

## **REASSESSING THE EXCAVATION OF THE CHURCH STREET WATER FURROW, PRETORIA, BY MAKING USE OF HISTORICAL SOURCES**

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### **ABSTRACT**

The results of the excavation of a water furrow, discovered in central Pretoria during 1994, were published in a previous issue of *South African Field Archaeology*. However these were not complete, mainly because of the time constraints placed on the researchers, as it was a rescue excavation. Only a selection of historical sources were used to obtain information on the site. In this article, the information regarding the furrow is expanded and reassessed in order to determine the correct date and function thereof. All available historical sources were critically compared in order to assess their reliability and accuracy.

### **INTRODUCTION**

When construction work was being carried out in Church Street in central Pretoria during 1994, the remains of a water furrow were unearthed. This discovery eventually led to the National Cultural History Museum being contracted to investigate the feature by means of an archaeological excavation. Findings of the initial research in this regard were published in this journal (Van Schalkwyk *et al.* 1995), but it was suggested that more detailed research should be carried out (see abstract in 1995).

Thorough research is a time-consuming activity. Sufficient time was not available to the researchers, as construction work had to be continued on the site as quickly as possible. This resulted in the researchers being unable to investigate all the possible historical sources, and led to misinterpretation of the history of the site. This is a major problem, since it frequently happens that archaeologists are not allowed enough time for investigation when sites are unearthed during construction activities. Although this might not always influence the excavation of the site, it does have an effect on the auxiliary research, especially in the case of historical sites.

By reassessing the information regarding the water furrow, new aspects came to light. These issues will be discussed in the article, but reference will be made to the previous research in order to put the results in proper context.

### **LOCATIO N**

The water furrow is situated on the southern side of Church Street, between Prinsloo and Van der Walt Streets (Fig. 1). This is in the city centre of Pretoria, directly in front of the State Theatre. The coordinates of the site are 25.44.46,5S; 28.11.39,3E, on map 2528 CA, Pretoria, of the South African 1:50 000 topographic series.

### **SITE DESCRIPTION**

A full description of the site was given when the results of the excavations were published (Van Schalkwyk *et al.* 1995:78-79). Therefore only a photograph of the furrow is included to show what it look like (Fig. 2). It is also sufficient to say that since the founding of Pretoria in 1855, the area has been subject to continual change owing to urban development.

During construction work on the site various remains of former features were discovered. These included different layers of tar representing former road levels, rails for trams that were used as public transport during the first half of the nineteenth century, a drain, a concrete slab and a second furrow in Van der Walt Street, running at right angles with the one in Church Street (Van Schalkwyk *et al.* 1994:2-3).

During the course of 1998 construction workers unearthed another water furrow on the southern side of Schoeman Street, between Prinsloo and Du Toit Streets.

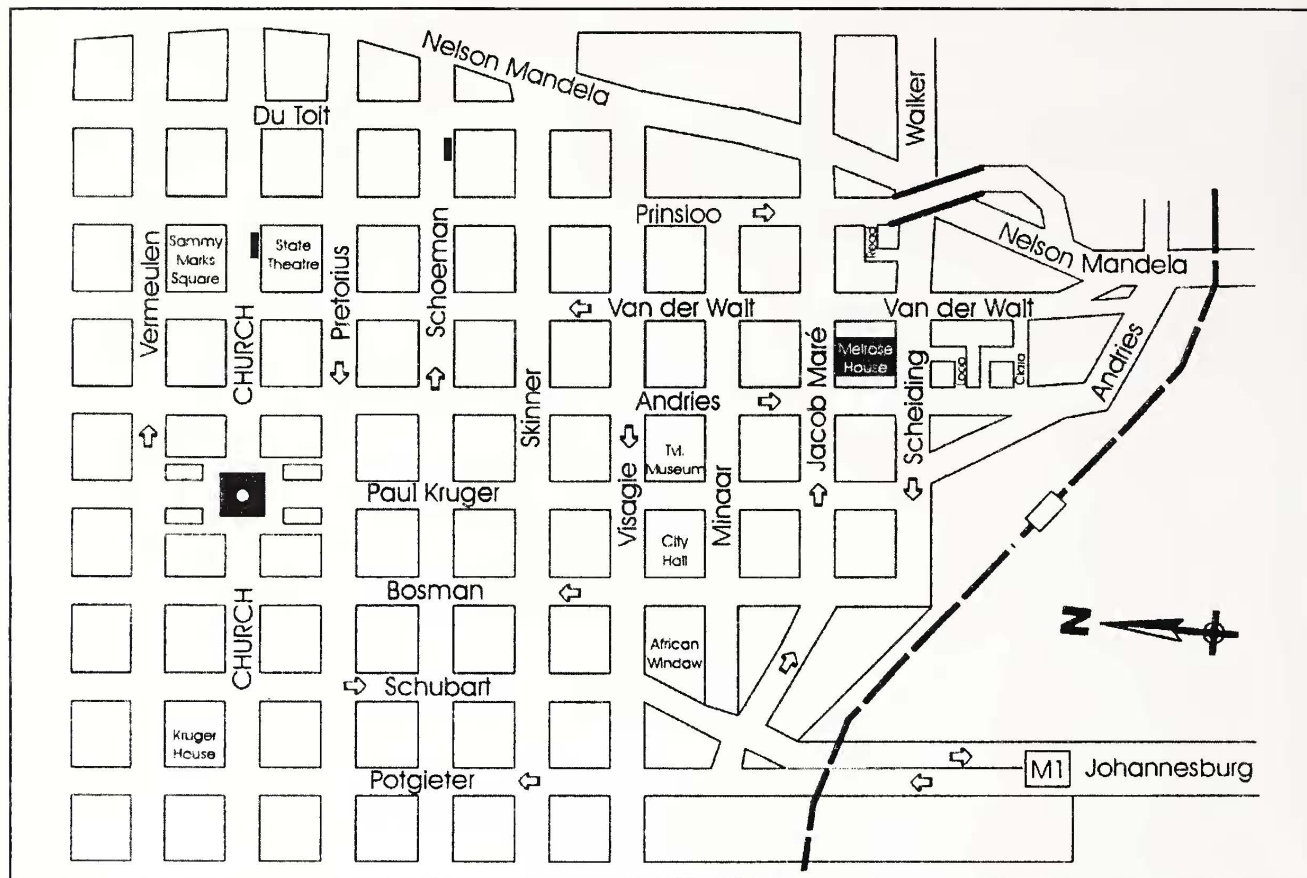


Fig. 1. Location of the furrow under investigation in Church Street, Pretoria Central, and the one found during 1998 in Schoeman Street.

This furrow was similar to those in Church and Van der Walt Streets. It was recorded for comparative purposes, and as an aid in further putting together the history and layout of the water furrow system of early Pretoria (Van Vollenhoven 2000:253, 256).

#### SUMMARY OF PREVIOUS RESEARCH

The research undertaken by the National Cultural History Museum needs to be summarised in order to understand the additional research leading to new interpretations. The historical research indicated that water was provided to Pretoria by means of a system of furrows, which were dug since 1860. A map drawn in 1879 showed some water furrows, but did not indicate one on the southern side of Church Street (Van Schalkwyk *et al.* 1995:79). This implied that the furrow had been constructed after 1879 and gave rise to three probable explanations for its function.

The first possibility was deduced from the fact that the furrow is situated on the southern side of Church Street. As the town centre slopes downwards towards the north, one could expect that irrigation furrows would be on the northern side of the street. It could, however, have been a main furrow providing water to the eastern side of town (Van Schalkwyk *et al.* 1995:82).

The second possibility is that it served the purpose of a stormwater ditch that had to drain excess water from the

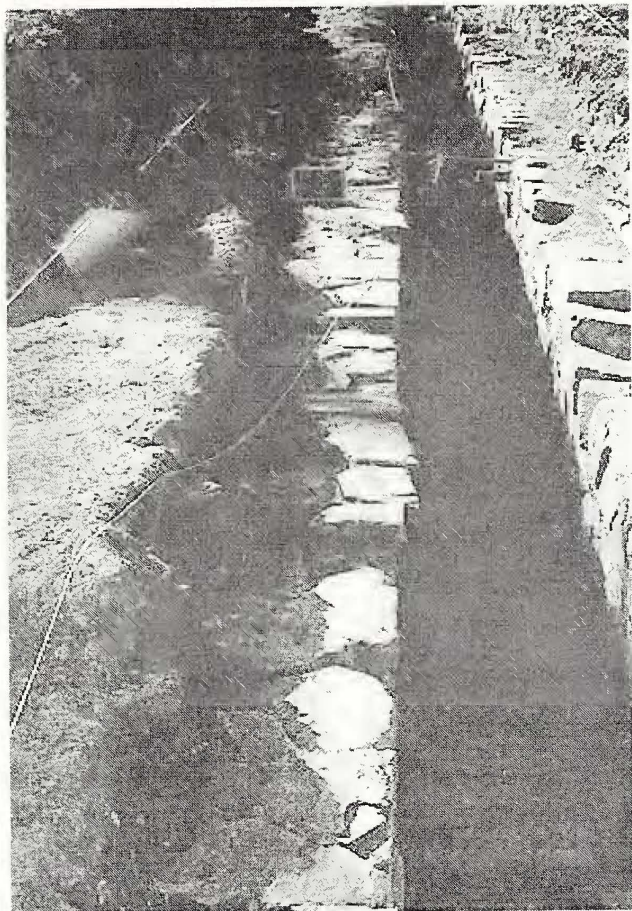
market square (which was situated on the corner of Church and Van der Walt Streets) to the Apies River to the east. This could also explain why the furrow was much deeper than the one in Van der Walt Street (Van Schalkwyk *et al.* 1994:24).

The last possibility is that the furrow provided water to the mill of Stephanus Meintjies. The mill was situated further to the east and had already been in use during 1880. This could also explain why the furrow was so deep (Van Schalkwyk *et al.* 1995:79).

The researchers were only able to give a broad indication of dates for the furrow. It was concluded that it was built after 1860, but before 1880. The reason for this was that the building of the market square in 1879 covered the area where the furrow was found, therefore it must have been built prior to this date. It was probably used until approximately 1910 (Van Schalkwyk *et al.* 1994:24; Van Schalkwyk *et al.* 1995:82).

The archaeological evidence did not cast much light on the dating and function of the furrow. The contribution of the archaeological excavation was that it provided a full record of the method of construction. Artifacts dating from the turn of the century (the late 1890s) suggested that it was still in use during those years (Van Schalkwyk *et al.* 1994:23; Van Schalkwyk *et al.* 1995: 82) and the presence of Coca-Cola bottles and plastic water pipes, proved that the furrow had been uncovered and covered again





**Fig. 2. The completed excavation 1 showing the furrow (Photograph by F.E. Dreyer).**

frequently during recent years. Staff members of the City Council's Water and Electricity Department confirmed that they had frequently found similar furrows in other parts of the city during their activities (Van Schalkwyk *et al.* 1995: 81-82).

#### **DISCUSSION: REASSESSMENT OF THE HISTORICAL CONTEXT**

It has already been mentioned that the research undertaken by the Museum was constrained by the time limits placed on the investigation of the historical sources. Additional research in connection with the water furrow system of Pretoria was later undertaken. It included a study of the relevant literature and an archival search for photographs and maps, as well as a computer search for documents in the National Archives depot. This research was integrated with the research work previously carried out by the Museum, in order to obtain a full picture. The sources were also subjected to the process of internal criticism in order to determine their credibility.

A letter, written by Fieldcornet A.P. van der Walt to President M.W. Pretorius, was used by Rex (1960:62), Pieterse (1942:25) and Peacock (1955:50) as a source. It indicated that excavations for a water furrow from the Fountains Valley to Church Square had started in 1854/5.

The purpose of the furrow was to provide water for Pretoria, and it had been dug by Van der Walt himself. By April 1855 the furrow had been completed up to the entrance ("die poort") to the south of the town (Peacock 1955:50).

In 1857 the "landdrost" (magistrate) of the town, A.F. du Toit, offered to bring order to Pretoria by providing roads, trenches and sewage, as water was streaming around all over town. A dam and a furrow, which was to carry water to the town, was excavated up to the house of Van der Walt, on the southern side of Scheiding Street, in 1857 (Pieterse 1942:26). Pieterse derives his information from two archival documents, a letter written by Du Toit and a contract between the government and the contractors.

During 1858, Du Toit marked off a water furrow for the town. It started at Van der Walt's house in Scheiding Street and crossed Market Street (today Paul Kruger Street) close to Maré Street. From there it ran along the western side of Market Street up to Church Square (Pieterse 1942:27; Meiring 1955:150; Basson 1994:175). Peacock derived his information from a document written by Du Toit, now in the National Archives depot. He also made use of a survey map that was apparently drawn by Du Toit in 1857. It may therefore be assumed that his observations, as well as the map, are correct. Pieterse uses a letter written by Du Toit to the State Secretary, in which this information was repeated. Although the letter was only written in 1875, the information corresponds with that on the map. Meiring mentions that his information originated from a map drawn by Du Toit in 1859. This date seems to be correct, since Du Toit could not have drawn information on a map of 1857, as the work was only completed in 1858. Although Du Toit (and therefore also Peacock) gives the date of the map as being 1857, it is probably the same map as the one of 1859. Basson uses an orthophotograph map (the standard series 1:10 000 maps of South-Africa) to arrive at the same conclusion. Apparently the brothers Vermeulen assisted Du Toit in this task (Du Preez 1978:8).

At this stage (1858) Du Toit had his own water furrow in Arcadia, and S. Schoeman also had his own to the south of Boom Street (Peacock 1955:51, 124). These were open water furrows. This is corroborated by the regulations for towns in the Zuid-Afrikaansche Republiek (ZAR) of 1857. These stipulate that no person, animal or poultry was allowed to soil the water furrows. A fine of 2 shillings was payable in the event of a person's animal being found in a furrow. Draught animals had to be outspanned at least 12 feet (3,6 m) from water furrows (Peacock 1955:54). In this case Peacock referred to the township regulations as published in the Government Gazette.

Since the main water furrow was lacking in capacity, tenders were requested during 1860 for the construction of means to ensure increased water supply. The tender of J.F. Schutte and A. van der Walt for the construction of a large dam and a large furrow for Pretoria at the sum of £120 was accepted. The furrow would run from the Fountains up to Church Square (Pieterse 1942:27-28; Peacock 1955:69). According to Pieterse (1942:28) a certain G. Ezel ultimately



took over the contract. This information was obtained from a report by J.L. Lys, who was a member of the Waterworks Commission of Pretoria. The original contract referred to previously (par. 3 of this section) was used by both as a source. According to Van Jaarsveld (1982:40), a contract for the construction of a dam had already been awarded to Schutte and Van der Walt in 1857, but this was not a success.

It is clear that the water furrow which ran from the dam in the Fountains Valley was 0,92 m (3 feet) wide and 0,45 m (18 inches) deep, and that it had been constructed on the southern side of Church Square. It also appears that smaller water furrows of 0,45 m (18 inches) wide and 0,30 m (12 inches) deep, were taken out of the main furrow around Church Square, to meet again at the lower end (the northern side) of Church Square in a single large water furrow (Pieterse 1942:28; Peacock 1955:69). Pieterse and Peacock once again referred to the contract. These measurements differ from that of the furrow archaeologically investigated (see Table 1), because the latter was a built-up furrow, paved with stone, while the above mentioned was a ground furrow (a furrow simply dug in the ground).

The government of the ZAR had undertaken to personally lay on water from the square to the various erven (Pieterse 1942:28). This project was undertaken in 1860, and it was completed in 1863 (Pieterse 1942:28-29). Once again the Lys report served as the source.

Eventually the water supply provided by the ground furrow was not sufficient for the inhabitants of the town (Peacock 1955:70). Although Van der Walt was allegedly still using this furrow around 1877 (Peacock 1955:125), the furrows in Pretoria at this time were so dilapidated that they were nothing but muddy ditches (Pieterse 1942:32). This suggests that these water furrows were not paved with stone, and did not have roofs, like the one that was excavated. A further indication of this is the description by Pieterse (1942:81) that strangers were looking for trouble if they walked about in the dark as water furrows were criss-crossing Pretoria.

The furrows were not deep, but were sometimes quite wide, especially at street crossings. This information dates from 1875, but is not clear from where Pieterse derived it. Peacock (1955:123) indicates a water furrow on a map which also dates from 1875. A photograph by Dunston (1975:21) shows a furrow on Church Square with a small bridge over it, as it had no roof. It is clearly a ground furrow.

In 1877 a certain Mrs Roche describes the water furrows as "tiny little dykes" in the streets of Pretoria (Lochhead 1913:53). In the same work (Lochhead 1913:55), an open water furrow in Market Street (Paul Kruger Street) is indicated on a photograph dated 1879.

Reference has already been made to the 1879 map of Pretoria. This map also indicates water furrows dating from this period (NAB 3/209). It shows a furrow running from the Fountains Valley along Market Street (Paul Kruger Street) to Church Square. From there it runs further along the southern side of Church Street. At Andries Street it

crosses Church Street diagonally and runs along the northern side of the street up to Van der Walt Street, and then along the western side of the street further north. The furrow that was excavated is not indicated. It further becomes clear from the map that at that stage little development had been taking place in Pretoria and almost nothing further towards the east. This poses the question why such a large furrow was constructed to an area that apparently had no need for it. The previous deduction that the water furrow dated from the period after 1879, and that it was connected with the development of the eastern part of the town (Van Schalkwyk *et al.* 1994:5), therefore appears to be correct. This development took place during the 1890s. This interpretation is supported by the fact that there is no description of covered furrows from the period prior to 1879.

The possibility that the furrow could have supplied water for the mill of Stephanus Meintjies was also previously presented as an explanation, and in this regard reference is made to a photograph taken by Gros. Unfortunately Gros's photographs are not dated, but since he worked in Pretoria between 1877 and 1895 (Dunston 1975:102) there is a fair chance that the photographs date from the era after 1880.

Other maps showing water furrows date from 1892 (NAB, S2/102), 1893 (NAB, S3/487) and 1900 (NAB, 3/1 297). However, not one of these maps show a furrow in the area that was investigated. Every map of Pretoria in the strongroom of the National Archives depot was examined, but with the exception of those mentioned here, not one showed any signs of water furrows in Pretoria.

In Gros's photograph no. 383, a water furrow of stone, but without a cover (roof) is clearly visible. Various photographs of open ground furrows have been obtained from various other portions of Pretoria. A Gros photograph of Church Square in the 1870s with a bridge over a water furrow is known (Dunston 1975:20-21). A photograph of Market Street, dating from 1889, shows a wooden gangway over an open furrow (Dunston 1975:197). Photographs from Dunston, showing open ground furrows, include the north-western side of Church Square - 1891 and 1892, Church Street West - 1896-1899, Andries Street - 1901 and Market Street 1906-1911. Photographs at the National Archives depot show an open furrow dating from 1870 on the corner of Market and Skinner Streets (NAB, 20 777), another in Boom Street (NAB, 20 778), one in Van der Walt Street (NAB, 18 430) and one in Church Street East, but none to the west of the area investigated (NAB, 12 112). A photograph from 1879 shows an open furrow in Market Street, but a photograph from 1912 of the same area shows a sidewalk, with no sign of a furrow (Lochhead 1913:57). There is a possibility that the furrow in Church Street had also been in use between these two dates (1879 and 1912).

The following photographs from the work of Dunston show neither furrows nor kerbstones: Church Square and Church Street West - 1889 (p 29), Church Street West - 1902 (p 167), Market Street - 1894 (p 217), Pretorius Street



1891 (p 247), 1892 (p 252) and 1906 (p 259) and Andries Street - 1902 (p 269). On some other photographs kerbstones and sidewalks are visible, but no water inlets appear in the kerbstones. This indicates that at these places there were no covered furrows; i.e. the south-eastern corner of Church Square - 1911 (p 63), Market Street - 1889 (p 66), 1893 (p 202), 1899 (p 206), 1905 (p 209) and 1911-1912 (p 210), Church Street West - 1895 to 1900 (p 175) and 1903 (p 173) and Pretorius Street 1906 to 1913 (p 231). An undated photograph from the National Archives depot (NAB, 20 773), shows Church Street West with a water inlet in the sidewalk and a fire hydrant. This proves that water pipes had already been installed, but since the photograph was not dated nothing more can be deduced from this.

These photographs prove that open ground furrows could be found in some places in Pretoria as late as 1911, and that the development of the water furrow system in Pretoria did not follow the same chronology in all areas. Therefore a more specific look was taken at the area under investigation, Church Street East. Various archival photographs of the site where the market building was erected, i.e. the south-eastern corner of Church and Van der Walt Streets showed no signs of a furrow, kerbstone or sidewalk (NAB, 1 156; 1 157; 1 158; 1 171 and 20 780). Only two of these photographs (NAB, 5 936 and 28 095) were dated, viz 1883 and 1901 respectively.

A photograph of the area under investigation (indicated as dating about 1888) shows a kerbstone with a water inlet on the southern side of Church Street. The sidewalk appears to have a gravel surface, and no manholes are visible (NAB, 12 111).

On two other photographs from 1888 a kerbstone is visible, but no water inlet or manholes are visible (NAB, 1 122 and 1 155). Also on photograph NAB, 12 104, which is undated, only a kerbstone along the street is shown. A photograph of Church Street East from the 1880s, does not show any furrow on the southern side of the road, while a photograph of the same area in 1892 shows a kerbstone but without any water inlet (Dunston 1975:116-117). This serves as clear proof that the furrow under discussion could only have been built after 1892, and that the date of photograph NAB, 12 111, mentioned earlier, could not be 1888 but also had to be later than this.

A photograph dating from the period before 1889 and a photo from 1890, show an open furrow on the northern side of the street (Dunston 1975:73-74, 154-155). This feature is in line with the hypothesis that the furrows had to provide water for the block of erven lower down the incline, that is to its north (Fig. 3). Photographs from the period 1890-1894, show no signs of a furrow (Dunston 1975:74-75, 122). A photograph taken by Gros, dated 1889, shows no sign of a furrow on the southern side of Church Street East (Dunston 1975:132), another of the same area dated between 1889 and 1904, also shows no furrow or water inlet at this spot (Fig. 4) (Dunston 1975:134-135), and nor do the rest (Dunston 1975:124-127). A photograph dated 1894-1895 does show a sidewalk and kerbstone with a

water inlet on the southern side of Church Street East (Fig. 5) (Dunston 1975:90-92). This demonstrates that a water furrow with a cover (roof) already existed at that time and that the date of Figure 4 is more probably between 1889 and 1892. Together with previous deductions this means that this furrow on the southern side of Church Street East must have been built between 1892 and 1894. It is shown on a photograph dating from 1903 (Dunston 1975:100-101). The market building was completed around 1891-1892 (Dunston 1975:144). It was built on the southern corner of Church and Van der Walt Streets, in other words, in the area under investigation. A poor quality photograph from 1892 of this area shows a kerbstone, but no water inlet (Fig. 6) (Dunston 1975:152-153). Since the sidewalk stretched over the furrow at about 1892 in the area being investigated, it may be assumed that the furrow was most probably built in 1892 - before the sidewalk and stoep (veranda) of the Market building extended over the furrow (Dunston 1975:135).

A photograph from 1904 of Church Street East between Andries and Van der Walt Streets shows a shallow 'furrow' against the kerbstone of the sidewalk on the southern side of the street (Fig. 7) (Dunston 1975:140-141). This is a small furrow with the purpose of quickly taking away storm water to the water inlets against the kerbstone. From here the water flows to a furrow, or storm water ditch, under the sidewalk. The photograph proves that the furrow that was investigated was still in use in 1904, and that it was nothing more than a storm water ditch.

One of the best photographs, indicating the possible existence of the water furrow, is Gros's photograph no. 367 of the Market Square (Fig. 8). On this the well-defined sidewalk, as well as the kerbstone can be seen. A hole in the kerbstone is clearly an inlet for water (Van Schalkwyk *et al.* 1994:7). Unfortunately, the photograph is not dated precisely, but on the grounds of the above evidence it is clear that it was taken only after 1892.

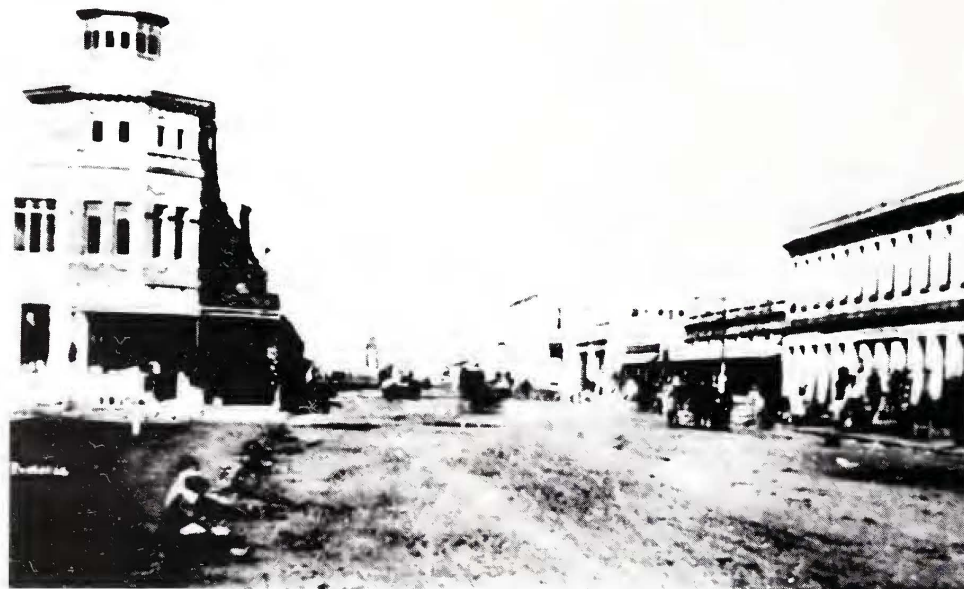
On Gros's photograph no. 384 the sidewalk is visible in the vicinity of what is known today as Strijdom Square. This photograph must therefore also date from the period after 1892. It is therefore quite possible that the water furrow that was investigated could have been under this sidewalk. The same deduction may be made from other photographs in the National Archives depot. Photograph 20 772, dating from 1906-1910, for example, also shows signs of inspection holes (manholes) in the sidewalk (Fig. 9). The quality is such that no definite conclusions could be made from it. Photographs show that should the water furrow have been under the sidewalk, it would eventually have been covered by the stoep of the old market building that was erected around 1879 (Peacock 1955:91), creating the impression that the furrow had already been built before 1879 (Van Schalkwyk *et al.* 1994:7). Because it is now believed that the furrow was probably built in 1892, and definitely not before this date, this argument will not hold firm.

Eventually the water furrows in Pretoria were replaced by a system of pipes (Van Schalkwyk *et al.* 1994:7). R.T. Hall, a civil engineer, proposed as early as December 1877





**Fig. 3.** This photograph from 1890 shows an open water furrow on the northern side of Church Street East (Dunston 1975:154).



**Fig. 4.** This photograph, dated between 1889 and 1892, shows no furrow or water inlet in the sidewalk on the southern side of Church Street East (Dunston 1975:135).

that water be laid on to the houses from a reservoir by means of pipelines (Peacock 1955:149). By 1890 water provided to Pretoria by means of water pipes with a diameter of twelve inches (Krige 1992:4). Maps dating from 1889, 1890 and 1892, already show pipelines in Pretoria (NAB, S1/3 and S2/102). In 1898 rainwater pipes with diameters of 8 inches and 12 inches were laid under the sidewalks to draining trenches (Peacock 1955:188),

while pipelines are shown at various places (NAB, S1/114). However, some open furrows were still being used by 1906 in the old portion of Pretoria (Lochhead 1913:79).

In March 1889 the contract for laying water pipelines to and over erven was awarded to L.G. Forstman. Sufficient water had to be left for the town furrow, and fire hydrants had to be erected. By 1891 this work was completed, and the town was provided with water by means of water pipes





Fig. 5. The southern side of Church Street East from 1894/5. A water inlet is clearly visible in the sidewalk on the left hand side. This is the street block just east of the area under investigation, *i.e.* between Andries and Van der Walt Streets (Dunston:1975:90).

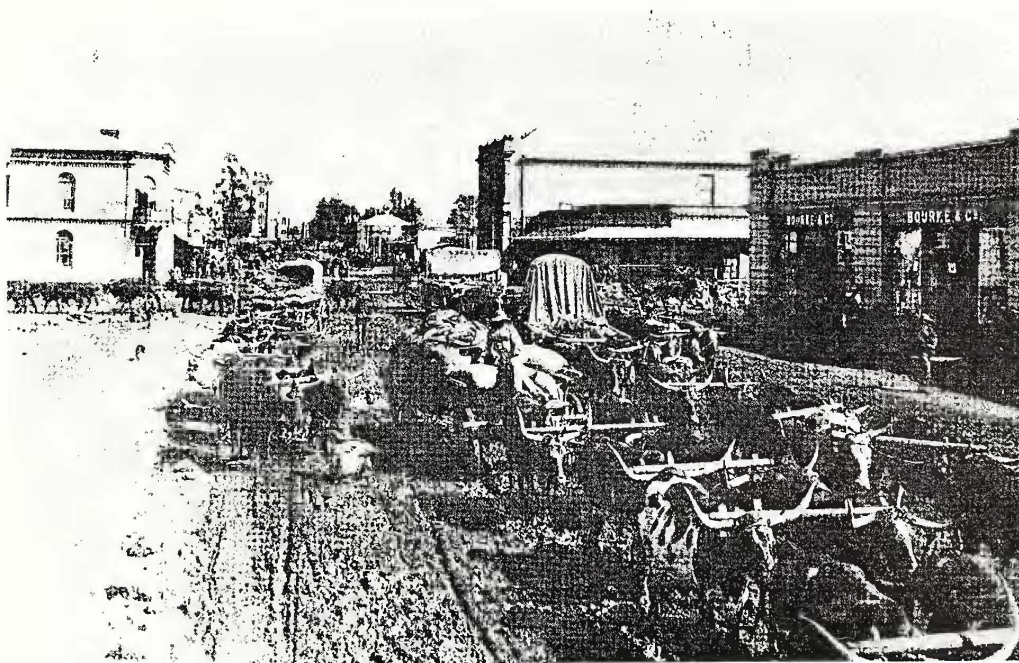


Fig. 6. This photograph, of the area under investigation from 1892, shows a kerbstone but without any water inlet (Dunston 1975:153).

as well as furrows (Peacock 1995:238-241). A pamphlet, dated 1891, gives an explanation of the rules and regulations regarding the provision and use of water in Pretoria, which had to take place by means of water pipes (NAB, Pretoria Waterleiding Maatschappij Beperkt 1891). This document was also cited by Peacock. Photographs in the National Archives from the period 1900 to 1910 show fire

hydrants on the sidewalks. This confirms that water via a pipeline was then already available (Van Schalkwyk *et al.* 1994:7).

It is interesting to take note of one provision of the contract between the government and Fortsman's Pretoria Waterworks Syndicate. This provision stipulated that the company was responsible for repairing any damage to roads





**Fig. 7.** A photograph of Church Street East in 1904. The function of the shallow furrow on the southern side (on the right) next to the kerbstone, was to drain storm water to inlets in the sidewalk. The photo indicates that the furrow under investigation was still used in 1904 and that it was a stormwater ditch (Dunston 1975:141).



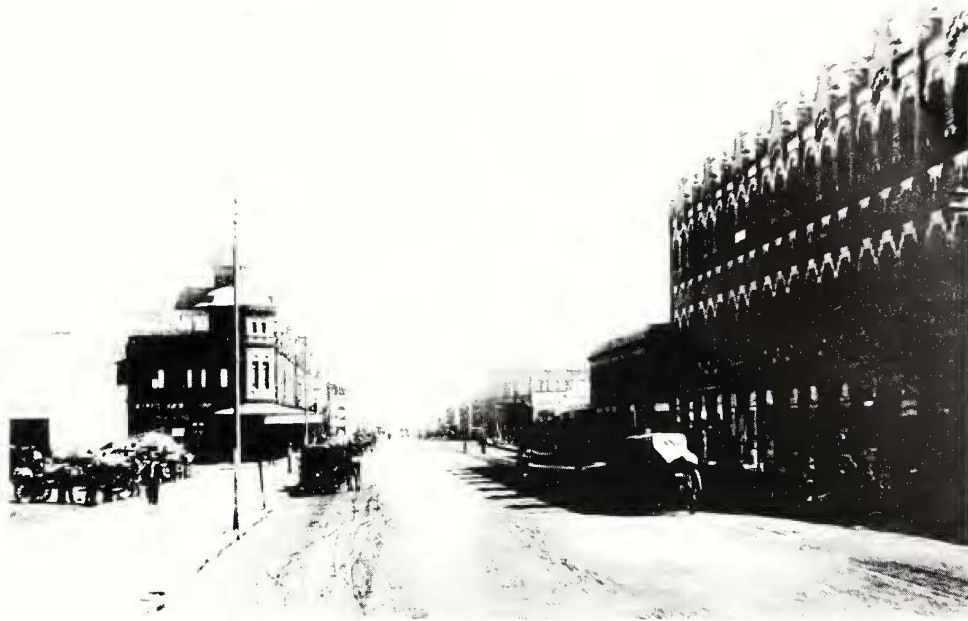
**Fig. 8.** This photograph clearly shows a water inlet in the kerbstone (bottom left) at the investigated area (Gros n.d.:367).

and streets as a result of water pipes being installed (Peacock 1955:239). This implies that it was no problem to remove something that was a nuisance, and to repair it again after the project had been completed. The possibility can therefore not be excluded that at a later stage (after 1892) the stoep of the market building did not really stand

in the way of a furrow being built at that spot and that it might even date to after 1892.

In 1902 the municipality took over the task of providing a sanitary service from the company Sutherland & Kie. In 1903 it took over the task of supplying water to the residents of Pretoria from the Pretoria Waterleidingsmaat-





**Fig. 9. This photograph shows manholes in the sidewalk (left) at the investigated area. It dates from 1906-1910 and proves that the furrow was still in use during this time (NAB, 20 772).**

maatskappy. Between 1903 and 1913 the number of residents who made use of these services had increased to such an extent that the outdated and rusty mainlines had to be replaced. New mainlines were laid on in all directions. During this process 25 miles (40 km) of kerbstones and drainage furrows, 29 miles (46 km) of underground storm water canals and 11 miles (18 km) of street sewers were laid (Lochhead 1913:75-115). This serves as further indication that underground waterways were dug, even though sidewalks and other obstructions had to be removed first.

All documents of the ZAR's Department of Public Works in the National Archives have been checked. The only relevant information is a resolution taken by the Eerste Volksraad (Parliament) on 20 June 1893 that a water furrow had to be dug in Utrecht (NAB, PW 433). From this it is clear that water furrows were still dug in the ZAR in the 1890s.

An architectural drawing from 1893, by the state architect S. Wierda, shows plans for open and covered water furrows (Fig.10) (NAB, S2/109). This indicates that water furrows were still being planned in Pretoria during the early 1890s. However, for the purposes of this study the evidence about covered furrows is more important. The measurements of the covered furrow on the plan were more or less the same as that of the furrow under investigation (see Table 1). This indicates that the excavated furrow was most probably built during the early 1890s. It is known further that open and covered drainage and water furrows were built in Pretoria in 1898 (NAB, ZAR 97:129; Peacock 1955:187).

The report of the city engineer indicates the following:

Open drainage furrows (without mortar)	30 350 feet
Open drainage furrows (with mortar)	4 485 feet
Covered drainage furrows	2 385 feet
Open water furrows	2 464 feet
Covered water furrows	1 184 feet (NAB, ZAR 97:129)

During this year major repairs were also carried out to open and covered water furrows. Because the furrows also silted up at regular intervals, sludge pits were dug in 1898 to overcome this problem. The furrow under investigation was also filled with silt and had manholes at intervals of 6 metres. According to the report of the city engineer these pits had to be cleaned regularly (NAB, ZAR 97:123-124). This means that water furrows were still being built and used in a period when water pipes had already been laid on and that the furrow under investigation could have been built then.

In 1892 Arcadia and Muckleneuk were not allowed to lay on water pipes (Peacock 1955:241), which means that these portions of the city to the east of Church Square were still provided with water by means of a furrow. Arcadia and Sunnyside were only provided with an underground drainage system between 1906 and 1913 (Lochhead 1913:79), while a water pipeline was completed there by 1903 (Lochhead 1913:99). At the same time certain non-residential areas were provided with open ditches for this purpose. It is interesting to take note that these ditches were paved with flat stones (Lochhead 1913:81).

This corresponds with the furrow that was excavated, except that it was covered. Perhaps it was provided with a roof at a later stage, but its design and the building materials



**Table 1. Comparison between the measurements of the different furrows in Pretoria and the plans drawn by S Wierda (NAB, S2/109).**

Furrow	Depth	Width	Thickness of walls	Thickness of roof	Thickness of floor
S. Wierda covered furrow(1893)	3 feet (0,90m)	2 feet (0,60m)	10 inches (0,25m)	4 inches (0,10m)	4 inches (0,10m)
Church Street	0,70-0,80m	0,60m	0,30-0,60m	0,03-0,08m	0,03-0,08m
Van der Walt Street	0,20-0,25m	not visible	not visible	thicker than Church Street	not visible
Schoeman Street	0,365m	0,43m	not visible	0,115m	destroyed
S Wierda open furrow (1893)	2 feet (0,60m)	top: 4 feet(1,80m) bottom: 2 feet(0,60m)	not given on plan	n/a	n/a
Main ground furrow(1860)	18 inches (0,45m)	3 feet (0,92m)	n/a	n/a	n/a
Smaller ground furrows(1860)	12 inches (0,30m)	18 inches (0,45m)	n/a	n/a	n/a

of the floor are simply just too similar to be a later addition. Water was pumped by means of pipelines to the forts which were built shortly before the Anglo Boer War, *ie.* the years 1896 to 1898 (Van Vollenhoven 1995:56-63).

This information comes from correspondence from the period that can be found in the National Archives depot (6 different document groups). Right after the war a 33-inch aqueduct was laid on from the Fountains Valley to Roberts Heights (later Voortrekkerhoogte - now Thaba Tshwane) (Krige 1992:4). Although no source reference is given by Krige, and no other source confirms this information, it can be assumed that water pipes were used from the 1890s.

It is therefore concluded that the furrow that was investigated was definitely built after 1879. The most acceptable date seems to be 1892, although 1898 is also a possibility since it is known that covered furrows were built in that year. Although new furrows were dug around 1906, this furrow was probably used for another few years. It is also clear that by 1912 or even 1910, it was no longer used.

### CONCLUSION

Information obtained from the archeological investigation alone could not explain the specific function and dating of the furrow. Therefore the historical information is invaluable.

The seemingly inexplicable difference in depth of the furrow, compared with the facts known about ordinary furrows, is because it was not one of the earliest ground furrows (around 1860) in Pretoria. It also appeared to make no sense that the water furrow was situated on the southern side of Church Street, since this portion of Pretoria is sloping upwards to the south. A water furrow would have

to have been on the northern side of the road to provide water for the block of erven to the north or down the slope (in other words between Church, Van der Walt, Vermeulen and Prinsloo Streets. Information obtained by Basson (1994:175) from ortophotographs supports the possibility that it was not an ordinary water furrow.

Previous suggestions that the purpose of the Church Street water furrow was to take away stormwater or run-off water and other waste from the market square (situated where Strijdom Square is situated today) to the Apies River is therefore correct. This explanation corresponds with historical information from the 1890s. The measurements of the furrow that was investigated agrees to a great extent with those appearing on an architectural plan from 1893.

The conclusion is that the furrow was only built by 1892 and possibly 1898, and that its purpose was to drain stormwater from the inner city towards the east (probably to the Apies River).

The furrow definitely does not date from the period before 1860, since work was still being carried out on them as late as 1863 (Pieterse 1942:28). Only ground furrows are documented between 1860 and 1880. Photographs suggest that the furrow was built in 1892. As it is known that covered furrows were built in 1898, there is also a possibility that the furrow could date from this year. It was probably not in use later than 1910, since it is known from historical information that water pipes and other drainage canals were generally in use shortly after the turn of the century. The cultural material uncovered from the furrow confirms this date. No object was found from a phase prior to the late 19th century. The appearance of recent artefacts in the archeological record can be explained on the grounds of later constructions.



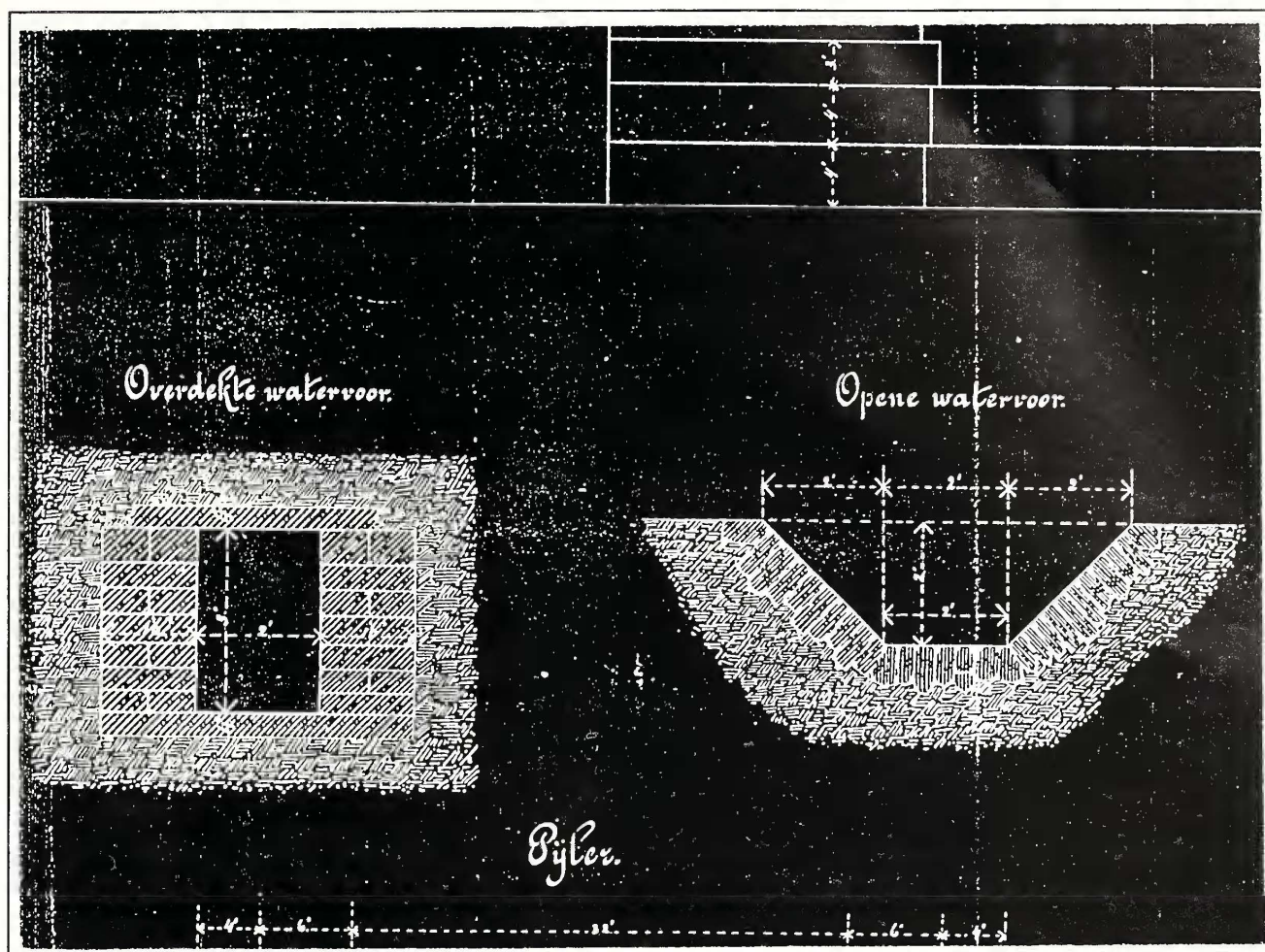


Fig. 10. A drawing by the State Architect S Wierda from 1893: plans for open and covered water furrows in Pretoria (NAB, S2/109).

Although there are still a few minor uncertainties about the Church Street water furrow, it represents a significant and authentic historical feature that survives in the modern city centre. Its preservation is therefore strongly recommended. The remainder of the furrow was sealed off under the pavement of the Church Street mall, so further archaeological investigation is still possible. The discovery of another water furrow during 1998 confirms that other such remains may have survived. During construction work this furrow was unearthed on the southern side of Schoeman Street, between Prinsloo and Du Toit Streets, *i.e.* two street blocks south and one east of the one in Church Street (probably dates from the same period). The measurements of this furrow are also shown in Table 1. Basson (1994:175) mentions the possibility that water furrows could be found in Scheiding, Jacob Maré, Minnaar, Visagie, Struben, Bloed and Boom Streets, in other words all the streets running east-west. The investigation showed, however, that some of the streets running north-south also had water furrows. By investigating these furrows, whenever they are found, the network of water furrows can be reconstructed and an important part of Pretoria's history will not be lost.

The Museum recommended that a portion of the furrow be reconstructed and opened to the public, partly because of the important role played by water in the establishment and development of Pretoria (Van Schalkwyk *et al.* 1994: 23-25), but also because this would serve the purpose of popularising archaeology and educating the public in compliance with the goals of cultural heritage resources management.

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