Sheltered Society

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Härmed ger jag mitt tillstånd att föreliggande uppsats får spridas och att forskare och studerande får citera ur densamma. Uppgifter om uppsatsen får läggas ut på Internet.

**Overseer:** You're back! And in one piece! How goes the search?

**Vault Dweller:** Not good, but I noticed the radiation count is low. Why don’t we just move the people out of the vault?

**Overseer:** We've debated this before. You ought to know now, after being out there! You think the rest of us could survive that? Besides, I'd be out of a job! I'm management! It's not like I know how to do anything useful!

**Vault Dweller:** We agree on that.

- *Fallout*
Abstract


Som material har statens offentliga utredningar använts som behandlar civilförsvar och skyddsrum under perioden. Resulatet har har därefter satts i relation till teknologifilosofen Langdon Winners idéer om inneboende politiska teknologier, somnambulism och Gabrielle Hechts arbete kring nationell identitet och dess koppling till teknologi.

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The origin of shelters
Introduction, Scope and Sources

Introduction

This thesis begins 1935, the year when one of the first Swedish government reports concerning shelters and civil defence was publicized. The 1930s is generally also the decade when civil defense emerges as a modern statecraft concept. The idea of defending the civil population is of course a lot older than that. As the American political scientist Lawrence J. Vale (1959) stated while drawing on philosopher and urban historian Lewis Mumford (1895-1990): although the term does not seems to be older than the twentieth-century the idea of civil defence goes back to the sixteenth century and Hobbesian times. The medieval city wall is probably one of the best examples of how civil defence has functioned through the ages. The air raid shelter can be said to be a modern version of the same solution, providing physical protection for the states citizens but now with a new technological frame. The combination of physical shelters and political protection, according to Vale seems to be a major part of the city as a concept in itself. Also, assuring protection for the denizens is commonly understood, in a Hobbesian sense at least, as one of founding pillars of governmental legitimacy.¹

The development of military defensive as well as offensive action is connected with the use of technology which is subject to constant change. Whenever a new method of war emerges there will be a change in defence as well. If not sooner, definitely later. This is one of the most basic notions of military technology. With this in mind Vale for example connects early modern siege technology with the defence of national borders and thus the nation state. The city as the final bastion was to vulnerable which meant that the state needed to engage its adversary at the borders of the nation instead of at the city walls.² Warfare development during the 1930s resulted in a move back to the city.

The technological framework between 1935 and 1950 and its connection to shelters is what will be discussed in this thesis. The shelter is however connected to a whole array of subsystems within civil defense which includes evacuation, fire-fighting, warning, education, medical services, provision services, police, sabotage, surveillance, transportation and communication. Alongside all these things the civil defence organization is connected with the military strategic planning of the nation which in the end can affect national policy towards other nations as well as domestic policy towards the

¹ Lawrence J. Vale, The Limits of Civil Defence in the USA, Switzerland, Britain and the Soviet Union (Houndmills 1987), p.14f.
² Ibid.
population of one’s own nation. In other words, passive civilian defence in the form of shelters converges with several other concepts of statecraft, technology and urban planning. However in this thesis I will try to focus on the shelter primarily.

The shelters, since being a physical artifact, still stand today as a constant reminder of past anxieties. Most of the plans and organizational structures, that once was just as important as the physical shelter themselves, nowadays exists only in form of documents in archives and books. The lived culture of civil defense so to speak, for example evacuation drills and signal testing, has slowly declined in importance and can no longer reenact the old Cold War fears through war scenario rehearsal. But the shelters still stand, sometimes with the purpose to protect against new threats, sometimes as storages, sometimes just abandoned, and sometimes as a tourist attraction and a cultural heritage, very much like the medieval wall.

At the physical artifact is also where my own interest in the subject begins. More or less every larger or public building built during the cold war era in Sweden has a shelter of some form and if you take a walk through any residential area in any town or city you will see that the entrances are all accompanied with the classic blue and orange shelter sign.

Artifacts existing over time gives a system of technology some of its momentum according to American historian of technology, Thomas P Hughes (1923) and in this case it is all too obvious what he meant. They serve as a historical iconic ruin of an age where the Soviets and the technological apocalypse were just around the corner. This was the age when the Swedish military planned for a Soviet attack or invasion.

According to statistics produced by Myndigheten för samhällskydd och beredskap, MSB (Swedish Civil Contingencies Agency), 65186 normal type shelters were built throughout the period 1938-2002. The period 1938-1945 produced very few of these 65186, according to the statistics only 82.\(^3\) From 1945 to 1950 however, 6277 were built which is a significantly larger number, which means about 1200 per year (see figure 2), and the trend goes on: Between 1950 and 1961, a staggering

\(^3\) This low number should perhaps be seen with certain caution. It is uncertain if the statistics show the number produced or the number still existing by 2011. However the extreme increase is obvious in either case.
number of 19078 were built, about 1700 per year. According to MSB the average size of these shelters is about 100 persons with a maximum of 400.

![Figure 2: The table shows the construction pace of normal type shelter with an average per year. The table consists of data from MSB.se (retrieved 2013-05-14).](image)

Apart from the 65186, 345 shelters constructed were “rock solid shelters, large complexes or special shelters” according to MSB.⁴ When I called them with some questions about these rock solid shelters, what I could get out of them was that “most of them” were from the 1940s and 1950s. Another report from MSB from 2004 states that between 1957 and 1976, no shelters were built in city centers with a few exceptions but was later resumed in the 1980s.⁵ A somewhat vague statement but since normal type shelters were regulated by law what they mean by that is probably larger structures like rock solid public shelters. The Swedish historian Wilhelm Agrell (1950) has also shown that after 1955 civil defence doctrine was drastically changed to evacuation of the cities. All this suggests that most of the 345 shelters built for civilian purposes probably originate from the period 1947 to 1957 and the period after 1976.

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⁴ Number of shelters per shelter type: [www.msb.se](https://www.msb.se/Upload/Insats_och_beredskap/Olycka_kris/Skyddsrum/Statistik/Antal%20skyddsrum%20per%20skyddsrumstyp%202011.pdf) retrieved 2013-05-14.

Seeing the phenomenon of civil defence in an international context there are some interesting points to make. Vale for one has been diligent in studying the civil defense from an international setting. The statistics he have found for example shows how Civil defence expenditure differed from nation to nation:

![Civil defence expenditure in dollar per capita](image)

*Figure 3: The table shows civil defence expenditure in American dollar per capita during 1982-83. Numbers are drawn from Lawrence J. Vale (1987) p.9.*

Two nations, Sweden and Switzerland, both said to be nonaligned and later neutral during the Cold War period, had the highest expenditure on civil defence per capita in the northern hemisphere. Both were neutral during the Second World War, and were for various reasons spared from any serious invasion or bombing raids at that time. How come that nations both neutral and spared from any experience of aerial warfare or invasion spent the highest amount of money on protecting its civilian population? A part of that question is trying to find out the logic and discourse surrounding shelters since they were a large part of civil defence expenditure.

A preliminary hypothesis behind this thesis is that the answer to this question lies in two intertwining concepts. One is that shelters, seen as a technological system, after being transferred to Sweden, acquired a certain momentum that carried it through the cold war period and worked in the background. Seeing the shelters like a technological system meant to counter an urban problem, very much like any other technological solution, might explain the fast expansion. However a regulated law is often accompanied with an ideological basis, a discourse that upholds it and keeps it going. Analyzing this discourse as well as the system by itself will show how discourses of national identity and progress, statecraft, urban planning and technological systems work together to motivate each
other. Doing this will combine two different strands of Swedish Cold War historiography, that of Civil defence culture and that of technology while also putting Sweden into an international context.

**Scope of thesis and research questions**

This thesis will be conducted in two steps.

The first is to analyze Swedish shelter building practices through a system analysis using Thomas P. Hughes’ theory of technological system. The system analysis includes several concepts and for this thesis I will use two of them: One is the study of the technological framework that shelters were supposed to counter and how the shelter building practices developed through the period after a system was established. This also includes how the regulatory laws and the institutions working behind the organizing of shelters contribute to the systems eventual momentum. The second is to backtrack were the ideas and knowledge of the new technology came from with the purpose of establishing what is particularly Swedish and what is not. This also puts Sweden in an international environment which can present something of how the authors positioned Sweden in relation to such environment as well as underscoring differences.

The second step will be to analyze the discourse surrounding the technological system. I will try to describe the ideal shelter for the two periods where the emergence of nuclear weapons serve as a separating line and then discuss the differences between them and what notions were behind them. This imagined vision of the future urban environment will function as a base for further discussion of national identity and domestication of the nuclear age. As analytical tools for this the American philosopher Langdon Winner’s (1944) ideas of inherent political technologies and somnambulism, the American historian Gabrielle Hecht’s ideas of technology and national identity discourse will be used along with Hughes concept of technological momentum.

By combining the materialist technological approach with the anti-materialist discourse I hope to open the two “black boxes” simultaneously so to speak. As the American historian Gabrielle Hecht put it: “The linguistic approach need not imply an anti-materialist position. Instead, it can show how the material world both derives meaning from culture and performs culture.”

The research questions are as follows:

1. In what manner can the Swedish shelters be described as a technological system

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6 No information about age available.

7 Gabrielle Hecht’s *The Radiance of France: Nuclear Power and National Identity after World War II* (Cambridge 2009), p.11.
and how did the system progress throughout the period 1935-1950?

2. What information and influences was the system based on and who were the main system builders?

And for the second part:

3. In what way can the system and the discourse around it be connected to modernist and nationalist discourse and domestication of warfare threats?

In the end I hope to have contributed to the historiography of this seldom discussed field. Technology is something dynamic and is ever still changing and my intent is that this research will show the subjectivity of technological solutions by combining a system analysis with discourse.

**Sources**

Here I will give some description to the sources used for this thesis, such as when they were commissioned, a short presentation of some of the authors and under which political flag.

To limit this research to a form fitting a Master of Arts thesis these analytical tools will be directed towards six government reports publicized by Defence- and Civil Defense organizations stretching between 1935 and 1950:

- **SOU 1935:38** *Arrangement proposal for Swedish defence organization*, given by the 1940 Defence Commission, Ministry of Defence.
- **SOU 1936:57** *The Civilian Aerial Defence*, given by the Aerial Defence Inquiry, Ministry of Social Affairs.
- **SOU 1939:42** *Gas masks and shelters for aerial defence purposes for the civil population*, given by the 1939 Aerial Defence Inquiry, Ministry of Social Affairs.
- **SOU 1944:5** *Civil Defence Statute*, given by the Civil defence inquiry, Ministry of Social Affairs.
- **SOU 1947:10** *The Civil Defence Organization*, given by the 1945 Civil Defence Inquiry, Ministry of Social Affairs.
- **SOU 1950:13** *Shelters for the Civilian population*, given by the 1948 Shelter Inquiry, Ministry of Social Affairs.  

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8 SOU 1935:38 *Förslag till ordnande av Sveriges försvarsväsende*, avgivet av 1930 års Försvarskommission, Försvarsdepartementet.  
SOU 1936:57 *Det civila luftskyddet*, avgivet av Civilia luftskyddsutredningen Försvarsdepartementet.  
SOU 1939:42 *Civilbefolkningens förseende med gasmasker samt inrättande av skyddsrum för luftskyddsändamål*, avgivet av Civilia luftskyddsutredningen Försvarsdepartementet.
SOU 1935:38 was commissioned the 24th October 1930 by a minority government with the purpose of reviewing the whole military organization and consisted of a mix of social democratic politicians and military men. As the Commissions director, Per Albin Hansson was chosen but since he became Prime Minister in 1932, the governor Theodor Borell took his place until the report was finished by 1935. The next report, SOU 1936:57, was commissioned 30th April 1936 on recommendation by the director of Minister of Defence, the right wing politician and jurist Einar August Beskow was appointed as director of the Commission. SOU 1939:42 was commissioned by the coalition government of Social Democrats and the Agrarian party the 30th of June 1939. As the director the jurist Torsten Peterson was appointed.

Through the Second World War the government was a coalition government which included both right wing and left wing parties with Per Albin Hansson as the prime minister. SOU 1944:5 was commissioned by that government and the individuals appointed to the commission was the social democrat Rickard Sandler, Major General C A Ehrensvärd, the jurist and social democrat Eije Mossberg and detective superintendent Zetterqvist.

SOU 1947:10 was commissioned 12th October 1945, about a month after the Hiroshima and Nagasaki bombs, under a social democratic minority government during Per Albin Hansson’s last year as Prime Minister. Eije Mossberg recommended the report to be produced and as the Commission’s director jurist and governor Thorwald Bergquist was appointed. Finally, the 20th February 1948 a minority government lead by the Social Democratic Party and Tage Erlander commissioned the production of SOU 1950:13. As the director of the Commission Fridolf Thapper was appointed. In this commission a number of scientists were included, for the first time.

After 1950 there are another two important reports, one authored by the Supreme Commander of the Swedish Armed Forces (ÖB) by 1955 called Marspromemorian, and another SOU 1958:13 Civil Defence Organization, given by the 1953 Civil Defence Inquiry. However, as interesting as these might be for my thesis they have been covered thoroughly by Agrell and his research, and will therefore not be treated as a part of my research. It should also be noted that many of these reports discusses Civil Defence in general (with some exceptions). As I stated above, Civil Defence includes a lot more than the physical shelter. Trying to include all aspects of Civil Defence would certainly be too grand for this thesis which means that I have focused on discussions of the shelter along with

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avgivet av 1939 års Luftskyddsutredning, Socialdepartementet.
SOU 1944:5 Civilförsvarsplan m.m., avgivet av 1943 års Civilförsvarsutredning, Socialdepartementet.
SOU 1947:10 Civilförsvarrets organisation m.m., avgivet av 1945 års Civilförsvarsutredning, Socialdepartementet.
discussions of old and newly introduced technology to state my argument. However, some parts of the organization have been included when considered important, especially concerning the development of the Department of Civil Defence during the early years of Civil Defence since they had an important function concerning regulatory laws and such surrounding shelters.

I have also found some resourceful intersecting literature such as *Hemskyddet: Handledning* (my translation: *Civil Defence at home: A tutorial*) (Stockholm 1939) which is a guidebook on how to operate and contribute to the civilian defence organization written for the population. Another guidebook is Göransson & Skogman’s *Civilförsvaret enligt 1944 års lagstiftning* (my trans: *Civil defence according to 1944's jurisdiction*). Both these books are based on contemporary government reports also used in the thesis. To backtrack some of the persons behind the organization as well as other persons of interest Project Runeberg has been of great help.9

Concerning the SOU’s description of other nations the reader should remember that in this case the only sources presented is what has been written about other countries in the reports. I have not investigated sources from the countries mentioned other than what the SOU authors have written. For my overall purpose this is not a major issue. Because what I am looking for here are positioning and influences, what the authors believed they saw or decided to bring back from their trips, what they thought to be relevant and applicable information from outside sources is what is important since that is what will affect their argumentation.

Neither was everything proposed in the reports vindicated. But what they do tell is what the authors believed were the optimal and ideal solutions to the problems presented, given an array of preconditions like realistic expenditure, workload, behavior of the citizen, time, and peacetime uses of the shelters. Trying to stay ahead, they present ideas according to their vision of the near future and how these problems should be solved.

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Theoretical starting points and methodological tools

In this chapter I will present some of the theoretical perspectives that will be used as analytical tools for the thesis. To begin with I will outline the historian of technology Thomas P. Hughes’ approach to technological systems: What is a technological system? How does technology spread and how does it evolve in to a mature state? Langdon Winner’s technological philosophy as introduced in *The Whale and the Reactor* will be used to discuss the unique traits inherent in technology and some consequences of it on a societal level. Finally Gabrielle Hecht’s *national identity* will be discussed to connect the technological system to nationalistic discourse as well.\(^{10}\)

*Thomas P. Hughes’ technological systems*

In this thesis I will try to analyze shelters built in Sweden as a component in a greater technological system. Hughes developed his theory and methodology while researching electric technology and how it was established throughout the USA. As he compared it with European counterparts he found several differences how systems evolved depending on regional, societal and cultural traits. As a definition of technological systems Hughes states that a technological system is both socially constructed and society shaping. A technological system includes not only the artifact itself (in this case the shelters) but also organizations, manufacturing firms, utility companies, investment banks and governmental institutions. Included is also legislative artifacts such as regulatory laws. Natural resources such as mines and granite, can also be a part of a technological system since its meaning is socially constructed and transferred into the system and the material itself is adapted into the system as a physical part. A piece of granite is perhaps nothing, but understood as a crucial part of a shelter, the material can get a new meaning.\(^{12}\)

Educational material and social uses of the artifact is according to Hughes’ definition also a part of the technological system. For example many of the training courses and evacuation exercises are

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\(^{12}\) A few concerns should be raised about this. First Hughes stresses that it is important to remember that environmental factors should be only carefully incorporated in a system since they do not interact with the system, for example geography and geology are passive elements. If the interaction between parts of a system goes only one way so to speak it should not be incorporated, which leaves us the conclusion that dynamic interaction between parts of a system is crucial in discussing technological systems.
included as a part of the technological system of civil defence and shelters. The purpose of the system is to solve contemporary problems with whatever means is at hand, but Hughes also says that they mostly concern a reordering of the physical world in ways that are desirable for the society.\textsuperscript{13} Re-structuring the urban landscape with shelters to protect the nation from contemporary threats is an example of that.

A Technological system also need a system builder. The primary characteristic of a system builder is according to Hughes: “the ability to construct or to force unity from diversity, centralization in the face of pluralism, coherence from chaos. This construction often involves the destruction of alternative systems.”\textsuperscript{14} In this thesis, I will recognize Civilförsvarstyrelsen (Department of Civil Defense) as the prime system builder, since their recommendations, propositions and reports had a structuring effect on shelter building praxis in Sweden.

It should be well remembered that the system a historian is studying may well be a subsystem of a larger system and vice versa. In this case shelters could be analyzed both as a more or less independent system or it can be analyzed as a subsystem within the system of aerial warfare technology as well as many other systems.\textsuperscript{15} That fact does not necessarily affect the result, the use of Hughes’ theory should be seen as a mode of inquiry. Using his tools, asking the questions connected with them, will provide certain answers that can be analyzed, and that does not mean a system actually exists in some true material form, that is neither the point with this thesis.

**Evolution of systems, technological transfer and technological style**

The history of evolving, or expanding, systems can be presented in the phases in which the activity named predominates: invention, development, innovation, transfer, and growth, competition, and consolidation. As systems mature, they acquire style and momentum.\textsuperscript{16} The shelter as counter to aerial attacks emerged in the 1930s. A part of the system analysis is technological transfer. I will argue that a system of shelters was established through technological transfer which resulted in a consolidation with regulatory laws that gave the Swedish shelter system both style and momentum.

A technological style is connected to technological transfer, this is where the adaption begins in some sense. When a new technology is incorporated into a society, and the special traits of that society will have a huge effect on the technology. The cultural, political or geographical differences can even

\footnotesize{
\textsuperscript{14} Ibid. p.52.
\textsuperscript{15} Ibid. p.53,56.
\textsuperscript{16} Ibid. p.56.
}
be so profound that the technology will never root successfully in that particular society.\textsuperscript{17}

In his discussion of style Hughes says that, style can be used to suggest that system builders is something more than the crude notion of applied science, there is also a creative strain which shows itself in differences in technological systems between regions and nations. The factors behind the different styles can be many, political, cultural or perhaps geographical. Regional differences, says Hughes, has a stronger connection to style than national ones do, but as a system matures, national centralization may cause the regional differences to become national through legislative regulations.\textsuperscript{18}

The notion of Momentum is not to be confused with technological determinism. A technological system acquires momentum mainly from people and organizations involved in the system, such as manufacturing corporations, public and private utilities, invested institutions and sections of technical and scientific groups, and of course regulatory laws has an important effect on the momentum of a system. Especially interesting in this case is the momentum of durable physical artifacts. Shelters remain long after they are considered obsolete along with the system. But their traits and socially constructed characteristics “project into the future”, as Hughes puts it.\textsuperscript{20} The medieval city wall is such an example, a defensive technological solution to contemporary problems, still existing and tells something of a society’s past and its inherent traits. In the same way shelters remain, after blasting out 10000 cubic meters of rock from a hill, such a constructed cave tend to remain through the years.

\textit{Do shelters have politics?}

As I mentioned before a system according to Hughes can be either a system itself or a part of a larger system. I will argue that shelters in Sweden should be seen as a subsystem within the system of aerial warfare technology, a system that encompasses the western societies on a grand, global scale during the postwar era. For this argument I will draw on Langdon Winner’s discussion of inherently political technologies and the consequences of it explained as technological somnambulism. He states that according to this view of the inherent political traits of technology, adopting such a technology brings with it certain conditions for a society and the behavior of its citizens. The atom bomb he says is the most obvious example since it is absolutely crucial that there is a hierarchical order within the groups that administer the weapon: a military apparatus is needed and with it comes the need of a centralized state, a political body of some sort and so on.\textsuperscript{21} The form of the technology is then what

\textsuperscript{17} Bijker, Hughes and Pinch (1987), p.67f.
\textsuperscript{18} Ibid. p.69,70.
\textsuperscript{20} Ibid. p.76f,80.
\textsuperscript{21} Winner (1989), p.34.
affects the needed traits of the society:

If we examine social patterns that characterize the environments of technical systems, we find certain devices and systems almost invariably linked to specific ways of organizing power and authority. Implementing regulations, organizations and building recommendations for shelters were decided by politicians to begin with. The decision to do so was made in a perspective where the citizens ability to defend themselves were seen as an extension of military defence and therefore important for state survival. For such a system to work, a beforehand planned behavior of the citizens is crucial.

Winner goes on to discuss another example. This time nuclear energy and uranium saying that when the uranium slowly runs out, nuclear energy organizations will be left with the option of using plutonium, which has some huge consequences for nuclear armament proliferation, as well as being expensive. The need then to control plutonium says Winner: “raises the prospect, and not a trivial one, that extraordinary measures would have to be taken to safeguard plutonium from theft and to recover it should be the substance be stolen.” Such a society needs a well-functioning surveillance system and absolute control of the nuclear plant workers, which ultimately has profound effect on the relation between the state, the nuclear energy companies and organizations and the individual citizen. Hence some kinds of technology are highly political or has political effects.

Winner calls this somnambulism, technological sleepwalking. By that he means that technology is taken in but the effects on the society are seldom foreseen. Neither are options or alternatives debated. Ad hoc solutions to emerging problems of the new tech gives the technological system an imagined determinism.

Shelters and the shelter system are both political and can be analyzed with somnambulism as a concept. What Winner can contribute with in this thesis is what happens when the technology has been introduced, when a technological system has been established to give some explanation to the systems further development and momentum, and the ad hoc character of its development.

Technology and National Identity

Using Gabrielle Hecht’s discussions about national identity will connect this technological “context” to a discourse of national identity which might in turn give answers to where the differences in technological style might come from.

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23 Ibid. p.37.
Hecht spent eight years studying the French nuclear program and one of the main questions she asked was; what was French about the nuclear program? After 1955, and the Atoms for Peace conference in Geneva, nuclear technology turned international on a new level, and Hecht says that after that it became harder to pinpoint what was French about the French nuclear program. Undoubtedly, there was something French about it according to the political leaders and becoming “radiant” or nuclear as a nation was connected to the nuclear technology discourse according to Hecht. Spearheading technological advancement in this field was a way of reclaiming the former French radiance as an empire after the humiliation of the Second World War. Still there was never something like a French technological style, nothing essentially French about nuclear technology: “Engineers did not make the choices they did because they were French.” Thus what happened was that frenchness was invoked into the technology and the choices made. Such as choice of models, workplace routines, and paths on the tech-tree of nuclear technology. Or for that matter, developing nuclear weapons.

While referring to Hughes and his research and insights about national technological style Hecht says that the most important insight of this type of scholarship is how “political, social, and cultural choices shape the design and growth of technical artifacts and systems.” By opening the black boxes of technology and culture simultaneously Hecht want to find new ways of seeing how technology shapes and is integrated into the social fabric of a society.

First, a definition of nation is needed and I will for this thesis adopt Hecht’s viewpoint (borrowed from Benedict Anderson) of the nation state as an Imagined community:

At the most basic level, this means that nations are not autochthonous social units but rather communities whose coherence is imagined through political and cultural practices. The content and function of these imaginings vary according to time and place. However stable a sense of nationhood may appear, national identity is in fact continually subject to negotiation and contestation.

Hecht’s way of using this is to describe and analyze a sort of bridge between a mythologized past and a future with the purpose of legitimizing and naturalizing change in the present and her main point is that the French nuclear reactors constitute such a bridge. A most convincing example was how her

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26 Ibid. p.3.
28 Ibid. p.9. Because the problems of social constructivist approaches Hecht states that the cultural part of this scholarship is commonly by-passed and that her study is trying to reclaim the cultural traits of technology. This goes also vice versa according to Hecht: “Explorations of French national identity have yielded rich analyses of how that identity is imagined in debates over issues such as Americanization, modernization, immigration, and colonization. But technology (writ large) is glaringly absent from this literature, as though it were not a site for discourse about national identity.” Ibid. p.13.
29 Ibid. p.12.
sources referred to the reactors as “modern heirs of the Eiffel Tower and the Arc de Triomphe” with the aim to make reactors French and a non-nuclear France an impossibility.

In similar ways there is little Swedish about the shelters themselves, but they became later part of a larger Swedish discourse. The project of defending a nation is perhaps the most obvious connection to nationalistic discourse, and the prospect of succeeding is dependent on the Swedish citizens’ character and ability to prepare, plan and act when time is nigh. As the 1940s progress the nationalistic discourse picks up modernistic traits intimately connected to shelter as a technological solution. Here then I will argue that we can find a connection, an opportunity to open the black boxes of both culture and technology at the same time.

Finally as the reader might have noticed, socially constructed as a concept has been used throughout my discussion and it should be mentioned that this thesis circulates this ontological starting point while at the same time constantly referring to the material realities of artifacts constructed during the Cold War. Discourse analytical approaches uses the spoken and written language as its main empirical basis and should always be followed by a critical approach to what is described as ‘knowledge’ at any given point in history. As a researcher with social constructivist methods, I look for how authors give meaning to physical realities, how they describe an artifacts importance and use, and the conflicts between them.

The consequences and problems of social constructivism are as always the fact that it is an interpretation that can be contested and rejected by other interpretations and none can ever be described as true in the word’s real sense if that is what a researcher is looking for.

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32 Marianne Winther Jørgensen & Louise Phillips, Diskursanalys som teori och metod (Lund 2000), s.10ff.
Civil defence and the shelter in modern historiography

Civil defence, its preconditions and rationales

During the second half of the twentieth-century perhaps Lawrence Vale is one of the more important authors concerning civil defence although in the center of his attention is another type of inquiry. Vale is a political scientist, concerned with urban architecture much like Mumford, but in his work about Civil Defence from 1989, *The limits of Civil Defence in the USA, Switzerland, Britain and the Soviet Union*, much emphasis is put on the different rationales behind each civil defence system. The focus there was to find out how the different Civil Defence systems were motivated on a political level.

Vale, to begin with, puts up certain preconditions that are necessary for a state to implement civil defence. The first one is financial resources, there has to be a financial basis for it to work. The second is “geopolitics” which means a state’s geographical position and relation to other states. The third and fourth are past experiences of natural disasters and war. Fifth is domestic policies, a centralized political and economic control and Vale also adds humanitarian intentions here. As the sixth he puts nuclear weapons and states that depending on a state’s relation to nuclear weapons (has their own, is allied to another state with etcetera), their Civil defence system will develop differently.34

Since Vale’s work sets out from 1945 and beyond the nuclear weapon as the sixth criteria is rather expected. However Vale also states that “The interwar development of airpower was itself a cause for unprecedented alarm and despair. […] When war came, many on all sides predicted a level of destruction commensurate with today’s notions of nuclear holocaust.”35 This suggests that when researching the inter-war period as my thesis will do, aerial warfare could replace the sixth precondition, or to unlock the preconditions from a certain period in history: the imagined use and power of new destructive technology is perhaps the sixth precondition for civil defence.

The four rationales described by Vale are perhaps more interesting for the political scientist although a noteworthy problem is the discursive element that Vale uncovers with them. The first one is the humanitarian rationale, protection of human lives, while the other three are strategic in different ways:

2. Rationale of Deterrence: The mere presences of civil defence have a deterring function

towards the aggressor.

3. Rationale of Crisis Management: Vertical evacuation, this is a continuation of deterrence when the initial deterrent has failed. If the state “survives” it can fight back and uphold status quo.

4. Rationale of State Survival: hardening, dispersion and protection of economic structures, to maintain the state apparatus at all cost.

The conflict between these reveals a discursive connection between what is said and what is done, since many government leaders emphasizes the humanitarian rationale publicly while actually working towards the strategic rationales. This conflict between rationales is often obvious according to Vale and a source of controversy for many nations.\(^{36}\)

The shelter per se is not then the center of Vale’s attention but his book should nevertheless be considered something of a pioneering work because of its international scope, rich material basis and its thorough definition of civil defence. The different rationales and preconditions, believe, intersects with the preconditions of implementing technological systems which means that I will return to them later.

**The shelter in American historiography**

The Cold War era has been subject to much historical research, mainly political but also cultural. Few have focused their research on the shelter, and used it as the center of attention. Most of the books written on the subject are American and for this thesis I will focus on two authors that I consider important in this particular field: historian Kenneth D. Rose (1946) and the architecture historian Tom Vanderbilt (1968).

Rose has mainly focused on the cultural sides of civil defence culture, and in his book *One Nation Underground: The Fallout shelter in American Culture* (New York 2001) he uses the shelter as the center piece. The main purpose of the book is to find out why the US, so intensely concerned with a potential nuclear war, failed to implement any national civil defence system worthy of the name. In the early post-war years the American government and military according to Rose prepared for a war much like the latest and thus claimed that the same passive defence used during the Second World War could be used against massive atomic bombing, and these ideas were also presented to the

population.\textsuperscript{37} This is very similar to what the Department of Civil Defence in Sweden advocated around 1947, but as we will see later the differences between Sweden and the US are huge.

Even though passive defence against the atomic warfare was considered possible the agency behind civil defence in the US was not the state but the individual. Several proposals for a national system of public shelters were given to the American Congress through the early 1950s but they were all rejected, mainly because few actually believed in shelters as means of protection at government level and because of the significant funding it would take to implement a national shelter system. Instead rhetoric was adopted, by the government and civil defence officials that claimed that it was every householder’s duty to protect his home and family against the new calamities.\textsuperscript{38} The responsibility was in the US turned to the individual and not on the state. Evacuation of large cities had similar problems, it was realized that the funding needed to improve infrastructure to allow a quick evacuation of the larger cities considered a potential target would not simply be realistic.\textsuperscript{39}

Here it seems that Lawrence Vale’s first precondition had one of its first examples. The failure to find funding for such a project hampered a national civil defence project. Much of the funding was turned over to military expenses instead.\textsuperscript{40}

In the chapter “Morality and national character at the shelter door” Rose explains the ethical problems the Americans discussed in public discourse during the 1950’s. The main problem was that since not everyone got prepared for nuclear war there would be an ethical problem when neighbors came running, wanting to get into your shelter adapted for only a few people, usually your family. According to Rose this actually caused many Americans not to build shelters at all since they could not live with the idea of putting a machinegun at the shelter door to keep their neighbors out. Also, the idea of going underground was connected to cowardly behavior, being a “mole” or a “barbarian” etcetera which did not fit well with American national identity.\textsuperscript{41}

While Rose’s work concerns the culture and discourse of shelters and civil defence Tom Vanderbilt in his book \textit{Survival City}, has an approach more concerned with the artifact itself. He tries to understand the logic of the Cold War architecture. It is an era where form follows function that he describes:

\begin{quote}
To understand the decisions that went into the design and construction of a missile silo or an underground command post - to know why this form or material was chosen over that one - is central to understanding
\end{quote}

\textsuperscript{37} Rose (2006), p.23.
\textsuperscript{38} Ibid. p.24.
\textsuperscript{39} Ibid. p.28f.
\textsuperscript{40} Vale (1989), p.59f.
\textsuperscript{41} Rose (2006), p.103f, 112.
the brilliant and terrible science occasioned by the Cold War, the architectural logic that underlay the policy described by John Foster Dulles: “How should collective defense be organized by the free world for maximum protection at minimum cost?”

Vanderbilt puts much focus on the city as a unit or organism and not just a collection of houses. The shelter and underground living is a part of the concept of city itself. For him the emerging aircraft technology meant that a city could be “killed.” Cities like Berlin, Kassel, Dresden, Hamburg, Tokyo, Hiroshima and Nagasaki proved to the international forum that a city could be emptied of its life and its infrastructure and architecture reduced to rubble. Any distinction made by military leaders, like tactical or strategic bombing meant something different in theory and practice, it did not matter that the bombings were excused with targeting industrial areas, communication hubs or factories of war. The result was a dead city.

The conquest of the third dimension, the air, allowed for this development, states Vanderbilt. The national frontier were obsolete and reduced to what they were to begin with: “historical incidents.”

The result of this new mode of urban life, the new exposure to warfare resulted in several alterations in urban planning. One was dispersion to avoid congested industrial areas and large amounts of citizens at the same place. The urban environment should be that of satellite cities connected to a network of cities where the killing of one would not cut off the other. Such cities would not provide material for fire storms, be much less tempting for bombing and would also be more attuned to modern commerce and industrial development. Another was the fortification of structures, or with Vanderbilt’s wording: “fortification of everyday life.” Extensive testing on the Nebraskan testing grounds had proved that a school building with 10 inch reinforced brick walls and no windows could withstand a nuclear bomb. Such buildings, while perhaps robust, definitely followed the “form follows function”-paradigm.

This form of logic can be said to result in a domestication of the threats presented by the nuclear age. It was matter of getting used to the atomic effects, to measure radiation as one would measure temperature. If window-less bunkers needed to serve as schools, so be it.

Vanderbilt covers many different aspects how the Cold War environment reflected itself in American architecture. Even if very few shelters were built in the US, its iconic traits are apparent and its connection to how a nation imagines itself going through the darkest hour of aerial attack even

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42 Tom Vanderbilt, Survival City (Chicago 2010), p.17.
43 Ibid. p.58-62.
44 Ibid. p.67.
46 Ibid. p.80.
47 Ibid. p.85-87; Abo Elementary School and Fallout shelter in Artesia, 112f.
if it means going underground.

The unique endeavor set out by the Swedish government during the 1950s is mentioned both in Rose’s and Vanderbilt’s research. In both cases it is the “European example” that serves as the source of curiosity. In the *Las Vegas Sun* from 1957 Vanderbilt reads:

One witness to a bomb blast mused on the European example: “Word from Stockholm, for example, is that no permit is given for construction of a new apartment house unless it is built above heavily encased basement bomb shelters. One, in the heart of Stockholm, will take 20,000 people in five minutes.”

And in the *New York Times* 1954: “The Swedes, like 7.7 million moles in and out of uniform, have gone underground to create a wholly viable second nation in the granite.”

The shelter referred to in the Las Vegas Sun is most probably *Katarinabergets skyddsrum* which will be discussed later as well. This enormous shelter also appears in Rose’s research through an article in *Time Magazine* from 1958 titled “The Cavemen.” That article shows a hardened Sweden, equipped for the new age through the story of a self-sufficient mega structure. The crucial industries have gone underground, along with air ventilation, power solutions and modern medical equipment such as X-rays. The life underground did not only bring with it the modern technology underground but also the Swedish nations culture, therefore Time Magazine made the interesting point that even the Swedish liquor *Aquavit* was buried in large amounts to feed the needs of the Swedish citizen. The domestication of the sheltered environment is obvious: “Claustrophobia is avoided through the use of windows that look out on painted landscapes and cloud filled skies.”

The vision of the underground life had everything you could ask for above ground.

The will to describe and reflect over the overseas shelter frenzy by the American newspapers shows the need to reflect over shelters and civil defence in an international context. There is more to a shelter than just a physical structure. The reference to moles and cavemen reveals the patronizing view and irony of credulous Swedes implicit in the articles. It also tells something of how Americans viewed themselves and that shelters and civil defence were something inherently connected to a nation’s domestic policy, imagined identity and projected future. Vanderbilt’s research also puts the shelter into an environment where the city has become more of a whole organism. The defensive return to the city made the problem of defence a collective problem once again. The city and its inhabitants needed to adjust to this new environment and the ideas of how the future life would be reveals a form of domestication of the threat of annihilation through war.

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49 Ibid. p.130.
50 See appendix.
An important point made by Vanderbilt is also the process of change. Since 1989, the world has seen a new threat to the city, terrorism, which have once again put architecture at the center of attention. Urban planning and ideas like dispersion and hardening are still there, remaking the urban fabric but with a new threat.  

Technology and the Culture of Civil Defence in Swedish historiography

In Swedish historiography there are no books aiming for the type of inquiry presented by Rose or Vanderbilt, neither is there any research trying to put the shelter into a technological system analysis. However there has been some work done about civil defence and technology. Perhaps the most famous and diligent one is the historian Wilhelm Agrell who has spent seemingly more than a lifetime writing and researching Swedish defence doctrine, mainly military but also civil.

The book *Vetenskapen i försvarets tjänst* by Agrell focuses on the technological sides of Swedish defence doctrine. Concerning the technological development during the inter-war years Agrell means the period from the Napoleon War to the Second World War is characterized by reaction to outside influences, how to handle the constant technological change. The growth of scientific warfare and the bureaucratization of military institutions was according to him a result of a growing complexity of warfare technology. Since the atomic bomb included the blast, fire and radiation which also resulted in medical problems there was a growing need for science connected to all these effects. This is also where one of the more important shift in mentality occurs to the use of science and technology. The need for scientific answers to modern problems put the scientist into a new position which merged research and politics. Science, technology and politics converged.

The small publication *Ett samhällsskydd för alla väder?* also written by Agrell, includes a thorough review of the civil defence organization and the ideology behind it. The Second World War made it clear that the nation needed to defend its entire existence. The new sort of war was a total war which included all aspects of the nation. He also states that very little changed when the nuclear bomb entered the scene, both the military and the civil authorities viewed it as an economical benefit and little changed in the late 1940s because of that mentality. By 1955 and with *Marspromemorian*,

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52 A recent study with similar perspectives has been written by Johan Gribbe: *Stril 60: teknik, vetenskap och svensk säkerhetspolitik under det kalla kriget* (Stockholm 2011). This book concerns an imported Command and control system but uses both Hughes and Winner in his work.


which was a report co-authored by the Supreme Commander and the Department of Civil Defence, the civil defence doctrine changed focus to mass evacuation. All cities considered a potential target for strategic terror bombing, which meant all cities with more than 50,000 inhabitants should evacuate down to only 15000. However in Stockholm, Gothenburg and Malmö a few more had to remain. The purpose of keeping a part of the citizens in the cities was to maintain activity in certain important industries and institutions crucial for the war effort. In total about 2,5 million people would be evacuated in such a scenario, but after some problems with this had been raised a compromise was settled, about 1,4 million would be more realistic. The vital part to protect was the lives of the civilian citizens, and only secondly critical societal institutions and property.

The technological backdrop for this logic is of course the prospect of getting bombed with nuclear bombs. By 1955 both USA and the Soviet Union had detonated their first hydrogen bombs and the effects were staggering. This point has also been discussed by another Swedish historian, Sverker Oredsson (1937) in his book, Svensk Oro (my trans: Swedish Fear). The detonation of the hydrogen bomb resulted in shock waves 300 kilometers from epicenter and Japanese sailors experienced radiation from a distance of 350 kilometers. To protect the Swedish nation from such destructive force only evacuation could be treated as a realistic solution.

With evacuation another important Swedish historian affiliates. Literature historian Marie Cronqvist (1973) has written some important articles on the subject of Cold War Culture where one stands out as more important for this thesis. To begin with it should be said that Cronqvist’s work mainly discusses the culture of civil defence, her work concerns the discursive practices of cold war culture using sources directed towards the population. Cronqvist has in one of these articles studied tutorial books from 1943 to 1989 on how to react “If the war comes” written for the population and mass distributed. The result was a sort of domestication: the Social Democratic party’s idea of folkhemmet (my trans: Peoples Home), a classless, socially equal society with the state as its patron was to be brought underground. Cronqvist also means that ideas of cleanliness much emphasized in the tutorial books were used as rituals to cope with the constant militarization of life during the period.

The change in doctrine from shelters to evacuation and then back to shelters in the 1960s is

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59 The publications were titled Om kriget kommer (my Trans. If the War comes) and the first editions were authored by the social democrat Eije Mossberg and the crown prince Gustav Adolf during 1943. Magnus Jerneck, (ed.), Fred i realpolitikens skugga (Lund 2009), p.176. Eije Mossberg was also involved in a few of the SOU’s read for this report.
60 Jerneck (2009), p.182.
according to Cronqvist partly due to the fast expansion of housing construction: the city’s fast population growth made evacuation impossible. And thus Cronqvist underscores the connection between peaceful social democratic policy and Cold War fears.61 All though I do not entirely agree with this explanation, since I think Cronqvist puts too much emphasis on social democratic policy, the domestication of the threat is apparent. As a final remark she states that Sweden’s position was that of a spectator by the sidelines of the Cold War,62 and in my opinion this is more important, the fact that reactions and solutions, perhaps also the financial basis, to Cold War problems came from outside, puts the story of folkhemmet and its inherent connection to social democracy into question. Also, seeing the shelter in a perspective of a technological system with its own momentum might give some new explanations while still interweaving public discourse.

Finally I would like to say something of my own earlier research on the subject. In my bachelor’s thesis I studied public newspaper discourse during three years; 1954, 1960 and 1966 with the purpose of investigating how Civil Defence with focus on shelters were motivated publicly and discussed throughout the early Cold War.

The two most important notions discussed in 1954 was that of motståndsviljan (my trans: will of resistance) and technological development. Often in combination: “applied” technology and faith in the defensive measures was critical.63 The population must not be gripped by “atomic psychosis” and continue to believe in Swedish defences and fight on. The real traitors were those who constantly advocated the uselessness of all passive defence measures and exaggerating the effects of the new type of modern warfare. In a few newspapers the faith in the defences was also connected to national traits like the Swedish ancient mountains (urberg), the ‘granite’ or the nation’s geographical position. The constant fear that Sweden would even be drawn into an international conflict shows how the journalists positioned Sweden in an international forum. Such ideas reveal another connection between technology, the need to stay ahead in the modern technological race and the imagined national identity.64

Other research of interest

62 Ibid. p.194.
This concludes the chapter on earlier research, but while writing about the Cold War period other literature need to be included, although it does not cover the shelters or civil defence per se. Concerning the political history and the logic behind deterrence policy during The Cold War period I will use the American historian John Lewis Gaddis’ (1941) *The Cold War: A New History*. American historian of technology, Martin V. Melosi (1947), with *Atomic Age America* contributes with some notes on the Cold War period from an atomic energy perspective. For information about Swedish nuclear war military doctrine the Swedish military historian Kent Zetterberg’s (1946) (ed.), *Totalförsvar och atomvapen* will be used.

Swedish historian Kim Salomon and his work on the Swedish national identity during the 1950s should be mentioned. While reading popular magazine printed during the decade, Salomon showed that the Swedish national identity during the period positioned itself somewhere between a western progressive modernist and traditional family morals. Identifying with the west also drew Sweden into an international environment according to Salomon.65

The examples of earlier research described in this chapter shows that research trying to combine both the materialistic sides of civil defence and the discourse surrounding it has not been conducted. My main influences are found in American scholarship, and by combining the different strands of inquiry such as ideas of urban development and planning, national identity and technological systems this thesis will complement Swedish historiography concerning the Cold War period in Sweden.

*The inter-war and post-war world as a subject of inquiry*

The introduction of nuclear technology is often used as a cornerstone of a historiographical narrative during the twentieth-century, it is not hard to understand why. It somehow marks the start of a hyper-modernist era, a promising future. The Swedish historian of science and ideas, Jonas Anshelm (1960), states that: both scientists, engineers, politicians and journalists mediated pretty much the same vision of the potential of modern technology throughout the 1950s. The nuclear in the center being almost revolutionary, putting the civilization into a new age, the atomic age.66 At the same time Swedish historian Peter Englund has discussed Hiroshima and Nagasaki as a representation of the ultimate end of the rational scientific utopian ideal, completely decoupled of some sort of humanist morale. The weapon that was supposed to be used only once, just to show its potential, was used twice and showed

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that there is no going back.\textsuperscript{67}

The nuclear bomb can be seen as the psychotic megalomaniac marriage between political power and rational-scientific explanation drawn to its full extension. President Truman’s order to continue research towards the hydrogen bomb, a bomb with “no inherent limit in the destructive power that may be attained” is one expression of this.\textsuperscript{68} Truman knew its potential but accepted it, he saw it critical for survival in the Cold War environment. The gruesome irrationality of rational-scientific logic, the irrationality of a bomb without limitations had to be expected. The Second World War was the most obvious evidence of this with all the different methods of killing.

The Kennedy administration's minister of defence during the early 1960s; McNamara, and his Mutual Assured Destruction policy with the fitting abbreviation MAD is perhaps the ultimate expression of how to solve that problem. The post-revisionist American historian John Lewis Gaddis in his book The Cold War: A New History explains; The Cuban Crisis had shown that both sides of the conflict had acted rational and logical to the problems presented to them, but still, the world was thrown to the absolute brink of total annihilation, which showed that logic and rationality could not be trusted as a deterrent of war. Putting a system into place which would at all instances mean a complete and utter destruction of the enemy along with oneself: “transformed this reliance on irrationality into a new kind of rationality in the aftermath of the Cuban missile crisis.”\textsuperscript{69} If Armageddon in its almost biblical sense is the consequence of any provocation, a provocation is impossible and both USA, and the Soviet Union would know this. Ironically the period after the Cuban Crisis which is also when MAD were implemented marks something of a relaxation of the Cold War.\textsuperscript{70} Somehow it seems to have worked.

In other words the reader should not expect ‘logic’ and ‘rationality’ when studying the shelters in Sweden during the Cold War if that is what the reader is looking for. It is my belief that they were not built with some scientific ‘Popperian’ logic in mind (if such a thing even exists), although the system builders might have thought so. Evacuation of entire cities within a few hours is simply not realistic, both American and Swedish exercises showed this,\textsuperscript{71} and the shelter had similar problems. Still they

\textsuperscript{67} Peter Englund, Brev från nollpunkten : historiska essäer (Stockholm 1996), p.263.
\textsuperscript{68} Martin V. Melosi, Atomic Age America, (Boston 2013), p.96.
\textsuperscript{70} Ibid. p.81.
\textsuperscript{71} Rose (2006), p.27 ”Washington civil defense official John Garret Underhill called Operation Alert [a massive evacuation exercise in USA] ”so inadequate it couldn’t cope with a brush fire threatening a doghouse in the backyard””; Marie Cronqvist, ”Utrymning i folkhemmet: kalla kriget, vålfärdssidyllen och den svenska civilförsvarskulturen 1961”, i Historisk tidskrift 128:3 (2008), p.467: ”I dessa redogörelser från uppsamlingsplatserna befann sig utrymningsövningen fjärran från kallakrissammanhanget; i stället tycks den på sina ställen ha utvecklats till regelrätta festivalarrangemang med liten eller ingen koppling till krigshot och orostid. Av de tre iscensättningarna jag
were planned for by the Department of Civil Defence, it was considered needed in the environment they lived in because of a piece of technology adopted into society, first aerial warfare and later nuclear technology in combination. This shows how important it is to include perspectives such as the technology philosopher Langdon Winner’s ideas of inherently political technologies and their systems and what they contribute to a society. The nuclear world had its own rationality and the shelters were built to protect from the irrational. In that sense they have more in common with churches and temples built to protect us from all evil both inherent in ourselves and in others through ritual and belief. And while trying to understand them in context you cannot take the position of an atheist trying to understand religion.

urskiljt i pressmaterialet är den idylliska folkfesten allra mest framträdande.”
The New Shelters: 1935 to 1944

This chapter will analyze the technological framework for the first years of shelter building in Sweden. It addresses the emerging aircraft technology and how the government reacted to this new type of threat through the first civil defence organizations and regulatory laws. It will also discuss the international influences described in official government reports that contributed to the development of a national shelter system. The sources used here are the four first government reports mentioned in the introduction.\(^\text{72}\)

This first part is mainly based on SOU 1935:38 *Arrangement proposal for Swedish Defence Organization*, and SOU 1936:57 *The Civilian Aerial Defence*. Something they have in common is that they were written by the Ministry of Defence. Only after The Aerial Defence Statute of 1937 the new civilian defence organization was sorted under the Ministry of Social Affairs. The authors of 1935:38 consists of a mix of politicians, governors and military expertise of different backgrounds and so do SOU 1936:57, but by that time much fewer since that one concerns aerial defence solely while the first concerns the whole defensive apparatus.\(^\text{73}\)

*Origins of the shelter system*

*Flight technology, total war and the normal type shelter 1935-1937*

To be urban was now to be subjected to the industrialized instruments of destruction. Great cities had been sacked before, but usually with ample warning - the airplane could appear instantaneously, drop its charge, and depart, an anonymous anarchist bomber of the sky. The airplane was rewriting geography, extending the temporary contours of the battlefield into the tangled streets of the metropolis.\(^\text{74}\)

Although Sweden emerged untouched out of the First World War, the development above described by Vanderbilt, was not taken mildly. In the first official government report studied for this thesis, SOU 1935:38 development of aircraft technology is the main reason why the modern war turned “total.”\(^\text{75}\) War “has extended to new areas” literally meaning this geographical intrusion aspect noticed by Vanderbilt, which meant that attacks might be directed to the adversary's power sources and communications as well as the “homeland in general.”\(^\text{76}\)

\(^\text{73}\) SOU 1935:38, p.2-4. As Chairman for the Defence Commission nonetheless than SAP’s Per Albin Hansson was chosen, but had later to step down since he became prime minister 1932-1936; SOU 1936:57, p.7f.
\(^\text{74}\) Vanderbilt (2002), p.54.
\(^\text{75}\) Ibid. p.114: ”Kriget har därigenom övergått från att vara en isolerad uppgörelse mellan härar och flottor till att bliva en kraftmätning mellan själva folken.”
\(^\text{76}\) Ibid. p.95f.
The purpose of bombing civil targets as industry, commercial centers and traffic (samfärdsel) is described in a very instrumental way as lowering a population's will of resistance (motståndsvilja). The key to this will of resistance is maintaining a steady level of supplies for the population which in turn is dependent on the nation’s mode of production. Maintaining the production and supply levels during war was thus the prime target of the civil defence. With this logic the report sets out to describe the country's production apparatus in whole before discussing or presenting any solutions to civil defence problems.\(^{77}\)

The problem at this point, was not then to save human lives. The problem was to maintain the will of resistance at all costs, because as long as the will of the people remained the government would not yield to the opposing nation.\(^{78}\) Homeland is therefore something of strategic importance just like power sources and communication hubs which means that the civilian population is regarded as another sort of resource to be bombed and brought to submission.

The solutions presented by the report to this problem is twofold. One is defending the cities with anti-aircraft weapons and building shelters. The other one is preemptive, which means bombing nearby enemy airbases so that the possibility of bombing the power plants, communications and industries becomes impossible by the sheer distances as well as keeping the enemies airborne forces busy.\(^{79}\)

Implied in these “distances” is a romantic national pride of sorts, Sweden as a nation in a geographical sense is uniquely robust against this new form of military method, the Baltic sea is described as a “natural shield.”\(^{80}\) Such arguments seems to have a disparaging function towards the new technological threat the authors states that even though the technological advances might continue, Sweden's geographical position would give leverage in comparison to other countries on the continent and could be considered “independent of technological development.”\(^{81}\) In the next

\(^{77}\) SOU 1935:38, p.96: "Enär dylika angrepp på handeln och samfärdseln i övrigt måste anses starkt kunna påverka befolkningens motståndskraft, synes en allsidig utredning av vårt lands försvarsproblem tarva ett närmare klarläggande av försörjningsläget.”

\(^{78}\) Ibid. p.114: “Utvecklingen inom krigstekniken och särskilt tillkomsten av ett operativt flygvapen har skapat ökade möjligheter för den anfallande att över eller förbi motståndarens stridskrafter nå hemorterns befolkning och direkt eller indirekt påverka denna. Kan befolkningens vilja till motstånd på denna väg brytas, tvingas ock den fientliga statsledningen att giva vika.”

\(^{79}\) Ibid. p.137: "I den mån motståndarens flygbaser kunna hållas tillbaka, kommer anfallsfrekensen att nedgå och därigenom även verkan av flygoperationerna att förminskas. Därtill kommer, att delar av de fientliga flygstridskrafterna bli knutna bundna i kampen mot de svenska. Operationerna komma att taga längre tid och förorsaka den anfallande allvarliga förluster. Det synes jämförligt under förutsättning av antydd organisation av luftförsvaret möjligt att bereda civilbefolkningen skydd i sådan utsträckning, att dess motståndskraft icke brytes.”

\(^{80}\) Ibid. p.133.

\(^{81}\) Ibid. p.133: “Östersjön och västerhavet utgöra dock naturliga hinder för en basering av starkare krafter i omedelbar närhet av vårt land. Till följd härav kommer Sverige, oberoende av den tekniska utvecklingen och möjligheten att i en framtid utsträcka bombplanens effektiva räckvidd, alltid att hava ett gynnsammare fäse än flertalet
breath the authors says that one should remember that most of the population along with the bulk of the nation’s assets is located in southern part, which is also the most vulnerable one. So it seems the geography might not help at all in future wars, but it still needs to be said.

A few years later with the 1936 report, information of the different bombs is extended as well as information on how to counter them and their effects. Here emerges more hands-on ideas about the uses of shelters and also the idea of different types of shelters. The separation of the civil and the military is also more apparent since in the earlier SOU the city should be defended with anti-aircraft weaponry in combination of shelters. In 1936 the weapons part is excluded and not discussed.

The perfect shelter in this new total war environment was usually to be placed in the basement of a building. The building needed to be improved above-ground with steel beams or thicker wooden beams and was ideally a few stories high since several floors could make some of the heaviest bombs detonate as high up in the building as possible. Concrete boards, steel beams and extra stakes for the below-ground shelters should be installed to reinforce the roof and walls (fig 4). Two entrances equipped with gas locks and installing telephones were recommended. Air volume per person was strictly recommended to 3m³ per person for these shelters (allows for 3 hours in a sealed shelter with

länder på kontinenten.”

82 The telephone, according to Hemsykdet, could be used as an internal communication between the shelter and the attic where a fully equipped fire guard should be situated, being the eyes of the shelter. Riksluftskyddsförbundet (1939), p.123.
an absolute of maximum 4½ hours). Air ventilation, gas-filters, steel doors, light, water-plumbing and toilet solutions along with light and reserve power units and of course medical equipment and other suitable equipment should be considered.\textsuperscript{83}

This first type of shelter is decentralized in its nature, ideally all buildings have a shelter adapted for the number of people residing there during peacetime, and according to a Danish report quoted this is to prevent large “clusters” of people at the same place.\textsuperscript{84}

To speed up evacuation, other modern technologies can be used such as “velocipedes” or older types such as skis, with such equipment for example hospital personnel can do their work up to the last minute.\textsuperscript{85} Evacuation during a raid could also be helped with palladiums placed along streets or parks that could serve as a temporary shelter. A palladium is a sort of open shelter with an inclined roof preferably made out of railroad steel beams ideally placed by an outcrop or a similar robust material or formation.\textsuperscript{86}

Gas bombs are given a lot of space and seems to be considered a growing threat hence is sealing of shelters for air quality purposes an area of inquiry for the authors.\textsuperscript{87} For example, while trying to cover cracks after a gas bomb blast, a roll of tape can suddenly become a lifesaver.\textsuperscript{88} Individual protection such as masks are also discussed thoroughly as a solution for this.\textsuperscript{89}

\textsuperscript{83} SOU 1936:57, p.67f. 
\textsuperscript{84} Ibid. p.64. 
\textsuperscript{85} Ibid. p.58. 
\textsuperscript{86} Ibid. p.69f. 
\textsuperscript{87} Ibid. p.10. 
\textsuperscript{88} Ibid. p.66. 
\textsuperscript{89} Ibid. p.71f.
The picture (figure 5) shows a splinter cover, which is supposed to protect from objects flying horizontally due to shock waves caused by bombs. The splinter cover was supposed to be assembled before an anticipated attack to protect the shelter’s weak spots such as emergency exits. The table at the top shows down to centimeters how thick the cover needs to be depending on the material used. Using sandbags, a 50 centimeter thick cover is needed, 35 centimeters with wooden material and 15 centimeters with reinforced concrete. Different methods of assembly is also described depending on the material. There is recommendations on practically everything down to inches and centimeters and different materials.90

Concerning the future war in general there is much uncertainty by 1936, a lot of emphasis is on försörjningskriget (my trans: supply war) which means in this context that the ability to provide supplies and maintaining production for a nations population is crucial in surviving and defeating a potential aggressor. Will of resistance, ethical will of resistance even (moraliska motståndsvilja), is still the most important factor in civil defence, although no shelter can protect every citizen, proper planning and shelter construction can reduce (begränsas) the effects.91 The fact that the next war might develop into a war of terror seems to be appalling, but the authors leave this aspect to hope and

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90 Riksluftskyddsförbundet (1939), p.127-140.
91 SOU 1936:57, p.50.
claims that no nation would want to be the first one to start such a war. In retrospect it is hard to know what to think about such a statement.

There are two points to be made before I move on to the next part.

The first one is that in SOU 1936:57 there is a very vivid discussion about urban planning in reaction to the new warfare technology. The authors recommend that military barracks, civil industries or other establishments that might be a potential target for the aggressor should be relocated to the outskirts of the city, away from residential areas. Luckily this desire is shared and in line with contemporary “hygienic” ideals in urban planning which results in a quite obvious connection between shelters and other governing systems. Even at this early stage the shelter and civil defence were intrinsically connected to modern ideals of the urban environment.

The second concerns evacuation during aerial bomb raids. Here an interesting problem is brought up. Hospitals were unfortunately often located in central urban environments and were both a potential target for aerial attack while at the same time need also to stay functional during an attack, which results in a dilemma. Should the doctors and nurses in a hospital evacuate at all? Not only do the personnel need to care for their patients, they must also be ready to receive newly injured citizens which will hardly be possible while being sheltered.

This hospital dilemma should be remembered since it is one of the more sober discussions found in the government reports concerning the realities of shelters, evacuation and civil defence in a war situation. Here lies one of the more important moral problems of short-term evacuation and long-term evacuation. At what point should the productive national organism stop living above ground and start living underground? This question we will return to later since it will grow in importance.

**The First Organization 35-37**

The first report was a part of a whole series of reports released during 1935 with the purpose of restructuring Sweden's military defence on all terms during the mid-war years. The Ministry of Defence was at this point commissioned to produce them and the same goes for SOU 1936:57. First

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92 SOU 1936:57, p.42.
1937 there was some sort of organization with the sole purpose of developing and nurturing the Swedish Civil Defence, *luftskyddsinspektionen* (literal translation: Air Defence Inspection Committee), before that it was considered the airborne military department's responsibility.\(^\text{94}\)

The Air Defence Inspection Committee's was instigated by the government through *luftskyddslagen* (my trans: Air Defence Statute) SFS 1937:504, which meant that the nation was divided into several civil defence districts, using existing counties as templates with the chief of police in each county as the head of civil defence (Figure 6).

\(^{94}\) SOU 1936:57, p.38. "Några bestämmelser, som närmare reglera luftskyddets organisation, finnas icke. Vissa stadganden hava emellertid tillämpning även på luftskyddet. Enligt i kommandovåg utfärdade bestämmelser åligger det sålunda vederbörande armeefördelningschef eller motsvarande myndighet att inom armeefördelningsområdet eller motsvarande område i fredstid planlägga erforderliga åtgärder för skydd mot anfall från luften.”
particular needs, a particularly decentralized solution. This board would work as an advisory installment and the Chief of Police in each district functioned as the operative director.\textsuperscript{95}

The Air Defence Statute of 1937 had its basis in SOU 1936:57 previously discussed. This one is the first where civil defence is considered a problem apart from the military apparatus, and the installment of a civil department is a milestone in that sense, drawing a distinct line between the military and the civil was no longer considered possible. So while trying to separate the civil and the military, the organization is an example of how war encompassed both branches. By organizing the civil it became drawn into the military world.

\textit{The role of the state, the new organization and old tech: 1939 – 1944}

This part will discuss the two later government reports from the earlier years, SOU 1939:42 \textit{Gas masks and shelters for aerial defence purposes for the civil population} and SOU 1944:5 \textit{Civil Defence Statute}. The report from 1939 could be described with a new characteristic, which it shares with its successor from 1944. What is proposed in these are mainly jurisdictional changes. Should the state provide gas-masks for all its citizens and should the state subsidy construction of more shelters in urban areas especially sensitive to aerial attack? Both proposals in SOU 1939:42 were rejected, gas-masks to everyone seems to have been too expensive along with problems of allocation and distribution in time of need. The proposals raises questions about the state’s role in this new total war environment; how much of this is the state’s duty, and how should all this be organized?

From 1939 to 1944 there was not much change in technological characteristics concerning aerial warfare as discussed in the SOUs. The war eventually came and aerial warfare became a giant part of it as expected, the planes were bigger, bombs were heavier and range of operation was extended. The SOU publicized 1939 discusses gas-masks for the population since the threat of gas warfare seems to be very appalling at the time. But even here it is explained that there are no “new” chemicals to be expected in an eventual war.\textsuperscript{96} Perhaps not very reassuring since the gas that existed were nothing pleasant, but seen in a perspective where new products and machines of war came by the


\textsuperscript{96} SOU 1939:42, p.50ff. An interesting observation in this SOU is found in an appendix about different types of gas and it goes “the popular idea that gas clouds could sweep over huge parts of the country and exterminate all organic life is both theoretically and practically impossible”. The sentence is quite explicit and reminded me instantly of the fear induced by nuclear fallout some years later.
month, such a statement might have had reassuring function to the reader. Nonetheless, at this time there were other things to worry about.

1944 and the report released that year is important in the same jurisdictional sense because this is the year when the Swedish normal shelter turned “systemic”, some of the points taken up in 1939 were now approved of. Two decades of rapid technological change and a second completely devastating World War resulted in this quite optimistic government report which served as basis for *Civilförsvarslagen* (SFS 1944:536, lit trans: Civil Defence Statute).

With the enforcement of the Civil Defence Statute every citizen at age sixteen was pledged to undergo civil defence training, every building (commercial, offices or residential) with two or more stories with the purpose of housing citizens in any way had to have a *normal skyddsrum* (my trans: normal type shelter). According to Göransson & Skogman, the authors of an extremely handy little book, *Civilförsvaret enligt 1944 års lagstiftning* (Civil defence according to 1944's jurisdiction) the following places were apt to have a shelter:

1. Harbours, railway stations or any other comparable establishment of importance to the general communication network.
2. Industrial establishment employing 25 or more persons.
3. Establishment with the purpose of education or healthcare adapted for 25 or more persons such as schools, hotels, hospitals.
4. Any building with two or more stories built for housing, offices or commercial purposes (attic is considered a story if more than half of it is furnished as living quarters or working space).
5. Any other building where citizen sojourns and the länsstyrelsen (my trans: county board) finds it necessary to administer shelter.97

The connection between Hughes view on technological systems and regulatory laws is here perhaps most obvious. 1944 the shelter as a piece of technology is now forced upon the citizen and the municipalities.

The type of damage that these shelters were supposed to handle were splinters and other flying objects, shock waves, and the eventual collapse of the building above. The shelter had to be air tight to prevent smoke and gas getting inside and should be large enough to house the same number of people estimated for peace time use for approximately 3 hours. Apart from the criteria of shock waves,

97 Göransson & Skogman (1944), p.120.
there is nothing new here since the 1930s, it’s the same type of shelter that had been introduced in 1937. It seems as if the character of military airborne weaponry appeared to be much the same during the period of 1935 to 1944 for the authors of the reports. The difference was just that everything was becoming bigger and stronger and more extensive. This meant that the protection against the weaponry was also of the same character as before, it was just a matter of reinforcing an existing blueprint.

The first lines in the introduction of Göransson & Skogman’s book is revealing in this aspect:

The modern warfare has through the development of modern weaponry, especially concerning aircraft technology, acquired a character of total warfare. Offensive action is no more restricted to local areas such as battlefields. What in military terms is called the home front will today be subjected to offensive military action, mostly through bombardment by aircraft. This renders it necessary for the civil population to organize in such a way that attacks against the home front can be limited and neutralized as much as possible.

Essentially this is no different from what was being said 1935, but nine years later this proposed organization was enforced by law, war concerned everybody whether you wanted it or not. At this point the civil defence and the shelter building practices in Sweden started to work on an institutional level after a slow start in 1937. The statistics from MSB also shows this quite well: Between 1938 and 1945 only a handful normal type shelters were built while the period 1945-1950 resulted in 6277, a staggering increase.

With the Civil Defense Statute of 1944, the statute from 1937 was rendered obsolete. The Air Defense Inspection Committee was restructured to Civilförsvarsmyndigheten (my trans: Department of Civil Defence). As a result of that change came also new authority. Air Defense Inspection Committee had been solely an advisory department, but the Department of Civil Defence could now demand inspection and expropriate buildings for civil defense purposes, also, failure to yield to these demands would result in penalties. To be sure that all new buildings would follow suit and implement

98 Göransson & Skogman (1944), p.120.

99 For example the report from 1944 states that currently the outer walls of the above building have been functioning as the main protection against bombs, but the development shows that the main protection should now surround the basement situated shelter itself which means that the shelter should be considered more like a building inside a building. SOU 1944:5, p.207.

100 Göransson & Skogman (1944): ”Den nutida krigföringen har genom utvecklingen av de moderna stridsmedlen, särskilt på flygvapnets område, erhållit en alltmera total karaktär. De särskilda stridshandlingarna är nu numerä icke inskränkta till vissa begränsade områden, krigsskådeplatser. Även vad som enligt militär terminologi betecknas som hemorten blir numera direktt utsatt för stridsåtgärder, främst genom bomber, eljest genom flyggande bomber. Detta gör det nödvändigt, att det civila samhället organisera sig på sådant sätt, att dylika stridsåtgärder i möjligaste mån neutraliseras.”

shelters into the blueprints all building plans had to be approved by Byggnadsnämnden (my trans: Construction Board) according to the new statute.¹⁰²

The first general director of the new Department of Civil Defence was Åke Natt och Dag. The head author of the government report preceding the Civil Defence Statute of 1944 was none less than Rickard Sandler, a social democrat who served as Prime Minister for little more than a year between 1925 and 1926.¹⁰³ Another well-known personalities behind the Civil Defence Statute was Alvar Zetterquist. Just as Åke Natt och Dag, Alvar Zetterquist was a jurist and became later director of kriminalpolisen (lit. trans: National Police Bureau) He was director of the first installment of civil defence organization the Air Defence Inspection Committee during 1937-1940 and have co-authored several of the government reports studied in this thesis.

Although the statute from 1944 is government enforced it is a rather decentralized system. Every municipality had to administer and construct shelters, and the state would only finance one third of the total cost. The shift from Air Defence Inspection Committee to Civil Defence Board was also a way of keeping the administration at a decentralized level, the existing Air Defence Boards at municipality level seems to have remained but now with a new name and more authority.

**International influences**

So far I have discussed is what happened when airborne warfare struck Sweden. Of course not in a literal sense. Knowledge of such a thing as airborne bombardment was only secondary. Very few bombs were dropped on Sweden during the Second World War, and Sweden did not serve as a development spearhead in weapons technology at this time. Actually very few bombs at all has ever since been dropped on Sweden.¹⁰⁸ The authors of the government reports knew this as well. The practice of including these international ideas reveal that the authors saw Sweden being subjected to

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¹⁰² The construction board’s purpose was to see too a municipalities urban development and has been an important part of the urban development. Urban planning as a concept origins from the nineteenth-century, especially the later period with the new statutes 1866,1874 and 1907. The period also saw an increased urbanization in general. Christer Ahlberger has written about this subject in the book *Den svenska staden: vinnare & förlorare* (Stockholm 2001), p.59-64, statistics at p.128.

¹⁰³ Rickard Sandler held several offices such as Minister of Foreign Affairs 1932-1936 and later he was appointed as a United Nations delegate between 1947 and 1960. This man was purely ideological and wrote several political texts used as base for the Workers Social-Democratic Party (SAP), he is also one of the few swedes who has translated Karl Marx's *Das Kapital*. Projekt Runeberg [http://runeberg.org/vemardet/1957/0875.html] retrieved 2013-05-28, Marx, *Kapitalet* (Stockholm 1930).

¹⁰⁸ Some bombs were dropped during Second World War over Sweden; 4 bombs over Malmö during 1940, several different places along the eastern coast was bombed by Soviet war crafts during 1944 and a stray V-missile ended up in a forest in south Sweden. Only the Soviet raid was deliberate although the official Swedish communiqué claimed it was incidental. Per Söderberg (ed.), *Andra världskriget : en uppslagsbok om bakgrund, förlopp och efterspel* (Malmö 2004), p.72-78.
the new aerial warfare in the future, and that some of the solutions to reduce the expected dangers were inherit in the proposed technology.

In this part I will discuss the international references found in the government reports with the purpose of backtracking some of the ideas behind both the shelter and the organization and the regulatory laws. The sources used here are all four reports from the period 1935 to 1944.\textsuperscript{109}

In the report from 1936 (SOU 1936:57) the origins of civil defence and shelter building is said to be the Soviet Union. It seems that 1928 is year when civil oriented air defence started to be prepared for. According to the authors it spread across Europe from here to Czechoslovakia and Poland, Germany and Switzerland, France and Italy in corresponding order. By 1935 it is noted that England began preparations and by the time the report was written the authors say that, Portugal and the Nordic nations probably are the only European nations without a proper civil defence organization.\textsuperscript{110}

The idea that civil defence organization was not a part of the military defence can also be seen originating from international influences. Many nations seems to have seen civil defence as a calamity protection, hence should responsibility be laid on emergency services such as fire brigades, police, security forces, and healthcare services and not the department of defence, which coincides with the view presented later in the report.\textsuperscript{111}

Concerning the shelters, the authors agrees with a Danish civil defence commission and states that building shelters for the entire population that could withstand a direct hit from any type of bomb is utterly impossible. To be protected from a direct hit by a blast bomb (minbomb) the shelter needs to be built as a fortress. However, a shelter blasted into an outcrop or rock can give such protection. The idea of reinforcing structures with steel beams was also taken from outside, that was a conclusion drawn by the German Civil Defence Commission.\textsuperscript{112}

In the government report from 1939 there is a section called “Experiences from the Spanish Civil War”, this was one of the first wars where aerial bombing was used and according to the authors the experiences from this war implies that shelters should be considered being of far greater importance than previously understood. Very few shelters with direct hit protection seems to have been built by that time in Spain but the normal type shelter, built to sustain a collapse of the building above and to protect from flying objects, was shown to have great advantages.

\textsuperscript{109} SOU 1935:38; SOU 1936:57; SOU 1939:42; and SOU 1944:5.
\textsuperscript{110} SOU 1936:57, p.19.
\textsuperscript{111} Ibid. p.19-20.
\textsuperscript{112} Ibid. p.63,66.
This government reports brings a lot more goods than the experiences from the Spanish Civil War. In the chapter “Shelter regulations in other countries”, we find that many of the regulations vindicated in Civil Defence Statute from 1944, can be found originating from other countries in Europe. In Denmark in 1938 all public buildings constructed from here on must have a shelter approved of by the civil defence department. In the English Civil Defence Act from 1939 the responsibility lies on the municipality to administer public shelters. In Latvia from 1934, the authors say that all public buildings, industries and residential buildings housing 25 people or more must have a shelter and these should be airtight to protect from gas warfare. In Luxembourg, a classification of different shelter types can be found similar to the Swedish classification, and in Germany, 1937, all reconstructed or new buildings must include a shelter approved by the German Air Defence Committee. In countries like Netherlands, Switzerland, France, England and Finland public shelters can be subsided to a certain degree by the state.\footnote{SOU 1939:42, p.24-27.}

What this shows is that not only was the warfare technology introduced to the Swedish government and defence planners something that was taken into the country from outside the nation's borders, the solutions to it, be it jurisdictional, organizational or shelter blueprints was also taken in and adapted to Swedish conditions which in my opinion constitutes an example of what Thomas P. Hughes would call technology transfer. This means also that this is the point where the national style of a technological system discussed by Hughes become introduced.

It should also be mentioned that military doctrine just as civil defence doctrine was inspired by ‘international’ ideas. As an example, the preemptive aerial attack against an enemy’s airbases is classic aerial warfare doctrine developed by strategists such as the Italian General Giulio Douhet.\footnote{Agrell (1989), p.95f.}

An observation is that in the report preceding the Civil Defence Statute 1944, this international aspect is missing completely. I could not find any reference of the sort that is present in the reports dating from 1935 to 1939. I believe a reason of this is a domestication of civil defence, the Second World War showed that any protracted motivation was ridiculously unnecessary, the question was how to organize it. Thus, the report from 1944 mostly concerns the organizational aspects of civil defense, how it should function in relation to other institutions and departments.
**Summary 1935-1944**

The new total war had put Sweden’s defences under completely new circumstances, aerial warfare brought the war back to the urban environment in a completely new way. The organization and accumulation of information about how to defend the nation were responses to this new development. National traits such as geographical positioning were used to disparage the new threat and even decouple Sweden from dependence of technological progress, the geographic traits made Sweden independent of technological development while at the same time emphasizes the nation’s vulnerability.

The typical shelter by 1944 was meant to be a temporary haven that could protect every citizen for a few hours while a bomb raid was raging above. The regulations and the 25 persons limit for shelters indicates that this is something for every citizen situated in some sort of urban environment. The shelter was typically situated in the basement of a larger building of several stories and was reinforced with concrete preferably, but other materials such as brick, steel beams or wooden beams could be used. The huge size of blast bombs emphasized strong skeletons in structures to prevent them from collapsing over the shelter and along the façade walls and by emergency exits splinter covers had to be arranged to protect weak spots from projectiles flying horizontally due to bomb detonations in the vicinity. The shelter should be airtight and have a gas lock to protect from gas bomb attacks anticipated during the 1930s. The three hour oxygen limit was apart from gas protection also important if the building above would collapse and the entrance’s needed to be dug out by helpful citizens. Further was communication outside important, telephones was ideal to communicate with outside fire guards for example and of course medical equipment and toilet solutions were needed. Sweden’s geographical position was situated so that this must be planned for if the nation in any realistic sense expected to hold out against an enemy.

It is obvious that the ideas and technological framework that characterizes the regulations from 1944 were established from what was known by the mid- to late 1930s which consisted mainly of aircraft technology. By 1944 a set of jurisdictional restrictions and regulations are put to use to counter the threats using the 1930s technological framework along with some new influences from the Second World War.

Most important is the fact that all new buildings or buildings under reconstruction had to implement a shelter of normal type if the building was constructed for 25 or more persons to be housed there at the same time. Failure to do so could result in fines and the new institution Department of Civil Defence had authority to expropriate buildings that they considered crucial for civil defence purposes.
The new organization also had tighter connections to other institutions such as the Construction Board, a detail perhaps but it shows that civil defence became a part of a much larger governmental system which also included examples like urban planning.

Even though the connection to social democratic politicians is obvious the relation between civil defence and social democratic policy remains obscure in all the reports. It can be a result of an idea about government reports being seen as something objective. My interpretation of this is that the problem of war, seen as a question of state survival was not seen as a matter of discussion in a left or right context, the imagined importance of will of resistance went deeper than that. As one of the contributors of SOU 1939:42 puts it while arguing over the fact that no shelters for city street dwellers have been planned for:

One of civil defence's most important duties should be to see to that the general public's calm remains, so that normal life can be upheld undisturbed as long as possible. From this viewpoint, shelters for the general public should be of uttermost importance. If such arrangements should not be provided for the city street dwellers, the result will be that the general public, when air bombardment commences, will not leave their dwellings which of course will greatly affect the societal organism adversely.115

No names are mentioned explicitly but Överståthållaren (my trans. chief of fortifications) is supposed to be the author of this remittance which should mean that the person behind this is one of SAP's closest and one of the founders of the parallel volunteer organization, Torsten Nothin and a close associate with previously mentioned Rickard Sandler.116 Politicians they were but the concept of societal organism does not easily fit into a left-or-right policy at that time.

The argumentation behind implementation of civil defence should not be explained in some humanitarian context. Concerning the people affected by the new type of war, there is little, sometimes no reference to their potential suffering. Keeping the populace underground for short periods is explained in strategic terms as a way of upholding will of resistance. There is no humanitarian context, no reference to the sanctity of human (or even civilian) lives or the state’s role to constantly nurture the life of the citizen. These points underscores that the civil defence in Sweden during the Cold War had little to do with Social Democratic policy per se. Many similar regulatory laws and organizational concepts originated from other nations and the Swedish one was just an adaptation. The reasons why civil defence was needed were strictly explained as state survival. Production, import and export must be upheld at all costs along with a normal, decent living. When

115 SOU 1939:42, p.30, "En av de civila luftskyddets viktigaste uppgifter torde vara att verka för att befolkningens lugn bevarades, så att det normalaivet skulle kunna förgå i möjligaste mån ostört. Ur denna synpunkt måste tillgången åskyddsrum för allmänheten anses vara av väsentlig betydelse. Saknades dylika skyddsmöjligheter för gatutrafikanterna, torde nämligen följen bliva, att befolkningen, då fara för luftbombardemang hotade, undveke att lämna sina bostäder, vilket givetvis komme att inverka i hög grad menligt på hela samhällsorganismen."
the bombs come falling down; stop working, get inside a shelter, wait three hours, get out and continue as if nothing happened. Society is an organism where all parts must function for survival.\footnote{SOU 1944:5, p. 47-51.}

The three hours of oxygen is a crucial point in this new system since it stresses the idea of temporary evacuation. After the raid life becomes normal again. Torsten Nothin’s statement is an ideal type of this mode of thinking. The citizen must not be afraid to go out even during war, if the Swede bunkers up at home the war will be over. Gas is considered one of the greatest threats during the 1930s, which results in technological solutions and information about keeping shelters airtight. But even gas is described as something temporary, it is something that passes and can be kept out and does not have long term effects on the biological life. Fire is a problem but not for shelters, fire seems to be a problem for the immaterial sides of civil defence. It is something that the civilian defence personnel should handle with example fire guards which further emphasizes the temporary traits of shelters at this point.

This marks the completion of what I would like to call the first phase of the shelter-system in Sweden. With the Civil Defence Statute of 1944 a system is definitely in place. Very, I would even like to say extremely little, of this is because of actual war experience. The government was constantly reacting to outside influences beyond their control. That reaction could be seen as a process of domesticating an outside threat. The reports from 1939 and 1944 is an example of how the reaction works. By stressing the organizational sides of Civil Defence, the organization acquired the particular national style. A system of threatening technology as well as potential solutions entered the scene from outside the nation’s borders during the 1930s. It is taken in and processed according to the nations envisioned traits and structure and results in the Civil Defence Statute of 1944.
The Normal Type Shelter: 1947

The introduction of missile technology and nuclear fission and fusion bombs to an already existing system

So far we can conclude that shelter-building became systemic during the period from 1935 to 1944. During the period 1945 and 1950 more than 6000 normal type shelters were built. By 1947 the news from Hiroshima had been processed and publicized by the new Department of Civil Defence. The next chapter will discuss what happened and what did not happen when a whole new type of weapon technology was introduced to the Department of Civil Defence and the system previously established.

News from Hiroshima

Reaction to atomic technology 1947

As the reader might remember the introduction of aerial warfare was taken seriously but with some caution. There were ideas that Sweden's geographic traits would serve as protection even in the longest run. In retrospect it can be said to have been naïve, since the operational range of warplanes expanded faster than expected. Similar attitudes can be found in the initial responses to atomic weaponry. Reports of them appears in a government report from 1947 initiated 1945 (1947:10). First; It is now understood in the introduction of this report that the civil defence must be reviewed at least every five years to keep in touch with the technological development. That is a first and initial difference from the 1930s; the idea that Sweden, to survive, must keep up with technological development, not only defend against it.

Although this new attitude there is little reference to the atomic technology which suggests that, it is not the atomic bomb that constitutes the idea of technological progress alone by 1947. The field trips conducted were neither to Japan, but to Europe and the places there that suffered from aerial bombardment but not with atomic bombs.118

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118The reader should be reminded that the reasons for this could have been many. According to Martin V. Melosi, after the Japanese surrender (Melosi (2012), s69f.), ground zero in both Hiroshima and Nagasaki became restricted areas, and might not have been accessible for foreigners, the distances could of course also have been a factor along with many others.
Disparaging arguments

According to the authors it is nevertheless a technological leap in some unknown direction. But just as the historian Wilhelm Agrell has noted many times before the first atomic bombs were discussed mainly as an economical advantage.\(^{119}\) One bomb now had the same effect as thousand normal type of bombs.\(^{120}\) A thousand bombs might sound like a lot but considering that according to the same report 1,230,000 tons of bombs were dropped over Germany during the late Second World War, 8000 new V-missiles were sent against Belgium alone. A thousand is not that much in such context. Thanks to bureaucracy we can delight in this horrible table from 1947 which sums up this argument pretty well:

![Image of Table 12]

*Figure 7: Dead and wounded ratio per tonnage bombs (estimated average at the bottom). The bizarre fact we can find here is that the bombing missions against England by German forces killed the most per 10 ton bombs. 8 dead civilians. Allied raid against Germany finished only second with 5 civilian deaths per 10 ton bombs. SOU 1947:10, p.38. The column to the far left “totalinsats”, is a summary of amount of bombs in tons dropped on England, Germany, France and Denmark. These numbers represents what was known by 1947 and are not necessarily up-to-date today.*

An interesting fact is that the known effects by the atomic bombs over Hiroshima and Nagasaki are somewhat enhanced by cultural traits of Japanese craftsmanship tradition with the purpose of downplaying the bombs importance to the near future. According to the authors, the bombs seems to have been built for such environments that Japan constituted. Low profile, wood and plaster based housing structures was a protection from frequent earthquakes but served as excellent material to be vaporized as Little Boy and Fat Man detonated.

\(^{120}\) SOU 1947:10, p.43.
Thus, dropping similar bombs on European cities with its both modern steel and concrete buildings and at the same time antique stone structures would not fulfill the purpose of the bombs. The European character served as protection in itself. And yes, another table gives percentage differences using this argument.\textsuperscript{122}

The numbers are taken from an English report on the bomb, but the arguments applies to Sweden as well according to the authors. Most importantly; had the Japanese inhabitants evacuated in time and taken shelter, many lives and property would have been saved.\textsuperscript{123} Here we can sense a national pride and faith in the Swedish shelters also expressed in this quotation:

\begin{quote}
All known experiences of the atom bomb gives certain assertion that the shelters used in Sweden has a significant protection value against it, which - if the population evacuates and takes shelter in time - probably will result in damage equal to the normal type of massive aerial bombardment.\textsuperscript{124}
\end{quote}

If we for now ignore the fact that the quote makes atomic warfare sound like a “normal,” conventional war, this is perhaps the most important strain of thought in this government report according to me. Because it emphasizes \textit{evacuation} and \textit{time} above the shelter and how it is constructed.

There are other arguments as well presented to downplay the bomb’s importance. Atomic bombs are said to be extremely expensive, uranium rare, and the delivering system must be reliable enough for the risk of sending a weapon against its target. There is also the chance that the atomic bombs will be prohibited through international sanctions and regulations.\textsuperscript{125}

\begin{figure}
\centering
\includegraphics[width=0.5\textwidth]{tabell18.png}
\caption{This table shows estimated percentage of killed civilians in every zone with a comparison between a Japanese city (middle column) and an English city (right column). SOU 1947:10, p.47.}
\end{figure}


\textsuperscript{123} Ibid. p.46.

\textsuperscript{124} Ibid. p.48. “Alla erfarenheter tyda på att skyddsrum av här i landet gängse typ redan i sin nuvarande utformning äga ett betydande skyddsverde även mot atombombens verkningar, varför — om skyddsrummen \textit{hinner uppsökas} — förlusterna i människoliv sannolikt kunna hållas inom samma storleksordning som vid ett massanfall utfört med vanliga bomber.”

\textsuperscript{125} Ibid. p.48, 76.
The economical sides of the bomb has also an effect on target choice. To be considered “nuclear worthy,” a city needed 30 000 citizens or more, with an optimum on 2 million. However, according to the authors, the 30 000 citizens-line must be revised if a city is of some other strategic importance apart from the mere terrorizing objective.126

This idea is quite important for a few different reasons. It laid out a distinct line between the urban and the rural; with such logic the atomic warfare became an urban problem, something to be mostly worried about in Stockholm, Gothenburg or Malmö. It perhaps also implies what is an aggressors target in terms of destruction, what they might consider being a nation's vital point: The urban milieu was where the post-war world grew, and so it was the prime target. Thirdly it is another rather horrid expression of the positivist mode of thinking: behind such expression lies a mathematical logic, one bomb costs this and that, to be worth dropping it needs to obliterate so and so many people. \textit{At least a} ratio of 30000 dead per bomb is recommended.

Among the effects of the new type of bombs are radioactive fallout and radiation emitted at the moment of detonation. By the time the report very little was known about this, an argument valid even for the American scientific community since much emphasis had been placed upon the instant destructive force of the bombs.127 An example is that the authors state that no long term radiation will contaminate the soil if the bomb is detonated above ground.128 The authors conclude that a normal type of shelter equipped with air ventilation and filters situated in a “modern four-story building,”129 approximately 500 meters away from ground zero should provide sufficient protection from gamma rays. The angles of incoming rays were obviously important for if situated directly below a detonation the rays will move vertically and then it is important that the roof of a building is sufficiently enhanced. It is unclear what to make of this particular statement, but it seems as if the authors expected to survive an atomic detonation even if you sat in a shelter directly below it.130

These arguments have the purpose of trying to relax the reader; the atomic bomb is not as bad as it sounds, the effects of radiation is treated as some sort of extension of gas, something you can successfully keep outside with proper planning. They are also used to lessen the bombs potential development and projected future. As if trying to say; yes they are here now, expensive and

\begin{itemize}
  \item \textsuperscript{126} SOU 1947:10, p.188.
  \item \textsuperscript{127} Melosi (2012), p.70.
  \item \textsuperscript{128} SOU 1947:10, p.45.
  \item \textsuperscript{129} Ibid. p.172. Note also how the word modern is used to create a feeling of safety.
  \item \textsuperscript{130} Ibid. p.172.
\end{itemize}
complicated as they are they will probably never be used and for the same reasons they will never become mass produced in the same manner as the “normal” bombs.

What’s missing here is also a discussion of what now has become a “normal” bomb, because implied in the discussion of atomic weaponry, the potential destruction of a mass aerial attack without atomic weaponry is being undercut. This is quite similar to how gas bombs and gas in general were discussed before the Second World War. By describing the disastrous effects of gases in detail, the normal bomb moved into a sort of background discourse, while still being the most anticipated mode of attack. This logic gives a sort of relief as if one should be happy that it is not gas bombs coming at you when thousands of tons of TNT are falling through the skies.

It is obvious that the authors are trying to react and keep up with the development outside the nation’s borders and that the information given is highly dependent on the author’s connections with other organizations and nations with data or real experience. The new threat is taken in from England in this case and is analyzed and discussed in a Swedish perspective, which means trying to find similarities in nation character with other western nations such as England while trying to distance themselves from the Asian character of Japan. Swedish civil defence can use the English study because we are similar, and our chances of survival are higher because we do not build or act as Japan. It is a double sided discourse, the growing threat at one side and disparaging arguments on the other.

**Missile technology 1947**

Apart from atomic weaponry the second largest bulk of technological news in this SOU is missile technology, it might even be more important in some aspects because of all the problems involving the nuclear. The Nazi Regime spearheaded missile technology in the autumn of the Second World War and as I mentioned above, around 8000 V-1 and V-2 rockets were launched at Belgium for instance. England also received a great deal. What was frightening with these according to the authors was the also the *time* aspect, The civil defence's reaction time was greatly reduced since the V-2 flew at supersonic speed, which is further emphasized with the authors conclusion that V-missile’s had higher “death ratio per tonnage” than ordinary bombs.

The projected future of missile technology seemed also very frightening since it was not burdened by the technological and economical restrictions of the atomic bombs. Another factor behind this is might be vivid memories of the aircraft's fast-paced development curve, perhaps the missiles were seen as an extension of aircraft technology and atomic bombs as an extension of bomb technology.
which gave them different projected paths. But anyhow, the future is one of missiles and atomic bombs no doubt.\footnote{SOU 1947:10, p.40-42; p.50-51.}

Because of this attitude, whether it can be said being right or not, no changes in the shelter regulations vindicated 1944 are recommended even though missiles and nuclear weapons have been introduced and treated as the future of warfare.\footnote{Ibid. p.26.} Which means that the rules, regulations, and construction recommendations remains as described in 1944. It remains until SFS 1944:504 is rendered obsolete by a new statute 1960, SFS 1960:74.\footnote{SFS 1944:536 was replaced 1960 with SFS 1960:74. Eskilstuna Kommun has written a short summary of the process on their webpage about their Civil Defence Board: <http://www.ekskilstuna.se/sv/Uppleva-och-gora/Arkiv/Stadsarkivet/Var-arkivbestand/Kommunala-arkiv/Namnder-styrelser-och-andra-kommunala-forvaltningsar/Civilforsvarsnamnd-1944-1995/> retrieved 2013-05-21.}

It should nevertheless be said that the civil defence organization was definitely under consideration. The technological development is faster than anything and it seems impossible for the civil defence to keep a steady pace. Because of this there is a new emphasis on evacuation and reaction time, the immaterial sides of civil defence instead of the material. The shelters were there, the problem is getting inside them in time. A problem is the inherent inertia of a society, it is said that a society's development pace is much slower than technology’s development pace.\footnote{SOU 1947:10, p.78.} In this sense atomic bombs and missile technology was definitely a new challenge which was not considered easy to overcome and thus must be carefully planned for.\footnote{Ibid., p.76.}

A new type of shelter?

By 1947 the ideal shelter seemed to be quite similar to earlier ideas. A normal type shelter can withstand even the new type of bomb if reinforced in very similar ways as discussed in the 1930s, with extra beams and sandbags. The uncertainty of its efficiency is definitely there, and the need to disparage the importance of atomic weaponry underscores this. The temporality of evacuation is also still present but time has become the most important factor. The shelter will withstand a nuclear bomb, the problem is getting inside them.
Sheltered Society

1950: Permanent evacuation

This final part of my research will discuss the introduction of the hydrogen bomb during the beginning of the 1950s. The source used here will be SOU 1950:13: *Skyddsrum för befolkningen* (Shelters for the Citizens). This report, written by the Department of Civil Defence as all the others, proposed a change in shelter building-practices from basement situated public shelters to shelters blasted into rock and outcrops. The reader should also note that the term *mass evacuation* points to both evacuation out of cities and evacuation into shelters.

The problems preceding this proposal was that the development in weapons technology, reaching unsurpassed levels of destruction, now made the normal type shelters partly obsolete. The normal type shelter was not enough to protect all citizens in the urban centers where a bomb was likely to strike. Also, most shelters built, according to the authors, had so far been built in outskirts of the city where the construction of new buildings had been prominent but not in the city centers where they were badly needed. This was of course a problem for the city-street dweller who would not be able to get home in time in the event of an attack.

To solve this, shelters with the capability of protecting against a direct hit from a nuclear weapon must be built in central areas of Swedish cities. The most effective way of doing this was to dig into the granite in all cities that could be treated as a potential target.

Finally, to afford such a gigantic project, an important part was to assure that there were peacetime uses for such shelters.\(^\text{136}\) Perhaps unintentional, but this shift in focus to underground living gives the discourse a sort of constant war character. Peacetime and wartime became a matter of configuration of an already underground environment.

Saying this the authors do not wish to stop the construction of normal-type shelters, which means that this so called phase in shelter building practices is additive, it is placed on top of the old practices. This new focus is what I would like to present as the Second phase and this is a continuation of a logic introduced with nuclear technology which now reached its culmination.

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\(^{136}\) SOU 1950:13, p.10-16.
If the report from 1947 was ambivalent in its approach to the new type of weapon there is clarity
1950. The story of technological development is now one of attack weapons and not of aircraft
technology, the missile technology has also fused with atomic weaponry. In 1947 they were carefully
separated into different technological branches with different projected development paths, but 1950
they seem to be understood as a delivering system in the future capable of carrying nuclear technology.
The atom bomb is described as “the culmination” of warfare development.\textsuperscript{137}

The time aspect introduced 1947 is of course still important, and some new inventions are radar and
_television technology which further decreases the problem of missile accuracy. Accuracy is
nevertheless quite a vague thing and it is concluded that so far only very large cities should be treated
as potential targets of V-missiles since the technology is still crude, which also emphasizes the
separation of the urban from the rural in civil defence.\textsuperscript{138}

Missile technology is also subject to disparaging arguments of the type we met in 1947 concerning
atomic bombs. Missiles are said to be expensive and complicated and will probably not be used in
several years.\textsuperscript{139} The same goes for atomic bombs, just as 1947, uranium and plutonium is said to be
sparse and expensive and therefore not to be over emphasized as fuel for bombs.

Mainly this has its consequence in targeting, and the 30.000 population limit earlier established is
now increased to 50.000; “no nation would at present time sacrifice an atomic weapon over a city
with less than 50.000 citizens or over a dense industrial complex with an area less than 12 square
kilometers in size.”\textsuperscript{140} So if you live in a city that does not fulfill these requirements, there is no need
to worry.

The fission bomb is surrounded by more technical facts than before and get a new description, it is
now described as a combination of incendiary bombs, blast bombs and war gas. Obscure details of
potential damage seems to be traded for more head on ideas such as the roof of a shelter needs to be
at least 85 centimeter to be able to withstand a fission explosion 800 meters above ground in the
vicinity (actually exactly 600 meters from epicenter), and if situated directly below: 105 centimeters
are recommended. The injuries in such case would be “serious” but not deadly. Sedimentation from

\textsuperscript{137} SOU 1950:13, p.22.
\textsuperscript{138} Ibid. p.23-24.
\textsuperscript{139} Ibid. p.23.
\textsuperscript{140} Ibid. p.34f. “[A]tt intet land för närvarande torde vilja offra en atombomb på en stad med mindre än 50.000 invånare
eller på ett koncentrerat industriområde med yta mindre än 12 kvadratkilometer.”
the mushroom clouds, radioactive fallout, water detonations and weather conditions are discussed in
details as well as radiation effects measured in distances from detonation.\(^{141}\) This is probably because
all information about the bomb is by this time imported from US which had done some testing by
1950.

Perhaps the most important new element in technology discussions in this report is the primary
focus on radioactive rays, fallout and gases. Gases, quite surprisingly makes a sort of return as fluoride
based gases which have an extremely deadly effects. Tabun, Sarin and Zuman, are mentioned in this
context and a few drops on the skin of a person would lead to death. Hydrogen cyanide and arsenic
hydrogen are also mentioned as possible gases that could be dropped with aircraft over densely
populated urban areas.\(^{142}\) Interestingly enough radioactive fallout is assorted under gases. What seems
to be the most frightening prospect of radioactive based warfare is the invisibility of the particles
causing the damages and the delay before effects will be seen. This is a trait it shares with the new
gases as well.

The invisibility of this threat gives a sort of paranoid character to the discourse, as an example a
potential threat is the fact that enemy collaborators might poison water and foodstuffs with radioactive
agents.\(^{143}\) There is no explanation of why an enemy would want to do such a thing. Most probably
there are military strategic reasons, but the effect of this absence of reason addresses paranoid
thoughts of home intrusion since foodstuffs and water are consumed at home. The Swede’s peaceful
breakfast might be part of an attempt to break the will of resistance, the gas might be seeping in
without being seen or smelled, the collaborator might be your neighbor, and the victim will not even
notice before it’s too late.\(^{144}\)

A fantastic example of how modern technology can be used to withstand a nuclear blast is found
on page 46, this picture (figure 9, p.55.) shows how many percent of evacuees will acquire deadly
radiation in different types of buildings and distance from detonation center. I (punkthus) and II
(lamellhus) are modern functionalist type buildings, while III is “older” buildings. The letters A, B,
C, are normal-type shelters with different alterations. A are standard types, B are standard types
with 40 cm sandbags along the façade walls and C are shelters with 30 cm concrete-reinforced walls. Thus
we can see that type I buildings with type-C shelter can save the life of the evacuees up to 99 percent
as close as 250 meters from detonation epicenter, while type III buildings with type A shelters stops

\(^{141}\) SOU 1950:13, p.33f.
\(^{142}\) Ibid. p.26.
\(^{143}\) Ibid. p.27.
\(^{144}\) Read more about this in Salomon (2007),”The Invisible enemy”, p.174-182; Read also Marie Cronqvist’s Ph.D
at 20 percent at the same distance. The conclusion is that only modern housing is a realistic alternative. Notice also that the picture is placed over a city very similar to Stockholm with the detonation center above what would be Hötorget. This is actually one of the first scenarios planned for by the military, an atomic bomb detonation 400 meters above Hötorget in Stockholm.\textsuperscript{145}

Figure 9: SOU 1950:13, p.46.
Other ways to counter fallout and radioactive rays are air ventilation and improved filters, air tight shelters and evacuation in time. According to the authors the lion’s share of these problems might already be accounted for since the estimated thickness needed to hamper gamma rays is luckily 30 centimeters which is the recommended thickness of walls in the normal-type shelter. The fear of war gases since the 1930s also gives certain advantages since air tight construction, ventilation and filters has been a part of shelter building practices for quite some time, and needed not much improvement to be up to date. In that way old technology gets reinvented with new purposes.

However, a great obstacle is lengthening the possible time to spend in shelters and this problems connects countermeasures against gas with fire. The new insight of firestorms presented for the first time in this report meant that shelters could not rely on ventilation only because the air would be sucked out. An independent air system had to be implemented that could nurture the shelter dwellers for several hours while fire rages above their heads. And 1-1½ hours of air would not be enough. Thus will the shelter work as an independent underground environment.

By 1950 no hydrogen bombs had yet been tested, but its potential was widely understood and both USA and The Soviet Union had begun research. And so a section of the report is left to hydrogen bombs.

To begin with; the uninitiated reader might wonder what the difference is between uranium bombs and hydrogen bombs. What has been discussed so far are fission bombs which is a group of bombs that are made to explode through a process of splitting atoms (fission means to split). These atoms are uranium and plutonium isotopes. Fusion bombs are bombs made to explode through fusing hydrogen atoms. To be able to fuse hydrogen atoms huge amounts of heat is needed, therefore a fusion/hydrogen bomb has a uranium or plutonium fission bomb as a detonator which produces heat and starts a chain-reaction where hydrogen atoms are fused. The details are not really important, what one needs to understand is that uranium and plutonium bombs (Little Boy, dropped over Hiroshima was a uranium bomb and Fat Man, dropped over Nagasaki was a plutonium bomb) have limited increase of potential power while hydrogen bombs are more material efficient and more or less have no limitations in potential power. The most powerful fission bombs had an effect equivalent of 500 kilotons of TNT. Hydrogen bombs enters the scale of megatons, which means 1000 kiloton or above. The most powerful bomb ever detonated was the Tsar-bomba. This bomb, detonated by the Soviet

147 SOU 1950:13, p.26ff.
148 Ibid. p.49.
military 1961 had an effect of about 50 megatons (50,000 kilotons) which means something around 4000 times more powerful than the Hiroshima bomb.\textsuperscript{149}

According to theoretical estimations the authors believes that direct hit-type shelters could probably be enough to withstand these bombs, given that certain reinforcements are made, which also underscores the purpose of the report. More direct hit-type public shelters needs to get built because existing shelters will only provide protection on much longer distances from the detonation center.\textsuperscript{150}

According to estimations, shelters with direct-hit capabilities situated in rock or detached concrete shelters can be arranged in such a way that they would offer satisfactory protection against to hydrogen bomb under the same circumstances as normal atomic bombs. [...] Hitherto constructed normal-type shelters will not offer protection in other ways than with substantially greater distances from the detonation than that of »normal« atomic bombs.\textsuperscript{151}

As the reader might remember, this type of argument returns for the second time around. The existing infrastructure of civil defence is said to be good enough in certain aspects but needs to be reinforced to withstand the next generation of bombs.\textsuperscript{152} Like layers in a cake. And even though hydrogen bombs have been never been tested the repositioning of what is considered normal is present and very explicit.

\textit{The international and the national}

I mentioned above that the international references that was apparent in the mid-1930s were not present during the reports of 1939 and 1944. As a possible explanation of this I presented the idea that these reports stressed civil defence's organizational and jurisdictional sides and not so much the technological. In SOU 1947:10 and SOU 1950:13 the international references made a distinct return again. I think this is because of the introduction of new technology to the global warfare 'community' so to speak, giving the discussion a character of a new technological cycle.

There is, I guess, nothing strange in this European outlook. Sweden still had no experience of war on its own and the Department of Civil Defence had to turn outwards for all types of information. The information of the atomic bomb and much other data seems to originate from England and Belgium. The trips to the British zone in Germany and the reference to British reports indicates

\textsuperscript{149} Rose (2006), p.170.
\textsuperscript{150} SOU 1950:13, p.30f.
\textsuperscript{151} Ibid. p.33. "Enligt utförda uppskattningar kunna dock bergskyddsrum och fullträffsäkra betongskyddsrum utföras så, att de erbjuda betryggande skydd mot verkningarna av en väteatombomb under samma förutsättningar som förut angivits för vanliga atombomber. [...] Hittillsvarande normalskyddsrum erbjuder icke betryggande skydd annat än på väsentligt större avstånd än vad som gäller för skydd mot »vanliga« atombomber."
\textsuperscript{152} Ibid. p.63.
perhaps some sort of cooperation or information exchange around 1947. It is also the same nations that return in that report. England, Germany, France, Switzerland, Holland, Belgium, Denmark and Norway. Finland is left out probably because of its relation to Soviet at the time.

By 1950, there is much similarity, Great Britain, Switzerland, Denmark and Norway is discussed, but there is one significantly important addition. This is the first time USA is given room in the reports. Actually all knowledge of the nuclear bombs by 1950 seems to be directly quoted from American reports. The ideas behind the new shift in civil defence doctrine can be recognized:

In USA the risk of a surprise attack has been stressed and one should reckon that an adversary will aim devastating blows against the home front. The civil defence must therefore be organized and planned for. Emphasis is on dispersion of industrial establishments, peacetime use of underground environments and a reconsidered urban planning Mass evacuation and shelters is mentioned as means to reduce the nations vulnerability to enemy attack.¹⁵³

The fact that civil defence is needed is perhaps nothing new here, what’s interesting is disaster preparedness in the form of dispersion, peacetime use and urban planning which all are sincerely stressed throughout the Swedish report. The reference to USA returns in discussing potential targets for nuclear weapons, the 50.000 population limit is for example taken from the National Security Resources Board. The data concerning radiation, blast effects and shock waves is taken from U.S. Atomic Energy Commission.¹⁵⁴ Most likely everything known of the hydrogen bomb is information from US research.

In the introduction of the report from 1947 the authors claim to have taken a trip to Germany, but such a thing as firestorms, which Hamburg and Dresden unfortunately became notorious for, are not discussed.¹⁵⁵ They are mentioned for the first time in 1950 and by then it is countered with the independent air system. Firestorms were caused by allied aerial raids and has the disastrous effect of sucking air out of the shelters which means that a shelter in a bombed city might become a tomb of suffocated evacuees.¹⁵⁶ This obvious huge problem in the civil defence plans are not discussed by that time; the faith in the existing organization of civil defence and the shelters construction plans remains unbroken, the eventual “normal” attack has been planned for and taken care of. However it is impossible to say if this is excluded deliberately. Also, since fire-fighting was a large part of civil defence organization, the authors might have thought that this phenomenon will be fought before it becomes dangerous.

¹⁵⁴ Ibid. p.29f,34.
¹⁵⁵ Ibid. p. 175. This part of the report referred to discusses oxygen and carbon oxide. But nor here or any other place is there a discussion of the effects of firestorms.
¹⁵⁶ There is a very short passage on the phenomenon on page 33, but it is discussed in relation to shock waves caused by detonation of ”normal” bombs in close vicinity of the shelter.
SOU 1950:13 is the first one to stress any form of national information accumulation which marks a shift in mentality and a move away from international dependence. At a few places the connection between konstruktionsforskning (my trans: construction research) and co-operation between military- and civil defence are very apparent: they should aid each other so that civil defence can keep up with that technological development race so important by the time:

Development within weapons technology and other adjacent areas should be followed in such a way, that defensive action can be modelled after recent development. Research and testing activities should therefore be conducted intimately with construction organizations who should convert the results into job descriptions and shelter type blueprints. This co-operation between research facilities and construction organizations represents a vital condition to be able to attain adequate protection required by any stage of future development.158

This marks a definite shift in mentality because here it is said that the Swedish nation must be ready to follow in the development’s footsteps. So far defences have been built on external information, but now Sweden must begin its own research accumulation. The primary research seems to be weapons technology, driven by Försvarets Forskningsanstalt (FOA) (my trans: The Defence Research Institute) and protection from weapons is considered “other research” and should be conducted by Fortifikationsverket (my trans: Fortification Office). Implicit here is a wish for Swedish nuclear weapons intimately connected to a modernist identity, the weapon is the primary target, since only by detonating such weapons can defence against it be tested (if not taken from other nations). Sweden can thus be in line with the future of progress and answer to whatever demands such progress might place on the nation.159

**The Plan**

In the context of the atomic, the plan, the concepts presented, to protect the nation and its populace from this new threat is a continuation of evacuation and meticulous planning as well as a shift from the temporary to the permanent. As the authors conclude: there can be no improvising when defending against nuclear weaponry, it has to be planned.160

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157 Construction research refers in this context to research aimed at construction of atomic bombs and not shelters.

158 SOU 1950:13, p.78. "Utvecklingen inom vapentekniken och andra berörda områden bör följas på ett sådant sätt, att skyddsåtgärder kunna utformas parallellt med den pågående utvecklingen. Forsknings- och försöksverksamheten bör bedrivas i intim kontakt med konstruktionsorgan, vilka skola omsätta resultaten i form av typritningar, detaljritningar, arbetsbeskrivningar m. m. Denna omedelbara samverkan mellan forsknings- och konstruktionsorgan utgör ett grundläggande villkor för uppnående av fullgoda och effektiva skyddskonstruktioner, vilka i varje skede motsvara utvecklingens krav."

159 SOU 1950:13, p.78f.

160 SOU 1950:13, p.29.
5 million seats must be built for the population, 800,000 have been built and the construction pace is about a 100,000 per year. These shelters need to be arranged into permanent living quarters as well. After careful consideration the authors however says that about 3 million citizens lives in potential target-areas, mainly cities with more than 50,000 inhabitants. About 35 percent of the 3 million people need to have permanent protection in the form of direct-hit proof shelter of some sort, but because of economic reasons the number should be set to 25 percent, 750,000 seats distributed to the 5 largest cities. This is presented as the absolute minimum and it relies on the idea that the rest of the population have the time to be evacuated, and if not, they might just squeeze in there “in case of emergency.” Such mega sized shelters were exceptions and were connected to special areas and urban environments called Skyddsrumsorter (my trans: Shelter cities), treated as potential targets in the Cold War environment.

The old normal-type shelter is said to be obsolete since it cannot withstand the blast from a nuclear weapon, but it can serve as protection from radiation and radioactive fallout as well as gases and other types of bombs. The new direct hit shelter type was thus something mainly for the inner city parts while the old shelter was mainly for the outer parts. This further emphasizes my argument that the phases are additive. The old system is re-used, but surrounded with a new type of discourse.

The report recommends that the maximum distances between the new rock solid and concrete shelters cannot be more than 400 meters if everyone would be able to get into them in time, another picture of an ideal city 1950s environment shows this (figure 8). The city presents a perfect late nineteenth-century grid street system with industries, military facilities, schools and hospitals placed in the outskirts of the city. The red dots in every zone is supposed to be a public shelter of different sizes. A striking example of how all aspects of contemporary life had become a problem of civilian defence. The city with all the facilities that constitutes work, production, military establishments, education, and health services are carefully considered in an ideal type city. The modern city is a large fortress situated in a potential battlefield. With this logic shelters are not seen as an independent environment in the basement of a single building, it is an independent environment situated in the basement of the city.

161 SOU 1950:13, p.60.
162 Ibid. p.44.
163 Ibid. p.70. "Av ekonomiska skäl har utredningen dock icke ansett sig kunna förorda en utbyggnad enligt det högre procenttalet. Det bör erinras om att även med så låg procentsifra som 25 kan hela befolkningen (sittande) beredas skydd i katastrof fall."
Figure 10: An interpretation of the typical Swedish city. The red dots symbolizes shelters of different sizes in accordance with the zone they are supposed to serve.

The reader might remember the hospital dilemma from the 1930s. The idea that evacuation was only something temporary is turned into evacuation as something permanent. Questions about if it is possible at all to succeed in such endeavor seems to be constantly dodged. The new focus on rock solid shelters or detached concrete shelters has a whole array of problems that gets shoved aside with mere hope. For example the problems of congestion by the shelter doors:

If forewarning time is about 3-5 minutes before a strike on daytime, most people within a maximum of 400 meters should be able to reach their assigned shelter. Any risk of congestion at the shelters entrances should not be at hand, since the evacuees arrival time will differ significantly because of distances.\footnote{SOU 1950:13, p.42ff. “Detta maximiavstånd har utredningen bedömt ligga vid omkring 400 meter. Bedömmandet har baserats på ett flertal faktorer. Sålunda finner man att, om en förvarningsstid av 3 å 5 minuter är för handen vid daganfall, de flesta människor inom ett skyddsrums uppsamlingsområde vid 400 meters maximiavstånd bör ha sina uppsöka skyddsrummets innan anfallet kommer. Någon risk för att stockning vid skyddsrumets ingångar skall uppkomma torde icke föreligga, då förflyttningstiden för de skyddssökande från uppsamlingsområdets olika delar kommer att variera avsevärt på grund av de olika avstånden.”}

It does not take much imagination to realize there will be problems when the shelter doors needs to
be closed, and the faith in distances is ridiculously utopian. If the plan is to build direct-hit shelters for 25 percent only a quite big problem will surface when the citizens realizes the only safe place in town has a limited number of seats. Add to that the 3-5 minutes of estimated reaction time and the “squeezing in”-part of evacuation might become a problem. Already 1937 this problem was addressed, the solution back then was the decentralized shelter system to prevent large clusters of people. It is unclear what function this type of argument has, is this an example of positivist naivety or is it a sort of disparaging argument trying to cover up the realistic problems behind permanent evacuation?
The life underground

10 to 12 meters with an absolute minimum of 5-7 meters. That is how thick the covering layer must be for adequate protection in a rock solid shelter. Inside the mountain rock a concrete arc-type roof should be constructed to provide extra protection from the cave falling in. Isolating walls are needed to keep temperature at a steady level, preferably of brick, concrete or siporex (a form of light weight concrete material). To uphold some sort of air quality a ventilation system must be installed along with electric wiring and sanitary facilities. All these installments must also function during a bombing raid which means that air and electricity must be provided independently when needed. The atomic weaponry also demands some kind of cleaning facility at the entrances to remove any radioactive particles that might hang on to clothes and other things brought into the shelter.¹⁶⁹

Figure 11: A picture showing a cross section of a rock solid shelter (SOU 1950:13, s.51). The numbers inside the design indicates what parts of the shelter is arranged for peacetime use and what is not. Number three for example is “furnished.”

If geography and geology does not allow for rock solid shelters the more expensive detached

¹⁶⁹ SOU 1950:13, p.50.
concrete shelter can be built.

The concrete direct-hit shelter can be traced back to Germany and Hamburg. In SOU 1947:10 Germany is treated as a pioneer, since already 1940 the so called Hochbunker saw its first days. A gigantic structure type, the most famous one is the Flakturm in Hamburg able to house about 20,000 people with a 1,5-3,5 meter thick concrete covering. In 1950 the concrete models of such size needs to be put underground according to the authors and covered with a mix of stone and concrete layer about 2,5 meter thick, and around 2 meters if the shelter is situated below a larger structure, but naturally they will not provide as good protection as the rock solid version since the material is “artificially made.” However it will provide enough protection for areas and cities that’s not considered a potential target for atomic weaponry.

Direct-hit proof shelters of this kind have been mentioned throughout all the reports read for this study although this is the first time they become the center of attention in an argumentation. Before this they seemed to function as an expensive luxury mainly for military personnel and industries of utter importance in war situations.

Since building structures meant to house several thousand people underground costs a lot of money, an important part of the argumentation in SOU 1950:13 is to convince the reader of the ability of these shelters to capitalize themselves through peacetime uses. Using them as workshops, storages or garages would add very little to the construction cost. Using shelters as hotels and office buildings recreation centers would cost a bit more initially. This is an important part of the permanent living constantly emphasized throughout this SOU. The modern city is especially in need of garage spots, a form of construction that also easily can be turned into a shelter when the alarm sounds. To protect industrial establishment production should be hardened, which meant moving production underground as much as possible since there will be no time for evacuating any longer. An example is Katarinabergets skyddsrum, one of the largest shelter structures ever built supposed to house 20,000 evacuees (or 550 cars in peacetime).

One advantage when building larger shelter structures is the cost benefits. In fashionable order the researchers of the 1950s report did some extensive calculations on the costs of rock solid shelters and thus found out that after 25000 square meters expenditure per meter falls back on a steady level of

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170 SOU 1947:13, p.67f.
171 SOU 1950:13, p.53f.
172 SOU 1944:5, p.206.
173 SOU 1950:13, p.53f.
130 kronor. Katarinabergets skyddsrum mentioned above is 15900 m². Shelters should be considered a defence expenditure and should therefore always be planned with peacetime uses in mind. Actually, if well planned, the initial construction cost might be returned up to 80 percent for rock solid shelters and about 50 percent for concrete shelters.

In the authors’ argumentation psychological factors are included. Living underground definitely has its downsides for the mind of a human. Air ventilation and temperature was shown during tests conducted by Fortification Office to have been a critical factor but “rational ventilation” should solve this problem. Also living without daylight for longer periods is taken up as a psychological factor but is dodged with the fact that many modern buildings above ground such as banks, shopping centers and “popular restaurants” functions every day without proper sunlight, it is just as ventilation, a question of rational lighting. To conclude this argument the authors refer to research that shows that deteriorating health cannot be derived to underground workplaces.

This research was part of a co-operation between Statens institut för folkhälsan (my trans. State’s Public Health Institute) and Försvarsmedicinska nämnden (my trans. Medical Defence Board) which highlights another connection between the civil state and the military organizations. It is also one of the few examples of research not imported but produced in Sweden. The project was supervised by psychologist Torsten Husén, one of the first military psychologist of the time.

The life underground was now apparently a subject of scientific research and cooperation between a civil and a military institution spearheaded such research which is another great example of how the system was integrated into many parts of society. Modernity and science was obviously connected to the shelter system.

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175 SOU 1950:13, p.53f.
177 SOU 1950:13, p.94f,89,90.
178 Ibid. p.93.
179 Ibid. p.93.
180 Ibid. p.91.
Visions of underground life

In the appendix of the last SOU read for this thesis, there is perhaps one of the most vivid proposals on how life underground might be. It will also represent a good opportunity to exemplify how ‘Swedishness’ was invoked into the technology. Behind it was the Fortification Office in co-operation with a quite unknown architect, SAR C. Grandinsson.182

The appendix includes three different models, one garage, one hotel and one recreation center all situated below Stockholm’s central areas. The plans include some fantastic drawings and models meant to appeal to the reader along with jurisdictional solutions and cost estimations as well as its use both during peacetime and wartime.

The pictures shown here to the right are some of them. Life in a underground hotel is just like any other hotel according to the authors, the lack of view to the outside is a minor problem and everybody knows apparently that the view from most hotels only show that “of a backyard.” The hotel is situated in two long tunnels but are fortunately designed with such a shape that the feeling of a long endless tunnel is countered.

There is of course a double use of every feature in this design. The lobby can be turned to foodservice facility. Changing rooms will be turned into a dining hall. Offices and the breakfasthall will instantly be turned into adminitration and operations room. Everything is of course strictly separated with gender in mind. The hotel visitor is a suited business man reading the paper, the food services is administered by a woman in uniform accompanied with a male soldier on her right. Also in wartime the authors seems to have imagined a separation of gender since the hotel room is inhabited by men only calmly reading books during wartime as well.

182 This man, C. Grandinson, appears to be quite unknown today and I have not been able to find anything substantial about him like other designs or pictures he has drawn.
The recreation center design does not offer this juxtaposition of peacetime and wartime uses but presents some other interesting features. The design is two floors with the groundfloor so to speak functions as a street milieu of a modern 1950s swedish city. There is a “Grand Square” (stortorget) and “Little Square” (lilla torget), they are joined with a street called Librarystreet (biblioteksgatan). The street have several shops along with display windows to accommodate the needs of the inhabitants; for example “Sports and Weapons” where you could buy skis and hockey equipment, a bookstore, a photostore and a clothingstore. In the middle of the street a library is situated and by the Grand Square the street dweller can relax at “Café La Rotonde.” At the upperfloor the design offers clubrooms and studyrooms and lecture halls as well as hobby rooms with typical recreations such as radio, modelbuilding, Chess, dance, music and song, a practice stage, theater/cinema and one room for weaving. Sporting facilities are also present, Ping Pong, Wrestling and Boxing, all used by male citizens according to the drawings.

The environment is then a modernist utopia, housing prominent culture and commerce, strong sporty men and the intellectual citizen, with that minor difference of being underground. When the bombs fall all you need to do is to close the doors, refurnish and life would continue as normal. There is neither any problems in these worlds, no medical bays, police offices, guard booths, sanitation is not spoken much of either. The assigned space for toilets is marked “men” and “women” only, or not marked
at all. There are no rooms for waste or anything similar that connotes sanitary solutions. Women and men are separated thoroughly, perhaps one might say that women are not only separated but absent in this vision of the modernist utopia.

This last section shows how the shelter building practices and its technology had become a part of a swedish identity. The shelters are now ‘swedish’ and includes typical ‘swedish’ things and cultural traits, the modern swedish future urban life is underground.

**Summary 1947-1950**

I have implied that 1944 somehow marked an end or at least should be considered as a separating line between two phases of shelter-building practices in Sweden. The first phase ended with the conclusion that a technological system was in place using the 1930s technological framework as its ideological base of sorts. When the atomic bomb was introduced first time in a report concerning civil defence, this old framework, was remapped in some ways but not in others.

Although I think this mark at 1944 is important, another argumentation could put such a border by 1950 instead. In a system perspective it is obvious that the Civil Defence Statute is crucial, but the envisioned use of the shelter changed just a significantly by 1950. It is quite clear that the authors of the report of 1947 was concerned of the new weaponry introduced but did not recommend a change in regulations regarding shelters, which meant that normal type of shelter was constructed during a long period ahead without any change in how or why. The ideas of how civilian defence should be
conducted therefore stayed until 1950, it is by 1950 that the future of shelters became a permanent solution. When the 1950s approached, evacuation and time became an increasing subject of inquiry. Forewarning is crucial, since it gives time to evacuate. Distance between shelter and the evacuee is the next problem, solved only by peacetime scrupulous planning and scholastic urban architecture. The old system of normal type shelter could no longer offer the preferred protection according to the authors.

Before this evacuation into shelters was only temporary, it was a kind of in and out doctrine. The knowledge imported from US concerning the new types of atomic weaponry and the effects of radiation and fallout seems to have pushed the projected future of civil defence into a permanent underground environment, Three hours wouldn’t be enough to escape the effects of the bomb. But it would take five years before this insight reached the government and meanwhile a massive amount of shelters were built all over the country. The statistics in this case are convincing: between 1950 and 1961, 19078 normal type shelters were built and the trend continues until 1974 without any significant change.

Before 1950 there is a separation of technological trees so to speak, missile technology is separated from bomb technology and gases. With the report from 1950 they fuse and become an ultimate weapon in a sense. The atomic bomb is now the weapon, it combines all the different ways a city and its surroundings can be destroyed. The missile gives it speed and the advantage of surprise, the blast offers the immediate destruction of infrastructure and followed by firestorms and afterwards the radiation sickens or kills the biological inhabitants for months after.

The perfect shelter at this point were thus the rock solid direct hit type shelter. It was not only cheap but could also be optimized for peacetime uses. It was based about 10-12 meters underground close to the city center or directly under it. It had several different entrances all super reinforced with meter thick doors and curved entrances to withstand shock waves from atomic bombs. It was self-sufficient both concerning water, electricity and oxygen. Especially oxygen is important since fire storms could cause oxygen to be sucked out of the shelter. It would also have extensive cleaning facilities for the inhabitants to be sure that radioactive materials would keep out. Being large and spacious it would counter the psychological problems of staying for longer periods underground as well as being optimal for peacetime uses like workshops, garage or hotels and recreational centers.

The peacetime uses for these shelters puts them into the center of attention of the projected future of the city. Like a skyscraper symbolizing prosperity through the alteration of a city’s skyline, the direct hit, rock solid shelter was envisioned as a skyscraper turned downwards. The future urban life
were underground, the modern recreational centers, hotels and garages needed only a shift of furniture to function as a proper shelter.

Conclusion and Analysis

*Establishing a technological system 1935-1944*

Throughout this thesis I have presented the idea that seeing the shelters as a technological system gives some new explanations to how, and why, the Swedish civil defence program grew so immensely and became one of the world’s largest. The Statute of 1944 is a milestone with its regulatory laws, making sure that every larger structure constructed or rebuilt during the Cold War period had to have normal type shelter. The statute was built on a technological backdrop established in the mid-1930s when aerial warfare emerged as a part of the future total war. The technology back then was crude, had little accuracy and had few long-term effects more than its instant destructive power. The temporality of the expected air raid, gave the shelters a similar temporary character. The citizens were to get in to the shelter, stay there for a maximum of three hours and then get out and clean up the rubble. Equipment was adjusted to first aid purposes and firefighting. Telephone-lines to the outside suggest that there was a habitable world on the outside of the shelter even during the raid. The shelter was also decentralized in its nature, all buildings in a city should be equipped with a shelter in the basement. The building were the unit to be protected and also what protected. With this mentality and technical solutions to aid, will of resistance would be maintained, the national organism would not stop, and thus the state would survive.

The statute restructured the existing organization, giving it more authority to control and expropriate, but still in a decentralized form. It also gave the state as well as the municipality a bigger responsibility, one third of shelter construction expenditure were to be subsided by the state and one third by the municipality. Urban planning was ideally adopted to the need of civil defence through a dialog between different municipal institutions such as the Construction Board. To use Hughes’ terminology; the new organization forced unity from diversity through control, fines and recommendation.

Gabrielle Hecht claimed that there was nothing French about French nuclear power and in similar ways I want to say that there was nothing Swedish about the shelters. Very little of the ideas on how the civil defence and the shelters should be organized, and the state’s role in this endeavor, were invented by the authors behind the reports. It was a constant European and western outlook that built
the Swedish shelter system. Both the fears of total war and the solutions to it were results of other nation’s experiences, an obvious example of technological transfer. But as time progressed the shelter was interpreted as a normal part of Swedish urban life. The imagined traits of the Swedish people, the modern Swedish life was transferred underground. In 1950 the architect Grandinsson even imagined a city street, with typical Swedish street names, plazas, cafés, cinemas and stores where you could buy sporting equipment of popular sports, all in a rock solid bomb shelter. Perhaps the biggest difference between Sweden and other European nations, Sweden’s style so to speak, was its zeal in actually trying to fulfill the idea of a sheltered seat for every citizen. Even though the above mentioned street never was built.

The ability to actually implement and construct shelters might suggest that there is humanitarian context behind the statute. For this I have found no evidence. Agrell means that by 1955 there is a focus on saving civilian lives and that the primary focus for civil defence is this and saving the societal apparatus only second. During 1935-1950 the will of resistance is connected to maintaining production, to uphold the structure of the national organism which suggest a change in view of the citizen by the early 1950s. Using Lawrence Vale’s terminology I would say that Civil Defence doctrine during this period is a mixture of the three strategic rationales; Deterrence, Crisis Management and State Survival. This challenges the notion of social democratic agency during the period. The idea of The Peoples Home or any similar ideas of a classless society or nurturing of the citizen are not present. My interpretation of this is that civil defence and military doctrine by this time were not seen as a subject of left-right politics, state survival went deeper than that.

Although this first period was characterized by a certain optimism it is unclear what role this optimism played. Aerial warfare was subject to hardly convincing disparaging arguments such as the proposed advantage of Sweden’s geographical position. The emphasis on the most terrible forms of technology like gas bombing have a confusing consequence. It established a vivid discourse of fear of the future war while at the same time normalized the ‘less’ terrible, like normal blast bombs, although they most likely were to be used to a greater extent than gas bombs. This poses the question if the technological system would have been different if the ‘worst case scenario’ had been given less room in the reports since it seems this repositioning of the normal mystified the future war.

Continuation and change of the system 1945-1950

What I believe is the most critical point here is that the regulations and organization of the Civil Defence Statute 1944 and the economic boom of the post-war year created a momentum which
allowed the shelter system to carry its own weight between the period of 1945 and 1950. This momentum carried the system through the Cold War period allowing for a huge expansion of shelters, expressed in the statistics shown in the introduction. My interpretation is that this happened independently from the discussions of civil defence and shelters during 1945-1950. There were questions asked both in 1947 and 1950 if the new atomic technology rendered the old normal type shelter obsolete, and the authors at least by 1950, was convinced that it was the case. Still there were no change in the regulations forcing normal type shelters to be constructed in every new larger building.

This might suggest that the shelter building practices were unintentional, that it just carried on without agency. I rather believe it was a question of reinventing the system from the current position. A sort of somnambulism. When new warfare technology was introduced to this system throughout the Cold War it challenged the system’s purpose which forced the system builders to re-invent the system through discourse and ad hoc solutions. To reassure the reader of the report that civil defence was fulfilling its purpose, old shelters got new clothing for each time a new weapon was introduced although beneath it there was the same old shelter blueprint.

By 1947, with the introduction of atomic weaponry, very little was known of all its effects. The old system of normal type shelters was believed to be able to withstand such bombs with scrupulous planning and reinforcement of existing structures. Although time and evacuation became more of a serious factor because of new missile technology, the temporary character of shelters were still there. The fears, however, are apparent. The many and numerous disparaging arguments for the use of atomic weapons uncovers this. The new weapons were considered expensive and complicated by the Department of Civil Defence, the fuel was rare, and perhaps most importantly, the national traits and constitution of Swedish cities would seriously reduce the effects of atomic bombs. A modern European city of bricks, stone and concrete would withstand this new threat.

Perhaps the most obvious change in how the Department of Civil Defence viewed the shelter by 1950 is the shift to mass and permanent evacuation. Agrell, Oredsson and Cronqvist have all discussed how Civil defence doctrine became one of mass evacuation because of the sudden realization of what atomic weaponry actually capable of doing during the mid-1950s. While true, those who stayed behind in the larger cities would find themselves in a permanent underground environment. The new ideal shelter was a self-sufficient underground city, equipped with modern technology able to withstand practically anything. Katarinabergets skyddsrum is somewhat the crown jewel of this era, a mega structure underground capable of housing 20,000 people. The ideas behind this new doctrine did not only emphasis enormous structures, it also adopted the view of the city as a
unit to be protected, as Vanderbilt pointed out: The new warfare meant that a city could be killed. From advocating a decentralized basement shelter system, protection where to be constructed in the basement of the city with entrances at an arm’s reach of 400 meters wherever the evacuee was situated. This urban basement was designed to be used in peacetime which meant that the modern city life would even during peace include a life underground, it was only a matter of furniture.

**Domestication of technological realities, the modern nation**

The convergence of old military threats into one weapon as well as the emergence of medical defences, was according to Agrell one of the reason why the defensive institutions became more concerned with science than ever before. It is also apparent that by 1950 the authors are trying to adopt a national research tradition and advocates co-operation between military research institutions as well as medical and psychological ones. This was the first time that any national accumulation of information and data appears in the SOU concerning shelters. There was also an implicit wish for Swedish atomic weapons by the authors. This marks a shift in discourse into a more independent view of the nation. By 1950, Sweden must become a part of scientific progress, not only passively defend against it.

The international aspects are important in other ways as well. I have shown that the organizations and regulations can be tracked to other nations. In 1950 it is obvious that everything known about the effects of atomic bombs were based on American research. Because of this fact, the ideas applied to Swedish Civil Defence doctrine was an adaption of American perspectives of how the bomb was to be used. But Sweden and USA had drastically different outlooks in the Cold War environment which results in a number of conflicts. Since there were few cities in Sweden of the magnitude that existed in the USA by the same time, the disparaging arguments of the nuclear threat might be seen as correct. But if an enemy had only very few atomic weapons because of their expensive and complex nature, why would Sweden be a potential target?

My interpretation of this problem is that by adopting foreign research and applying its conclusions on Swedish soil the Department of Civil Defence compared the Swedish position in the international forum with the American, which made a potential Soviet attack against Sweden plausible. If we are like the Americans the Soviets might want to attack us. In 1947, when the authors identified the Swedish city with the English city a similar conclusion can be drawn. English and European urban milieu would not allow such destruction seen in Hiroshima and Nagasaki. Imagined inherent national
traits worked as a psychological defence.

Kim Salomon has shown that during the 1950s the Swedish popular press discourse revolved around a will to identify Swedishness as compatible with American progressiveness while the eastern block was seen as backwards and anti-modernistic. This idea, a national identity that adopted American traits and being a western modern nation, might give some explanation to why the Civil defence adopted such an extensive all-encompassing evacuation and shelter doctrine. Salomon states that: “With help from current threats, Sweden incorporated itself into the struggle between the superpowers, which became something of Swedish concern,” and that struggle was intrinsically connected to technology. The inevitable downside of the will to identify Sweden to an international western modern environment is then to get used to modern warfare. Because being modern, western, European and perhaps American is also about being a potential target.

Kenneth D. Rose’s research showed that the failure or perhaps lack of will to produce a national shelter system as was done in Sweden was connected to ideas of national identity and moral problems. The specific structure of the Swedish society apparently was of a different kind. There were few problems finding an economic basis for the shelters or the civil defence organization, and it was adopted much earlier. USA’s geographical position during the inter-war years might be a factor, the Swedish defence authorities realized already by 1935 that aerial mass bombardment was likely to be directed towards Sweden during a war situation. Since the shelter was adopted as a plausible solution at this early stage of aerial warfare it was easy to re-invent it, reinforce and motivate its expansion throughout the 1940s. The shelter was domesticated during a long period before the atomic bomb was invented. The American shelter is usually known as the fallout shelter, a reference to atomic fallout, because the idea of any need of shelters emerged in the states when the atomic bomb had already arrived as a potential weapon. This argument further emphasizes the advantage of seeing the Swedish shelter as a part of a system with a momentum and that the geographical position of the nation had important effects on how/and if the system was adopted. Had the shelter been introduced by 1947 as a solution to atomic warfare I doubt it would have gained any ground.

The difference between the American and Swedish perspective on shelters exemplifies the sort of somnambulism active in the background. When the Swedish government vindicated the Civil Defence Statute of 1944, they did it with what was known at that time. The consequences in the longer perspective was an extension of the uses of shelters. Whenever the technological warfare landscape

187 Ibid. p.155f.
changed, the already implemented solutions decided how the Department of Civil Defence should continue and progress. In the end the hubris of Swedish construction zeal even made the Department of Civil Defence believe that the entire city can go underground.

Langdon Winner’s inherent political technology and Lawrence Vale’s terminology of strategic civil defence shows that, creating a sheltered society definitely had a political effect. It was inherently connected to the nation’s foreign policy because the technology became connected to Swedish identity. And as Hughes pointed out; adopting one system often excludes alternative systems. This chosen system gave few other options, by accepting the new technology of aerial warfare. By adopting it in military terms and by adopting a solution to defend the civilian population against it, Sweden became a part of the international Cold War deterrence politics environment. The system of shelters were thus deeply political. The domestication of the appalling threats of warfare resulted in plans for underground living and changed perspectives on urban planning thus transforming the urban fabric and the view of how the nation, and its cities should progress and develop.
Postscript: The artefact

I stated in the introduction, drawing on Hughes that a physical artifact project into the future. In the case of the shelters I think there is enough room to make this point. Just like the medieval wall, many of the old shelters still stands. They can be seen in all sorts of environments. In the Humanities Building at Umeå University, on the ground floor an old shelter built during the end of the 1960s serve as a lunch room. I doubt very much that the students visiting the room each day around noon gives any thought on why the room has two exits with heavy steel doors, air ventilators that can be closed and why the room has a 50 centimeter thick concrete encasing.

![Lunch room, Humanities building, Umeå University.](image)

As a child we had a similar room in the basement of my first elementary school that functioned as a recreation room, used for Ping-Pong, Pool, and rehearsals. There are also other uses for old shelter structures, as rental locals ([www.skyddsrummet.se](http://www.skyddsrummet.se)) and locals for tire firms ([www.essingedackhotell.se](http://www.essingedackhotell.se)). Katarinabergets skyddsrum is by the way still used as a garage to this day. In other words, the domestication of the threat was obviously successful in Sweden. The shelters are a normalized phenomenon in Swedish urban environment, they constitute an essential part of any public building or apartment house but cause no stir or anxiety in contemporary life although they are built for calamities and crises.

Lately the shelter, especially the military version has emerged as a tourist attraction. In Karlskrona,
a city more or less built as a fortress, guided tours and walks through the tunnels and military installations are common. Swedish Television frequently shows programs about forgotten “secret rooms.”

Urban Exploring has also revived abandoned shelters and internet is filled with photos, videos, and forum threads about notable UE locations in many Swedish cities. In Umeå where I am situated one noteworthy example can be seen. In one of the public parks in the city center one of these shelters was built by the municipality. The shelters was initially used as a locale for an amateur theater group, a typical peacetime-use solution. Fittingly they took the name Grotteatern (my trans. The Cave theater). Sometime during the 1980s the shelter was abandoned for a new locale. The shelter was probably used by homeless people for a while until it was closed with concrete planks. While doing research for this thesis I found a thread on a forum with pictures from the inside of this shelter. The pictures were taken just a few years ago by a group of teenagers that broke into the shelter as part of an urban exploring venture. The shelter had now become a source of mystery for this new generation, something to be explored. Telling something about the history of their hometown. The videos found on YouTube are also often accompanied with a dark setting and instrumental music, trying to invoke a ghastly feel as if wandering through a haunted tomb treasure hunting.

Some of these shelters, from what I understand mainly the military types, are for sale every now and then. For example, while writing this, a rock solid shelter in Härnösand is for sale. Perhaps the biggest irony of it all is the fact that many of these rock solid shelters were covered inside with light-concrete materials that later was discovered being radioactive since they contained crude uranium. This means that many of the rock solid shelters, built to protect from radiation along with other things, actually became radioactive from the inside to a level that they now are unusable in their current state. The metaphor is too good to resist. By going underground, the Swedish citizens would become truly radiant.

The shelters today are according to MSB still used as protection for war based threats. The old word formulations can be recognized: gases, fragmentation, shock waves and ionizing radiation. MSB however, has changed drastically in comparison to their Cold War counterpart. What you can find on their webpage today is advice on how to prevent injuries from “ball related sports activities” to rescue

189 A video recording was also done and publicized on YouTube: <http://www.youtube.com/watch?v=qqqF2BqkoBY> retrieved 2013-05-28.
ventures in case of natural disasters. Perhaps the most obvious difference is the fact that potential war scenarios directed against Sweden are far from a primary concern while armed intervention directed towards other nations has taken a greater role. From passive defending to active intervention. This shows again how a nation positions itself in an international environment is vital to understand its domestic policy and how it changes. Used, adapted technology is in this perspective far from something to be seen as objective, rather the opposite.
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This thesis include statistics produced by Swedish Civil Contingencies Agency (MSB):

Antal skyddsrum per skyddsrumstyp, januari 2011.


**Image list**

Cover image: SOU 1950:13, appendix.

Figure 1: Shelter sign <http://commons.wikimedia.org/wiki/File:Skyddsrum_skylt.jpg>

Figure 2: Construction pace of normal type shelter with an average per year. Numbers are drawn from MSB.se (complete address above) retrieved 2013-05-14.

Figure 3 : Civil defence expenditure in American dollar per capita during 1982-83. Numbers are drawn from Lawrence J. Vale (1987) p.9.

Figure 4: Riksluftskyddsförbundet, *Hemskyddet: Handledning* (Stockholm 1939), p.137.

Figure 5: Riksluftskyddsförbundet, *Hemskyddet: Handledning* (Stockholm 1939), p.133.

Figure 6: Riksluftskyddsförbundet, *Hemskyddet: Handledning* (Stockholm 1939), p.43.

Figure 7: SOU 1947:10, p.38.

Figure 8: SOU 1947:10, p.47.

Figure 9: SOU 1950:13, p.46.

Figure 10: SOU 1950:13, p.95.

Figure 11: SOU 1950:13, p.51.

Figure 12: SOU 1950:13, appendix.

Figure 13: SOU 1950:13, appendix.

Figure 14: SOU 1950:13, appendix.

Figure 15: SOU 1950:13, appendix.

Figure 16: Picture taken by Peter Bennesved, April 2013.
**Literature**


<http://urn.kb.se/resolve?urn=urn:nbn:se:umu:diva-58152>


Jerneck, Magnus (red.), *Fred i realpolitikens skugga*, Lund 2009.


This article, found in Time Magazine, June 23 1958, is about the Swedish public shelters. It shows quite explicitly how far the domestication of the nuclear threat had gone by 1958 and how it was depicted by the American journalists in an quite ironic language, stressing concepts of mania, socialistic statecraft and cheerful ignorance. The final note remarks: “[T]he state liquor monopoly, caught by the underground mania, has found a safe place to bury enough spirits so that the Swedes who survive atomic war will be able to toast their luck in a glass of aquavit.”