The National Geospatial Information Museum in Cape Town: From Chains and Theodolites to 3D Scanning

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SUMMARY

This paper introduces the history and development of the National Geo-Spatial Information (NGI) Museum in Cape Town and highlights a recent collaboration between NGI and Global Digital Heritage Afrika (GDHA) to digitally document parts of its collection through 3D scanning.

The National Geo-Spatial Information (NGI) Museum in Cape Town holds a remarkable collection of surveying and mapping instruments from the mid-1600's to the present which traces over three centuries of surveying and mapping in South Africa—from the seventeenth-century age of chain surveys to the precision of twentieth-century electronic distance measurement devices and space based positioning techniques. The period represented by the museum's artifacts mirrors the trajectory of both technological progress and the complex histories of colonial expansion and scientific advancement.

Early mapping in South Africa was rooted in exploration and the establishment of property boundaries that underpinned systems of ownership and governance. As mapping technologies advanced, particularly during and after periods of war, the demand for accurate geospatial data accelerated innovations in instruments and methods. Despite South Africa's prominent role in developing and refining surveying technologies, these same instruments also facilitated colonisation, conquest, and the spatial organisation of subjugated territories.

The NGI's institutional history reflects this evolution. From the late nineteenth century, the offices of the Surveyors-General were responsible for mapping within each province, culminating in the establishment of the Trigonometrical Survey Office in 1920 and the formation of a national mapping authority. The museum's collection includes historically significant instruments such as the Wild T3 theodolite, Serial number 1, of which over 200,000 were produced and one of the 5

Great 36 inch theodolites built between 1784 and 1867 of which only 4 remain.

A number of the instruments in the museum have been scanned in 3D. The scanning of the museum's collection is an undertaking that presents both technical and interpretive challenges. The resulting 3D digital models offer new possibilities for preservation, education, and public engagement. The act of "surveying the survey instruments" introduces a recursive dimension: tools once used to measure vast landscapes are now being measured themselves. By linking historical surveying at national and cadastral scales to contemporary 3D documentation at object scale, the project situates the NGI Museum as a living bridge between South Africa's geospatial heritage and its digital future.