

## MILITARY ARCHITECTURE IN THE NETHERLANDS AND HER FORMER COLONIES (1500-1800)\*

*In this article we wish to consider the history of certain Dutch fortifications in the Netherlands, her former colonies and spheres of influence. Special attention will be given to the construction of our Castle and the engineers responsible for the design of South Africa's most important historical monument.*

*Trading concerns such as the Dutch East India and West India Companies erected fortifications as the occasion demanded in their possessions and areas under their control. This was done out of purely military or also commercial considerations which they deemed necessary for the protection of their interests against internal or external threats of trading competition.*

*The result was that many forts, fortified trading posts and trade castles of Dutch design were erected in the East-Indies, Ceylon, the coast of West-Africa, the north coast of South America, the southern tip of Africa and elsewhere in the Dutch colonial empire. One of these splendid and impressive military structures was the Castle of Good Hope in Cape Town. The extent of the importance of this castle erected by the Dutch at Table Bay can hardly be overestimated.*

*An interesting history lies behind all these fortifications, a history which can be traced back to the growth of cities in the country of towns, the Netherlands.*

### 1 *The beginning of the Dutch fortifications architecture*

On reading prof. dr. W. Jappe Alberts' *De Middeleeuwse Stad*, (Bussum, 1965), and taking note of the characteristics of such a city, the reader will agree with the author that the walls, towers, gate-ways and moats gave the inhabitants of the medieval town necessary security. These urban communities were islands in the surrounding countryside and they governed themselves. This placed the responsibility for the care of the fortifications in the hands of city authorities.

It was not only for the urban authority's responsibility to erect the fortifications, they also had to maintain the earthen ramparts, walls, gate-ways, ordinance, etc. and had to organise the defence of the city.

When taking into account medieval political relationships, factors such as jealousy between the cities, enmity between the barons, and so forth, it will be realised that military matters played an important part in the activities of the city government.

It is an accepted fact that after the invention of gunpowder and the rise of military science, continuous vigilance and purposeful action to keep abreast of the latest developments in the art of fortification and defence, was required. The late Col. W. H. Schukking points out this fact in his publication, *De oude vestingwerken van Nederland*, (Amsterdam, 1947).

### 2 *Developments during the Eighty Years War*

On land the Eighty Years War (1568-1648) was mainly a fortifications war. Historians point out that Prince Maurits (1585-1625) fought only two battles on land while his successor, Prince Frederik Hendrik (1625-1647), confined his military actions exclusively to the besieging of cities. These statements are exemplified in that Prince Maurits besieged and captured the fortifications of Zutphen, Deventer, Delfzijl, Hulst, Nijmegen in 1591; in 1592 Steenwijk and Coevorden; in 1593 Geertruidenberg and in 1594 the city of Groningen.

Prince Frederik Hendrik gained fame particularly with his successful sieges and captures of 's Hertogenbosch (1629), Venlo, Roermond and Maastricht (1632). He was honoured with the name *Stedendwinger* which is indicative of the nature of his military achievements.

\*Our thanks to Dr. W. H. J. Punt, director of the *Simon van der Stel Foundation*, for approval to make use of this contribution, which had earlier appeared in the Foundation's publication *Our Cape Gables*, together with illustrations for publication in *Militaria*.

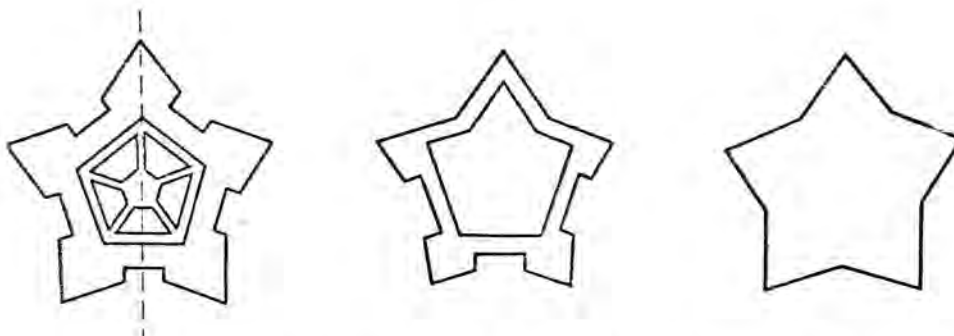
The struggle for independence against Spain was largely one of military actions against fortified towns, and to this day the names of cities such as Den Briel, Haarlem, Alkmaar and Leiden mean much more to modern Dutchmen than mere place names.

On one of the entrances to Leiden, the well-known *Zijlpoort*, the city crest still proudly proclaims the motto, *Haec Libertatis Ergo*, "this for freedom," a motto with many meanings and a warning from the past for any possible enemy!

### 3 *The bastion or rampart*

Before gunpowder revolutionised warfare the military equipment for defence which a citadel, castle or city possessed was usually superior to that possessed by the attackers. After the advent of gunpowder however, a gradual change in favour of the attacker came about, and this compelled the defenders to revise and improve the defences of their fortified places.

This change made pentagonal bastions an essential part of the architecture of 16th century fortifications. The then Maj. W. H. Schukking makes this point in his book *Grepen uit de geschiedenis der Nederlandse vestingen*. (Arnhem, 1934). According to the same author the Italian architect Michel Sanmichele, added small bastions to the fortifications of Verona in 1525. Countrymen of Sanmichele, such as Alexander de Pasqualini and Donato de Bono, introduced the art of bastion building to the Netherlands. Here it was used in the construction of *Fort Rammekens* and the town of Grol in 1547 and 1550. It is important to note that in 1567 the Duke of Alva ordered a pentagonal castle with large bastions to be built for the defence of the Scheldt city of Antwerpen. This castle was to become the prototype of many such fortifications and in 1569 a similar fortress was built for the city of Groningen.



(V.l.n.r.): 'n Reëlmatig gebastioneerde vyshoek (sitadel), 'n vyshoekige fort met hele en twee halwe bolwerke en 'n redan, 'n vyshoekige sterskans. | (F.l.l.r.): A regular bastioned pentagon (citadel), a pentagonal fort with two whole and two half bastions and a redan, a pentagonal starshaped redoubt.

Stichting Menno van Coehoorn.

### 4 *The rise of the "Old Dutch Fortification System"*

During the initial decades of the Eighty Years War, the war's many dangers prevented urban and provincial authorities from systematically improving the existing fortifications. The distressing shortage of funds also had a retarding influence on the building of forts and castles.

Maj. Schukking states in his book that after 1579, the year in which the northern provinces formed the Union of Utrecht, the fortifications system showed signs of improvement. However Prof. Dr. J. Presser in his book *De Tachtigjarige Oorlog*, (Amsterdam-Brussel, 1948), draws attention to the fact that the Dutch fortification system experienced its greatest development after the Twelve Years Armistice, 1609 to 1621. Dr. Presser describes this as a period of stabilisation in the building of fortifications and considers that years of warfare before as a transitional period, during which the Italian style of fortification with earth walls and small bastions, was superseded by the so-called *Old Dutch System*.

A shortage of money and the clayey soil the Dutch had to contend with, forced them to abandon heavy earth walls requiring very sound foundations. Thus the smaller earth walls became a feature of Dutch fortifications of the time. These walls could not easily be destroyed by artillery and because of their width, they presented blind angles and corners which the defenders could easily cover with artillery and musket fire from the bastions.

To increase the effectiveness of their artillery fire, the Dutch engineers built much larger bastions than their Italian predecessors. They placed the flanks perpendicular to the adjoining walls between the bastions. In this manner they ensured that the adjoining walls (*courtines*) and the external faces of the bastions could be effectively covered by fire from the flanks of any particular bastion.

### 5 *Simon Stevin*

These building designs and other innovations adapted to Dutch soil, were welded into an organic whole known as *the Old Dutch Fortifications System* by the famous Simon Stevin of Brugge (1548-1620).

Simon Stevin came from the Southern Netherlands. This versatile man was one of a group which played an important part in the military history of the Dutch Republic, as described by Dr. J. and A. Romein in their publication *Erflaters van onze beschaving*, (Amsterdam, 1938). Shortly after 1570 Stevin left Flanders to settle in the Northern Provinces in 1580 after having wandered through Europe. He studied at the University of Leiden and later became professor of mathematics at the same university. He was a teacher and adviser of Prince Maurits particularly in the repulsing of the enemy armies from Dutch territory.



*Nederlandse penning van omstreeks 1600 waarop 'n vyfhoekige fort voorkom.*

*Versameling: Jonkheer W. van Beyma, Pretoria.*

*Dutch coin (circa 1600) showing a pentagonal fortress.*

*Collection: Jonkheer W. van Beyma, Pretoria.*

He was the author of *Stercktebouwing* (1594) and *Stercktebouw door Spilsluysen* (1607). In these military works he developed a mathematical system for the building of fortifications and the systematic use of water as a means of defence. Authoritative writers to this day consider Stevin the intellectual father of the fore-mentioned system which, in a modified form, was widely used in fortifications in the Netherlands Republic, and also in her overseas colonies.

According to Maj. Schukking and also according to C. A. de Bruijn and H. R. Reinders' publication *Nederlandse vestingen*, (Bussum, 1967), contributors to this process of simplification were the French mathematician Samuel Marolois (1572?-1628) and especially a physician of Polish decent in Leiden, Adam Freitag (1608-1650). Marolois was the author of the authoritative publication on fortification which was translated into Dutch in 1627. Freitag's book was published in Leiden in 1630 and was reprinted twice in Dutch as well as being translated into German and French.

## 6 The Fort "Good Hope"

Much information concerning the building of the *Fort De Goede Hope* can be found in, *Daghregister gehouden by den oppercoopman Jan Anthonisz van Riebeeck*, edited by Prof. D. B. Bosman and Prof. Dr. H. B. Thom (Kaapstad, 1952); in the works of Prof. Dr. E. C. Godée Molsbergen. *De Stichter van Hollands Zuid-Afrika Jan van Riebeeck*, (Amsterdam, 1912) and *Jan van Riebeeck en sy tyd* (Pretoria, 1968), and particularly in Anna C. Ras' excellent study, *De Kasteel en ander vroeë Kaapse vestingwerke 1652-1713*, (Kaapstad, 1959). These publications describe the ground plan and measurements equally well.

Van Riebeeck went ashore on April 9, 1652 and, *on this day marked off the fort and in the evening returned to the ship* (*Daghregister*, p. 25).

Godée Molsbergen states in his earlier book (p. 140) that Jan van Herwaerden rendered excellent service to the Commander with the building of the fort. The author adds that, *he served under the conqueror of cities, Prince Frederik Hendrik and acquainted himself with the excavation work in the building of forts*.

The publication of De Bruijn and Reinders (p. 16) depicts how a fort was planned. According to this illustration the particular fort is shown as a pentagon, whilst the *Fort Good Hope* at the Cape was planned as a regular tetragon. (Ras, p. 9).

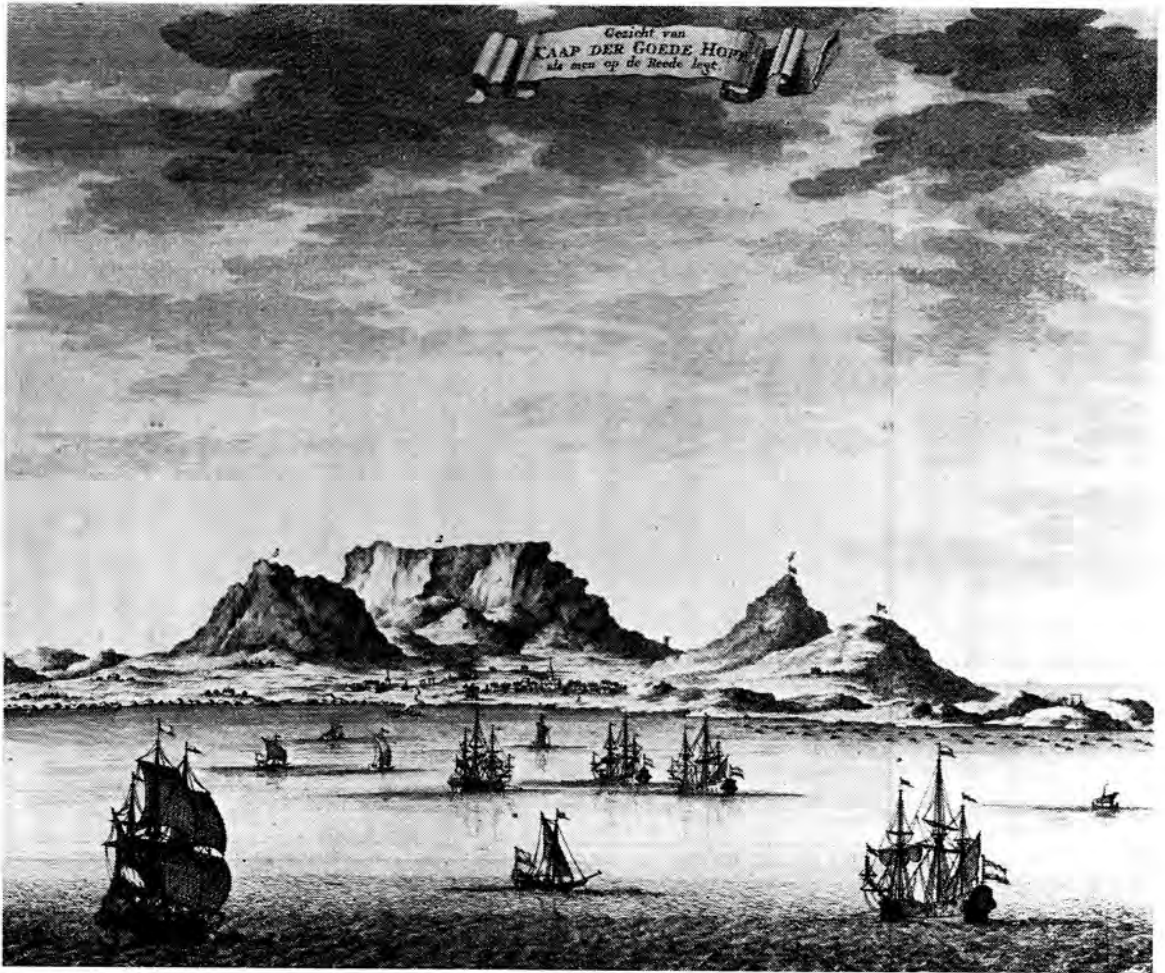
The vertical bastion flanks of the *courtines* classify Van Riebeeck's fort as a typical example of the *Old Dutch system*. Diverting the water from the stream nearby into the moat as an additional means of defence is a typical usage of the mother country.

The site plan of Van Riebeeck's fort shows a regular tetragon. But one finds in books, such as Col. Schukking's study of Dutch fortifications, the *Kunstreisboek voor Nederland*, (Amsterdam, 1960) of De Bruijn and Reinders and in other publications, a variety of examples indicating that various systems were used. Simon Stevin advocated the use of the regular hexagon. The plan for the town of Elburg is approximately that of a regular tetragon with four bastions (1580-1592) and a systematically planned residential area in a square within the walls. In 1581 the small Frisian town of Sloten was strengthened with five bastions. In 1593 Stadtholder Willem Lodewijk decided to build a pentagonal stronghold with bastions at Bourtange. By order of Prince Willem of Orange in 1583, the village of Ruigenhil was temporarily fortified. Two years later the Dutch military engineer Adriaan Anthonisz completed this stronghold. In later years the heptagon design of the stronghold, now known as Willemstad, was altered and improved. Today Willemstad is one of the best preserved Dutch strongholds of Old Dutch design.

The citadel of Antwerpen was a pentagon, as was the fort at Groningen, which was built during the governorship of the Duke of Alva (1567-1573). Reproductions of these castles are to be found in De Bruijn and Reinders (photo 4, figure 7).

Although the last-mentioned castles and the forts of Bourtange and Willemstad were not only designed to existing urban needs, other cities were influenced by these walled towns. Enkhuizen had six and one half bastions and it is known that Groningen and Amsterdam had seventeen and twenty seven bastions respectively





*'n Sewentiende eeuse afbeelding van die nedersetting aan die Kaap die Goeie Hoop.*

*Foto: Rijksmuseum, Amsterdam.*

*A seventeenth century illustration of the settlement at the Cape of Good Hope.*

*Photograph: Rijksmuseum, Amsterdam.*

before they were dismantled and demolished. The author H. le Page, in the V.T.B. publication, *De Vesting Hulst* (Antwerpen, 1967; No. 79), mentions nine bastions (1618-1623) with circumvallation and three gateways which enclosed this old fortress in Zeeuws-Vlaanderen.

Other examples of bastioned Dutch fortresses with a varying number of bastions are the following: Sluis — thirteen bastions, Tholen — seven bastions — Naarden — six bastions (1673-1685), Norg — four bastions, Harlingen — seven bastions.

### 7 The Fort Amsterdam (Curaçao)

The Fort Amsterdam, Willemstad, Curaçao, deserves mention in connection with Dutch colonial fortifications of the first half of the seventeenth century. This fort was originally planned as a regular pentagon with the bulwark points 25 Rhenish rods apart. Eventually, as a result of omission of the fifth bastion, it became an oblong fortress with four bastions and a *rondeau*. As the flanks of the bastions were placed perpendicular to the adjoining *courtines*, this fort, which came into being in 1635, is also an example of the *Old Dutch fortification system*.

In 1959 Prof. Dr. M. D. Ozinga who personally investigated the fortifications on Curaçao island, described this fort in his standard work, *De monumenten van Curaçao in Woord en Beeld*, ('s-Gravenhage).



Deur / By A. A. TELFORD

*Die Kasteel is die oudste gebou in Suid-Afrika. Die eerste fundamente is in 1666, onder toesig van die ingenieur, Pieter Dombaer, gegrawe en die bouwerk is, met uitsondering van die grag, in 1679 voltooi. | The Castle is the oldest building in South Africa, the first stones of the foundation having been laid in 1666, under the supervision of the engineer, Pieter Dombaer. By 1679 the Castle was completed except for the moat. Bo links: Die Kasteelingang | Top left: The entrance to the Castle. Bo regs: Die „Kat-“ balkon | Top right: The „Kat“ Balcony. 1. Die noordelike bastion: „Buren“ | The north bastion: „Buren.“ 2. Die oostelike bastion: „Katzenellenbogen“ | The east bastion: „Katzenellenbogen.“ 3. Die suidooselike bastion: „Nassau“ | The south-east bastion: „Nassau.“ 4. Die suidelike bastion: „Oranje“ | The south bastion: „Oranje.“ 5. Die westelike bastion: „Leerdam.“ Hierdie vyf bastionne het hulle name aan die hoof-titels van die Prins van Oranje ontleen | The west bastion: „Leerdam.“ These five bastions were named after the chief titles held by the Prince of Orange. 6. Die hoofingang is tydens Simon van der Stel se bewind gebou. In die toringkie bokant die poort hang daar 'n klok uit die jaar 1697. Dit is gelui om die ure aan te dui, maar het ook diens gedoen as brandalarm en om die garnisoen en burgers te ontbied vir die lees van proklamasies, ordonnansies, ens. | Main entrance built in Simon van der Stel's time. The turret over the gateway contains an old bell dated 1697, which was struck not only to*

mark the hours but also as a fire alarm and to summon the garrison and burghers to hear the reading of proclamations, ordinances, etc. 7. Die buitenste of tuinbinnehof | The outer, or garden court. 8. Die „Kat“-balkon is tussen 1780 en 1790 aangebou | The “Kat” balcony, erected between 1780 and 1790. 9. Die „Kat,” ’n hoë verdedigingsmuur wat die Kasteel in twee verdeel, is in 1696 voltooi. Die onderkant van die muur is vyftien voet dik en die bokant ses voet. Geboue is teen die muur opgerig. | The “Kat,” a great wall for defensive purposes dividing the Castle into two, which was completed in 1696. It is fifteen feet wide at the base and six feet wide at the top. Buildings were erected against the sides. 10. Die Sekunde se huis tydens Van der Stel se bewind. Die gewelfde graankelders was onder die huis | The Secunde’s house in Van der Stel’s time. Under the house were the vaulted grain cellars. 11. Die Goewerneurswoning tydens Van der Stel se bewind | The Governor’s residence in Van der Stel’s time. 12. Die oorspronklike Kommandeurskwartiere, een van die oudste geboue in die Kasteel. | The original Commander’s apartments, one of the oldest buildings in the Castle. 13. Die ou uitkyktoring. | The old look-out tower. 14. Die ligging van die oorspronklike ingang tot die Kasteel wat tydens Van der Stel se bewind deur die nuwe een vervang is. Die see het teen hierdie ou ingang aangespoel. | The first entrance to the Castle, closed up in Van der Stel’s time when the new entrance was built. The sea used to wash right up to this old doorway. 15. Die binnehof of „Wapenplaats.” Lady Anne Barnard se beroemde tuin was aan die westekant daarvan geleë. | The inner court or “Wapenplaats.” Lady Anne Barnard’s famous garden was situated on the west side of this court. 16. Die grag, vandag feitlik onsigbaar. | The moat, now mostly filled in. 17. Waar die strand vroeër was. | Where the beach used to be.

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## 8 The Castle of Good Hope

In August 1665, thirty years after the building of *Fort Amsterdam* in Curaçao was begun, governor Isbrand Goske and military engineer Pieter Dombaer arrived in Table Bay aboard the *Nieuw Middelburg*. The Lords XVII had ordered a new fort, the present day *Castle of Good Hope*, to be built and before the end of that month surveyor-fiscal Hendrik Lacus and the engineer had marked off the new fortification. It was to be a fortress with five bastions. These instructions were carried out in accordance with the principles of the Old Dutch system of fortification with the bastions and flanks built in a rectangular way on the adjoining *courtines*. As has already been stated, pentagonal fortifications were common in the Dutch Republic during the 17th century.

## 9 Vauban-Coehoorn

In view of the known facts regarding Dutch fortifications, it is strange that P. E. Roux in his work *Die Verdedigingsstelsel aan die Kaap onder die Hollands-Oosindiese Kompanjie (1652-1795)*, (Stellenbosch, 1925) p. 5, concludes without decisive proof that the Fort was built according to *Vauban concepts*.

Similar are the following conclusions:

In the Historical Monuments Commissions’ publication, *Die gedenkwaardighede van Suid-Afrika*, (Pretoria, 1941), on page 23 we find:

*The Castle is pentagonal with a bastion on each of the five corners . . .*

*In those days this type of castle was common in Europe.*

In the second edition of this book (Johannesburg, 1949) the following statement appears on page 22:

*The fort was designed according to the principles laid down by Louis XIV’s famous fortifications engineer, Sebastian de Vauban and his Dutch contemporary, Menno, Baron van Coehoorn.*

Fred. Oudschans Dentz declared in his contribution of April 1952. “Het Kasteel van de Kaap de Goede Hoop” (*Heemschut*, Amsterdam), that the Castle is a pentagon with bastions according to the *system of Vauban*.

In 1957 Prof. Eric Walker declares on page 44, of his work, *A History of Southern Africa* (London, 1957): *Pieter Dombaer designed it on the most approved model of Louis XIV’s great military engineer Vauban.*

Two years later, in 1959, Miss Ras states on page 58 in her excellent study on the Castle and other early fortifications:

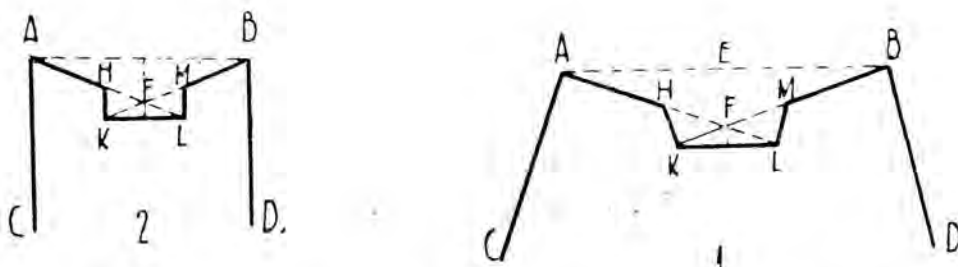
*According to the Lords XVII's project the new Fort should take the form of a pentagon, that is a fortification with five bastions according to the Vauban system.*

Neither Roux, Walker nor Ras produce documentary evidence, indicated by foot notes or otherwise, that the site plan and bastions were influenced by the famous French fortifications designer Vauban. The book of the Historical Monuments Commission (2nd edition) also does not give the authority for the statement that the Castle's design was influenced by Vauban and Menno, Baron van Coehoorn. The above-mentioned description by Frederik Oudschans Dentz was criticised in Holland.

Col. W. H. Schukking replied on behalf of the Dutch *Menno van Coehoorn Foundation*. In the same issue of *Heemschut* in which Dentz's article appeared he states:

*We consider it unlikely that the bastions of the Castle were constructed according to the system of Vauban. Sketches of old fortresses in the National Archives show that both the old tetragonal fort of 1652 and the existing pentagon of a more recent vintage, were built according to the Old Dutch system of fortress construction as described in particular by Marolois and Freitag (1615-1630). After all, this system was typified by straight flanks and the absence of the inwards curving flanks and oreillons at the bastion corners which Vauban and Coehoorn later introduced.*

Col. Schukking further referred to Prof. Eric Walker's publication of 1957, that according to Dr. P. Lazard of Paris', Vauban had not yet begun with his systematic improvements of French fortifications by 1665. P. Lazard also makes it clear that at the time our castle in Cape Town was planned, Vauban was not yet well known in France as a military engineer. This naturally excludes the possibility that his constructions were copied overseas.



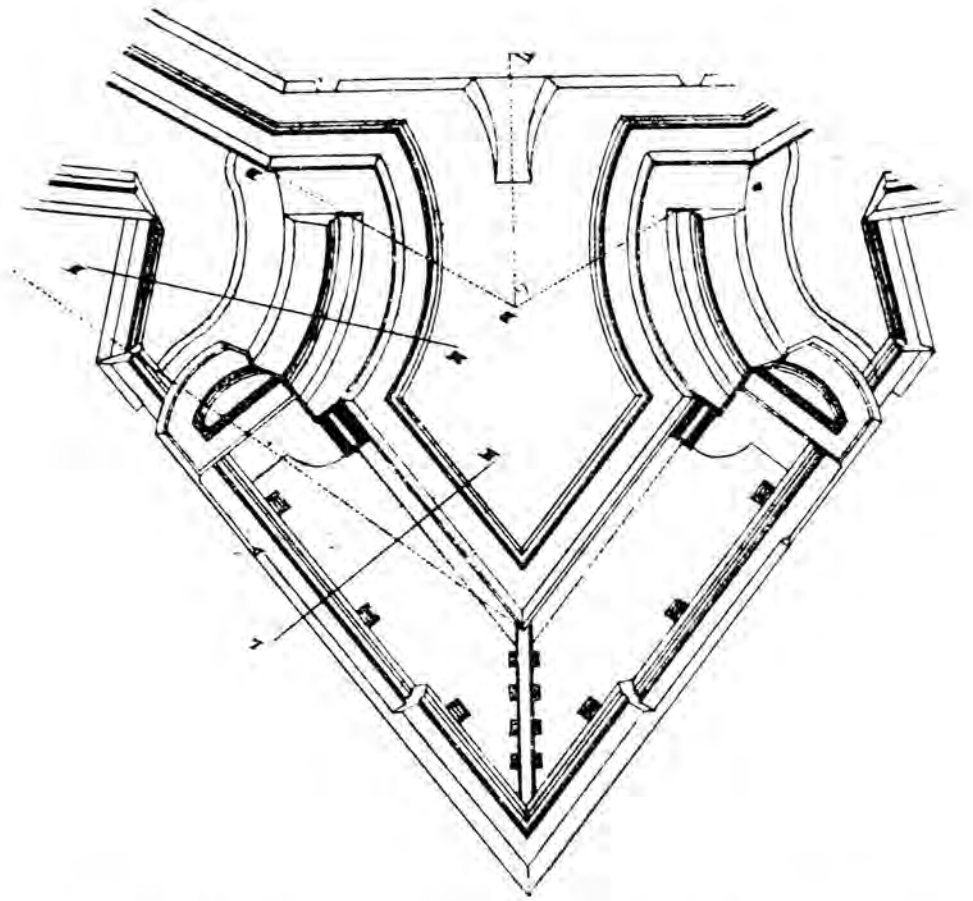
*Horingwerke — 2. Ounederlandse stelsel. 1. Nieuwnederlandse stelsel.  
Hornwork — 2. Old Dutch system. 1. New Dutch system.*

*Stichting Menno van Coehoorn.*

With reference to the question whether Vauban developed a fortification system of his own, G. A. van Kerkwijk in his *Handleiding* (Breda, 1846), p. 49, expressed the opinion that Vauban did not originate a new system. In 1912 the German author Reuleaux in *Die geschichtliche Entwicklung des Befestigungswesen* (Leipzig, 1912) p. 45, confirms this fact. According to Reuleaux, Vauban declared in his writings that he never developed a special fortification system, instead he always adapted himself and his structures to local conditions. Only later did other authors attempt to group Vauban's works in a military system.

It is also important to note Col. Schukking's mention that both Vauban and Coehoorn introduced the principle of curved flanks in their bastion designs and added oreillons i.e. curved towers, in the saillant of the bastions<sup>2</sup>. The bastions of the Castle in Cape Town show none of these characteristics.





*Curved flanks are characteristic of the New Dutch system of fortification.  
Geboë flanke kenmerk die Nieuwnederlandse stelsel.*

*Stichting Menno van Coehoorn.*

#### 10 *The significance and importance of Coehoorn*

In his *Grepen uit de geschiedenis . . .* (pp. 12-13) Maj. Schukking describes developments in the change over from the *Old* to the *New Dutch fortifications systems*. This was a gradual process which began to take form after the war of 1672-74, thus after our Cape Castle had already been built.

During this war Sebastian le Prêtre Vauban's successes in siege warfare, brought home the fact to the military leaders in the Netherlands that the old fortification system was outdated.

Menno, Baron van Coehoorn (1641-1704) was destined to become a leading European fortifications expert and opponent of Vauban. He was to adapt Dutch fortifications architecture to the new demands of his age.

This versatile military engineer and architect of fortresses was born near Leeuwarden. In 1674 he invented a special type of mortar gun and in 1680 he designed the fortress of Coevorden. He was appointed military commander by the Stadtholder King Willem III (1672-1702) before he gained fame as designer as well as an attacker on and or defender of fortresses.

Contributing largely to his fame were the sieges of Keizersweer and Bonn (1689) and the defence and subsequent recapture of Namen (1692). In his capacity as chief fortifications engineer (1695-1704) of the Dutch Republic he designed and built many forts in his homeland, such as Bergen op Zoom.

Coehoorn's pioneering principles heralded the advent of the New Dutch system and were set out in his famous, *Nieuwe Vestingbouw op een natte of lage Horisont* (New fortress design for a marshy or flat terrain) in 1685<sup>3</sup>. This work was translated into French and German. According to a brochure of the *Menno van Coehoorn Foundation* the building methods described in this book were dictated by the state of the Dutch soil and the necessity of defending the country's freedom against foreign aggression.

#### 11 *The Menno van Coehoorn Foundation*

In about 1915 an author pointed out that Coehoorn's merits as a military engineer have been overlooked by later generations mainly owing to ignorance of his genius. All this changed in 1932 when Gen. Snijders became the first chairman of the Netherlands registered foundation, *Menno van Coehoorn*. In Belgium a similar foundation exists to honour the memory of Simon Stevin.

The statute of the *Menno van Coehoorn Foundation* describes its aims and objects as follows:

*The Foundation has as its aim the promotion and the preservation of old fortifications in the Netherlands which no longer have any military use. These buildings are memorials to History and Art and monuments of nature, contributing to the preservation of meaningful relics and proud traditions of our national past, and to develop and promote the Dutch nations appreciation of art and nature.*

The foundation has made the Dutch public fortress preservation conscious and has completed many important restoration projects. In this manner fortresses which are monuments dating from before the beginning of our own history, with which it is closely connected, have been preserved.

#### 12 *Coehoorn's name was coupled to our old fortifications*

We have especially mentioned, Menno, Baron van Coehoorn, in this article as his name is coupled to a part of the fortifications line between the Castle and Devil's Peak. According to P. E. Roux (p. 14) these defences were designed by French engineers temporarily resident in Cape Town on their way to the East.

A battery in this defence line was built by governor Cornelis Jacob van de Graaff and according to Roux was named Coehoorn<sup>4</sup>.



## NOTES

- 1 *Vauban*, (Paris, 1934), p. 141.
- 2 Examples of these bastions are to be found in De Bruijn and Reinders, pp. 15-18. Vauban's fortress front is depicted on p. 21 of the same publication.
- 3 This brief biography of Menno, Baron van Coehoorn, and the period in which he formulated his new ideas on fortress design (1685) proves clearly that these ideas could not have influenced the building of the Cape Town Castle (1665).
- 4 Last but not least, a special word of thanks to Captain C. A. de Bruijn of the Reserve of Officers, Oegstgeest, Holland, secretary of the *Menno van Coehoorn Foundation*, for his enthusiastic help in obtaining important data for the author of this article.  
For further study we refer interested readers to the publications referred to in the text.

