

# Restoring Personhood and Dignity to the Ancestors in the East Marshall Street

## Well: Community-Engaged Research in Forensic Science

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### The East Marshall Street Well Project:

The East Marshall Street Well Project (EMSWP) research is the result of a multi-year community consultation concerning remains of ancestors discovered during the construction of the Kontos Building on the campus of Virginia Commonwealth University's (VCU's) medical school in 1994. A well, used as an anatomy pit, was uncovered (Figures 1 and 2); contrary to the law, the university's president gave the archaeologist only two days to recover the commingled human remains (primarily long bones and crania). The remains were sent to the Smithsonian for analysis, and a report was provided in 2012. The minimum number of individuals was 54, including nine children <16 years of age.



Figure 1. EMSW upon discovery. Source: Shawn Utsey



Figure 2. Details of the EMSW. Source: Shawn Utsey

The EMSWP began as a community consultation forum throughout the summer of 2015, when individuals met to discuss the fate of the human remains. The Family Representative Council (FRC) was formed to represent the descendant community, and final recommendations concerning research, memorialization, and internment were presented in 2018. This project addressed the research recommendations concerning DNA applications, including reassociation of the human remains, reconstructing regional ancestry, health environments, and providing further information about the subadults.

### Reassociation of Bones:

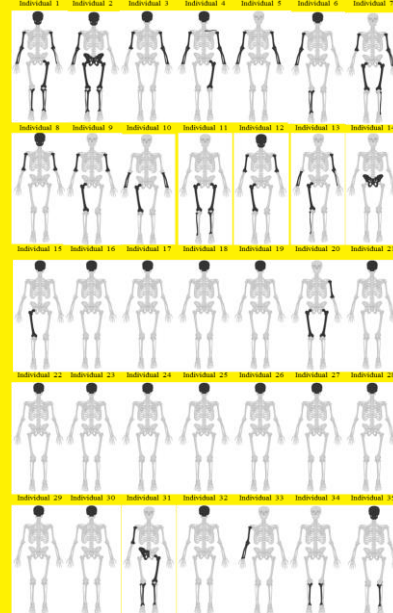


Figure 3. Grouped bone elements discerned into individuals using genetic, anthropological, and microbiome analysis. Individuals 14, 20 and 31 were children.

The FRC's recommendations concerning DNA first required that, using minimally invasive techniques, as many of the bones as possible be reassociated to form discrete individuals. A total of 33 individuals were identified using either a combined analysis of autosomal insertion-null (INNUL) markers and short tandem repeat (STR) genetic markers or a mitochondrial DNA workflow (Figure 3). Additionally, the remains of Individuals 34 and 35 were grouped based on microbiome analysis, indicating the presence of *Treponema sp.*, which corroborated the palaeopathological diagnosis of Syphilis. Individuals 14, 20, and 31 were children.

### Microbiome and Health:

The microbiome of the EMSW individuals was assessed using 16S ribosomal DNA high throughput sequencing of the dental calculus and bone samples from Individuals 34 and 35 (N = 17). Many of these samples exhibited bacteria associated with specific diseases such as tuberculosis (*Mycobacterium sp.*), tetanus (*Clostridium tetani*), and syphilis (*Treponema sp.*); their presence suggests, but is not definitely linked to cause of death. Other bacteria present are associated with periodontal diseases or non-specific infections (e.g., *Streptococcus sp.*, *Neisseria sp.*, *Veillonella parvula*, *Veillonella dispar*, *Tannerella*, *Selenomonas*, etc.). Periodontal disease and tooth loss were prevalent in the EMSW people.

### Genetic Ancestry:

Genetic ancestry obtained through the analysis of autosomal single nucleotide polymorphisms (SNPs) and insertion/deletion (INDEL) markers showed that most individuals had major African continental ancestry (Table 1), although individuals of major European ancestry or with African/European admixture were also found. For maternal ancestry (mitochondrial DNA analysis), only one haplogroup was of Eurasian origin. The remaining seven haplogroups detected were of African origin. Paternal ancestry was predicted with Y-chromosome STRs (Y-STRs). Three individuals had paternal Eurasian ancestry, while paternal lineages from five individuals were classified within African haplogroups.

Table 1. Genetic ancestry obtained for autosomal SNPs and INDELs, for mitochondrial DNA and for Y-STRs.

Individual	Autosomal Ancestry			Mitochondrial DNA		Y-Chromosome	
	African	European	Native American	Maternal haplogroup	Geographic Origin	Paternal haplogroup	Geographic Origin
Individual 1	81%	14%	0%	AFR	L1b2a		Female
Individual 2	84%	1%	15%	AFR	L1b2a		Female
Individual 3	3%	87%	10%	EUR	L3	Eurasia	R1b - M269   Europe
Individual 4	83%	15%	4%	AFR	L2'3'4'6	African or European	B2a1 - M218   Africa
Individual 5	91%	8%	1%	AFR	mt-MRCA	Unknown	E1b1a - U175   Central West Africa
Individual 6	87%	6%	8%	AFR		No data	No prediction   Unknown
Individual 7			No data			No data	No data
Individual 8	94%	2%	5%	AFR	L1c2	Africa	No data
Individual 9	32%	67%	0%	AFR/EUR		No data	Female
Individual 10	92%	3%	4%	AFR		No data	No data
Individual 11	12%	88%	1%	EUR		No data	R1b - M269   Europe
Individual 12	89%	11%	0%	AFR		No data	E1b1a - L485   Central West Africa
Individual 13	79%	19%	2%	AFR		No data	No data
Individual 15	97%	1%	2%	AFR		No data	Female
Individual 16	93%	6%	0%	AFR	L1c1c	Central West Africa	E1b1a - L485   Central West Africa
Individual 17	57%	43%	0%	AFR/EUR		No data	E1b1a - L485   Central West Africa
Individual 18	5%	87%	8%	EUR		No data	Female
Individual 19	90%	4%	6%	AFR		No data	Female
Individual 21	93%	5%	3%	AFR	L4b2	African	Female
Individual 22	87%	1%	12%	AFR		No data	Female
Individual 23	14%	86%	0%	EUR		No data	J2a1 - PF5087   Eurasia
Individual 24	100%	0%	0%	AFR	L2a1	Central West Africa	E1b1a - U175   Central West Africa
Individual 25	2%	96%	2%	EUR		No data	
Individual 26	78%	22%	0%	AFR		No data	
Individual 27	93%	6%	1%	AFR		No data	Female
Individual 28	85%	3%	12%	AFR		No data	No data
Individual 29			No data			No data	No data
Individual 30	74%	16%	10%	AFR		No data	No data
Individual 32	87%	8%	5%	AFR		No data	No data
Individual 35			No data			No data	No data

### Conclusions

Historical and genetic evidence indicates a strong connection of the EMSW ancestors to Central West Africa, though other African origins cannot be excluded. The analyses reveal the hard reality faced by individuals of African ancestry during the 19<sup>th</sup> century in Richmond. Integrating multiple forensic disciplines was essential in reconstructing a fuller narrative of the EMSW individuals' lives. This will ultimately help achieve the EMSWP main goal: ensuring the ancestors are finally laid to rest with the respect they were denied in life and after death, and that they deserve.