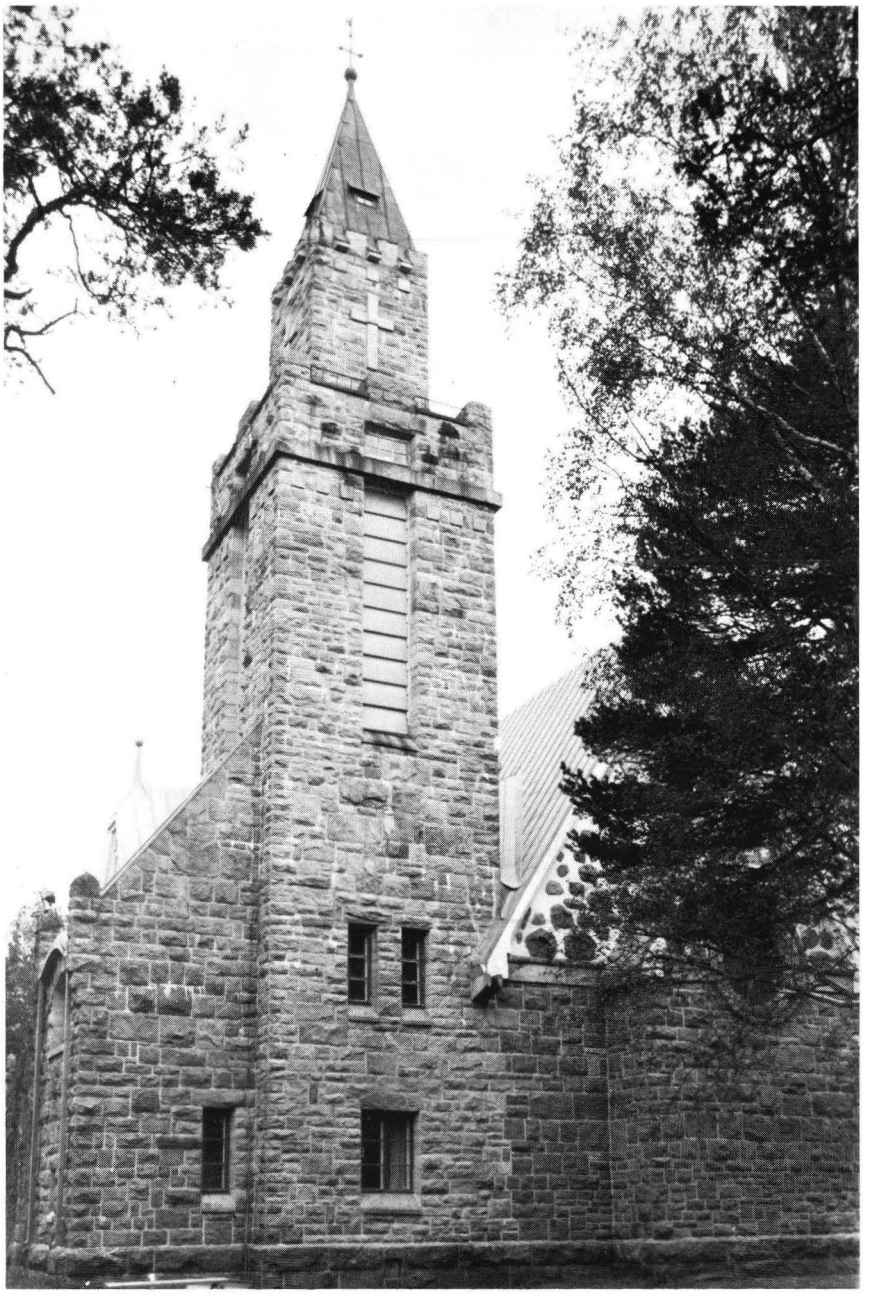


270. Josef Stenbäck, Pyhäranta Church. 1904-1909. S. wall. (Photo SR)



271. Josef Stenbäck, Vuolijoki Church. 1904-1906. (Photo SR)

272. Josef Stenbäck, Sonkajärvi Church. 1907-1910. (Photo SR)

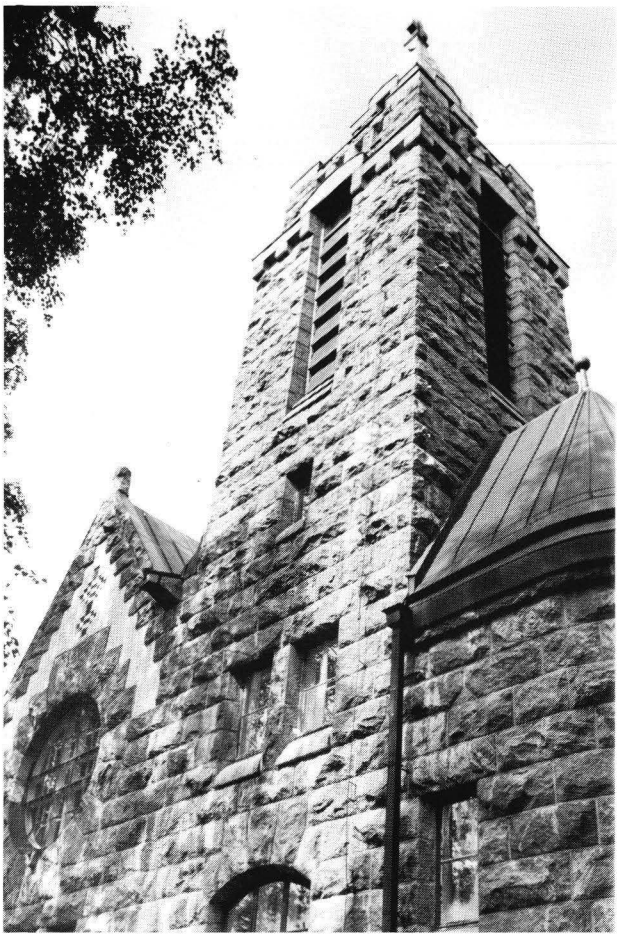


273. Josef Stenbäck, Luvia Church. 1908-1910. (Photo SR)

simple granite architecture.'' Although less mature than its plan, its exterior was seen as capable of development: ''In case the church is to be built according to this design, there exists the possibility of making true a natural and much- cherished wish held especially by professional people; that is, to clad the façades with local granite, which is eminently suitable for the purpose.''[118] The term ''professional people'' referred, it seems, not only to the architectural profession, but to its representatives in the jury, Sebastian Gripenberg, Onni Törnqvist (Tarjanne) and Hugo Lindberg, all of whom had in one way or another worked for the use of natural stone in the preceding years. It is clear from the jury's report that the possibility of using granite at a realistic cost was an important criterion in the evaluation of the submitted projects, although the second prize was awarded to Grahn-Hedman-Wasastjerna for a project in brick.

Sonck's ''simple granite architecture'' referred to by the jury was a regular coursed cyclopic bond after the model of medieval parish churches (Fig. 275). Sonck has here abandoned the regular ashlar of his 1894 project for the St.Michael Church. An intermediate phase is to be seen in two later studies, ''Eskiss till en Landskyrka'' (1897)[119] and in the design for a church in Kylmäkoski (1898) which was never realized (Fig. 276).[120]

In her fundamental monograph on Sonck's church Paula Kivinen has pointed to the possible role of Hugo Lindberg in Sonck's development of the façade texture.[121] In his definitive elevations signed in December 1901 Sonck introduced squared rubble (Fig. 277), and



in his specification he described and illustrated (Fig. 278) the construction. At this stage Sonck still envisaged ''grey granite of varying colour nuances,''[122] The stone was delivered by Finska stenindustri Ab - Suomen kiviteollisuus Oy and consisted mainly of grey granite from Uusikaupunki with colour accents of a red variety, identified by Sederholm as stone from Ruovesi. Sederholm, we recall, disapproved of such a mixture of stone.[123] As a rubble bond the system is far from orthodox, containing side joints with up to six or even eight stones. The small stones, ''snecks,'' are not only used to fill out single gaps between blocks, but applied in concentrations. In the corners are quoin blocks that protrude from the surface; some of these protruding blocks seem to have, as it were, wandered from the corner towards the surface (Fig. 279). With apparent pride the architect had his signature incised in the middle of the raw rock surface: LARS SONCK ARCH (Fig. 280).

The Church of St. John was completed in 1907. The rationalist architect and critic Sigurd Frosterus praised the handsome shape of the asymmetrical building, which in his opinion looked equally fine from all directions. The development which we have here sum-

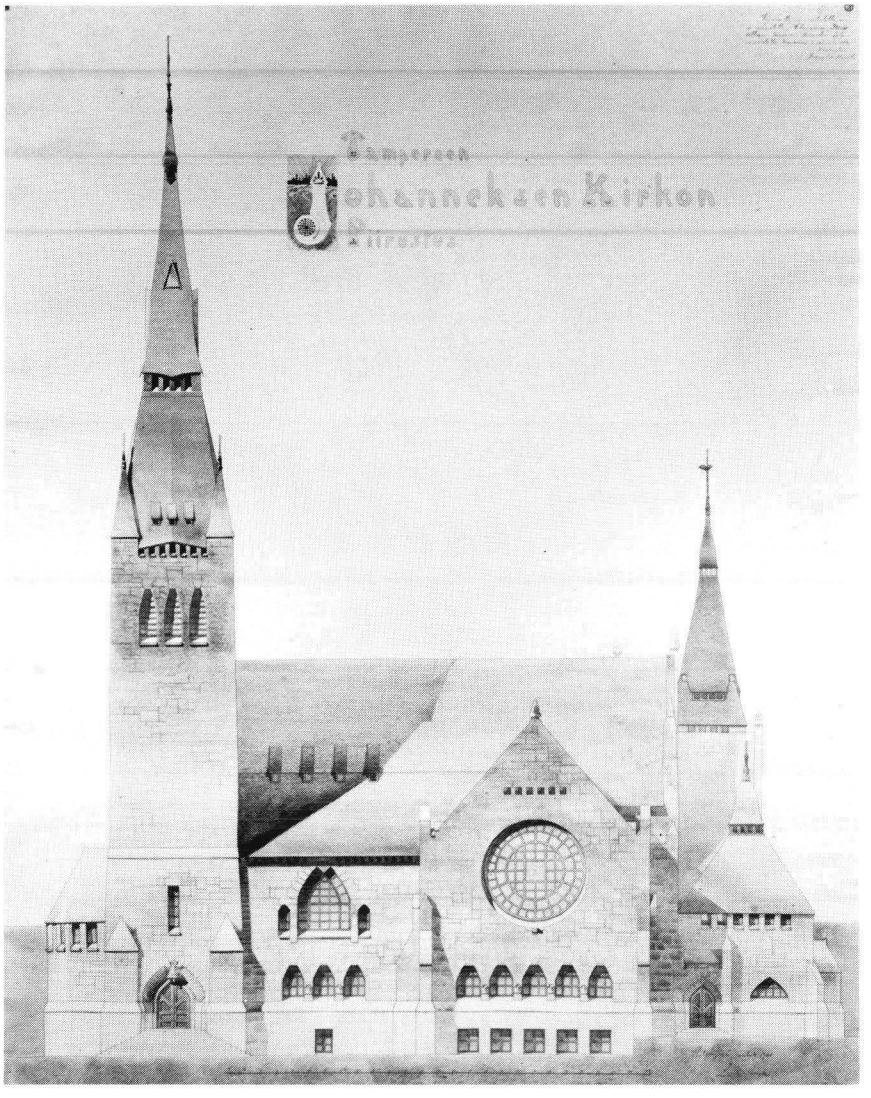
274. Josef Stenbäck, Karuna Church. 1908-1910. (Photo SR)

275. Lars Sonck, »Aeternitas». Winning entry for the Church of St. John in Tampere (Sw. Tammerfors). 1900. From *Teknikern* 1901, pl. 186.

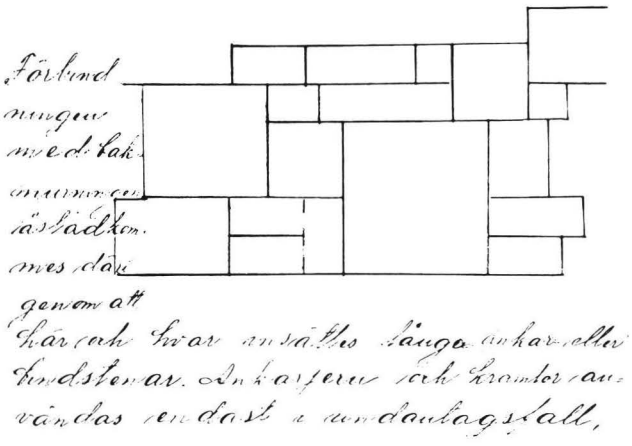
marized with the words "from ornament to texture" was duly noted by Frosterus: "The treatment of the details, or perhaps more correctly, the absence of details, is certainly devised for being seen at a distance. The rusticity, which is uncalled-for and strange next to a narrow and busy street — compare the house of the Polytechnical Students — is fully justified here on the brow of a gradually sloping hill."[124]

The impact of Sonck's church seems to have been immediate. At the meeting of the Architects' Club on December 8, 1900, all entries for the Tampere competition were exhibited.[125] A week later Stenbäck sent his drawings for Koivisto church to the parish council there. Until then Stenbäck had worked within the confines of "church styles", mainly a sharply linear Neo-Gothic idiom. Stenbäck's Tampere entry had still been of this character.[126] In Koivisto (and its twin, Muuruvesi) there came a decisive turn to organic, grown con-

276. Design for a granite church in Kylmäkoski. 1898. Kylmäkosken seurakunnan arkisto. (Photocopy)



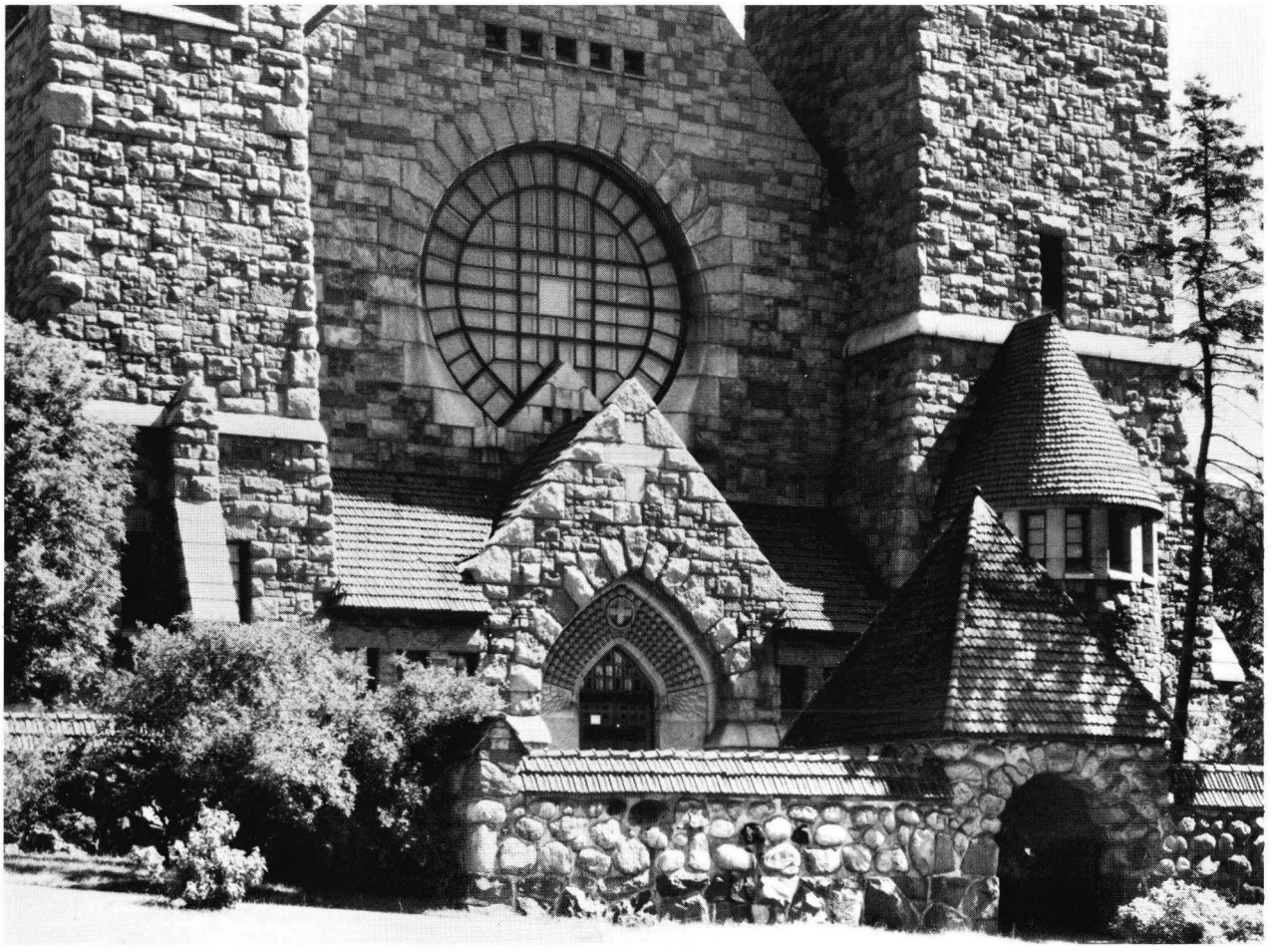
277. Lars Sonck. Elevation for the Church of St. John. December 1901. Tampereen Evank.-luth. seurakuntien arkisto, Tampere. (Photo SRM-FAM, E.M. Staf)



278. Lars Sonck, Illustration in specification 1901. Tampere, Evank.luth. seurakuntien arkisto. From Kivinen 1961, fig. 46.

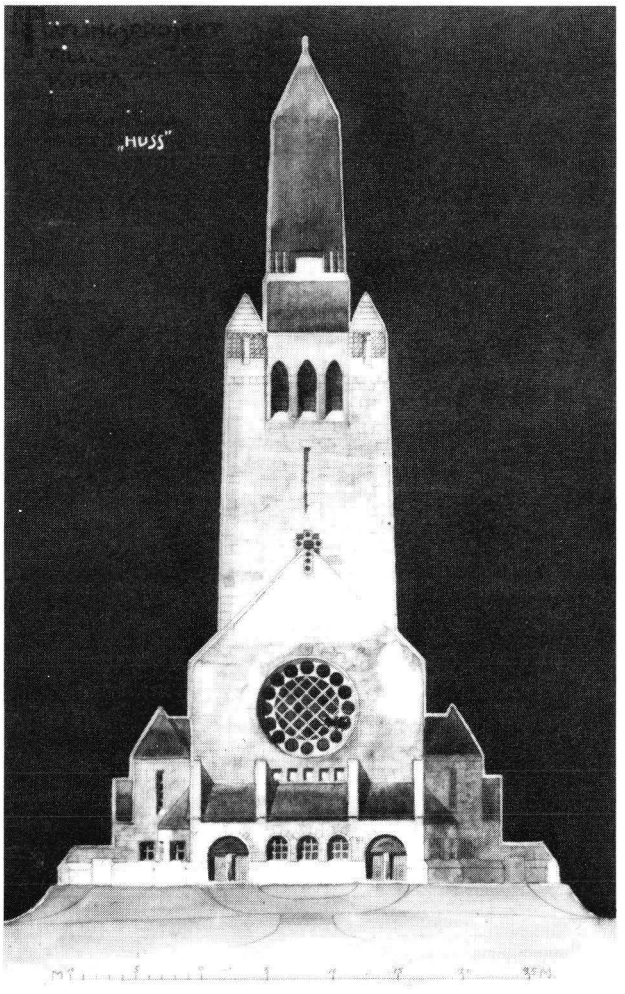
tours; in one of his studies at the time, Stenbäck, like Sonck, envisaged traditional cyclopic bond.[127] Stenbäck can be said to have been liberated by his young colleague from the bond of his German schooling .

Sonck's following church, Kallio (Sw. Berghäll) in Helsinki (1906, 1908-1912; Fig. 281-285) still reveals his interest in textural effects, although the main challenge of this task lay in the landscape requirements. The site is a hill, which commands the whole district, and which is visible at a distance from many other parts of the capital. At the request of the parishioners Stenbäck had already submitted a sketch in 1901. This project — which he named ''Kalliokirkko - Bergskyrkan'' — was planned to have façades of local granite used mainly with rough surfaces and very sparsely distributed cut details.[128] Stenbäck's project was not realized, but it precipitated a long awaited reorganization of the parishes of the capital.[129] A competition for the new church was announced in 1906, with a programme allowing for façades of brick or natural stone.[130] Sonck's prize-winning entry ''Huss'' (Fig. 281) featured façades of squared rubble, as did his revised project (Fig. 282) submitted in a renewed competition for three entrants from the first phase. Again the ideals of the stone movement seem to have influenced the members of the jury, which included the architect Bertel Jung and Onni Tarjanne. In their introductory remarks they recommended the use of granite, which is ''very durable, as well as handsome and inexpensive;'' a condition for the last advantage was that the main surfaces were left rough. On these grounds they relegated a project by Gustaf Nyström to a mere third place.[131] This

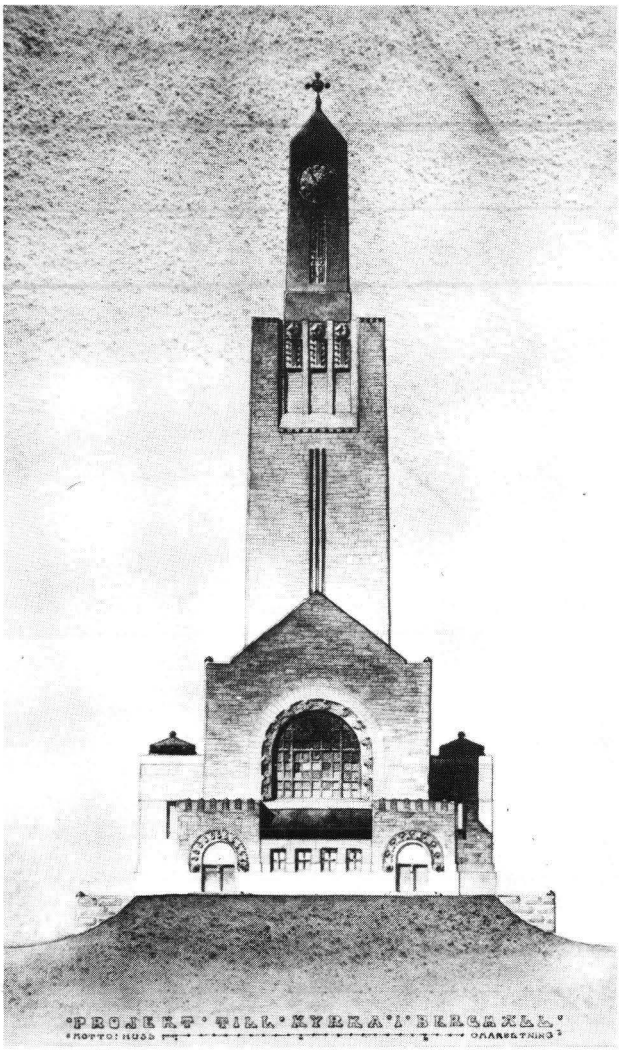


279. Lars Sonck, The Church of St. John. 1902-1907. W. facade. (Photo SRM-FAM, Heikki Havas)

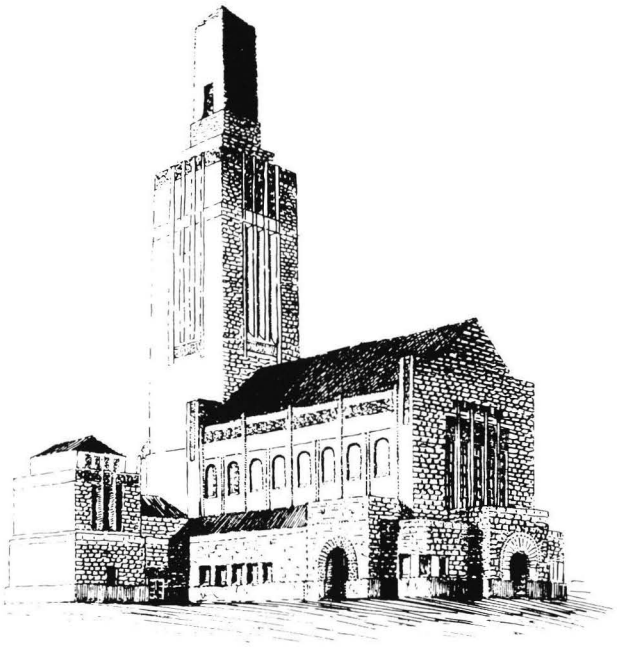
280. Lars Sonck, The architect's signature in the S. wall of the Church of St. John. (Photo SR)



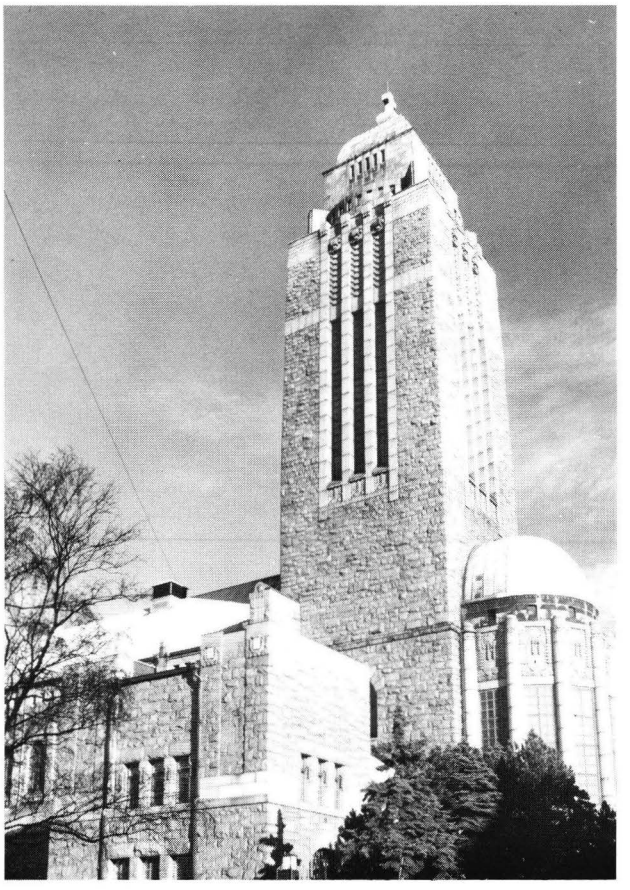
281. Lars Sonck, ''Huss''. Entry for the first competition for the Kallio (Sw. Berghäll) Church, Helsinki. 1906. The Museum of Finnish Architecture, Helsinki (Photo SRM-FAM)



282. Lars Sonck, Revised version of ''Huss''. Entry for the second competition for the Kallio church. 1906. The Museum of Finnish Architecture. (Photo SRM-FAM)



283. Lars Sonck, study for regular coursed rubble for the Kallio Church. Ca 1908. The Museum of Finnish Architecture. (Photo SRM-FAM)



285. Lars Sonck, Kallio Church from SW. (Photo SR)

angered Nyström, who in a rejoinder declared that he had tried to follow the principles laid down by Ruskin in his *Seven Lamps*; besides, he added, "if the jury wanted the walls of the church faced with granite, they should have said so in the programme for the competition."[132]

In his principal elevations, which were officially approved in January, 1908, Sonck had achieved variation by means of varying bonds: large ashlars on the plinth, regular coursed rubble for the main surfaces, and exactly square shaped stones in the wall areas above the windows. Squared rubble in irregular courses did not occur on these elevations. From his preparatory studies from this stage (e.g. Fig. 283) it is clear that Sonck had come to regard irregular rubble as a past phase. That the finished building was nonetheless built with the customary type of rubble wall was due to saving measures and the fact that the stone contractor already had a routine for this kind of work. In March,

284. The Kallio Church under construction. Photograph in the archives of Suomen Kiviteollisuus, Vinkkilä.

1908, the building committee found that all four tenders submitted for the granite of the façades exceeded the estimate for the church, and Sonck was therefore asked to introduce cost-saving simplifications. On the basis of revised tenders the contract was signed with Finska stenindustri - Suomen kiviteollisuus in May, 1908.[133] The firm delivered Uusikaupunki granite in two varieties, a darker grey for the rubble and a lighter, almost white for the dressed details (Fig. 284-285). In its plant in Helsinki the Finska stenindustri - Suomen kiviteollisuus had recently installed a pneumatic drill which made it possible to work hard granite as if it were freestone, and in 1908 the machinery was producing the delicate ornaments for another Sonck building, the Mortgage Society (Fig. 296-298).[134] Among contemporary critics the material of the Kallio church no longer elicited more than perfunctory comments. There was a certain feeling of satiety with the more obtrusive effects of stone, and attention was already shifting to other qualities of the material.

11. REACTION AND ECLIPSE

The enthusiasm and success of the stone movement could not last forever, and soon after the turn of the century signs of satiety began to show in all three countries. In the course of the first decade a radical reorientation took place and the result was soon to be seen in practical applications.

Apart from the pendulum movement inherent in fashion generally, there were a number of circumstances that seemed to give additional momentum to the counterstroke. One such factor was the built-in *moralism* of the stone movement, and more precisely the repeated claim for truth. How true was, after all, a stone building which looked like a granite pile, but in which the coating was about 10 cm thick, not counting occasional binders added to prevent the stone from falling off? Ruskin, in his time, had defended marble lining by claiming that every beholder must realize that one does not build houses of marble throughout. The moralists of the 1890's rejected marble lining, and in the first years of the twentieth century the possibility of solid stone construction was hopefully discussed both in Norway and Finland.[1] In 1907, a little belatedly it seems, H.J. Sparre still speculated on "a national method of construction" based on thick greystone walls.[2] At the same time the numerous granite churches built around 1900 proved to be irreparably damp. The interior of Lademoen church in Trondheim was so damp that it could not be plastered, and the scandalous condition of Koivisto church at the other end of Fennoscandia led to legal proceedings. In 1909 an Ålesund engineer, K. Brun, wrote that in the western parts of Norway the vogue for natural stone had ended in disappointment and resulted in "an irretrievable loss for many who some time ago proudly declared that their houses were to be built of the old *fjeld* of Norway, of pure granite from top to toe."[3] The moral argument for stone seemed to lead to an impasse, the impossible choice between all stone construction, doubtful from the technical point of view, and stone facing, doubtful from the moral point of view.

With irresistible force the *traditional façade materials* that had been superseded by the stone vogue began to reclaim their place in Nordic architecture. Brun recommended strong plaster as the best solution in the Vestlandet, and Henrik Nissen, who served as the leader of the reconstruction of Ålesund, similarly ranked plaster equal with natural stone.[4] As early as 1893 the great proponent of natural stone, I.G.Clason, had praised the seventeenth- and eighteenth-century plaster façades of Stockholm for showing "attractive and playful forms, completely free from all imitation of stone." Since plaster will in any case remain a common material in Sweden it would be worth while to "cultivate this plant."[5] In 1899 a critic in *Teknisk Tidskrift* praised the recent architecture of Norrköping for going in for plaster and brick "in our days, when the taste for coating the façades with natural stone has almost become an epidemic".[6] In 1903 a "new" old material was introduced in Sweden, the deep red Helsingborg brick known from the Middle Ages, which now began to be produced on an industrial scale. Helsingborg brick was introduced in Stockholm architecture in 1907.[7]

A third important factor was the *stylistic development* during the early years of the century. As Wagner, Hoffmann and other Viennese architects began to play an increasingly important role as models for Swedish and Finnish architects, the interest in British and American rustic styles waned; the new British example to be followed was, above all, Voysey.[8] For the smooth surfaces, the vertical mouldings, the pretty wreaths and festoons, and the hanging garlands of Vienna-inspired facades, the textural effect of natural stone was no longer required, although limestone or fine grained granite obviously did not harm the appearance either.

To single out the "first" buildings in this tradition is not meaningful, since examples of the combination of restraint and festive dignity can already be observed in what we have called "stone boom historicism." Svenska Livförsäkringsaktiebolaget in Stockholm (Fig. 286), built of light grey Gotland limestone, was planned by Johan Laurentz, who had worked in a Richardsonian vein a few years earlier (cf. Fig. 101). In Christiania Harald Olsen's Glassmagasinet (1897-1901; Fig. 113), modelled on German *Warenhausarchitektur* already has a remarkably restrained composition which brings out the surface effect of the light grey granite. Ernst Stenhammar — who was to build the pioneering Tjänstemannabanken in Helsingborg bricks — used an almost classicist idiom in a Stockholm bank building in 1904-1909; here the Gotland stone is used in a technique which stresses the surface by making the joints almost invisible (Fig. 287). Symptomatic for this phase of the stone movement was that smooth, non-imitative plaster and dressed stone were regarded as visually equivalent. An example of this interchangeability is provided by the handsome building for Bankaktiebolaget Södra Sverige by Thor Thorén (1907-1909; Fig. 288). In 1907 a building permit was granted for a project with plastered brick, but in the following year the specification was changed; the façade was to be faced with yellow-grey granite.[9]

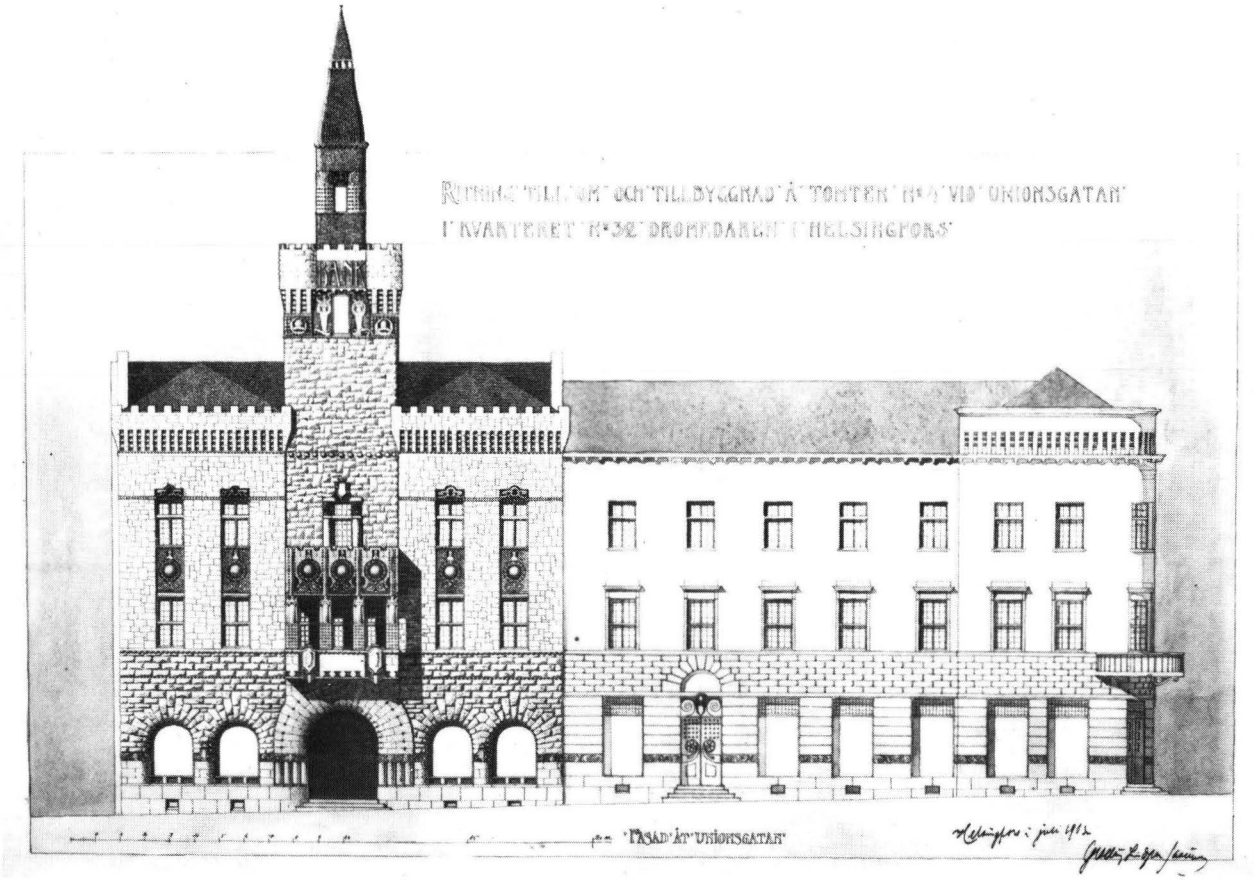
In Norway this reaction came fairly late. There the

286. Johan Laurentz, Svenska livförsäkringsaktiebolaget, Norrmalmstorg 16, Stockholm. 1900. (Photo SR)

287. Ernst Stenhammar, Bankaktiebolaget Stockholm-Öfre Norrland, Fredsgatan 10, Stockholm. 1904-1909. (Photo SR)

288. Thor Thorén, Bankaktiebolaget Södra Sverige. 1907, 1908-1909. (Photo SR)

289. Henrik Nissen, Kongeriget Norges Hypoteksbank. 1913-1916. (Photo SR)



290. Gesellius-Lindgren-Saarinen, Design for the Pohjoismaiden Osakepankki-Nordiska Aktiebanken, Helsinki. July 1903. Suomen Yhdyspankki-Foreningsbanken i Finland, Archive, Helsinki. (Photo SYP-FBF)

long life of the *råkop* style was guaranteed by Sinding-Larsen's vast building programme for the Oslo University (cf. Fig. 183). In the provinces rubble was employed for monumental architecture until the Second World War. Perhaps the closest Norwegian parallel to the style shift in Stockholm and Helsinki is to be seen in Henrik Nissen's Kongeriket Norges Hypoteksbank (1913-1916; Fig. 289).

In Finland the reaction was stronger than it was in either Sweden or Norway. The deliberate rawness of Finnish National Romanticism made, so to speak, the initial swing of the pendulum more violent than it was elsewhere. In connection with the Pohjola building the Saarinen trio had been both praised and blamed for their rough handling of the material. The year after the completion of that work, the trio came up with a project for the Helsinki office of Nordiska Aktiebanken (Fig. 290). Although "some doubts were expressed concerning the appropriateness of the tower proposed for the building," the Board of the bank decided to use the design and empowered the Helsinki branch "to settle the question of the façade of the bank building."[10] The architects discarded the tower; but not only that, the character of the whole façade was also altered. We do not know the course of this process in which the italianate Gothic town hall was transformed into a remarkable mixture of a Spanish palace and Finnish ornaments (Fig. 291). The strict symmetry of the original design already contained a contradiction with the exaggerated picturesqueness of the details, a contradiction that could be resolved by toning down the textural effects and enhancing the surface of the wall. As pointed out by Marika Hausen, the result is reminiscent of Clason's Hallwyl Palace (Fig. 90).[11] It is likely that the trio, probably Saarinen himself, had cast a glance at Clason's Spanish sketches such as the doorway in Salamanca (Fig. 91). The whole composition followed Clason's Spanish lesson that ornamentation should be concentrated to select parts and contrasted against the undecorated main surface. The ornamentation was "national," the "crenelation" consisting of a row of ravens, and the balcony being decorated with plant motifs. The doorway was surrounded by a row of dwarfs (Fig. 292) and the frieze of figural capitals featured foliage with occasional inhabited scrolls representing the various branches of industry and trade with which the bank was connected (Fig. 293.)

The material in the Nordiska Aktiebanken façade was soapstone, employed in thin slabs for the ashlar as well as for the delicately carved details. The smooth surface was "boasted," that is, treated with a broad,

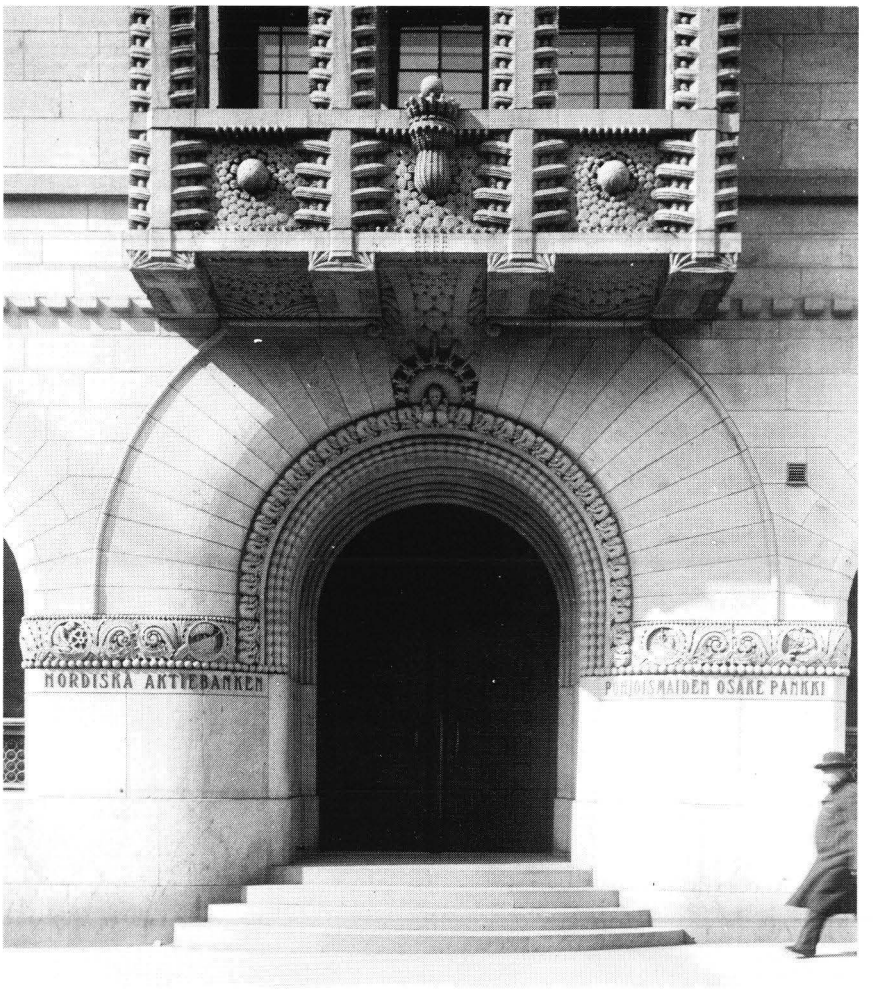
291. Gesellius-Lindgren-Saarinen, Pohjoismaiden Osakepankki-Nordiska Aktiebanken. 1903-1904. Demolished. (Photo SRM-FAM, Nils Wasastjerna)

fine-toothed chisel (''boaster''). With varying lighting, the furrowed texture adds life to the surface. The Nordiska Aktiebanken was a building in Sederholm's taste. He regarded it as ''an unsurpassed paragon, at least as far as the employment of the soapstone is concerned.''[12]

The Nordiska Aktiebanken has been considered a turning-point in the shift from National Romanticism to more restrained ideals of style. However, the issue of the material may here have been more important than has generally been admitted. Although self-assured, the Saarinen trio was not impermeable to criticism, and they must have felt reluctant to repeat the contradictory combination of soapstone and rock face once again.

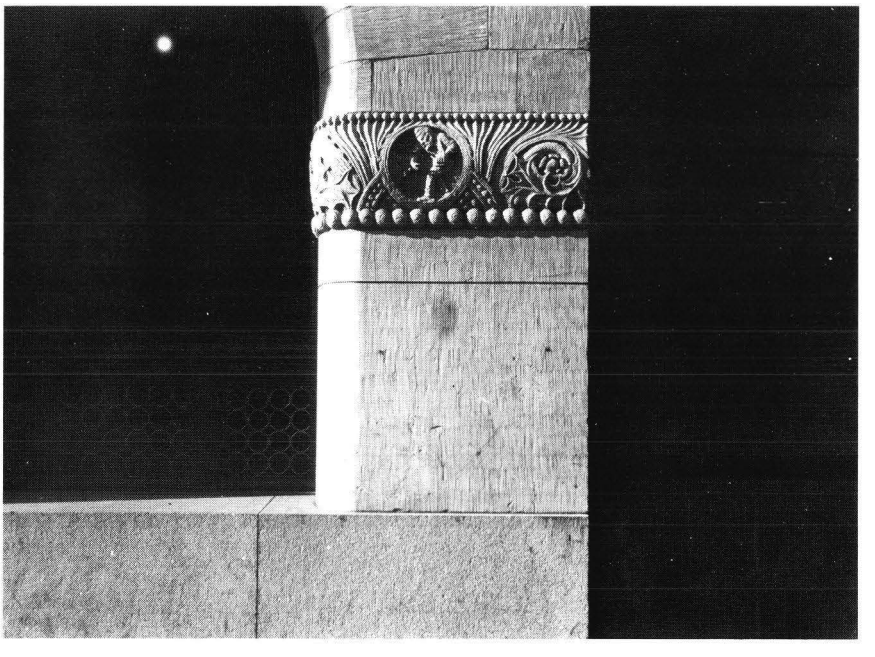
The same issue became topical in the same year as the Nordiska Aktiebanken was completed. In the spring of 1904 the results of the competition for the Helsinki Railway Station were announced, and in the ensuing discussion the winning project by Eliel Saarinen was criticized for its stale romanticism. One of the most vehement critics, the anonymous writer using the signature N-n, attacked the Saarinen design and in general the National Romantic movement for disregarding the most elementary laws of statics and for ignoring the properties of the materials used. ''Natural stone, which is now being increasingly employed, is often maltreated in a peculiar fashion. Thus granite is used hewn in different small pieces, which are then joined together more or less satisfactorily; this despite the fact that it can be had at the same price in large, handsome blocks which can give the building a dignified and monumental appearance.'' N-n also repeated the customary objection against the treatment of the soapstone in the Pohjola building.[13]

Inspired by the competition the two advocates of



292. Gesellius-Lindgren-Saarinen, Pohjoismaiden Osakepankki-Nordiska Aktiebanken. (Photo SRM-FAM, N. Wasastjerna)

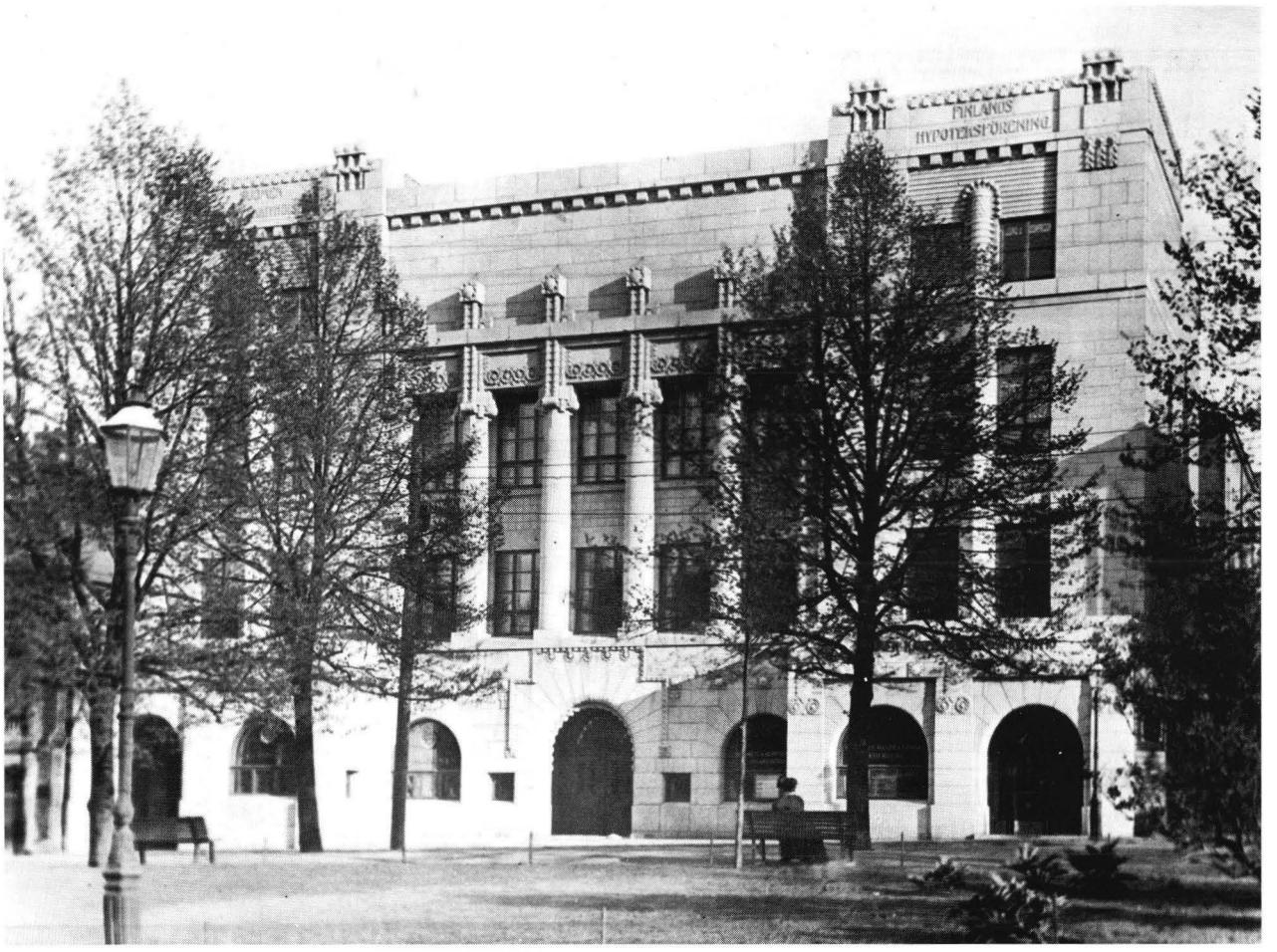
rationalism, Gustaf Strengell and Sigurd Frosterus, published an important pamphlet where they attacked the national movement and its exaggerations. The new trend had started from a rationalist base by proclaiming TRUTH as the fundamental principle, but then lapsed into complete arbitrariness. The forms of the Pohjola building might be regarded as a joke, but the two critics questioned the notion of ''making jokes in a



293. Gesellius-Lindgren-Saarinen, Pohjoismaiden Osakepankki-Nordiska Aktiebanken, capital. (Photo SRM-FAM, N. Wasastjerna)

294. Eliel Saarinen, Helsinki Railway Station. 1904-1916. (Photo HKM-HSM C. Grünberg).

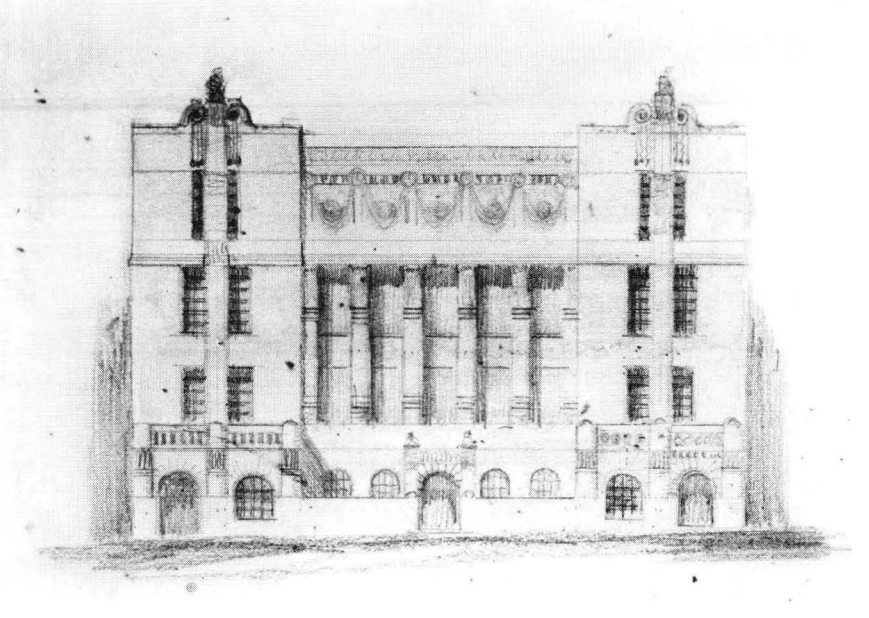
295. Eliel Saarinen, Helsinki Railway Station. (Photo SR)



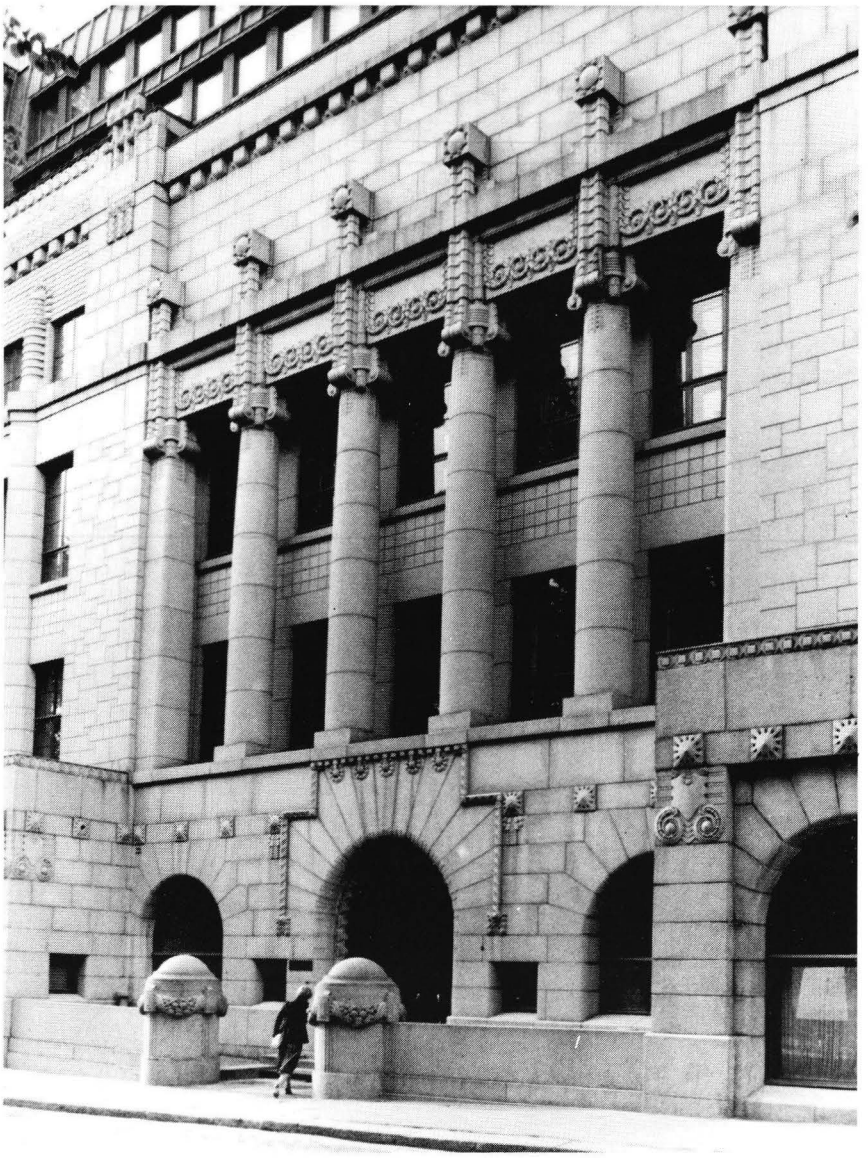
296. Lars Sonck, The Finnish Mortgage Society Building, Helsinki. 1907-1909. (Photo Archives of Suomen Kiviteollisuus Oy, Vinkkilä)

material such as building stone!''[14] They did not question the use of stone as such, but argued for a contemporary approach to this traditional material. From the purely geological point of view stone remains the same as it was, but applied science has given us new methods of utilizing it. The two rationalists even allowed themselves a temporary relapse into national symbolism:

> And we who live in Finland have a real potential for developing something original. Out of the proud and solid granite, with its unique resistan-



297. Lars Sonck, Sketch for the Finnish Mortgage Society Building. 1907. Suomen Hypoteekkiyhdistys-Hypoteksföreningen i Finland, Helsinki. (Photo SR)



298. Lars Sonck, The Finnish Mortgage Society Building. (Photo SR)

> ce, it would be possible to call forth an assured and deliberate architecture, airy and light, bold and vigorous. But where is anything of this to be seen? Where, indeed? Heavy blocks of stone, heaped one upon another, dead material; slumbering powers which will never be awakened; a mismanagement and a misunderstanding of the nature of stone which can no longer be dismissed as thoughtlessness, since we do possess a science; with strenuous work we have attained our command of nature.[15]

As finally completed in 1916, Eliel Saarinen's Railway Station (Fig. 294, 295) presents a much more restrained appearance than the original competition entry of 1904. The textural effect of the first conception parallelled that of the final working drawings for the National Museum (Fig. 196), but in the end the station facades were clad with red Hanko (Hangö) granite with dressed surfaces. The contract with Ab Granit was signed on October 7, 1912, and stipulated delivery before August 1, 1914.[16]

By 1907 the reorientation of the leading Finnish architects was complete. Eliel Saarinen's winning entry for the Parliament House in Helsinki (1908) envisioned a coolly geometrical Babel tower with smooth granite surfaces.[17] In the same year Lars Sonck designed the main building for the Finnish Mortgage Society (Fig. 296-298). One of his sketches for this project (Fig. 297) shows that Sonck now created in terms of planes and ornamental accents, not stone textures. For the façade tenders were submitted by Ab Granit and Finska Stenindustri.[18] The latter firm received the contract which was carried out in the new stone working plant which it had established in the capital. According to a contemporary account ''the hard granite was here treated in a manner which had earlier been restricted to 'soft'

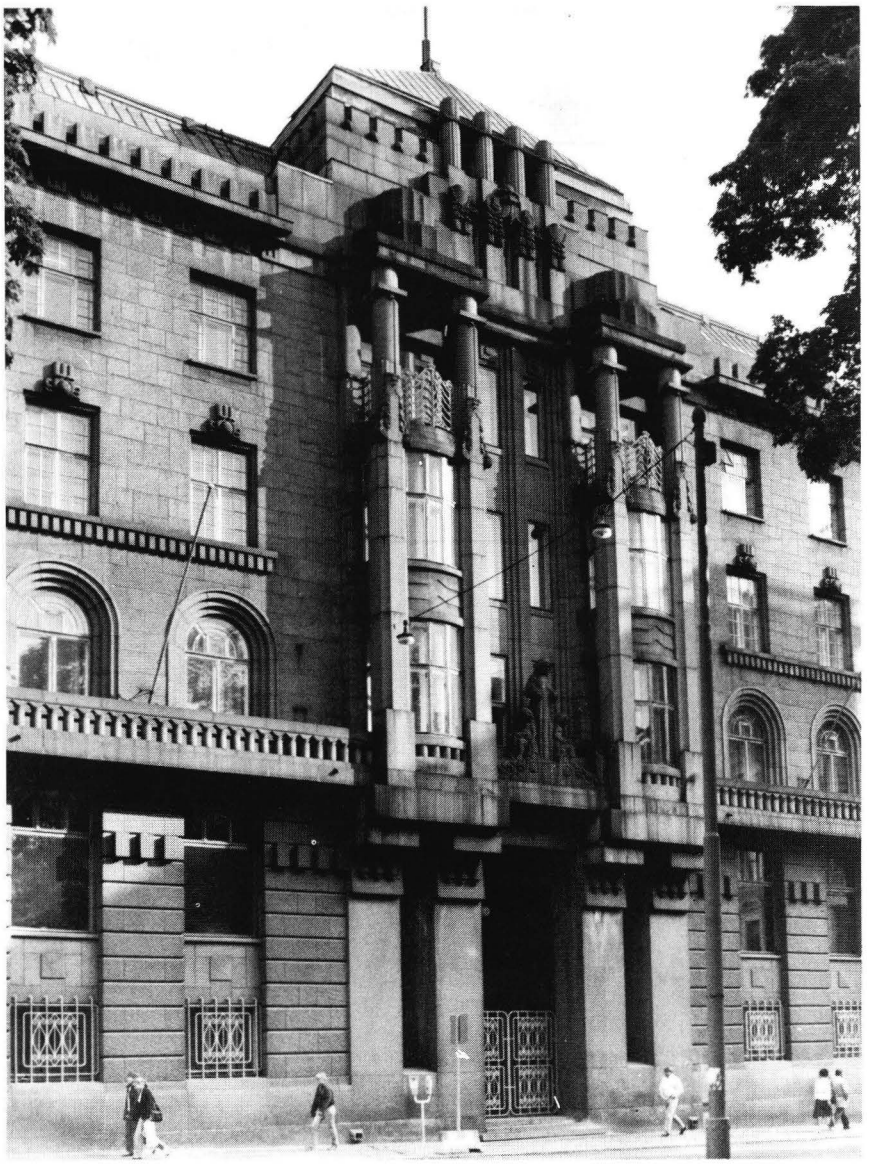
299. Lars Sonck, The Stock Exchange, Helsinki. 1910-1911 (Photo SR)

stones."[19] Sigurd Frosterus — who together with Gustaf Strengell had advocated a contemporary approach to stone — reviewed the Mortgage Society Building in *Arkitekten*.

> In a certain respect it marks an epoch in our modern architecture: the material is throughout treated in a manner which matches the working of modern machinery better than does the rustic rubble wall and the rough granite blocks which, in lesser or greater quantity, adorn some 80 per cent of the new buildings of this city.[20]

Frosterus praised Sonck for his treatment of the ornaments which "give the wall the character of complete homogenity, in which the individual stones vanish like the threads in the fabric." He concluded his review (which dealt exclusively with the façade of the building) by saying that "it is a delight to see Finnish granite treated with such understanding, both by the architect and by the stone contractor." What Frosterus did not notice, or preferred to ignore, was the distinctly Spanish elements of Sonck's entrance composition (cf. Fig. 90 and 91 above); yet it was such borrowings that he had thundered against in his pamphlet of 1904.[21] The Mortgage Society soon received a pendant with even more severely geometrical forms in the Helsinki Stock Exchange (1910-1911; Fig. 299). The granite was here reduced to a thin coating, and it was even expressly stipulated in the contract that "the thickness of the material is to be kept at a minumum," or 12-25 cm.[22]

In 1909 the Suomi Insurance Company arranged an invited competition for the façade of its new main building the plans of which had been commissioned from Onni Tarjanne. Apart from Tarjanne himself, Sonck, Saarinen and Lindgren submitted entries. The project by Armas Lindgren was preferred by the jury.



300. Armas Lindgren, The Suomi Insurance Company, Lönnrotinkatu 5, Helsinki. 1909-1911. (Photo SR).

In the massive façade of red Kökar granite (Fig. 300) there is little left of Lindgren's picturesque employment of the material which still marked the exterior of the National Museum, a project which he had concluded a little earlier.[23] A little later, other former stone romantics sobered to a similarly restrained mode of expression. Onni Tarjanne was not only the architect of the paradigmatic National Theatre; as an influential member of numerous competition juries he had also favoured the national movement's picturesque use of materials. By 1910 we find him designing austerely regular and symmetrical façades for commercial buildings where the textural gamut of the granite varied between smooth-dressed and lightly picked (Fig. 301).

The master of the Poli, Otava and the Workers' Association, Karl Lindahl, completed his reorientation in the building of the Suomi Insurance Company in 1910-1912 (Fig. 302). Birger Brunila, an architect and critic who had criticized the national excesses in the 1905 debate, was relieved to see, for once, "an unbroken, classical cornice, a rare sight in more recent architecture in our capital." But he noted that Lindahl had gone to the opposite extreme. With their smooth-dressed surfaces, Brunila wrote, the façades appear too indifferently even and somewhat sharp in their colour. As a result, they look as if they had been "cut out mechanically from a smooth slab, instead of being formed and modelled in depth of separate blocks."[24] In fact, the impression described by Brunila was the result of the genesis of the façade composition. The Suomi Company had commissioned sketches from both Lindahl and his former partner Valter Thomé. Lars Sonck and another architect, Oscar Bomanson were asked to evaluate the projects, and on the basis of their report the Suomi Company decided to give Lindahl the commission. Lindahl's project was intended to have only the ground floor arcade of stone, but on the suggestion of Bomanson stone was employed throughout,

301. Onni Tarjanne, The Salama Insurance Company, Aleksanterinkatu 15, Helsinki. 1911. (Photo SR)

since "the site is so demanding and located in the busiest part of Helsinki."[25] In earlier projects the architect had made changes in the façade material (cf. Fig. 208 and 209). But in this case he seems to have regarded plaster and smooth stone as simply interchangeable, without any need on his part to account for the change in terms of either textural effects or architectonic articulation. The parallel with what was taking place elsewhere is striking; in this way Thor Thorén in Stockholm just replaced plaster with smooth stone in his Bankaktiebolaget Södra Sverige (Fig. 288).

*

The growing indifference to the textural effect of stone signalled the end of the epoch which has been sketched on the preceding pages. The stone firms could no longer rely upon a steady flow of contracts. Some had to reduce their production, others ceased activity altogether.[26] In a wider perspective, the end of the stone movement also reflects a change in basic attitudes to architecture. The preoccupation with *façades* was inherited from the nineteenth century. But as other aspects of the architectural environment began to attract increasing attention, the primacy of the façade became a thing of the past, except in monumental projects with strong national and political connotations — where, indeed, stone has retained its age-old position to this very day.

302. Karl Lindahl, The Suomi Insurance Company, E. Esplanadi 2, Helsinki. 1910-1912. (Photo SRM-FAM)

ABBREVIATIONS

ÅAK = Åbo Akademi, Konsthistoriska institutionen (Art History Department)
ÅAKop = Åbo Akademis kopieringscentral
ÅAB/H = Åbo Akademis Bibliotek, Handskriftsavdelningen
AB = *Allgemeine Bauzeitung*
ATA = Antikvarisk-topografiska arkivet, Riksantikvarieämbetet, Stockholm
DBZ = *Deutsche Bauzeitung*
GFF = *Geologiska föreningens i Stockholm Förhandlingar*
HKA = Helsingin kaupunginarkisto — Helsingfors stadsarkiv (The Helsinki Municipal Archive)
HKM-HSM = Helsingin kaupunginmuseo — Helsingfors stadsmuseum
HMA = Helsingin maistraatin arkisto — Helsingfors magistratsarkiv
HUL = Helsinki University Library
KB = Kungliga Biblioteket
KUD = Kirke- og udbildningsdepartemanget, Oslo
MV = Museovirasto — Museiverket (The National Board of Antiquities)
NAM = Norges Arkitekturmuseum
NGU = Norges geologiske undersøgelse
NKL = *Norsk Kunstner leksikon*
NMa = Nationalmuseum, Stockholm, Arkivet
NTT = *Norsk Teknisk Tidsskrift*
ÖIÄ = Överintendentsämbetet
Oslo Bk = Bygningskontrollens arkiv, Oslo
PT = *Polyteknisk Tidsskrift*
RA = Riksarkivet, Stockholm (The Swedish State Archive)
RakH = Rakennushallitus — Byggnadsstyrelsen
SAM = Sveriges Arkitekturmuseum
SB = Stockholms byggnadsnämnd, Tekniska nämndhuset
SGU = *Sveriges Geologiska Undersökning*
SR = Sixten Ringbom
SRM-FAM = Suomen rakennustaiteen museo — Finlands arkitekturmuseum
SSA = Stockholms stadsarkiv
SSM = Stockholms stadsmuseum
ST = *Suomen Teollisuuslehti*
TBI = *Tidskrift för byggnadskonst och ingeniörvetenskap*
TFF = *Tekniska Föreningens i Finland förhandlingar*
TPB = *Tidskrift för praktisk byggnadskonst och mekanik*
TT = *Teknisk Tidskrift*
TTa = *Teknisk Tidskrift, Allmän afd.*
TTb = *Teknisk Tidskrift, Afd. för Byggnadskonst*
TTk = *Teknisk Tidskrift, Afd. för Kemi och bergsvetenskap*
TU = *Teknisk Ugeblad*
TUa = *Teknisk Ugeblads Arkitektafdeling*
TUh = *Teknisk Ugeblads Hovedafdeling*
VA = Valtionarkisto — Riksarkivet (The Finnish National Archive)

NOTES AND REFERENCES

1. Introduction

1. Frosterus 1909. In 1907 the editor of the Finnish *Arkitekten,* W. Wilenius, protested against the habit of judging architecture merely in terms of facades. "An elevation without plans is like a shell without a kernel," he wrote (Wilenius 1907, p. 116).
2. See e.g. Mårtelius on Clason's travels 1883-1886 (Mårtelius 1987, p. 63).
3. *Moderne Fassaden* [. .] hrsg. von A. Neumeister 1-2, 1901-1902.
4 Lund 1896a, p. 166.
5. von Rothstein 1856, 1875, 1890. I thank Bo Grandien for this reference.
6. *Handbuch der Architektur,* 1883, 1895, 1905.
7. Cf. Bandmann 1969.
8. Kroeber 1940.
9. Kroeber 1940, p. 1.
10. Kroeber 1940, p. 2.

2. Ideological Roots

1. For Lodoli, see Kaufmann 1955, p. 95-99, Kruft 1985, p. 221-224. Lodoli's words were recorded by Algarotti 1779, p. 61-62.
2. Algarotti 1779, p. 62.
3. Algarotti 1779, p. 62-63.
4. Memmo 1833-1834, p. 163. Cf. Germann 1980, p. 213-214.
5. Algarotti's "Saggio" was printed and reprinted from the 1750's onwards. Memmo's *Elementi* appeared in 1786, and saw a second edition in 1833-1834, which was reprinted in 1835.
6. Durand, I, 1823, p. 52.
7. Pugin 1841, p. 1-2.
8. Pugin 1841, p. 2.
9. Pugin 1841, p. 53.
10. Pugin 1841, p. 65-66, cf. p. 34, 53.
11. Pugin 1841, p. 19. For "the rubble work" etc., *ibid.* p. 53.
12. Ruskin 1883, p. 34.
13. Ruskin 1883, p. 35-36.
14. Ruskin 1883, p. 46.
15. Ruskin 1883, p. 48-49.
16. Ruskin 1883, p. 49-51.
17. Ruskin 1883, p. 51.
18. Ruskin, "To what properties in nature it is owing that the stones in buildings, formed originally of the frailest materials, gradually become indurated by exposure to the athmosphere and by age, and stand the wears and the tear of time and wheather every bit as well, in some instances much better, than the hardest and most compact limestones and granite?", *The Magazine of Natural History and Journal of Zoology*, vol. 9, 1836, p. 488-490, reprinted in Ruskin 1903, p. 197-200. For Ruskin's interest in geology and mineralogy, see *ibid.* p. xxv. Two chapters of Ruskin's *Val d'Arno* were devoted to marble, see Ruskin 1906, ch. vi-vii.
19. Pevsner 1969, p. 9-10.
20. Ruskin 1883, p. 82.
21. Ruskin 1883, p. 82-83.
22. Ruskin 1883, p. 83-84.
23. Ruskin 1883, p. 56 and note 20.
24. Ruskin 1883, p. 52.
25. Ruskin 1904:X, p. 98.
26. Street 1855, p. 287.
27. Street 1855, p. 284.
28. Street 1865; for Clason see Edestrand & Lundberg 1968, note 12, p. 28.
29. Pugin 1841, p. 6
30. Boult 1853a.
31. Boult 1853b.
32. Hempel 1956, p. 14.
33. Peschken 1968, p. 53-54.
34. See Hamran 1960 and 1981.
35. Holst 1852, p. 64-65.
36. According to Riiber 1893, p. 34.
37. Hübsch 1828, p. 2, 6-7, 13, 19-20, 23.
38. Döhmer 1973, p. 26-31.
39. Wolff 1846, p. 361.
40. Wolff 1846, p. 366.
41. Reichensperger later wrote a book on Pugin (Reichensperger 1877); cf. Pevsner 1972, p. 120-121.
42. Reichensperger 1845, p. 18-19.
43. Reichensperger 1845, p. 35.
44. Reichensperger 1845, p. 49.
45. Wiegmann 1846.
46. Semper 1883, p. 219; cf. Kruft 1985, p. 356.
47. Semper 1883, p. 220.
48. Semper 1883, p. 270-271. Semper (1852, p. 18) also wrote that "the hardest stone can be cut like cheese and bread" (quoted from Pevsner 1972, p. 259).
49. Semper 1883, p. 271.
50. Semper 1849, p. 11.
51. Semper 1860-1863, 2, p. 375.
52. Semper 1860-1863, 1, paragraph 2, p. 7.
53. Semper 1883, p. 271, 279-281.
54. Semper 1860-1863, 1, p. xv. Heinz Quitsch (1962, p. 73) even thinks that "Semper dem Material eine untergeordnete Rolle in der Baukunst beimisst."
55. Semper 1883, p. 382-394, on Greek stone construction p. 394.
56. Kieslinger 1972, p. 14-16, 74-75.
57. Viollet-le-Duc 1863, I, p. 472.
58. Viollet-le-Duc 1863, I, p. 451-452.
59. Viollet-le-Duc, 1863, I, p. 464-465.
60. Viollet-le-Duc 1863, I, p. 466.
61. Viollet-le-Duc 1863, I, p. 188.
62. Stål 1834, II, p. 43, 50, note 1. Cf. Gejvall(-Seger) 1954, p. 23-24.
63. This account of Nyström's travels is based on Lundvall 1960, p. 65-123 *passim* and Marianne Nyström 1981.
64. Grandien 1974, p. 277-282.
65. Lundvall 1960, p. 102. By 1845 Nyström did in any case know Hübsch's *In welchem Style sollen wir bauen?*
66. Lundvall 1960, p. 102-103; Josephson 1922, p. 61.
67. Axel Nyström, Arkitekturstudier (MS. 1845 in the Archive of the Royal Academy of the Liberal Arts, Stockholm); see Josephson 1922, p. 61.
68. Axel Nyström, Travel report 22.12. 1845, Stockholm, SSA, Drätselkommissionens arkiv F.III nr. 308:17.
69. Nyström, Arkitekturstudier (see note 67 above).
70. As pointed out by Schiller 1931, p. 78.
71. Grandien 1979, p. 438-439.
72. Grandien 1979, p. 192.
73. Nyblom 1899, p. 166-167, cf. Grandien 1979, p. 192.
74. Scholander 1882, p. 179.
75. Nyblom 1899, p. 166-167.
76. Clason 1896a, p. 38.
77. Clason 1896a, p. 47; Schiller 1931, p. 89-96.
78. Astrup 1973, p. 42.
79. "Wilhelm v. Hanno," (obituary) *PT* 1882, p. 212.
80. See in particular von Achen 1983, p. 201-202; Tschudi-Madsen 1981, p. 16-17.
81. Aars 1927, p. 265-266.
82. "Egte bygningsmaterialier," *TU* 1883, p. 115-116.
83. *TU* 1884, p. 8, p. 42; also p. 124.
84. "Protokoll förda vid andra teknologmötet... 1886," *TT* 1887, p. 122.
85. A.H. Hörlin, in "Protokoll ...", *TT* 1887, p. 124-125.
86. Ferdinand Boberg, in: "Protokoll...", 1887, p. 141.
87. "Protokoll..." *TT* 1887, p. 138-139.

88. I.G.Clason to "Fackafdelningen för husbyggnadskonst," on 8 October 1894, *TTa* 1894, p. 231-232.
89. Ahrenberg 1897/1898, p. 10.
90. Lindgren 1891, p. 157-161; cf. Ruskin 1883, p. 54.
91. Lodoli, as quoted by Algarotti 1779, p. 58.
92. Schinkel as quoted by Pevsner 1972, p. 63.
93. Collins 1965, chapter 13 and p. 133.
94. Hope, Donaldson as quoted by Pevsner 1969, p. 75, 82.
95. Ruskin 1883, p. 202.
96. Semper 1869, p. 31. The demand for a new Style was also rejected by texbook authors such as Wilhelm Lübke (1871, p. 615, 1875, p. 828).
97. Quoted after Döhmer 1973, p. 40.
98. At one stage Ruskin had even speculated on "a new system of architectural laws [...] adapted entirely to metallic construction" (Ruskin 1883, p. 39). For Semper's categorical rejection of iron, see Semper 1860-1863, 2, p. 550.
99. Pevsner 1969.
100. Boult 1853b, p. 152-153.
101. Tarbuck 1855, p. 74-75; Swedish translation 1859, p. 184- 185.
102. Tarbuck 1855, p. 79, 1859, p. 185.
103. "Holländska renaissance-stilen," *TBI* 1864, p. 1-3. The article closed with the conclusion that in actual practice the architect will have to resort to earlier styles such as the Dutch Renaissance.
104. Collins 1965, p. 128. Also Döhmer (1973, p. 41 with note 238) who noted a significant decrease in the number of articles dealing with this issue after ca 1851.
105. von Falke 1891.
106. Lindgren 1892, p. 206-207, 208.
107. Forsberg 1902, p. 95, 97-98. For the role of the concept in Swedish discussions around 1900, see Johnsson 1970.
108. Jung 1901a.
109. Jung 1903 p. 93-94.

3. Stone Trade, Geology and Architecture
Sweden

1. E.g. Tilas 1742, p. 199-201, Tilas 1748.
2. [Cronstedt] 1781, p. 272,277,283-284
3. Polhem 1760
4. Cronstedt 1761.
5. *Kongl. Maj:ts Nådiga Förordning Angående* [...] Publique Byggnader 1776, paragraph 2.
6. König 1752, p. 106
7. Cronstedt 1761, p. 202-203.
8. Stål 1834, I, p. 44-64, 218-248, 252-256.
9. Pettersson 1964, Julin 1963, p. 139-140, Hedström 1908, p. 45.
10. Krantz 1953.
11. Hedström 1908, p. 50-51, Sandberg 1942, p. 6-30.
12. Lundbohm 1900, p. 92-93, Hedström 1908, p. 60.
13. Hofrén 1956, p. 643, cf. Hedström 1908, p. 53, 61. In 1892 Kessel & Röhl published an illustrated book describing its works and products (see *DBZ* 29, 1895, p. 168), but I have not been able to trace this publication.
14. Hedström 1908, p. 6-7.
15. Hedström 1908, p. 7, also Svedmark 1900, Svedmark 1902.
16. See *TTb* 1896, p. 24. The exhibits of the SGU seem to have been on view in the Naturhistoriska Riksmuseet and not in the exhibition building, since the official catalogue lists only the products of the stone firms; see *Allmänna industri-utställningen i Stockholm 1866, Officiel Katalog*, Stockholm 1866, *Supplement till officiela katalogen*, Stockholm 1866, and *Expositionstidningen* 26.6. and following, 1866, under "Daglig vägvisare".
17. Andersson 1900; cf. Holmström 1901.
18. See *GFF* 29, 1907, p. 207-209; *Förhandlingarne vid Tekniska Samfundets i Göteborg Allmänna möte 1891*, Göteborg 1892, p. 111-112; *Svensk biografiskt lexikon*, 9, Stockholm 1931, p. 236-243. In 1897 Cronqvist gave a talk on the conservation of natural stone in the Building Section of the Swedish Technical Society (see *TTa* 1897, p. 105).
19. Hoffstedt 1871, p. 74.
20. Hoffstedt 1871, p. 90-93.
21. af Kleen 1863, p. 53. In 1865 a writer in *TBI* claimed that the Swedish machines at Borghamn and Hällekis "are scarcely, if at all inferior to those used in England," see [A.W. Edelsvärd?] "Om senare tiders arkitektur i England," *TBI* 1865, p. 30.
22. Lundbohm 1888, p. 6.
23. Lundbohm, Rapport afgifven till Chefen för Sverges Geologiska Undersökning om en under år 1879 påbörjad geologisk undersökning af Sverges Stenbrott och stenhuggerier, 1879, MS E IV 2 c 68 in SGU, Uppsala.
24. Hoffstedt 1877, p. 230-232.
25. "Meddelanden från Byggnadssamfundet," *TT* 1878, p. 79-80.
26. "Meddelanden från verldsutställningen i Paris 1878, 4. Stenbearbetningsmaskiner af Brunton & Trier," *TT* 1878, p. 232-233. In 1879 Lundbohm reported that C.A. Kullgrens Enka already used Brunton & Trier machinery for the manufacture of columns, see Lundbohm, Rapport 1879.
27. *TT* 1881, p. 144.
28. Julin 1963, p. 71-72.
29. Julin 1963, p. 145.
30. Clason 1896a, p. 47.
31. Julin 1963, p. 147.
32. KB, Autografsamlingen, Hj. Lundbohm-A.W. Kjellström 8.12. 1886, 30.1. 1887.
33. Kåring 1983, p. 26.
34. *TT* 1887, p. 126.
35. "Protokoll förda vid andra teknologmötet i Stockholm [...] 1886," *TT* 1887, p. 45.
36. *Förhandlingarne vid Tekniska Samfundets i Göteborg Allmänna möte* [...] 1891, p. 111.

3. Stone Trade . . .
Lundbohm

1. For Lundbohm's personality, career and writings, see Geijer 1927, Åström 1965, Corin 1949, Sveriges Geologiska Undersöknings chefer och tjänstemän, Biografiska och bibliografiska uppgifter insamlade och ordnade av Edvard Erdman, MS in SGU, Uppsala.
2. Lundbohm, Rapport 1879 (MS E IV 2 c 68, SGU, Uppsala).
3. Lundbohm, Rapport 1879.
4. In the archive of SGU, Uppsala, *s.v.* Lundbohm, H.
5. SGU, Uppsala, MS. E IV 2 c 12:1887/1-6.
6. *TT* 1884, p. 64.
7. The group has been dealt with by Göran Kåring in two publications; for Lundbohm see Kåring 1982, p. 24-27 and 1983, p. 26.
8. E.g. Lundbohm 1884, 1886, 1894, 1895, 1900.
9. Lundbohm 1889a, 1889b, 1889c.
10. Lundbohm 1891b, cf. 1891a.
11. Lundbohm 1893.
12. Day 1894, p. 578-579.
13. *The Builder*, December 29, 1894, p. 470.
14. *Förhandlingarne vid Tekniska Samfundets i Göteborg Allmänna möte* [...] 1891, p. 109-111.
15. G.Lindgren 1894, p. 17.
16. *TTa* 14.1.1893, no 2, p.2. On rubble, see *TTa* 15.4.1893 no. 15, p. 1-2.
17. Lundbohm 1896, p. 21.

3. Stone Trade . . .
Norway

1. For a survey of the early marble industry, see Vogt 1897, p. 104-11, 299-302, 328-33.
2. Vogt 1897, p. 330-332.
3. Riiber 1893, esp. p. 26-43. Madsen 1892, p. 143-144.
4. Vogt 1886, p. 31.
5. *Norsk biografisk leksikon*, 7, 1936, p. 367-371.
6. [Kjerulf] 1858, p.50.
7. "Egte bygningsmaterialier," *TU* 1883, p. 115.
8. See *Norsk biografisk leksikon*; for Reusch: vol. 11, p. 400-403, Brøgger vol. 2, p. 288-314, Vogt vol. 18, p. 143-145.
9. Vogt 1886.
10. Reusch 1890.
11. Madsen 1892, p. 133-134.

12. Thrap-Meyer 1893, p. 190. In the original, Thrap-Meyer's pun reads: "Der er noget ærefrygtindgydende ved ordet granit, det er unægtelig, men igjennem lang omgang er min følelse gået over i ærefrygt minus ære."
13. Reusch 1894a.
14. Thrap-Meyer 1894a, p. 104.
15. Reusch 1894b.
16. Thrap-Meyer 1894b. in the same issue Thrap-Meyer urged that Norwegian marble, which was now becoming fashionable, should also be investigated so that undesired effects might be avoided. The "paper warfare" between Reusch and Thrap-Meyer was reported by a correspondent of the *The Builder*, April 22, 1894, p. 314.
17. The proceedings were summarized in two issues of the *TU*, "Om huggen stens anvendelse i vor husbygningskunst," *TU* 1896, p. 34-35, and "Foreningsefterretniger: Huggen stens anvendelse i vor husbygningskunst," *TU* 1896, p. 41-43.
18. "Foreningsefterretninger [...] 1896," *TU* 1896, p. 43.
19. Brøgger 1896, p. 95.
20. Brøgger 1896. Soapstone had been discussed by Amund Helland in a monograph of 1893 (*NGU* 10). Cf. later: Dahl 1898.
21. Lund 1896a. Earlier the same year Lund had published an article on the technical testing of natural stone (Lund 1896b).
22. Thrap-Meyer 1900, p. 95.
23. Thrap-Meyer 1900, p. 126. The material is ground and polished Furuli dolomitic marble with some portions of Løvgafl marble; see Vogt 1897, p. 126.
24. Hofstad 1901. Hofstad had apparently received the idea from Finland, where a committee appointed by the Architects' Club had proposed standard sizes for rubble in March 1900, see below.
25. Bugge 1901.
26. "Foreningsefterretninger [...] 1904," *TU* 1904, p. 154.
27. "Anvendelse [... 1904], *TU* 1904, p. 571-582.
28. Olsen 1898, p. 74.

3. Stone Trade . . . Finland

1. Dahlström 1927.
2. Alopaeus 1787, p. 18; also p. 13-17, 27-28.
3. Alopaeus 1787.
4. Hirn 1963, p. 17, with refs. p. 263-264.
5. Hirn 1963, p. 17-19.
6. de Montferrand 1836, p. ii.
7. de Montferrand 1836, p. 2.
8. Topelius 1875, p. 79-82.
9. Sederholm 1898, p. 11.
10. Sederholm 1898, p. 11; Raunio 1965. In 1872 a British author wrote: "The use of granite for architectural purpose is splendidly illustrated in the city of St.Petersburg, to which it is brought from Finland. Here, not only the Imperial palaces and public buildings are constructed with this material, but even ordinary dwellings are partially or entirely built of it; so that St.Petersburg may be considered a city of granite" (Hull 1872, p. 50).
11. *Teknologen* 1847, p. 296. For the competition from continental firms, cf. Tammelander 1889, p. 242.
12. *Ruskeala, Ruskealan pitäjän muistokirja*, 2. painos, Joensuu 1966, p. 78-79.
13. Karsten 1936, p. 9-26.
14. ÅAB/H, Ab Granits arkiv 455, Bolagsstämma 19.3.1887, Allig.A.
15. ÅAB/H, Ab Granits arkiv 455: Direktionens berättelse 1890, Bolagsstämma 30.4.1891.
16. [Stenbäck] 1885a.
17. E.g. N-a 1886, Sellergren 1886, Tammelander 1889.
18. Tammelander 1892; MS version dated 1891 (HUL, Yliopiston mineralogis-geologisen laitoksen kokoelma, V, Varia II).
19. Helsinki VA, Senate archives, Board of Industry, letters from the Geological Commission Ed 2 1889-1891: K.Adolf Moberg - Industristyrelsen 17.5. 1890. The rejoinder concerned the Tammelander application, where the same charge was made (Board of industry, letters from private persons Eh 8, 1890).
20. Sederholm 1896, p. 3-4.
21. Sederholm 1892.
22. E.g. in 1894 by Axel Tigerstedt, a geologist and official of the Board of Industry.
23. Sederholm 1896; "Expositionen i Riddarhussalen [...]," *Teknikern* 1896, p. 98.
24. Letter Hjalmar Lundbohm - J.J. Sederholm 24.7. 1896, ÅAB/H, J.J. Sederholms samling.
25. Sederholm 1898. The Finnish Technical Society had been founded in 1880, and the Architects' Club (Arkitektklubben) in 1892.
26. "Tekniska föreningens klubbmöten 1898, fackklubben för arkitektur, [...], Mötet den 23 mars," *TFF* 1898, p. 27.
27. Sederholm 1898, p. 5. For the Åland granite, see Frosterus 1896. The soapstone of Juuka in eastern Finland was discussed by Frosterus (Frosterus 1899).
28. Sederholm 1898, p. 5; letter Blankett - Sederholm 7.8. 1895, ÅAB/H, J.J. Sederholms samling.
29. Blankett - Sederholm 1.2.1896, ÅAB/H, J.J, Sederholms samling.
30. Blankett - Sederholm 1.2. 1896.
31. Blankett - Sederholm 22.3. 1896.
32. Blankett - Sederholm 14.5. 1896.
33. Blankett - Sederholm 5.9. 1896.
34. Blankett - Sederholm 10.11. 1896; 6.2, 16.4, 10.5, 7.6, 10.9, 9.10, 10.11, 18.11, 27.11, and 4.12. 1897.
35. Ringbom 1978, p. 215 with further refs.; K.Senatens resolution 23.3. 1900, Archive of the Suomen Kiviteollisuus Oy, Vinkkilä. Also *Teknikern* 1900, p. 59; *Finska Stenindustri Ab*, no 4, Helsingfors 1910. In fact, Blankett took over an earlier quarrying right that had been granted in April 1896 on the island of Haidus outside Uusikaupunki (Nystad), see Kaukovalta 1943, p. 275.
36. Ahrenberg 1893
37. Ahrenberg 1897/1898, p. 14.
38. See the application to the Senate, January 13, 1899, in: *Museifrågans officiella handlingar*, Helsingfors 1900, p. 4-5.
39. Lindberg 1899a; also *Teknikern* 1899, p. 126.
40. *TFF* 1899, p. 159.
41. Helsinki VA, The Board of Industry (Teollisuushallitus - Industristyrelsen) Bg5 Förteckning öfver industriella verk anlagda under år 1899. I have not been able to verify the founding year 1893 given by Kotivuori 1981, p. 5.
42. Kotivuori 1981, p. 5.
43. Sederholm 1905, p. 56.
44. Kotivuori 1981, p. 6.
45. Frosterus 1903, p. 12.
46. "Arkitektklubbens möte den 10 mars," *Teknikern* 1900, p. 59.
47. "Arkitektklubbens sammanträde," *Arkitekten* 1905, p. 16.
48. Sederholm 1905.
49. Sederholm 1911.
50. Sparre 1909, p. 131.

4. Materials and National Expression

1. Kruft 1985, p. 334-336.
2. Stier 1843, p. 315.
3. Wolff 1846, p. 359-360.
4. Ross 1850, p. 8-9.
5. Hausmann 1858, p. 54.
6. Lundbohm in: *Förhandlingarne vid Tekniska Samfundets* [...] 1891, p. 109.
7. Clason in: *Förhandlingarne 1891*, p. 11!.
8. Boberg in: "Protokoll, förda vid andra teknologmötet i Stockholm [...] 1886," *TT* 1887, p. 140-142.
9. Kjellström in: "Protokoll [...] 1886," p. 142-143.
10. Edestrand & Lundberg 1968, p. 22. By this time Clason's main concern was the development of a quality of brick suitable for facades. For a recent, instructive discussion of Clason and Spain, see Knutsson 1984.
11. Clason 1891, p. 155-156.
12. Clason 1896a, p. 36, 48.
13. Östberg 1901, p. 5-8.
14. Palm 1954, p. 62, 78 (quotations).
15. Clason 1893, p. 5.
16. As pointed out by Bedoire 1974, p. 53.
17. H.M. Schirmer 1886, p. 408.

18. *NTT* 1889, p. 94-95, quotations p. 95.
19. "Foreningsefterretninger: Huggen stens anvendelse i vor husbygningskunst," *TU* 1896, p. 43.
20. H.M. Schirmer 1896, p. 270. Schirmer made use of a saying, which is difficult to translate into English: "en stil der ikke er kun i klaederne båret, men af kjödet skåret."
21. Sinding-Larsen 1896, p. 397.
22. Sparre 1900, p. 70-71.
23. Thrap-Meyer 1900, p. 96.
24. Thrap-Meyer 1900, p. 124.
25. Thrap-Meyer 1900, p. 125.
26. Jørgen Berner in: *TU* 1901, p. 34. A member of the older generation, disguising himself behind the signature "C", protested weakly against Berner's view: why was not acknowledgement given to the work accomplished before the founding of the Y.A.F.? See C[pseud.] 1901.
27. Bugge 1901, p. 134.
28. Sparre 1901, p. 616-617.
29. Joh. Meyer 1902, see also *TU* 1901, p. 645-647.
30. "Regjeringsbygningen," *TU* 1902, p. 138.
31. "Regjeringsbygningen i Kristiania," *TUa* 1908, p. 28.
32. Sparre 1907, p. 85
33. Bugge 1901, p. 133.
34. Topelius 1875, p. 79. For an important discussion on the search for a national style in Finland, see Tuomi 1979.
35. Langbehn 1890, p. 207. I am indebted to professor Teddy Brunius for calling my attention to this passage; see now Brunius 1986.
36. Langbehn 1890, p. 207.
37. Plagemann 1972, p. 231, 238.
38. A. Nyström 1897, p. 156.
39. A. Nyström 1897, p. 159.
40. [Signature] X, "Vår hufvudstads moderna arkitektur," Hufvudstadsbladet 22.10.1897.
41. Lindberg 1899a, p. 155.
42. Strengell 1903, p. 636.
43. Wasastjerna 1900.
44. S. Frosterus 1906, p. 23.

5. Scottish, English and American Models

1. Hoffstedt 1871, p. 74.
2. For Souttar's activity in Sweden 1863-1866, see von Aikay 1981, p. 81. As the English Church was nearing completion, a writer in *TBI* recommended the English practice of walling churches with greystone or sandstone as worth adopting in Sweden, too (p. 27). In general he praised the extensive use of natural stone in England, "in which we are lagging too far behind" (p. 30). See "Om senare tiders arkitektur i England," *TBI* 1865, p. 25-31.
3. "The new English church in Stockholm is a very fine example in recent times, showing the employment of this sandstone [Roslagssandsten] on a large scale" (*The Exhibition of the Geological Survey of Sweden at the Exhibition in Philadelphia 1876*, p. 53). Another article in *TBI* dealing with the English church, did not mention Roslagen stone, only Motala and Enhörna-Södertälje stone ("Engelska kyrkan i Stockholm," *TBI* 1864, p. 156). Cf. Hesselman 1952, p. 124, who lists Motala and Enhörna stone.
4. "Engelska kyrkan i Stockholm," p. 156.
5. Weilbach 1935, p. 643; Madsen 1892, p. 133.
6. Clifton-Taylor & Ireson 1983, p. 51.
7. R.F. Berg, in: "Protokoll [...] 1886", p. 142. The English Church in Copenhagen was also praised by Lundbohm 1889a, p. 39.
8. Julin 1963, p. 145.
9. Clason 1896a, p. 47 and illustration.
10. Sjöberg in: "Protokoll förda vid andra teknologmötet [...] 1886," p. 124.
11. Harris 1888, p. 68-71. This book was recommended by Sederholm 1892, p. 66, note.
12. Hull 1872, Hull refers to *Modern Painters*, iv, pt.v. ch. 8 (see Ruskin 1904:VI, p. 144).
13. Munro 1891, p. 1.
14. Lundbohm 1891b, p. 4.
15. Lundbohm 1889a, p. 5.
16. Lundbohm 1889a, p. 27-29.
17. Lundbohm 1889a, p. 31-32.
18. Lundbohm 1889a, p. 21-25. *Notes on Building Construction*, p. 44.
19. "Svenska Teknologföreningens fackafdelning för husbyggnadskonst," *TT*, 1890, p. 104-105.
20. "Fackafdelningen för byggnadskonst," *TTa*, 1893, p. 1-2.
21. Lundbohm 1891a and 1891b.
22. *American Architect and Building News*, April 5, Vol. 28, 1890, no. 745, plates.
23. Jostedt 1976, p. 89, Johnsson 1965, p. 62. As for the source material in the Castle Archive at Tjolöholm my text is based on Jostedt. In addition I have used the extensive documentation contained in the Wahlman papers in the Nationalmuseum Archive in Stockholm (which was not used by Jostedt).
24. Blanche Dickson - Lars I. Wahlman 25.4.[1899?] NMa, Wahlman Correspondence H IIIb:156b.
25. Malmberg 1910, p. 23.
26. Grafversfors Stenhuggeri och Sliperi - L.I. Wahlman 26.7.1897, MNa.
27. Blanche Dickson - L.I.Wahlman, dated "Friday" [autumn 1897; probably October/November], NMa.
28. Ernest Krüger - L.I. Wahlman, correspondence January-February 1899, especially 3.1, 11.2 and 22.2. 1899. NMa.
29. Wahlman's own term, see Jostedt 1976, p. 93.
30. Wahlman-Blanche Dickson 17.1. 1902, Tjolöholm; quoted after Johnsson 1965, p. 67 (my translation).
31. Blanche Dickson - L.I. Wahlman 6.9. 1899. NMa.
32. Blanche Dickson - L.I. Wahlman 20. 11. 1897, L.I. Wahlman - Blanche Dickson 14.10. 1904. NMa.
33. *Academy Architecture and Architectural Review*, Vol. 13, 1898[1], p. 116,117.
34. Ernst Krüger - L.I. Wahlman 17.3. 1899. NMa.
35. See note 28 above. In June 1899 Blanche Dickson wrote to Wahlman: "We would get on quickly with the house if it were not for the continued delays occasioned by Grafefors [*sic*]. The Vånevik stone comes regularly, is well worked & causes no delay. I think you will be pleased with it when you see it, & find it harmonises very well with the other stone" (original in English, c. June 1899, NMa).
36. This was, of course, well-known to those familiar with the Scottish building methods and stone trade, see e.g. Lundbohm 1891, p.6.
37. Tschudi Madsen 1981, p. 15-17, 30.
38. von Achen 1983, p. 206. H.J. Sparre (1900, p. 69) reminded the most enthusiastic pro-British young men that there were no technical universities in Britain, as there were in Germany; for this reason the training of Norwegian architects in Germany had to go on until a Norwegian institution could assume this responsibility.
39. Schirmer 1886, p. 408; cf. summary of Schirmer's articles in *NTT* 1889, p. 94-96. Schirmer's role for the orientation towards England has been stressed by Aars 1927, p. 273-274.
40. "Det præmierede udkast [...] *NTT* 1893, p. 185. Ringbom 1986.
41. Sinding-Larsen 1896, p. 415-416.
42. Thrap-Meyer 1894a, p. 103.
43. See the important discussion in January 1896 ("Foreningsefterretninger [...] 1896," p. 41) and March 1904 ("Foreningsefterretninger [...] 1904," p. 154).
44. Cf. "Anvendelse af naturlig sten [...]" p. 571, with Lundbohm 1891b, p. 7.
45. Letter Hugo Blankett - J.J. Sederholm 10.11. 1896, ÅAB/B, J.J. Sederholms samling.
46. "Arkitektklubbens möte [...] 1900," p. 59.
47. A. Nyström 1897, p. 155-156.
48. See e.g. correspondence in *The Builder*, March 18, 1893, p. 217, March 25, 1893, p. 236, April 8, 1893, p. 271-272, April 15, 1893, p. 292, and report from the 12th R.I.B.A. meeting, *The Builder*, April 22, 1893, p. 303-305.
49. "The Architecture of [...] Aberdeen," p. 455 and 463.
50. Lindberg 1899c, p. 22-24, 32-33, note p. 30.
51. Lindberg 1899a, p. 159.

52. "Arkitektklubbens möte 10 mars (1900);" for the first meeting, see "Tekniska föreningens fackklubb för arkitektur [...] 1899."
53. Lindberg 1899c, p. 28, note. Lindberg had obtained the following measures in the rubble of the Royal Hospital in Edinburgh: 75×225 mm (3"×9"), 150×450 mmm (6"×18"), 225×675 mmm (9"×27"). Lindberg and Stenbäck had, it will be seen, allowed 10 mm for each brick joint. The proposal was in principle approved, but a final decision adjourned, see "Fackklubben för arkitektur [... 1901]," p. 7.
54. *Neubauten in Nordamerika*, I, pl. 23. A copy of this publication, which is in the library of the Art History Department of Åbo Akademi bears two owner's stamps: "Hugo Lindberg, Arkitekt, Helsingfors" and "Teknologföreningen, Helsingfors."
55. Eaton 1972.
56. See Hausen 1967 and 1977; Tuomi 1979.
57. Gruner 1874.
58. Lund 1896a, p. 174.
59. Ehrensvärd 1966, esp. p. 357-358.
60. Eaton 1972, p. 14.
61. Östberg 1894, p.3.
62. Östberg 1894, p. 4-5. This gave rise to a squabble about "nature" and "stylization" with G. Lindgren (1894).
63. Sederholm 1898, p. 15..
64. Ehrensvärd 1966, p. 357; Neovius 1981, p.14.
65. "'Passage Birger Jarl'," p. 54.
66. Designs for kv. Rännilen 7, 11.12. 1894, March 1896, applications 10.4. 1895, 29.1. 1896 and 10.3. 1896. Stockholm, SB.
67. The project, which comprised the rebuilding of the facade, was made for the *grosserer* C.S. Christensen; it was submitted 22.9. 1898 and the building was approved 25.2. 1901. Designs in Oslo Bk.

6. Stone and/or Brick?

1. Stüler - Nationalmusei byggnadskommitte 22.8. 1847, RA, Stockholm, Äk 438, Vol 5, no.3.
2. Stüler's explanation of 1848, quoted from Laine 1976, p. 91. Laine points out that the variety actually used must be darker than the architect originally intended.
3. Hall 1976, p. 26.
4. Stüler, Gutachten 12.11. 1849, RA, Stockholm, Äk 438, Vol. 5, no. 5.
5. Repr. Hall 1976, p. 24, 25..
6. af Kleen 1863, p. 53.
7. "Nationalmuseum i Stockholm," p. 8.
8. [Sander] 1866, p. 22, 30. For a discussion on Sander's analysis, see Laine 1976, p. 90.
9. Kjellström in: "Protokoll förda [...] 1886," p. 143.
10. Clason 1896a, p. 38.
11. Bugge 1954a, p. 341, 1954b, p. 347; Tschudi Madsen 1981, p. 24.
12. "Meddelanden från Bygnadssamfundet," *TT*, 1878, p. 30.
13. "Bygnadssamfundet (1881)," p. 144.
14. "Konstgjord sten enligt Fr. Ransome's metod," *TT* 1872, p. 229-231. The plans were submitted 9.9. 1873 (approval 10.7. 1874; 24.10. 1875), SB. The Ransome stone for Skandinaviska Kreditbanken came from Copenhagen (Rothstein 1890, p. 156).
15. Lundbohm 1888, p. 13.
16. Clason 1896a, p. 44. During the 1886 Convention F.G.A. Dahl excused the use of artificial stone: "If our domestic stones had not been so inordinately expensive, they would, of course, have been used instead" ("Protokoll [...] 1886," p. 144.)
17. Lindgren 1897, p. 200.
18. [Sandberg] 1942, p. 45.
19. Hesselman 1952, p. 134. The German designs were adapted by Magnus Isaeus.
20. Engelbrektsgatan 19, kv. Trojenborg 11; plans signed April 1883, submitted 8.5. 1883.
21. Karsten 1935, p. 14.
22. Viljo 1985, p. 111-112.
23. Selim A. Lindqvist, Elevation for Merkurius, P. Esplanadi / N. Esplanadgatan 33, signed December 1888, HKA. Cf. Ringbom 1978, p. 210, with fig. 2. In the 1890's Lindqvist also served as the works manager of Ab Granit (Karsten 1936, p. 30).
24. Viljo 1985, p. 170. "Försäkringsbolaget Kalevas hus i Helsingfors," *Teknikern* 1891, p. 147-148.
25. Ahrenberg 1893, p. 278.
26. Clason 1896a, p. 46.
27. [Bygnadssamfundet] "Vid sammanträdet den 18 mars," *TT* 1884, p. 64.
28. I.G. Clason to Kasper Salin, quoted from Edestrand & Lundberg 1968, p. 22.
29. Edestrand & Lundberg 1968, p. 26-27.
30. Clason 1891, pl. 16, 17. For the medallions, cf. the drawing Clason 1891, pl. 20.
31. Application by Evald Thavenius 8.6. 1885, SB, plans, kv. Ädelman M 17.
32. Edestrand & Lundberg 1968, p.27.
33. Edestrand & Lundberg 1968, p.25 (Edestrand); cf. p. 111 (Lundberg). For Clason's impressions of Spanish buildings, see Knutsson 1984, p. 70-73.
34. Lindström 1889, p. 130.
35. Edestrand & Lundberg 1968, p. 29-30.
36. Lundin [1887-]1890, p. 39-40.
37. Clason 1896a, p. 47.
38. As in the Adelsvärd House, Stockholm (1889-1890), where the first two storeys are clad with dark slate from the owner's estate. The wall surface is otherwise dark, roughcast plaster.
39. See Bedoire 1974, p. 207.
40. Hoffstedt 1877, p. 57; Isaeus in: "Protokoll [...] 1886," p.122.
41. For the Workers' Institute, see "Stockholms Arbetareinstituts nybyggnad," *TTb* 1894, p. 1-2; for the Gothenburg libraries, see Stackell 1986, p. 222-224.
42. Stockholm, SB, plans and applications, kv. Krabaten 2.
43. A vast block of flats by Fritz Ullrich & E. Hallquisth, Torstensonsgatan 6 was started as a building with a stone facing of the ground and first floors with plaster on the remaining levels (SB, kv. Lägret 1, application 20.11. 1894, 8.1. 1895, 9.8. 1897). In January 1898 the Building Commission found that the street façades had been entirely faced with natural stone, although this material had never been approved by the Commission (28. 1. 1898). The builder G.L. Söderman was requested to submit, without delay, a new elevation "showing that the façades are executed in natural stone" (28.2. 1898). Among the extant elevations there is no such modified version; perhaps Söderman ignored the request. — In another case (Skeppargatan 22, arch. P.J. Lindblad, versions 1892, 1898, 1899) the Building Commission complained (27.10. 1899) that they had never been notified of the builder's change of façade material, although in this case the Commission had actually been informed three months earlier (13.7. 1899). SB, kv. Valfisken 3.
44. Lundbohm 1896, p. 22-23.
45. Lundbohm 1896, p. 24.
46. J. 1895, p. 155. For an account of the history of the building, see Pedersen 1967, p. 90-92.
47. "Program for konkurransen om tegninger til justisbygning i Kristiania," *TU* 1895, p. 417-418.
48. Sparre, quoted from Tschudi Madsen 1981, p. 28. See also Pedersen 1967, p. 92-94, for the materials (grey Idefjord granite, red bricks from Ullendorf Werke, Germany)
49. Eldal 1986. I thank J.C. Eldal for putting the MS of his article at my disposal.
50. See Viljo 1985, p. 19 with further refs.
51. "Ett nytt uppslag," *Teknikern* 1893, p. 47.
52. "Lifförsäkringsbolaget 'Suomis' nya hus," *Teknikern* 1893, p. 225-226.
53. For Settergren's work with Grahn, Hedman & Wasastjerna, see Hansson 1984, p. 11-23.
54. E.g. Strengell 1903, p. 628.
55. Sederholm 1898, p. 15.

7. Through Stone Boom Historicism to "Modern Taste"

1. Forhandlingsprotokol, Forstanderskap 9.6. 1879, 22. 6. 1881, Trondhjems Sparebanks Arkiv. See also [Aagaat Daae] 1923, p. 67-68; *Throndhjems Sparebank 1823-1898*, Trondhjem 1898,

p. 16-18. Sverre Pedersen (1922, p. 34) writes that Adolf Schirmer won a competition for the building. I have been unable to find any reference to such a competition in the minutes of the Representatives.

2. See Klasen 1884, p. 496. The volume of the *Deutsche Bauzeitung* was not available to me at the time of writing. Ingrid Pedersen (1956, p. 29-30) suggests Paul Sedille's Les Magasins du Printemps as a source; however, this building dates from 1881-1882.
3. Ingrid Pedersen (1956), p. 30.
4. A. Schirmer in: "Foreningsefterretninger: Huggen stens [. . .]," *TU*, p. 41.
5. Skandia, Historiska Arkivet, Försäkringsbolaget Skandias protokoller 1.6. 1886, 30.7. 1886, 15.10. 1886, 17.11. 1886, 11.12. 1886 and 30.8. 1889. Cf. Leffler 1905, p. 211-212, 219.
6. Leffler 1905, p. 219. Anderson & Bedoire (1973, p. 70-71) mistakenly maintain that the façade is Malmön granite throughout.
7. Lundbohm as quoted by Reusch 1894b, p. 158.
8. Lundin [1887-]1890, p. 28.
9. A case in point is Göteborgs Köpmansbank with a façade of granite and cement by Karl Johansson (1891); see Anderson & Bedoire 1980, p. 132, 336.
10. Andersson & Bedoire 1980, p. 269-272.
11. "Stockholms stads Sparbanks Nybyggnad," *TTb* 1897, p. 41. In a bank building two years later (Gävle Bank 1896-1899) Johansson built the Florentine façade of granite and marble (Andersson & Bedoire 1980, p. 271, ill. p. 270).
12. Boberg in: "Protokoll . . 1886," p. 41.
13. Hesselman 1952, p. 146. Hesselman has no source documentation. The attribution is accepted by Anderson & Bedoire 1973, p. 149.
14. Stockholm SB, kv. Styckjunkaren 5, application 24.2. 1890, letter of attorney for Ernst Haegglund 11.3. 1890 by A.G. Janson.
15. For instance by I.G. Clason (1890). Johan Knutson (1984, p. 74) believes that the timber roofing the ogee arches are influenced by Spanish architecture.
16. Neovius 1981, p. 21-22.
17. Josephson 1893, p. 34; Neovius 1981, p. 21-22. Josephson lists the artists and craftsmen responsible for the figurative and decorative work.
18. Stockholm SB, kv. Milon 12, elevation January 1891, repr. Neovius 1981, fig. 17.
19. Neovius 1981, p. 24-25.
20. Östberg 1901, p. 22-23- For a similar scathing judgement, see Nordensvan 1902, p. 57-58.
21. Stockholm SB, kv. Landbyska verket 4 (formerly Aspedingens backe 50), application 23.3. 1897, specification 6.4. 1897.
22. *Hallwylska Samlingen, Grupp I*; stone materials, contractors and carvers listed in *Text*, p.222.
23. Clason 1891. Cf. Knutsson 1984, p. 70-73, 76.
24. Boberg 1898, p. 93.
25. Stockholm SB, kv. Vätan 19. Application 3.1. 1898, elevation signed B. Almqvist & I.G. Clason June 1898. For the stone, see Hedström 1908, p. 33.
26. SB, kv. Landbyska verket 3, application 17.8. 1897, elevation signed S. Kjellberg, August 1897; new elevation signed S. Kjellberg April 1898.
27. *Lunds stadsbild*, p. 169.
28. Knutsson 1984, p. 70 with fig. 2.
29. Östberg 1901, p. 17.
30. See Knutsson 1984, p. 74.
31. Clason 1896b, p. 101. Östberg (1901, p. 12) wrote lyrically: "In the von Rosen House we hear Swedish melodies from the festive eighteenth century. There is marble splendour and playful movement, and grace in every contour a la mode francaise. There is an aristocratic feeling and a courtly tone 'from the days of Gustav III.' There is old Swedish refinement and old Swedish character in everything — with the exception of the coarse marble quoins, which seem to be a thoroughly modern licence against the material."
32. Clason 1896b, p. 101.
33. Östberg 1901, p. 12.
34. The façade was delivered by C.A. Kullgrens Enka in 1903, see [Sandberg] 1942, p. 71.
35. Stockholm SB, kv. Matrosen 4 (formerly Skrafvelberget 17), application 19.4. 1892.
36. "Nybyggnad vid Birger Jarls-, Nybro- och Smålandsgatorna," *TTb* 1894, p. 71-72.
37. "Nybyggnad vid Birger Jarls [. . .]," p. 70.
38. "'Passage Birger Jarl' i Stockholm," *TTb* 1897, p. 54.
39. SB, kv. Sumpen 10, elevation no. 2139.
40. "Nybyggnad vid Stureplan," *TTb*, 1898, p. 19.
41. Hedström 1908, pl. 13.
42. SB kv. Torgvågen 7 (formerly Vinkelhaken 7), elevation. The treatment of the rubble in Drottninggatan 76 was also praised by Östberg (1901, p. 23).
43. SB kv. Styrmannen 30, application 29.6. 1897; elevations signed Hans Hallström. Anderson & Bedoire (1973, p. 190) note that the sandstone facade has "American forms."
44. In fact the doorway is even more elaborate in the elevation submitted with the application 8.5. 1900. SB, kv. Kejsaren 17.
45. Oslo Bk, Kongens gate 31, application 9.11. 1893, approved 28.10. 1895.
46. Lund 1896a, p. 166.
47. Thrap-Meyer 1900, p. 126.
48. Bøe 1981, p. 382-385.
49. The dates of the building are: plans and elevations 1896 and 1897 (elevation November 1896), approved 5.6. 1900; Oslo Bk.
50. D[ahl] 1898, p. 673.
51. Thrap-Meyer 1900, p. 126.
52. Thrap-Meyer 1900, p. 126.
53. Olso University Library, Biographical collection of newspaper clippings.
54. "Gloser til 'huggen sten'," *TU* 1900, p. 213-214.
55. See "Moderne banklokaler i Kristiania: Kristiania handelsbank," *TU* 1901, p. 98-100.
56. Olsen 1898, p. 75.
57. Oslo Bk, Stortorget 10, supplementary application by Harald Olsen, dated 26.3. 1898.
58. "Bilder fra det nyere Kristianias arkitektur, " *TU* 1900, p. 488.
59. Oslo Bk, Kongens gate 8, application 25.4. 1898, approved 10.7. 1900.
60. "Billeder fra det nyere [. . .]," p. 488.
61. [Pseud.] F_1, 1896. In 1898 the Norwegian Association of Engineers and Architects devoted their November meeting to a discussion on soapstone, which was introduced by O. Dahl (Dahl 1898).
62. D[ahl] 1899.
63. [Kristiania] *Sager som bliver at behandle i møde af* [. . .] Sag No. 103 (1899), esp. p. 14.
64. D[ahl] 1899.
65. Oslo Bk, Riddervolds gate 3 (Formerly Reichweinsgate 3), application 27.2. 1897; plans and elevations 27.2., 27.8. 1897.
66. Repr. Ochsner 1982, figs. 83c-d.
67. Oslo Bk, first application 21.11. 1900, several applications 1901, approved 31.10. 1903; extension comprising the four most easterly window axes, application 19.6. 1905, approved 31.12. 1906. The first elevation is dated 5.11. 1900.
68. Repr. Ochsner 1982, figs. 136b, 145a. Åse Moe Torvanger (1983, p.91) thinks that Hansteen attempted to create a building in a national style, based on Norwegian art of the Middle Ages.
69. "Centralbanken for Norge," *TU* 1901, p. 597. Thus it was not used for the first time, as claimed by Torvanger 1983, p. 91.
70. "Moderne banklokaler i Kristiania: Centralbanken," *TU* 1903, p. 437-438.
71. "Brumunddal-sandstenen og Centralbanken," *TU* 1903, p. 498- 499. Unfortunately the *TU* critic does not give the name of the correspondent or the newspaper against whom he levels his polemic.
72. "Brumunddal- sandstenen," p. 499.
73. "Om byggnadsvärksamheten i Helsingfors," *Teknikern* 1893, p. 11; cf. "Arbetsbristen i Helsingfors," *Teknikern* 1894, p. 21.
74. "Försäkringsbolaget Kalevas hus i Helsingfors," *Teknikern* 1891, p. 147.
75. Konstvän [pseud.] 1897.
76. Ahrenberg 1897/1898, p. 9-10.
77. Demonstrated to members of the Building section at a meet-

ing of Finnish engineers and architects in 1899; "Teknikermötet i Helsingfors 1-3 juni, Sektionen för husbyggnadskonst," *Teknikern* 1899, p. 126.

78. Ab Granit - Föreningsbankens Direktion 27.1. 1898, SYP/FBF, Archives. This document, composed to justify a claim for additional payment, contains a review of the various phases in the delivery of the facade. See further Ringbom 1978, p. 219-220.
79. This was alleged by Hugo Blankett in the autumn of 1896 (Blankett-Sederholm 5.9. 1896, ÅAB/H, J.J. Sederholms samling).
80. Ringbom 1978, p. 220, with further refs.
81. Contract Ab Granit - Föreningsbanken i Finland 16.11. 1896, SYP/FBF, Archives.
82. Annual Report 1897 in: Protokoll [...] 1898, Ab Granits arkiv, ÅAB/H.
83. P[enttilä] 1898, p. 265-266.
84. Jung 1899a, p. 219.
85. The delivery was contracted on 23.11. 1898 (according to a letter Ab Granit-Nordbanken of that date, Ab. Granits arkiv, ÅAB/H) and 28.2. 1899 (see "Icke effectuerade beställningar den 21. Mars 1900" in: Protokoll 1901, Ab Granits arkiv, ÅAB/H).
86. Wasastjerna 1902, p. 161-162.
87. Helsingfors Sparbank, Protokoller 1896-1900, Board 23.11. 1900, Representatives 27.11. 1900. Board 21.2, 1901; report by Wilhelm Ramsay and J.J. Sederholm 23.2. 1901. Helsingfors Sparbank, Archives.
88. Strengell 1903, p. 632.
89. This connection, too, was commented on by Strengell (1903, p. 628)
90. L.J. Kurtén - Joachim Kurtén 14.11. 1897, Vasa, Suomen Yhdyspankki - Föreningsbanken i Finland, Archives of the Wasa Bank.
91. C.J. Österholm - Joachim Kurtén 17.2. 1898, Vasa, HOP/HAB, Wasa Banks Arkiv. The delays in the delivery of the stone are recorded in the minutes 23.11. 1899 (Protokoll 1898-1924)
92. L.J. Kurtén - Joachim Kurtén 7.6. 1899 and 10.6. 1899, Vasa, HOP/HAB Wasa Banks Arkiv.
93. Ericsson & Kjellströms Mek. Stenhuggeri - K. Hård af Segerstad 11.9. 1899, Nylands Nations arkiv, Helsinki.
94. Jung 1899, p. 225.
95. Lundin [1887-]1890, p. 37.
96. Westerback 1976, p. (112). HUB, Nyländska afdelningens protokoll 20.9. 1898.
97. HUB, Nyländska afdelningens protokoll 24.10 1899 and 31.10. 1899. An appeal had also been published in the mimeographed paper *Nylands Dragon* (24.10. 1899), where the choice of material was seen in terms of progressive ideas: the association "which has always strived to march in the vanguard of new ideas" should not let its building represent a style which is now considered retrograde.
98. Letters to K. Hård af Segerstad from Ab Granit 25.8. 1899, from Ericsson & Kjellström 11.9. 1899, from Yxhults Stenhuggeri Ab 30.9. 1899; Nylands Nations arkiv. Among the extant papers is no tender from Finska täljstens Ab, which received its charter in the same year and which ultimately was to deliver the facade.
99. Protokoll fördt vid Nyländska Afdelningens Byggnadsfullmäktiges möte 27.10., 1.11., 13.11., 17.11. 1899; Nylands Nations arkiv.
100. Byggnadskommitten/E.Öhman-Byggnadsfullmäktige 3.-12.11. 1899; Nylands Nations arkiv.
101. Jung 1903, p. 93.
102. Wasastjerna 1902, p. 235.
103. "Kansallispankin talo Viipurissa," *Rakentaja* 1901, p. 95.

8. Monumental Architecture

1. Lindgren 1897, p.213. F.G.A. Dahl's Library was built in 1865-1878.
2. Andrén 1967, p. 31-34. For the Nordiska Museet, see now Mårtelius 1987.
3. *Förslag till byggnad för Nordiska Museet*, Stockholm 1891 (unpag.), last page.
4. Eugène Svedmark - Nordiska Museet Byggnadsnämnd 20.11. 1891, Nordiska Museet, Arkivet: Nordiska Museets byggnad, cahier 'Strödda handl.'
5. Protokoll vid Nordiska museets nämnds sammankomst 1.4. 1892, Nordiska Museet, Arkivet. Andrén 1967, p. 36.
6. Protkoll vid Nordiska museets [...] 1.4. 1892.
7. Nordiska Museet, Bildarkivet, elevations by Clason 379.J.q, 379.J.r, 379.I.s, 179.T.w.
8. Stribolt 1982, p. 228-331.
9. *Operabyggnaden i Stockholm, Festskrift*, 1898, p. 48.
10. Clason 1898, p. 96. For Clason's decisive role in the Opera project, see Stribolt, p. 332, 335 and Index, s.v. Clason.
11. Lindahl 1899, p. 6, 33. Lindahl had conducted a careful experiment to test the durability of the stone varieties to be used in the Opera House.
12. See *Förhandlingarne vid Tekniska Samfundets i Göteborg möte* [...] 1891, p. 112.
13. *Operabyggnaden* [...] p. 89.
14. For a recent summary of the complicated building history of the *Riksbyggena*, see Larsson 1976, p. 38-58.
15. Lundbohm 1896, p. 24.
16. The proposal was made by F. Almgren, a member of the First Chamber, on 3.1. 1895; see Riksdagshuskomiténs protokoll 3.1. 1895, Stockholm RA (shelfmark Rb.Bih.1). The tenders from Norrtelje mekaniska stenhuggeri AB and Ab Lindström in Gotland, are mentioned in the minutes for 31.5. 1895.
17. B.A. Leijonhufvud - Riksdagshuskommitén, May 1895, in: Riksdagshuskomiténs protokoll 31.5. 1895, RA.
18. Riksdagshuskomiténs protokoll 5.9. 1895, 12.3., 16.7., 30.7. 1896. RA.
19. Riksdagshuskomiténs protokoll 20.8., 17.9, 15.10, 29.10. 1896.
20. Riksdagshuskomiténs protokoll 10.11, 12.12, 1896.
21. Riksdagshuskomiténs protokoll 17.5., 1.7., 9.9. 1897. The technical execution in [Aron Johanson] 1897, p. 9.
22. Riksdagshuskomiténs protokoll 6.10. 1898, 2.3., 13.3., 5.4. 1899.
23. *Bihang till Riksdagens protokoll*, 4 saml., 2 afd., 13. häftet, no. 16, quotation on p. 2.
24. Larsson 1976, p. 51. The photograph Fig. 141 first appeared in Larsson's essay.
25. This photomontage was published by Eklund and Stribolt (1978, p. 44). For the somewhat later elevations, see *ibid.* illustration on p. 45.
26. Stockholm RA, Dramatiska teaterbyggnadskonsortiets arkiv, box 4: P. Ax. Lindahl 18.12. 1901, estimate May 1902; another estimate 27.5. 1902.
27. Dram. teaterbyggnadskonsortiets arkiv, box 4: Fr. Lilljekvist 16.12. 1904; box 5: Wickman & Clason 28.7. 1903, Carl Möller 28.7. 1903; Box 5: Gerhard Holm 10.7. 1907.
28. Dram. teaterbyggnadskonsortiets arkiv, Box 5: F. Lilljekvist 28.7. 1903.
29. Lilljekvist 28.7. 1903. The Finnish soapstone had been offered by Flodquist who referred to several Finnish buildings, Pohjola (Fig. 187-193), Nylands Nation (Fig. 129-131), Kansallispankki (Fig. 132-133) and others; tenders in Dram. teaterbyggnadskonsortiets arkiv, box 5.
30. See Holmen 1972.
31. "Program for konkurrence [...]," *TU* 1889, p. 87-88; "Indstilling fra den nedsatte komite [...]," *TU* 1890, p. 79-82.
32. E.g. Georg Nordensvan (1900, p. 163) wrote about "the barbarian ornamentation" of the National Theatre.
33. For a convenient summary of the building history of the Regjeringsbygningen, see B.S. Pedersen 1967, p. 84-89, 115-118. Pedersen also discusses the use of the materials (esp. p. 117).
34. "Betenkning fra den [...] 1888 opnaevnte komite til bedømmelse af [...] regjeringsbygning i Kristiania, " *TU* 1888, p. 91-92.
35. "Regjeringsbygning på det gamle Rigshospitals tomt [...] *TU* 1892, p. 35.
36. *St[ortingets] medd. nr 4 (1901-1902) Angaaende* [...] *regjeringsbygningen*, p. 2.
37. *[Stortinget] Indstilling S. nr 90, 1901/1902: Indstilling fra budgetkomiteen vedkommende forskjellige statseiemdomme m.v.*, p. 234, 235.
38. "Regjeringsbygningen," *TU* 1902, p. 138. The passage is discussed by B.S. Pedersen 1967, p. 116.

39. B.S. Pedersen 1967, p. 117.
40. Bull 1906, p. 445.
41. Bull 1906, p. 446.
42. "Regjeringsbygningen i Kristiania," *TU* 1908, p. 27-28.
43. "Indbydelse til konkurance om tegninger til en bygning for Norges banks hovedsæde," *TU* 1900, p. 228-230.
44. "Moderne banklokaler i Kristiania: Nybygning for Norges bank," *TU* 1901, p. 109.
45. "Norges Banks nye bygning," *TUa* 1907, p. 1-6.
46. "Indbydelse til konkurrance om tegninger til Den tekniske høiskole," *TU* 1901, p. 524-528.
47. Article in Morgenbladet, as quoted and discussed in "Bygningen for den tekniske høiskole," *TU* 1901, p. 592-593.
48. "Konkurranceprojektene til den tekniske høiskolebygning," *TU* 1902, p. 265-266, 277-278; "Den tekniske høiskoles nybygning," *TU* 1902, p. 237 (news item).
49. "Konkurrencen for den tekniske høiskole," *TU* 1902, p. 189-190.
50. Greve 1910, p. 436; cf. Greve 1905, p. 449-454.
51. Ingrid Pedersen 1956, p. 54.
52. Ingrid Pedersen 1956, p. 53.
53. For a history of the building for the Historical Museum, later to become the National Museum of Finland, see Kopisto 1981.
54. Repr. Kopisto 1981, fig. 3.
55. The Finnish Board of Public Buildings - The Imperial Senate for Finland 13.1. 1899, in: *Museifrågans officiella handlingar*, p. 4-5.
56. The Senate - The Board of Public Buildings 1.2. 1899 (*Museifrågans*, p. 6) and The Board of Public Buildings - The Senate 20.12. 1899 (*Museifrågans*, p. 7).
57. Aspelin-Haapkylä 1909, p. 153-170. A convenient survey of the the building history of the National Theatre is given by Jorma Kolmijoki in his seminar paper *Suomen Kansallisteatterin fasadikilpailu ja lopullinen fasadi*, Helsinki University, Art History Department 12.11. 1966. I am indebted to Mr. Kolmijoki for putting his paper at my disposal. Also: [Kolmijoki 1982].
58. "Palkintokilpailu," *ST* 1898, p. 263.
59. Kolmijoki 1966, p. 6.
60. Hausen (1967, p. 9) has connected the project with Wagner's Steinhof Kirche of 1898.
61. Ahrenberg 1902, p. 85.
62. Ahrenberg 1902, p. 85. Other commentators were aware of Tarjanne's American sources, e.g. Söderhjelm 1902, p. 253, Strengell 1903, p. 630. See also Tuomi 1979, p. 89.
63. Ahrenberg 1902, unsigned appendix p. 87.

9. National Romanticism: from Ornament to Texture

1. See e.g. Hausen 1967.
2. Johnsson 1970, p. 29.
3. Bedoire 1974, p. 53, 108-109.
4. "Skånes Enskilda Banks nybyggnad i Stockholm," *TTb* 1900, p. 42.
5. For this building, see Bedoire 1974, p. 113, Bedoire & Fredriksson 1974.
6. *Minnesskrift vid invigningen af Nya Posthuset i Stockholm år 1903*, p. 246-248.
7. Boberg in: Utdrag ur protokoll hållet hos byggnadskomitén för nytt posthus i Stockholm 29.6. 1899, Byggnadskomitén, kapsel 187, bil. till nr. 1922, Postens arkiv och förlagstjänst, Stockholm.
8. *Ibid.*
9. Lundbohm - Building Committee 14.7. and 14.8. 1899; Contract Kongl. Generalpoststyrelsen - C. Wienberg 30.11-1.12. 1899; various correspondence, telegrams, newspaper clippings in Byggnadskomitén kapsel 187.
10. Vogt 1922, p. 109.
11. An elevation signed by Nissen in April 1899 (in the archive of Oslo Sparebank, Eiendomsafdelingen) still lacks the heads.
12. "Billeder fra det nyere Kristianias arkitektur," *TU* 1900, p. 488.
13. Joh. Meyer and Henrik Nissen in *TU* 1901, p. 646.
14. Ruskin 1883, p. 82, 83, cf. above p. 16.
15. [Andreas Bugge] 1903, p. 139, 179, 191-192. For Adolf Schirmer's idea of using marble, see J.C. Eldal's article on Solberg in *NKL* 3 p. 623. The technique of sawing stone with a steel wire had been introduced a few years earlier in France, see "Stensågning medels ståltrådslina," *TTa* 1899, p. 7.
16. Andr. Bugge 1901, p. 133.
17. Andr. Bugge 1901, p. 133.
18. Andreas Bugge 1903, p. 179.
19. Andr. Bugge 1901. Bugge expressly warned against chiselling the stone, since this "kills" the colour.
20. Cf. e.g. Sparre 1900, p. 71.
21. Tschudi-Madsen 1955.
22. Tvinnereim 1980.
23. Quoted in Tvinnereim 1980, p. 131.
24. Sparebanken (Savings Bank, 1905) and Aalesund Kreditbank (1905; damaged in WW II; today Sunmørsbanken). The Kreditbanken features a cyclopic bond at first floor level.
25. Quoted after Tvinnereim 1980, p. 135-136. A similar, although less brash façade is seen in Michalsen's Nedre Strandgata 25A.
26. Dag Myklebust on Osness in *NKL* 3 (under publication).
27. Trondheim, Bygningskontrollens arkiv: Trondhjems Handelsbank, Udvidelse, signed Johan Osness, 19.12. 1916.
28. *NKL* 2, p. 258-260.
29. The term can be documented in print at least as early as 1956 (Ingrid Pedersen 1956, p. 45), but is certainly much older.
30. "Det naturhistoriske Museum paa Tøyen," *TUa* 1910, p. 53-56.
31. *Ibid.* p. 56.
32. "Det nye Universitetsbibliotek - Nationalbiblioteket," *TUa* 1908, p. 16; the motions passed by the Association p. 17-18. *TU* referred to the subject later on, cf. e.g. "Universitetets Bygningsadministration," *TU* 1910, p. 317.
33. "Bergens offentlige bibliotek," *TU* 1906, p. 31; "Indbydelse til ny konkurrance om [. . .] Bergens offentlige bibliotek," *TU* 1906, p. 168-169; "Engere konkurrence om [. . .] Bergens offentlige bibliotek," *TU* 1906, p. 414-415.
34. See "Konkurrancen til Bergens offentlige bibliotek," *TU* 1906, p. 226, fig. 6; "Bergens nye biblioteksbygning," *TUa* 1907, p. 77- 78.
35. "Bergens nye Biblioteksbygning," p. 79.
36. "Arkitekt Olaf Nordhagen," *Arkitektur og dekorativ Kunst*, 3, 1911, p. 167.
37. "Den finska paviljongen å Pariserutställningen," *Teknikern* 1898, p. 207. For a detailed study of the pavilion, see Hausen 1971.
38. "Suomen paviljonki Pariisissa," *ST* 1898, plate xi (after p. 214).
39. "Suomen paviljonki Pariisissa," p. 217.
40. Hausen 1971, p. 58; further *Le pavillon finlandais a l'exposition universelle de 1900*, p. 35; *Catalogue d'une collection de cartes géologiques etc. exposée a l'exposition* [. . .] *de 1900 dans le pavillon finlandais*, Helsingfors 1900, p. 63-84.
41. "Utlåtande från prisnämnden för täflingen angående bolaget Pohjolas nya hus," *Teknikern* 1899, p. 113-114; Pore 1941, p. 44-46.
42. The extant elevations in HMA (microfilm nos. 75-003627 and 75-003628) correspond to the October 1899 project in the Pohjola archive (our Fig. 188). The revised version (Fig. 189-190) was apparently never submitted to the building authorities.
43. Sebastian Gripenberg, as quoted in Pore 1941, p. 47-48.
44. A[hrenberg] 1901, p. 170-171.
45. Jung 1901a.
46. *Vårt Museum*, p. 33-34.
47. "Museifrågan," *Nya Pressen* 22.4. 1900.
48. Strengell, as quoted by Kopisto 1981, p. 16.
49. "Pristäflingen för arkeologiskt-historiskt-etnografiskt museum i Helsingfors," *Teknikern* 1902, p. 175.
50. "Pristäflingen för arkeologiskt" p. 174.
51. For the working drawings, see Kopisto 1981 with ills. 50-51.
52. Kopisto 1981, p. 54.
53. Kopisto 1981, p. 71. For the delays and controversies, see RakH Tulleet asiakirjat 1906 (Eb 66) N 243/346, 1908 (Eb 70) 114/329, Kirjekonseptit 1907 (Da 50) 1229, 1230, 1398; 1908 (Da 51) 835, 906.
54. The Museum has been dealt with in detail by Rolf Nummelin in an unpublished licentiate thesis *Donatorer och byggherrar*, Åbo Akademi 1981.
55. Gustaf Nyström, Material- och kostnadsberäkning till projektet

"För de fria konsterna" [...] variant-projektet "Ver sacrum," ÅAB/H, Dahlströmsla samlingen 2: Åbo Konstmuseum.

56. *Täflan om ritningar till Konstmuseum och Ritskolelokal i Åbo Stad* (privately printed 1900) ÅAB/H Dahlströmska samlingen 2.
57. Nummelin 1981, p. 116-118.
58. Specification öfver arbeten hörande till Åbo nya konstmusei sockel, fasadbeklädnad [...], ÅAB/H, Dahlströmska samlingen 2. The heights, but not the lengths of the the blocks agreed with the standard sizes proposed by the Stenbäck committee on rubble sizes, see above p. ***.
59. Gesellius 1900, p. 197.
60. Helsingin Puhelinyhdistys/Helsingfors Telefonförening, Bestyrelse Protokoll 21.2. and 26.5. 1903. See also Turpeinen 1981, p. 91-92, Korvenmaa 1981, p. 63-66.
61. Helsingfors Telefonförenings Bestyrelses protokoll 9.4 and 22.4. 1904.
62. *Neubauten in Nordamerika*, II, pl. 151.
63. Sederholm 1905, p. 81.
64. Polytekninen yhdistys-Polytekniska föreningen, Byggnadsaktiebolaget Sampo, Protokollbok 4.6. 1902.
65. Byggnadsaktiebolaget Sampo, Protokollbok 13.12. 1902 and 12.4. 1904. In his brief account of the undertaking (read at the opening ceremony on 30.10. 1903) C.E. Holmberg implies that the board went in for granite at the 4.6. 1902 meeting (or soon afterwards). No such decision is recorded in the minutes of the Board.
66. See e.g. *Sampo, Festskrift* p. 33. Wasastjerna (1903, p. 53) reported that "many regard the building as a complete failure and as a mockery of everything that has until now been deemed beautiful."
67. Jung 1903, p. 93-94.
68. Wasastjerna 1903, p. 54.
69. Ahrenberg 1903, p. 391, 393.
70. Kustannusosakeyhtiö Otavan johtokunnan pöytäkirjat 10.5. 1905. Helsinki, Archive of Otava.
71. Otavan johtokunnan pöytäkirjat 5.6. 1905. Elevation in the archive of Otava, signed 7.6. 1906; official approval 8.6. 1905. According to Thomé (1909, p. 79), the older part was completed in the spring of 1906.
72. Otavan johtokunnan pöytäkirjat 28.11 and 20.12. 1906.
73. Holmberg 1903, p. 396.
74. Helsinki, Työväen arkisto: Helsingin Työväenyhdistyksen pöytäkirjat 1906-1914, 8.6. 1906. "Redogörelse öfver prisnämndens arbete i täflingen för Helsingfors arbetareförenings nya hus," *Arkitekten* 1906, p. 81-89.
75. Lindahl 1908, p. 106; [Hänninen] 1908, p. 38-39.
76. [Hänninen] 1908, p. 40.

10. Churches: Stone for Eternity

1. Grandien 1974, p. 396-399.
2. Letters of 10.11. 1983 and 1.12. 1863, in RA, Överintendentsämbetets huvudarkiv B Ib20. Cf. Jacobsson 1933, p. 42.
3. In Brastad (Bohuslän), built, with interruptions, 1863-1877 each farm contributed 6 stones 5 by 6 ft and 6 inches thick; see Rydstrand 1946. Roosval & Gardell (1944, p. xi) regarded Brastad "as a precursor to the modern type of granite church."
4. *Allmänna anvisningar rörande kyrkobyggnader*, Stockholm 1887; see Alm 1973, p. 35.
5. "Protokoll der deutschen evangelischen Kirchen-Conferenz in Eisenach," *Allgemeines Kirchenblatt* 1861, p. 549, 545. The article 4 goes on to specify that wood in the interior should not be used in imitation of stone.
6. von Aikay 1981, p. 96-97.
7. See Malmström 1981.
8. F.W. Scholander, memorandum 12.4. 1881, Överintendentsäbetets huvudarkiv, RA.
9. A.Elgqvist till Kongl. Öfver Intendents Embetet 23.3. 1881; F.W. Scholander, memorandum 12.4. 1881, RA, Öfverintendentsämbetets huvudarkiv.
10. Emil Langlet - Kongl. Öfver Intendents Embetet 20.11. 1882, RA, Överintendentsämbetets huvudarkiv.
11. For A. Peterson, see Kjellin 1969. For illustrations of Peterson's work, see Claesson 1958, Jacobsson 1932, Jacobsson 1933.
12. Plans and elevations in Överintendentsämbetets huvudarkiv A93/1, RA. Cf. Jacobsson 1933, p. 138-139.
13. In this connection I would like to thank Rolf Danielsson, Uddevalla Museum, for supplying me with documentation on Peterson's churches.
14. Memos 8.5. 1888 and 11.6. 1888; drawings G50/1.2A, RA, Överintendentsämbetets huvudarkiv.
15. Memorandum by Ludvig Peterson 30.9. 1890, Överintendentsämbetets huvudarkiv F II aab:20, drawings F6/4-7, 1890 and 1891. For Falkenberg, see also Jacobsson 1932, p. 40.
16. Parish meeting 28.5. 1890, Kyrkostämmoprotokoll, Pastorsämbetet i Falkenberg och Skrea.
17. "Falkenberg kyrka fyrtio år," *Falkenbergs tidning* 8.10. 1932 (News clipping, ATA) The poem was written by the dean Björck in Vinberg:

    Så står den färdig nu
    Din helgedom så sköna,
    Ur klippan mejslad ut, -
    Ett äkta konstverk visst, -
    (etc.)

18. "Lysekils nya kyrka," *Göteborgs aftonblad*, 19.11. 1901. Cf. Granqvist 1962-1963, p. 34-46. According to *Svenska män och kvinnor* 5, 1949, p. 201, Malm visited Britain in 1883-1884.
19. Carl Möller, memos 30.11. 1896 (quotation), 18.5. 1897 Öfver Intendents Embetet - Kongl. Majt. RA, Överintendentsämbetets huvudarkiv.
20. "Lysekils nya kyrka."
21. Överintendentsämbetets huvudarkiv, plans K54/1-2, signed by Clason 1887, approved 1.4. 1887.
22. Överintendentsämbetets huvudarkiv, Drawing L 119/1-3, Ludvig Peterson, memo 28.11. 1887 (FIIaa:19).
23. Ludvig Peterson, Memorandum 25.11. 1890 (FII aab:20).
24. The complete monograph on Oscarskyrkan is by Malmström, 1975.
25. *Oscars kyrka, Minnesskrift vid kyrkoinvigningen den 20 september 1903*, Stockholm 1903, p. 4.
26. G.Hermansson - Oscars kyrkas byggnadskommitté 3.9. 1896, Hedvig Eleonoras församlings Kyrkobyggnads komités Protokoll och Journal 9.12. 1896. See Malmström 1975, p. 172-173.
27. Hedvig Eleonoras församlings Kyrkobyggnads komités Protokoll och Journal 13.10. 1897.
28. *Ibid.* 18.2. 1898.
29. Malmström 1975, p. 172-173, fig. 95.
30. *Handlingar rörande leveransen af huggen sten från Anderssons mekaniska stenhuggeri till Oscars kyrka*, Stockholm 1900, p. 52.
31. See preceding note.
32. Rosell 1961, p. 418, 424-426, 437; Malmström 1985, p.6.
33. Principal drawings October 1901, RA, Överintendentsämbetets huvudarkiv S 297/1-10.
34. Gothenburg, Kyrkonämnden, *Göteborgs kyrkofullmäktiges handlingar*, 1902, no. 6, p. 4.
35. Gothenburg, kyrkonämnden, Vasa församling: elevations signed 1903, royal approbation 20.11. 1903.
36. *Arbetsbeskrivning för Ny kyrka inom Domkyrkoförsamlingen i Göteborg*, II: *Arbeten i natursten* Ös.l.e.a.' p. 2. Copy in Kyrkonämnden, Gothenburg.
37. Hedström 1908, p. 61.
38. Voluminous correspondence in Byggnadskommitteers handlingar, Vasa församling 1900-1909, Kyrkonämnden, Gothenburg.
39. *Göteborgs kyrkofullmäktiges handlingar 1908, no. 20: Beredningsbetänkande med ritningar och förslag till ny kyrka för Masthuggsförsamlingen*, Göteborg 1908, p. 9; copy in Gothenburg, Kyrkonämnden.
40. Erik Bohrn, PM 3.9. 1946 in ATA, Gärdhem. See also Grandien 1979, p. 254-255.
41. For the ideological basis of the appreciation of raw medieval masonry, cf. Bandmann 1971, p. 129.
42. "Vaalerengens kirke," *TU* 1902, p. 413. Aars (1927, p. 268) made this handbook knowledge.
43. This happened as late as 1969 to Oscar's kapell (built in 1869, arch. J.W. Nordan), see Muri 1971, p. 248. In the case of

Havsten, the meagre source material is inconclusive. The dressed jambs and quoins suggest that the church originally had a coating.

44. *Om en ny Kirke i den vestre Del af Byen* (Bergen 1870), committee report 24.2. 1870, copy in Bergen byarkiv. I thank Town Archivist Arne Skivenes for tracing this document for me.
45. *Bilag til Indstilling No. 7 ang. Erhvervelse af Tegninger of Overslag til Sandvigens Kirke m.m.* (see next note).
46. *Indstillinger fra Bergens formandskab og de dertil knyttede Repraesentantbeslutninger*, 1877, no. 7, 1879, no. 7. See also *Sandvikens kirke 50 år, 1881-1931*, Bergen (1931).
47. Meeting 1.12. 1876, "Udskrift af Bergens Raadstuprotokol," in *Bilag* [...] 7/1879, p.9.
48. "Konkurrance til en ny kirke for Ihlens menighed i Trondhjem", *TU* 1884, p. 128: "Kirken skal opføres af 'rå tilhuggen gråsten', hvilket formodentlig er det samme som tugtet brudsten, der vel er firkantet men ikke rektangulaer i murfladen. Man har også søgt at tyde det som 'grovhugne kvadere', altså stene med horisontale lagerfuger og vertikale stødfuger. Denne antagelse er neppe rigtig, udtrycket er dog så vagt, at det traenger naermere kommentar."
49. "Konkurrancen for Ihlen kirke i Trondheim," *TU* 1885, p. 29. Also "Fra bedømmelsekomiten for tegningar til en kirke for Ihlens menighed," *TU* 1885, p. 60-61.
50. Trondhjems formandskab - Kirkedep. 23.7. 1885; Indstilling 25.9. 1885, Oslo, KUD, A. Prestegjeldserie, Trondheim V.
51. Jaehn 1882, p. 138.
52. Trondheims Stiftsdirektion, Journal, 10, 1882-1888: no. 1882 594/82 (26.3. 1882), 834/82 (5.4. 1882); Kopibog 15, 1879-1894: no. 594 (1.4. 1882), no. 634 (11.4. 1882). Trondheim, Statsarkivet.
53. J.W. Nordan - Kirkedep. 2.5. 1884, Rissens Formandskab - Kirkedep. 10.7. 1884, Oslo, KUD, A. Prestegjeldserie, Stadsbygd, Eldre saker 2: Rissa kirke. The greystone was to be quarried in Føl.
54. Melhus herredsstyrelse - Kirkedep. 17.4. 1888, Oslo, KUD, A. Prestegjeldsserie, Melhus, Eldre saker. For the discussion on timber versus stone, see Øyaas 1977, p. 542-544.
55. Oslo, KUD, A. Prestegjeldserie, Orkdal I, Eldre saker.
56. Ringbom 1986.
57. "Det praemierede udkast til Oslo nye kirke," *NTT* 1883, p. 185.
58. The project is richly documented in Oslo University Library, Håndskriftsamlingen, H. Sinding-Larsen, MS.fol. 1575, A-E.
59. Sinding-Larsen 27.9. 1894 (MS.fol. 1575A, p. 22).
60. Sinding-Larsen [end 1894], MS.fol. 1575A, p. 75.
61. [Kristiania by] *Sager som bliver at behandle i møde af Kristiania bys repraesentanter og formaend*, Sag. No. 102 (1900) *Angaaende Overskridelse af Bevilgningen til Kirke for Vålerengen.*
62. "Vaalerengens kirke," *TU* 1902, p. 413.
63. "Program for konkurrence om tegninger til en kirke for Fagerborg menighed i Kristiania," *TU* 1899, p. 422-424.
64. "Fra komiten for bedømelse af udkastene til kirke for Fagerborg menighed i Kristiania," *TU* 1900, p. 388-390; "Konkurrencen till Fagerborg kirke," *TU* 1900, p. 385-386; Thrap--Meyer 1900a, p. 404.
65. "Fagerborg kirke," *TU* 1904, p. 25.
66. [Kristiania] *Sager som bliver at behandle i møde af Kristiania bys repraesentanter og formaend*, Sag no. 103 (1899), p. 5, 13, 14.
67. [Kristiania] *Sager som bliver at behandle* [...] Sag no. 31 (1900), p. 2-3.
68. *Akers formandskab*, Sag no. 228, (1900): *Opførelse af ny Kirke ved Grorud*, 1900, p. 90-91.
69. Indstilling, Oslo KUD, Prestegjeldsserie A: Grorud Jr.nr-4733A1900.
70. "Frogner kirke," *TUa*, 1907, p. 85.
71. [Kristiania] *Sager som bliver at behandle* Sag no. 51 (1902).
72. "[...] brudsten eller tugtet gråsten i alle ydre flader og med anvendelse af huggen sten til hjørner, indfatninger og gesimser," see "Program for udarbeidelse af tegninger til en kirke for Baklandets menighed i Trondhjem (Lademoens kirke)," *TU* 1900, p. 386.
73. "Konkurrence til en ny kirke i Trondhjem" (critical comment), *TU* 1900, p. 406.
74. Medhjelpermøde for Lademoens Menighed 19.3. 1909, 12.2. 1910, 27.3. 1911. For the foundations, see Ingrid Pedersen (1956), p. 45-46.
75. Ingrid Pedersen [1956], p. 56.
76. "Program for konkurrance om tegninger til Aalesunds kirke," *TU* 1904, p. 394.
77. "Aalesundsmur," *TU* 1906, p. 451-452.

77b. Knudsen 1909.

78. E.g. Karl Norum's granite church for Namsos (1904, destroyed in WW II), ill. in Norum 1904, p. 181. Norum still used horizontal bands in the walls, and tracery in the windows.
79. *Samling af Placater, Förordningar, Manifester och Påbud*, 1 (1808-1812), Åbo 1821, p. 153.
80. C. Lindberg, 1935, p. 308.
81. E.B. Lohrmannn - Eckl. Exp. 30.6. 1848; RakH (Eb 8), VA, Helsinki.
82. Knapas 1984, esp. p. 76-84.
83. M.E. Alopaeus 22.11. 1847 - Guv. ämb. S:t Michel, RakH (Eb8), VA.
84. Drawings in Juva, Seurakunnan arkisto (1851, 1856 and 1858) and VA, Helsinki (1851 and 1856). As built the tower gable was executed in brick instead of stone.
85. Kiteen kirkonkokouksen pöytäkirjat 9.7. and 3.12. 1876, 1.7. 1877. Kitee, Kiteen seurakunnan arkisto.
86. 1.7. 1877 (see preceding note).
87. Letter by the architect read to the parish council, Kiteen kirkonkokouksen pöytäkirjat 11.8. 1878, Kiteen seuraunnan arkisto.
88. Ringbom 1982.
89. *Matrikel öfver Tekniska realskolans* [...] *samt Polytekniska institutets i Finland lärare och elever 1849-1899*, [Helsingfors] 1899, p. 211.
90. Stenbäck 1885b, p. 79-80.
91. Stenbäck in: "Tekniska Föreningens möte den 11 December 1886," *TFF* 1886, p. 130-141.
92. Euran kirkonkokouksen pöytäkirjoja 28.4. 1895. For further documentation see Ringbom 1982, p. 60-65, with figs. 1-7.
93. Stenbäck 1896 and 1898.
94. Stenbäck 1898, p. 24.
95. Stenbäck 1908, Stenbäck [1909].
96. For the intermediate stages of this transformation, see Ringbom 1982, fig. 12-14.
97. This allusion, obvious enough, was also explained by Stenbäck himself (1904a, p. 26).
98. Pöytäkirja Alahärmän [...] seurakuntaan rakentavaa uutta kirkkoa koskevassa valmistuvissa kokouksissa 6.8. 1898, Kirkonkokouksen pöytäkirjat, 1892-1942, Alahärmän seurakunnan arkisto.
99. Alahärmän kirkkoraadin pöytäkirja 25.5. 1900, Alahärmän seurakunnan arkisto.
100. Josef Stenbäck - P. Härkönen 15.12. 1901, Koivisto, Kirkkoa [...] koskevia asiakirjoja, Mikkeli, Mikkelin maakuntaarkisto.
101. Stenbäck - P. Härkönen 24.12. 1901, Koivisto, Kirkkoa koskevia asiakirjoja, Mikkelin maakuntaarkisto.
102. Stenbäck 1904b, p. 58.
103. Stenbäck 1904c, p. 197.
104. Stenbäck, Warpaisjärven Seurakunnan uuden kirkon työselitys (March 1902), Varpaisjärven seurakunnan arkisto.
105. Stenbäck - Varpaisjärven seurakunnan Kirkkorakennistoimikunta 19.6. 1902. Varpaisjärven seurakunnan arkisto.
106. See further Ringbom 1982, p. 78-79, with fig. 30-33.
107. Rakennustoimikunnan pöytäkirja 31.8. 1902, Nilsiä, Kirkkoherranvirasto.
108. Stenbäck's specification as quoted in Rakennustoimikunnan pöytäkirja 11.-13.12. 1903.
109. Ringbom 1982, p. 80, with fig. 37-38.
110. Stenbäck, Pyhärannan [...] kirkkoa koskeva Työselitys (February 1905).
111. Stenbäck, specification 31.5. 1908, Rutakon kirkonkokouksen pöytäkirjat 5.7. 1908, Sonkajärven seurakunnan arkisto.
112. Luvian kirkonkokouksen pöytäkirja 28.12. 1907, Luvian seurakunnan arkisto.
113. Sederholm 1898, p. 6.
114. Soiri-Snellman 1974, p. 10, 21, 39.
115. In 1910 the Architects' Club published a strongly worded state-

ment condemning certain dealings of Stenbäck's, see Lindgren & Palmqvist 1910.
116. "Pristäflan till Åbo nya kyrka," *Teknikern* 1894, p. 125, quotation p. 132.
117. "Pristäflan," *Teknikern* 1899, p. 224.
118. "Redogörelse öfver [...] täflingsprojekten till [...] kyrka för Tammerfors stad," *Teknikern*, 1901, p. 18.
119. Repr. Kivinen 1961, fig. 24.
120. I thank Mr. Pekka Korvenmaa for calling my attention to this design.
121. Kivinen 1961, p. 75-77.
122. Sonck, Specification, quoted from Kivinen 1961, note 92 on p. 225.
123. Sederholm 1905, p. 81 (who disapproved of the blending of different coloured granites).
124. F[rosterus] 1908, p. 4.
125. "Fackklubben för Arkitektur, Mötet den 8 december," *TFF* 1900, p. 349.
126. See Stenbäck's plan and elevation repr. Kivinen 1961, fig. 10-11.
127. Muuruvesi design 1901, repr. Ringbom 1982, fig. 28.
128. Stenbäck, Helsingin etukaupunkiin "Kallio" rakennettavaa kirkkoa koskeva ehdotus, May 1901, Rakennustoimikunnan kokouspöytäkirjat 1901-1913, Kallion seurakunnan arkisto, Helsinki.
129. *Kallion kirkko*, Helsinki 1977, p. 9.
130. *Pristäflan för kyrkan i Berghäll*, [Helsingfors] 1906.
131. "Protokoll fördt af prisnämnden för täflingsritningar till ny kyrka i Berghäll i Helsingfors," *Arkitekten* 1906, p. 106, 113.
132. Gustaf Nyström 29.8. 1906, Kallion kirkko, Rakennustomikunnan pöytäkirjat.
133. Kallion kirkko, Rakennustoimikunnan pöytäkirjat 10.3., 7.4. 1908; contract 29.5. 1908.
134. "Nytt stensliperi," *Teknikern* 1908, p. 90.

11. Reaction and Eclipse

1. For Norway, see "Foreningsefterretninger, Referat af N.I.A.F.s arkitektafdelings og Yngre arkitektforenings fællesmøde 22de marts," *TU* 1904, p. 154, and for Finland "Arkitektklubbens sammanträde, Den 11 februari 1905," *Arkitekten* 1905, p. 16, 24.
2. Sparre 1907, p. 85.
3. Brun 1909, p. 628.
4. Tvinnereim 1980, p. 131.
5. Clason 1893, p. 5.
6. "Om byggnadsverksamheten i Norrköping," *TTb* 1899, p. 107. In Finland Bertel Jung (1901b, p. 68) equated non-imitative plaster with natural materials.
7. In E. Stenhammar's Tjänstemannabanken in Drottninggatan; see Brunius 1913, p. 141.
8. Cf. Strengell 1903, p. 626.
9. Applications 14.6 and 3.10. 1907, permit 30.10 1907, new application 28.1. 1908, Stockholm SB, kv. Näcken 24.
10. Nordiska aktiebanken, Förvaltningsrådets protokoll 30.7. 1907. SYP/FBF Archive.
11. Hausen 1977, p. 87.
12. Sederholm 1905, p. 56.
13. N-n, "Arkitekturen på afvägar," *Teknikern* 1904, p. 157.
14. Strengell & Frosterus 1904, p. 20.
15. *Ibid.* p. 38-39.
16. Various contracts between the Building committee and Ab Granit, Ab Granits arkiv, ÅAB/H.
17. See colour repr, in *Saarinen Suomessa - In Finland*, p. 83.
18. Suomen Hypoteekkiyhdistyksen Johtokunnan pöytäkirjat 1897-1910, 18.1., 27.4. and 8.5. 1907.
19. "Nytt stensliperi," *Teknikern* 1908, p. 90-91.
20. Frosterus 1909, p. 64, 68, 69-70.
21. Strengell & Frosterus 1904, p. 22.
22. Contract Ab Börs-Ab Granit 2.6. 1910, Ab Granits arkiv, ÅAB/H.
23. For the competition, see "Prisnämndens utlåtande [...] om fasadritningar till 'Suomi'-bolagets nya hus, *Arkitekten* 1909, p. 96-102. The granite was brought from Kökar to Hanko (Hangö), where it was worked in the plant of Ab Granit. Suomi, Johtokunnan pöytäkirja 29.1. 1910, Archive of the Pohjola Insurance Company, Helsinki.
24. Brunila 1912, p. 100.
25. Suomi, Johtokunnan pöytäkirja 2.2. and 4.6. 1910, Pohjola Archive. The façade was contracted by Ab Granit (Suomi pöytäkirja 28.12. 1911) not - as erroneously stated by Brunila 1912, p. 101 — by Finska Stenindustri-Suomen Kiviteollisuus.
26. In their Annual Reports for 1912 and 1913 the directors of Ab Granit noted that no important building project had provided new contracts for the firm. The year 1912 turned out reasonably well for Ab Granit because one competitor had to close down and another (Finska stenindustri-Suomen kiviteollisuus) was compelled to cut its output considerably. Ab Granits arkiv, ÅAB/H.

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