

2012/2013 Excellence in
Upper-Level Writing

Writing

The Gayle Morris Sweetland
Center for Writing

Excellence
in
Upper-Level Writing

2012/2013

**The Gayle Morris
Sweetland Center for Writing**

Edited by
Alan Hogg and Dana Nichols

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Excellence in Upper-Level Writing 2012/2013

Sweetland Writing Prize Chairs:

Alan Hogg

Dana Nichols

Administrative Support:

Laura Schuyler

Hanna Linna

Nominees list

Student	Course	Instructor
Stephanie Bahorsky	Environ 320	Emilia Askari
Steven Bareis	History 399	Christian de Pee
Molly Blakowski	Earth 442	Sarah Aciego
Nicole Braverman	Environ 320	Emilia Askari
Daniel Chardell	History 399	Christian de Pee
Carrie Glauner	Earth 442	Sarah Aciego
Rachel Kalayjian	Writing 300	Lila Naydan
Krisda Krisralam	Environ 320	Julie Halpert
Jamie Monville	Writing 300	Christine Modey
Jamie Nadel	Writing 300	Christine Modey
William Benjamin Rogers	AAS 495	Adam Ashforth
Hallie Rosenthal	Psych 351	Selin Gulgoz
Nicholas Royce	PolSci 411	Joel Clark
Hayley Sakwa	PolSci 411	Joel Clark
Rebecca Seguin-Skrabucha	Psych 351	Selin Gulgoz
Emily Shuart	Econ 495	Sarah Aciego
Sam Walker	English 340	John Whittier-Ferguson

Sciences winners

Molly Blakowski: “Wind-driven Dust Transport in the Transantarctic Mountains and Antarctic Dry Valleys” *nominated by Sarah Aciego, Earth 442*

Carrie Glauner: “Identifying Channel Migration Directionality in the Agricultural, Low Relief Setting of the River Raisin” *nominated by Sarah Aciego, Earth 442*

Social Sciences winners

William Benjamin Rogers: “Mines, Migration and the Confluence of Disease: The Story of South Africa” *nominated by Adam Ashforth, AAS495*

Hayley Sakwa: “Fresh Food Financing Initiative: A Replicable Practice in Detroit?” *nominated by Joel Clark, PolSci 411*

Humanities winners

Rachel Kalayjian: “To Find A Voice” *nominated by Lila Naydan, Writing 300*

Sam Walker: “Ezra Pound, Aura, and the Memory of Time-Past” *nominated by John Whittier-Ferguson, English 340*

Introduction

When the Upper Level Writing Requirement was adopted by the Faculty of LSA thirty-five years ago, it was described this way:

The ULWR, which is generally completed within the student's major, aims to help LSA students recognize and master the writing conventions of their chosen discipline, so that, upon graduation, they are able to understand and communicate effectively the central concepts, approaches, and materials of their discipline. The program is based upon the assumption that the best way to master disciplinary knowledge is to express that knowledge in the form of clear and incisive writing.

Today the College is much more interdisciplinary than it was in 1978, but the ULWR remains a central part of undergraduate education, with many students completing two and three ULWR courses in their several areas of concentration. A recent study shows that a majority of students receive good grades in ULWR courses and feel that this requirement helps them improve as writers. In particular, students express gratitude for opportunities to incorporate writing into their specific areas of interest. This volume demonstrates that ULWR courses create contexts where students can produce writing that sets a standard for excellence.

Drawn from the three divisions of the College, the prize-winning selections contained in this volume represent a wide range of topics: from the migration of a river to the migration of laborers in South Africa; from the economics of fresh food in Detroit to the history of climate change in Antarctica; from an interior monologue about an Armenian family to an essay on the poet Ezra Pound. Despite their differences in approach and content, the selections included here share a number of features. They show creativity as well as thoroughness, they synthesize complex ideas into compelling arguments, they demonstrate intellectual independence and sophisticated style.

Of course the students who wrote these essays did not produce them without assistance. The instructors who nominated them and, no doubt, many other instructors along the way, continually urged them forward, insisting that they could do better. Draft after draft and revision after revision, those who taught these students gave new meaning to the idea that writing is re-writing. Often suggesting, or even requiring, some form of publication, these instructors helped students see themselves as addressing a broader audience. And so they are.

The judges for the Excellence in Upper-Level Writing prizes faced a formidable challenge as they chose from among the nominations because each of the selections submitted was exemplary. We judges—I was a judge too—took pleasure in seeing such a wide range of fine writing that often transcended traditional boundaries of genre and discipline while at the same time maintaining focus and argumentative edge. Many thanks are due to Rolf Bouma, Abigail Celis, Jessica Getman, Katy Goldey, Rafe Kinsey, Dana Nichols, Richard Pierre, Joshua Shipper, Selena Smith, Melanie Yergeau, Jason Zurawski, all participants in the Sweetland Seminar, who made the final decisions.

The work of editors Dana Nichols and Alan Hogg is over; they have solicited nominations, organized the judging, and edited the entire volume. They have provided a valuable service on behalf of all of us. Now, however,

the real work of this volume begins, as it is read by parents, friends, faculty, and, especially students; as individual selections serve as models in ULWR courses; and as it suggests to students that they, too, can compose prize-winning selections in Upper Level Writing Requirement classes.

Anne Ruggles Gere,
Director, Sweetland Center for Writing

Winning Essays

Sweetland Prize for Excellence in Upper-Level Writing (sciences)

Wind-driven Dust Transport in the Transantarctic Mountains and Antarctic Dry Valleys

From Earth 442: Molly Blakowski (nominated by Sarah Aciego)

Ms. Blakowski's work describes the geomorphology of one of the most unique environments on Earth, where the transport of dust provides meaningful information about climate in the past. Her paper is well-researched and well-written and I was impressed by her synthesis of a wide range of texts in order to describe the processes in action as well as provide a critical analysis of depositional sources to one of the more under-studied ice accumulation areas in East Antarctica. Perhaps more important for this nomination, reading Molly's work is a joy even within the structure of the journal format because she carries a narrative arc.

Sarah Aciego

Wind-driven dust transport in the Transantarctic Mountains and Antarctic Dry Valleys

Abstract

Climatic conditions in polar deserts result in highly underdeveloped soils, and consequently in abundant unconsolidated sediment easily influenced by wind-driven transport. The focus of this work was to investigate dust entrainment and transport behaviors, specifically in terms of source landforms, by performing geomorphic analyses on sampling sites in Victoria Land, a region including ranges of the Transantarctic Mountains and the hyper-arid McMurdo Dry Valleys. The findings of our analyses based on reviews of existing literature and computer-based mapping suggest that landforms in both Northern and Southern Victoria Land are more likely to be influenced by aeolian rather than by fluvial or glacio-fluvial processes. Furthermore, we have determined that future studies on paleoclimate and wind regimes in this region should focus on the analysis of dust sourced from Southern rather than Northern Victoria Land, as it is probably more likely to be found in pre-existing ice core data from Taylor Dome.

Introduction

Variations in regional climatic conditions including temperature, precipitation and wind velocity result in unique geomorphological processes (Fountain et al., 1999; Marchant & Head, 2007). One of the most important factors used to characterize geomorphic forces present in a given environment is the abundance and state of water (Marchant & Head, 2007). For instance, environments with average annual temperatures near or below the freezing point of water will hardly be influenced by fluvial action (Eveland, Gooseff, Lampkin, Barrett, & Takacs-Vesbach, 2012; Marchant & Head, 2007). Desert environments tend to be extremely climate-sensitive because small changes in environmental conditions can have huge impacts on limited hydrologic

systems (Fountain et al., 1999).

Deserts are associated with a diverse array of erosional and depositional landforms. Particularly unique physical conditions are found in high-latitude desert regions, including desiccation, freeze-thaw cycles, powerful winds and distinctive daylight cycles (Fountain et al., 1999). These conditions result in underdeveloped soils, and therefore abundant unconsolidated sediment.

Soil development and weathering trends in polar deserts are highly dependent upon the degree to which land surface materials either give in to or resist wind erosion, with geomorphic changes resulting from aeolian processes in which resisting forces in surficial material are overcome by wind (Marchant & Head, 2007; Ritter et al., 2011). When wind blows across a surface composed of unconsolidated sediment, a critical friction velocity determines whether or not particle motion will begin. Particle entrainment behavior is primarily influenced by air density, particle size and texture, pore water, snow, ice or vegetative cover, and wind velocity (McKenna Neuman 1993; Ritter et al., 2011). In this contribution, we focus on the unvegetated land surfaces of a polar desert region proximal to the northern-central extent of the Transantarctic Mountains (TAM), as this area is among the most important regions considered in geomorphic wind action studies (Marchant et al., 2002; Marchant & Head, 2007) and is a potential dust source to the East Antarctic Ice Sheet.

The TAM are an intracontinental mountain range that partitions the East and West Antarctic Ice Sheets (EAIS, WAIS). They span approximately 3500 km and reach elevations greater than 4000 m (Stump & Fitzgerald, 1992). On their seaward margin, the mountains are steep, with abruptly dipping normal faults that are in some places down-to-the-coast, while their landward side dips gently under the EAIS (Stump & Fitzgerald, 1992). The mountains are composed of Late Proterozoic to early Paleozoic age granites and gneisses, unconformably overlain by Devonian to Triassic Beacon Super-

group sedimentary rocks. Both layers are intruded by sills of Jurassic dolerite (Fitzgerald, Sandiford, Barrett, & Gleadow, 1986; Stump & Fitzgerald, 1992).

The McMurdo Dry Valleys (MDV) of Antarctica are located in Southern Victoria Land, between the EAIS and the Ross Sea (Figure 1), and are composed of a series of east-west oriented, ice-free valleys each approximately 80 km in length and up to 15 km wide, carved by a series of retreating glaciers (Fountain et al., 1999; Marchant & Head, 2007). Generally, the MDV are the only regions in Antarctica that remain virtually free of ice throughout the year (Eveland et al., 2012).

Air flowing seaward from the polar plateau is forced over the TAM, cooling and condensing and falling as snow at high elevations, a phenomenon that casts the intense 'rain shadow' over the MDV to which it owes its extreme aridity and winds (Fountain et al., 1999). Alpine glaciers in this hyper-arid region are dry, or cold-based; unlike wet-based glaciers that slide over their substrate, they move only by internal creep (Marchant & Head, 2007). Consequently, wet-based glaciers erode bedrock much more aggressively than cold-based glaciers, and in fact, studies have suggested that bedrock erosion resulting from wind-driven, saltating sand grains may be orders of magnitude more prevalent in this region than erosion from glacial activity (Malin 1984; Marchant & Head, 2007). Gravity-driven, katabatic winds are characteristic of the MDV, originating from the differential heating of the low-albedo valley floors and the much colder, high albedo ice surfaces to the east. These thermotopographic winds sweep through the valleys at speeds oftentimes exceeding 50 mph, entraining coarse sand grains that proceed to abrade the landscape.

Because wind is a dominant driving force in the MDV, windborne mineral dust deposited in snow and ice layers of surrounding regions has become a particularly important tracer of past and present atmospheric climate and circulation (Marchant et al., 2002). Ice cores drilled from Antarctica

and Greenland have provided widespread evidence that atmospheric dust concentrations are considerably higher during glacial periods than in interglacial periods (Gaiero, Brunet, Probst, & Depetris, 2007; Marchant & Head, 2007). Climate variations associated with the Last Glacial Maximum (LGM) in particular have become major points of focus for dust cycle modeling and research. This is due to several factors, predominantly (a) lowering of sea level during glaciation exposes more land (i.e. continental shelves); (b) glacial periods result in colder, drier land surface conditions conducive to the accumulation, rather than the weathering, of materials such as silt and clay (Ridgwell & Kohfeld, 2007; Albani, Mahowald, Delmonte, Maggi, & Winckler, 2012); (c) glacial and periglacial processes produce easily deflated, silt-sized material (i.e. rock flour) (Gaiero et al., 2007; Albani et al., 2012); and (d) increased windspeeds associated with glacial ages alter transport times and aeolian transport pathways (Gaiero et al., 2007; Ridgwell & Kohfeld, 2007; Albani et al., 2012).

In addition to the information that dust provides on past climates, dust fluxes darken ice surfaces and decrease the fraction of sunlight reflected from the Earth, playing a “greenhouse effect” (Ridgwell & Kohfeld, 2007). Thus, investigating dust transport trends within aeolian systems must be considered a priority in order to understand the effects of climate change in the past and future.

In this research, we compare and contrast the plausible entrainment and transport behaviors of potential dust sources from both Northern and Southern Victoria Land. We assess the likelihood of deposition on Taylor Dome, an area of ice accumulation located slightly inland from the TAM on the margin of the EAIS and the site of an ice core drilled in 1994 (Steig et al, 2000).

Materials and Methods

We used the geographic information system (GIS) software ArcMap

10 to analyze to identify analyze our possible dust source landforms. This program allowed us to visualize the locations of our sampling sites and Taylor Dome based on latitude and longitude GPS coordinates. We downloaded layers depicting rock outcrops, moraines, lakes and streams from the Scientific Committee on Antarctic Research (SCAR) map viewer feature (Scientific Committee on Antarctic Research, 2012), which we proceeded to drape over a “Bing Maps Aerial” GIS basemap (ArcMap, 2011). The ArcMap Measure tool allowed us to trace the distance between Taylor Dome and each of the collection sites. We entered these values into MATLAB R2011a to create a script rendering a basic distance plot. Finally, we applied our spatial analyses to existing literature and field studies.

Results

Our efforts have resulted in a location map of potential source areas in Northern and Southern Victoria Land (Figure 1).

In this map, rocks are indicated by brown; moraines by green; lakes by blue; and rivers and streams by blue lines. Potential source areas in Southern Victoria Land are closer to Taylor Dome than those in Northern Victoria Land.

Distance measurements between dust sources and Taylor Dome are compared in Figure 2, where distances are reported in kilometers from the dome.

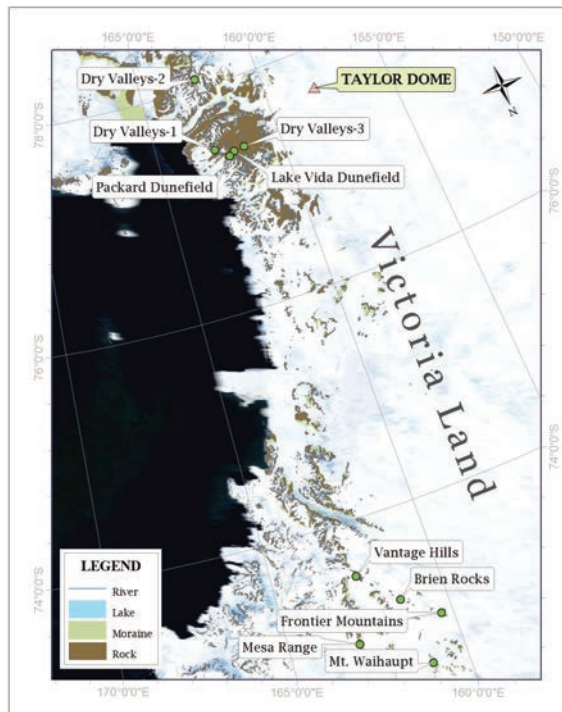


Figure 1.

A location map of the Transantarctic Mountains (TAM) bordering the Ross Sea. The East Antarctic Ice Sheet (EAIS) is shaded in white-blue, exposed rock surfaces are indicated by brown; moraines by green; lakes by blue; and rivers and streams by blue lines. Note: orientation of north arrow. Potential ice-free dust sources in Northern (bottom) and Southern (top) Victoria Land are indicated. Taylor Dome, a local accumulation high on the EAIS and ice core drilled site is also noted.

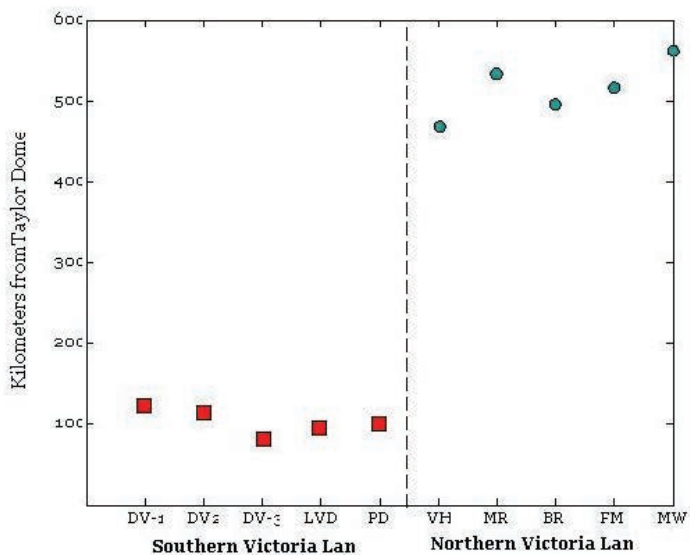


Figure 2.

In this figure, individual potential source sites are clearly categorized as material from Northern Victoria Land (red squares) or Southern Victoria Land (green circles). Distances between potential source areas and Taylor Dome are direct lines and thus must be considered minimum travel distances between entrainment and deposition. The proximal and distal relationships between the two regions of potential dust sources are clearly recognized in Figure 2: all locations in Southern Victoria Land are approximately 100 km from Taylor Dome, while all locations in Northern Victoria Land are 500 km from the dome.

Discussion

Antarctica is colder, drier, and windier than any other continent on Earth (Bristow, Augustinus, Wallis, Jol, & Rhodes, 2010). Most of the continent is covered by ice that in places can exceed 3000 m in thickness (Fountain et al., 1999). In the very few areas free of snow and ice, streamflow of liquid water is restricted to about two months each year during the austral

summer (Bristow et al., 2010; Bristow, Augustinus, Rhodes, Wallis, & Jol, 2011). Although the continent's thermotopographic winds switch direction bi-seasonally, they blow throughout the year, suggesting that the landscape is less likely to be influenced by fluvial activity than by other geomorphological processes, such as wind (Marchant & Head, 2007; Bourke, Ewing, Finnegan, & McGowan, 2009; Bristow et al., 2010; Bristow et al., 2011).

A fundamental understanding of aeolian dust transport begins by recognizing that a critical friction velocity controls the moment at which a particular dust grain begins to move (McKenna Neuman, 1993; Ritter et al., 2011). This critical point is referred to as the threshold friction velocity. The threshold friction velocity is controlled by the complex relationships between environmental factors such as air density, pore water, snow, ice or vegetative cover, and wind velocity, and geologic factors such as particle size and texture (McKenna Neuman, 1993; Ritter et al., 2011). Depending on these factors, sediment transported by wind can do so in suspension, by saltation, or by surface creep, which we discuss here in the context of our TAM samples.

Extremely fine-grained particulate matter is not normally in contact with land surfaces for extended periods of time, and tends to remain suspended in the atmosphere as an aerosol. Fine-grained silt and clay materials are lifted into higher velocity zones and are transported as particles in dust storms. These particles can be transported to great elevations, perhaps kilometers high, and may remain suspended in the atmosphere until they are brought back down to the Earth by rainfall. We may expect to see this type of behavior in the older drift material collected from the MDV (Dry Valleys locations in Figures 1 and 2), which is likely to be finer from extensive weathering over long periods of time. This drift material has been identified as a thin glacial diamicton, also referred to as Granite drift (Marchant et al., 2002). Field observations suggest that the Granite drift is less than 1 m thick and is probably older than 8 Ma, based on $^{40}\text{Ar}/^{39}\text{Ar}$ dating (Marchant et al., 2002). Likewise, we may expect the sample comprised of lacustrine sand

material that was found on top of older glacial drift to be susceptible to suspension, as it was once deposited in a very low energy environment indicative of a very-fine grain size. Lacustrine sediments are likely from a large lake that existed in the MDV, specifically in the Victoria Valley. Carbon dating suggests that this ancient lake disappeared sometime in the early Holocene (8.6 kya), providing a framework for the development of the Packard and Lake Vida dunefields (Figure 1) currently covering its former area (Bristow et al., 2011).

Aeolian dunes are common features in polar desert landscapes, and are generally composed of mixed materials such as wind-driven snow, sand, silt and organic detritus (Bourke et al., 2009). The sediment source of the dune sands is the Lower Victoria Valley Glacier outwash sediments (Selby, Rains, & Palmer, 1973), with probable contribution from the wind-driven weathering of surficial bedrock and erratic boulders (Calkin & Rutford, 1974). Rather than transport by suspension, we believe that our dust samples from this region were transported by saltation, which can be described as a bouncing motion. Saltation involves fine to medium-grained sands, and occurs when the upward velocity of a particle is significantly lower than its terminal velocity (Ritter et al., 2011). Saltating particles can dislodge other grains when they bounce against the land surface, which again can perpetuate the suspension of those finer-grained materials. Most sand grains tend to move by saltation. It has been suggested that gravimetric water content (GVC), seasonal snowfall and ground frost may stabilize surfaces exposed to wind erosion (McKenna Neuman & Langston, 2006; Bourke et al., 2009). Wind tunnel experiments have demonstrated that it is unlikely for natural winds to be able to pick up dune sand with GVCs greater than 1-2 percent (McKenna Neuman, 2003; McKenna Neuman & Langston, 2006). Due to extremely low humidity in the TAM, we expect that sediment transported by saltation could travel large distances.

Some sand grains are too large to be transported by saltation. These particles are typically coarse sands or fine gravels. Coarse sands and fine

gravels are too heavy to be transported by the wind itself, and may instead be transported by rolling, sliding, or small “hopping” movements; a process referred to as surface creep. There is little to no upward movement in surface creep, and therefore no deflation of smaller particular matter into the atmosphere. The ice-free areas of Northern Victoria Land are primary sediment sources—the material is weathered directly from rock instead of undergoing multiple weathering pathways such as glacial grinding, fluvial transport, and migration within dunes. Therefore, their grain size will preclude transport by suspension and minimize transport by saltation.

The above geomorphic analyses suggest that dust from Southern rather than Northern Victoria Land is probably more likely to be identified in ice core data from Taylor Dome, as saltating sand grains from drift material are more proximal to the dome than are materials in Northern Victoria Land. It is also possible based on our knowledge of the region’s thermotopographic winds and the ‘rain shadow’ effect that any suspended dust would be likely to return to Earth’s surface via precipitation not to the MDV and nearby Taylor Dome, but at high elevations of the TAM.

Conclusion

Soil development and weathering behaviors in any given environment are both strongly related to the degree to which surficial materials either give in to or resist erosion by aeolian forces, and geomorphic changes result from instances in which resisting forces in these materials have been dominated by the wind attack. Sparsely vegetated environments such as those in the polar deserts of Antarctica are among the most susceptible to erosion by wind. Our geomorphic analyses of the Victoria Land region of Antarctica suggest that future research concerning paleoclimate and wind patterns in and around the TAM and MDV should consider investigating dust sourced from Southern rather than Northern Victoria Land, as it is more likely to be present in the Taylor Dome ice core.

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Appendix: Matlab code

% Final Project Plot

% By Molly Blakowski

% 11/21/12

clear

clc

xdata = [125.246 117.633 85.254 97.604 104.595 470.43 536.038 497.709

518.168 562.883] %Creates variable xdata depicting sites' distance from

Taylor Dome

plot(xdata,'b*') %Plots distance values

ylabel('Kilometers from Taylor Dome')

Identifying Channel Migration Directionality in the Agricultural, Low Relief Setting of the River Raisin

From Earth 442: Carrie Glauner (nominated by Sarah Aciego)

Ms. Glauner's work is based on curiosity of her surrounding – she grew up next to the River Raisin and wanted to know if the agricultural changes in her region affected its path. In pursuing this project, she tracked down old maps from the Library archive, scanned them and then spent time-consuming days getting her reference points lined up in order to provide a quantitative evaluation of her results. The resulting paper presents her methodology, results and implications with clarity, which is often sorely missing in scientific texts. Only because of the soundness of her scientific writing do we understand how creative, yet dogmatic, she is as a researcher.

Sarah Aciego

Identifying channel migration directionality in the agricultural, low relief setting of the River Raisin in Southeast Michigan

Abstract

Local historical maps were combined with and compared to modern digital elevation and hydrological data via ArcMap 10® to assess the meander of the extremely low gradient River Raisin in Southeast Michigan. Soil homogeneity of the area points to upstream hydraulic factors and agricultural use of the area to be the lead causes of high meander distances within the meander belt. Heavy agricultural land use from 1830 to 1960 is hypothesized to have influenced meander rate, and current agricultural land use will promote this exaggerated meander rate while riverside cultivation remains in practice. MatlabR2012® was used to project this information graphically to better represent the data in a distributed fashion, as well as to calculate total distance and trending direction of river location.

Introduction and Background

Meandering rivers have been known to span tens of kilometers within their meander belts. The tell-tale snaking back and forth of meandering channels has been observed and studied for hundreds of years, however to this day both rate and directionality of river meander in low gradient areas of largely agricultural use are not fully understood. Measurement of river channel migration throughout historical time will aid efforts in understanding the connection between land use and meandering river migration, along with assisting in creating a detailed riverine history of the area.

Controls on meander behavior of low-gradient rivers are not fully understood, with some scientific groups claiming that meander wavelength, or average length from one river bend to the next, is determined only by hydraulic factors such as local and regional currents. Other groups counter with models supporting local soil characteristics as being integral to channel

behavior (Sun et al., 1996; Motta et al., 2011). As such, a case study of the meandering River Raisin, located in southeast Michigan, is useful in evaluating these scientific claims against one another by using previously gathered data on the river and flood plain in which it flows (Allan et al., 1997).

The River Raisin flows predominantly south-easterly and drains an area of approximately 2800 square kilometers, of which over 70% is agricultural land (Allan et al., 1997). With a length of 216 km in the mainstem and an overall elevation change of 145 m, the average gradient of the river is 0.61 m/km. The specific area of study is a 10.6 kilometer stretch of River running from the Village of Blissfield to an area of several stream junctions downstream (Figure 1.). A site of an ancient lake, the Blissfield region has extremely subtle topography and is composed of relatively homogeneous lake bed clays; these factors result in the lowest gradient seen in the River Raisin, measuring 0.2462 m/km. Here, flat topography is a result of large-scale sediment diffusion from the more northward, glaciated areas of Michigan as Blissfield, Michigan is (Knutilla and Allen, 1975).

Forming initially as a glacial melt water stream throughout the Wisconsin Glaciation, the River Raisin originally ran to the west of its current location (Dodge, 1998). The study area of Blissfield, Michigan was formerly an oak-dominated wetland that was deforested and drained to propagate agricultural development during the mid-1800's. As such, soil type is dominated by alfsoles or moist, nutrient-rich clays and muds with little sand or gravel content. Histosols are also present along current and former riverbanks (Allan et al., 1997).

Large-scale drainage and deforestation of the area began in 1830, promoting an influx of over 40,000 people from 1830 to 1880, and converting the area to function as an agricultural hub. Land use was almost entirely dedicated to agriculture until the 1960's; agricultural land use declined from 1968 to 1988 and continues to decrease with increased farmland consolidation (Allan et al., 1997).

Through the use of ArcMap10®, it is possible to explore The River Raisin, specifically within the Village of Blissfield limits and the changes the river has experienced throughout recorded history by comparing past and present river locations via the georeferencing and measurement tools (Fig. 1,2) (Appendix 2, 3).

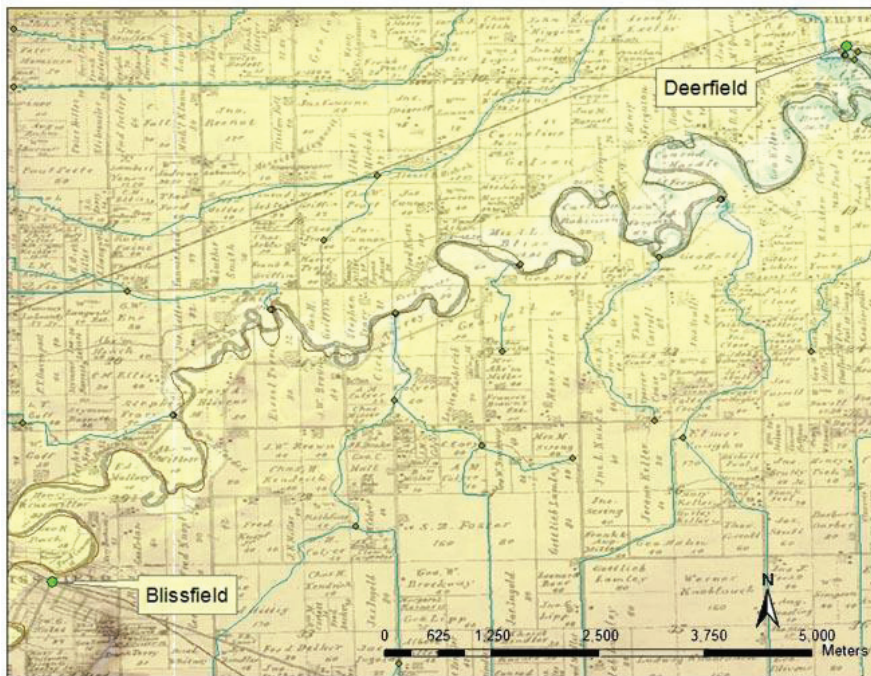


Figure 1.

ArcMap10® could also be used to explore the relationship between land use and meander, as well as the influence of other anthropogenic factors such as canal and dam building.

Materials and Methods

The United States Geological Survey (USGS), National Map Viewer, provided digital elevation model (DEM) information at 1/9 arc second resolution. The DEM information was projected in the ArcMap10® program. Historical maps (Bliss, 1890; Grosvenor, 1970), made available through the

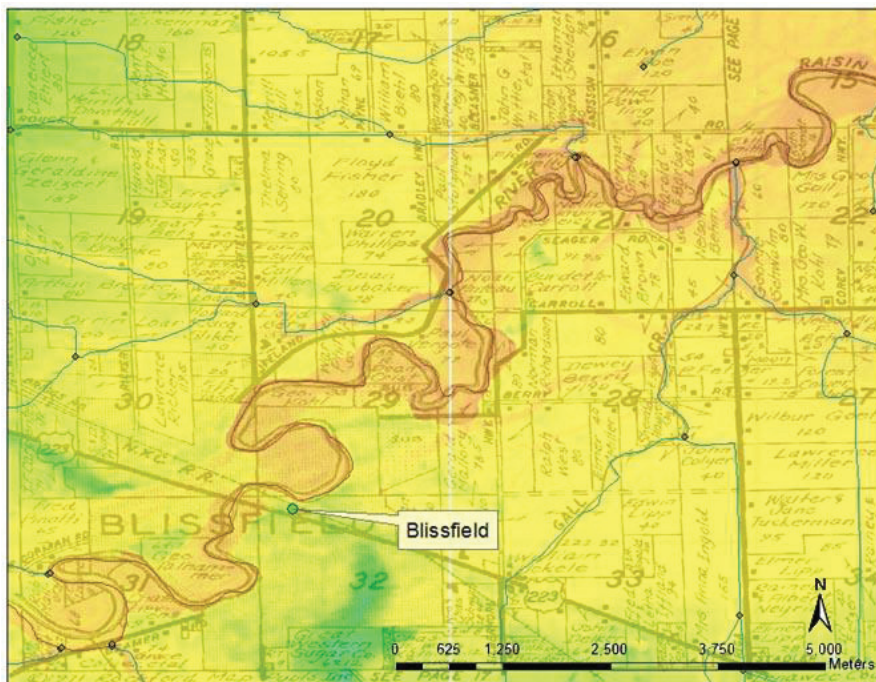


Figure 2.

University of Michigan Stephens S. Clark Library, were georeferenced to the modern DEM, allowing discrete measurements of river displacement between historical and modern river location data. Georeferencing, or matching up of geographical information data to existing and existing map, was conducted through matching of roadside drainage channels and stream junctions in the projected DEM with those points found on historical maps, with fewest possible referencing points located on the river itself; this was to ensure that channel meander would not affect quality of georeferencing. Hydrology data from the USGS was also projected on the map to assist in qualifying the stream and tributary systems surrounding the River Raisin, as well as providing an extremely precise location of the stream channel as it exists today. It should be noted that the 1971 map included less information on canals and drainage systems, which may have affected accuracy within georeference.

Displacement measurements were conducted using the measure-

ment tool at length intervals of 150 meters along the channel, beginning at the Blissfield township marker and ending at an area of stream interference approximately 10,650 m downstream (eastward). Convention in this study denotes that positive values indicate a historical river location as being to the southeast of the modern river channel, and negative values representing historical location values to the northwest of modern channel. Historical maps of the area as drawn in 1892 and 1971 were both georeferenced and measured in this fashion (Fig. 1, 2) (Appendix 2,3).

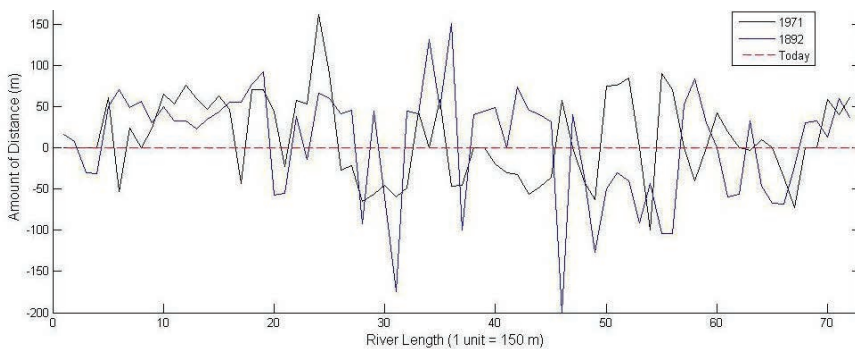


Figure 3.

The measurements gained were entered as vectors that were then plotted against one another and the modern control group in Matlab® (Fig. 3) (Appendix 1).

Finally, the study used Matlab® to calculate the mean displacement of both the 1892 and 1971 river locations by first subtracting the 1892 from 1971 variants, then calculating the total area underneath this curve. (Fig. 4) (Appendix 1).

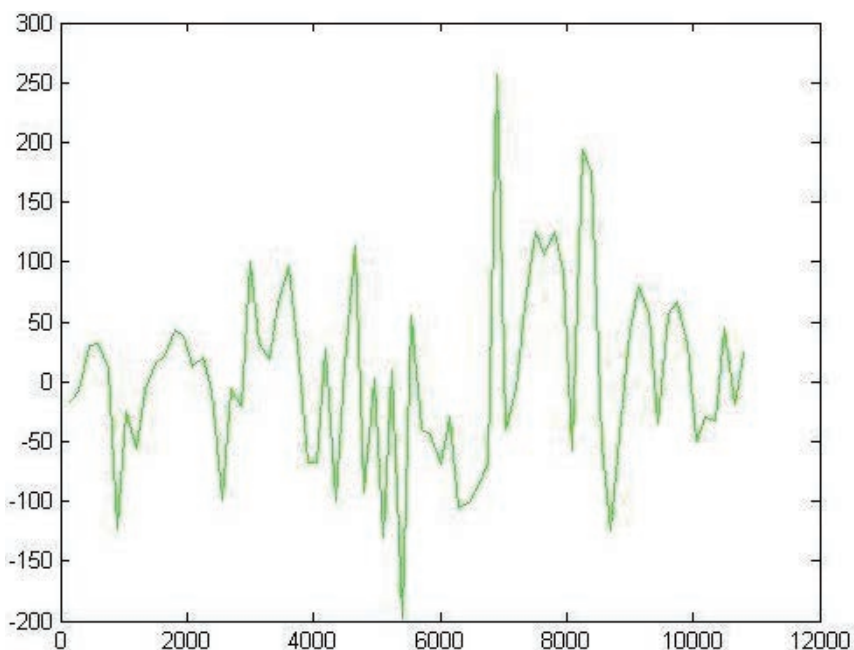


Figure 4. Net River Migration Graph

Graph of 1892 location variants when subtracted from 1971 variants. Note that values are generally in the positive range, indicating a general migration toward the northwest from 1892 to 1971.

Results

Total river displacement from 1892 to 1971 to today is predominantly in the northwest direction. The following maps and graphical representations of measured and calculated River Raisin meander data demonstrate influences to and with this trend.

Within the 1892 Variant map many complex features are present such as partially and fully formed oxbow lakes, as well as tight meander curves. These features however are not present in the modern channel, though records of these features can be seen in the DEM topographic profile (Fig. 1). Canals found using the Hydrology tool in ArcMap10® align with both mod-

ern and historic roadside ditches and drainage channels. Junctions of water sources are almost exclusively located on the cut-bank of tightly meandering curves of the river.

Mean displacement of the modern River Raisin when measured against the 1892 map is 6.4 meters. Displacement values at intervals of 150 m are graphically displayed in Figure 3.

Complex features such as the oxbow lakes found in the 1892 map are not observed in the 1971 map (Fig. 2). As such, divergence from the modern river channel follows overall modern river shape more closely. As with the 1892 map, junctions of water sources are located on the cut-bank of tightly meandering curves of the river.

Mean displacement of the modern River Raisin when measured against the 1971 map is 10.3 m. Displacement values are displayed in Figure 3.

Amount and direction of displacement are expressed visually in the Variant Differential Graph (Fig. 3), allowing for interpretation of meander data. It should be noted that peaks and troughs appear to match one another in the 1892 and 1971 graphs from point 0 on the axis to about point 35, where there appears to be a leftward, or eastward shift of data in the 1892 map as compared the 1971 map (Fig. 3).

Variant values of 1892, when subtracted from those of 1971 yield the graph shown in Figure 4, or the Net River Migration Graph. A total value of positive 277.1 m was calculated for the area beneath this graphical curve, which corresponds to 277.1 m of total river migration from 1892 to 1971.

Discussion

The graphical representation of data gathered through ArcMap 10[®] in this study can be used to compare meander directions and amounts for the two time periods (Fig. 3). There exists a south-eastward trend of former river placement in over half of the graph, represented by positive values, in the

1892 map. Several peaks within this positive range in the 1892 graph match up to peak to peak with the 1971 map (Fig. 3). The matching of these two graphs is indicative of a north-westward shift in the meander from 1892 and 1971.

Graphing the differences in river location variants, and then calculating the total area under this curve allowed a very accurate estimate of the meander trend of the Raisin River from 1892 to 1971. With an overall positive value for 1971-1892 variants, it can be directly inferred that the River Raisin has migrated to the northwest from 1892 to 1971. Causes for this directional change in migration from moving southeast to northwest are not investigated in this study.

Meander mechanisms are strongly argued in the scientific community, with only two factors having been proven to influence meander properties: hydraulic factors of the stream itself (Sun et al., 1996), and heterogeneity in the surrounding soil (Motta et al., 2011). Hydraulic factors are predominantly the effects of upstream currents and behaviors, which are represented in situ by the presence of high topographic gradient and strong channelization approximately 50 km upriver in town of Tecumseh, Michigan, located northwest of the study area. It is possible that this strong channelization and high gradient could translate to elevated stream energy to the Blissfield area, despite the area's extremely low topography.

The soils surrounding the River Raisin in the Blissfield area are predominantly lake bed clays and contain very little sand or gravel. With such a homogenous soil in the flood plain and meander belt, it can be hypothesized that the dominant factor of river meander must be upstream hydraulic factors if only these two mechanisms are considered.

Additionally, the area of study experienced heavy volumes of deforestation and forced drainage around 1830, which steadily increased until around 1960. Land change occurred and encouraged settlement and cultivation of the fertile soil, producing what is now the most highly farmed area

of land in Michigan (Allan et al., 1997). Farmed land is shown to increase suspended sediment loads, as can be seen in the studies of Allan et al. in 1997 and by the USGS. Therefore, the time of highest suspended load sediment in the River Raisin occurred between 1830 and 1960. Though high suspended load will counteract avulsive processes, gradual channel migration is known to increase with high exchange of surrounding soil in and out of the suspended load.

Effects of agriculture on stream migration were modeled by Mitchell et al. in 2004, and were found to increase sediment erodibility by up to 150%. Thus, this high period of agricultural use of the River Raisin basin, specifically in the Blissfield area must have had a direct and positive effect on the meandering of the river. Though agricultural use of the area has been on the decline for the past 20 years, Blissfield is still a heavily farmed area, in fact the most heavily farmed township in the River Raisin extent. It can then be predicted that River Raisin will continue to meander at an exaggerated rate in areas of active riverside agriculture.

Conclusion

Using ArcMap10® and MatlabR2012®, information gathered from the USGS National Map viewer was analyzed to gather information on short-term river meander of the River Raisin within the limits of Blissfield Township in Southeast Michigan. Blissfield, Michigan lies in the lowest gradient section of the river, and has experienced the highest amount of meander since 1892 of any other area in the river basin. In comparing historical river locations and features from 1892 and 1971 today, information about relative location was gathered and displayed graphically (Fig. 1-4). Meander of the River Raisin has likely been exaggerated due to agricultural activity, which was at its maximum from 1830 to 1960. Other than agricultural use, upstream hydraulic effects are likely the source of meander due to the high homogeneity of the soil. Current land use remains heavily agricultural, and it

is expected that the River Raisin will continue to meander at an exaggerated rate while cultivation continues proximal to riverbanks.

Acknowledgements

Sarah Aciego

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Appendix 1: Matlab code and GIS Measurements

a) GIS measurements- negative numbers correspond to southeast river migration over tested unit time (1892-1971)

```
u=[0 0 0 0 61 -53 24 0 24 65 53 76 60 47 63 47 -43 71 71 43 -23 57 53 162 90 -27  
-22 -65 -56 -46 -60 -49 43 0 58 -47 -45 0 0 -20 -30 -32 -56 -48 -36 57 0 -41 -63 75  
76 85 0 -100 90 71 0 -40 0 42 20 0 -3 10 0 -36 -73 0 0 58 40 61];  
y=[15.8 8 -30 -31 50 70 49 56 30 50 32 32 23 35 43 55 55 77 92 -57 -55 38 -14 66  
60 41 45 -92 44 -60 -174 44 41 131 48 151 -100 40 44 49 0 74 45 40 31 -200 40  
-35 -127 -50 -30 -40 -91 -43 -104 -104 52 84 30 0 -60 -56 33 -47 -67 -68 -23 30  
32 13 60 37];  
c=[0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0  
0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0]
```

b) Matlab code creating graph of 1971 variants minus 1892 variants, or Variant Differential Graph shown in Figure 3.

```
z = [1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28  
29 30 31 32 33 34 35 36 37 38 39 40 41 42 43 44 45 46 47 48 49 50 51 52 53 54  
55 56 57 58 59 60 61 62 63 64 65 66 67 68 69 70 71 72]  
l = 150.*z  
v = u-y
```

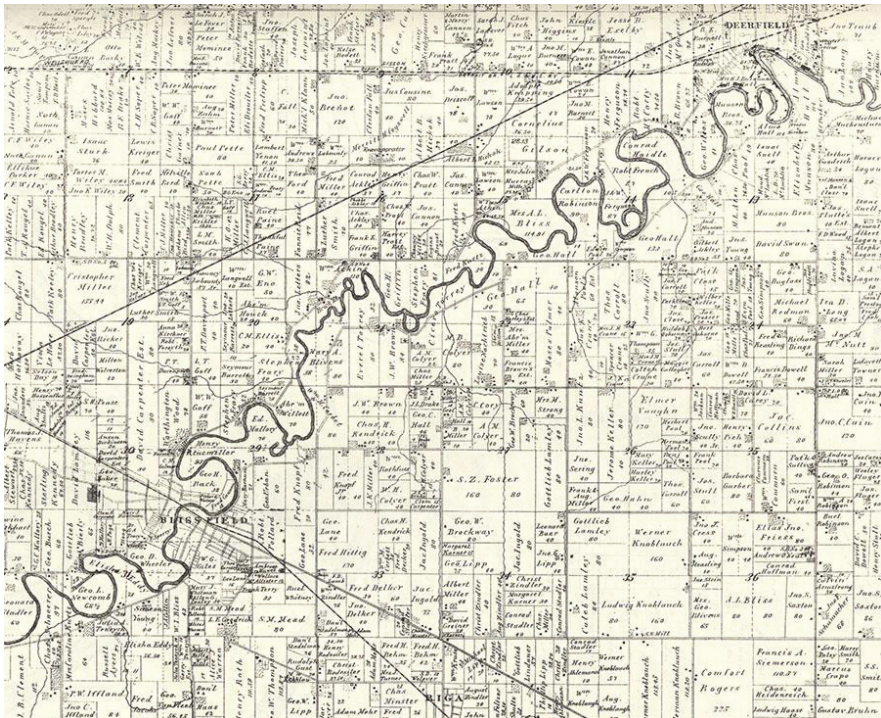
```
figure;  
plot(l,v,'g');
```

c) Matlab code creating graph of total area underneath Variant Differential Graph, or Net Migration Graph in Figure 4.

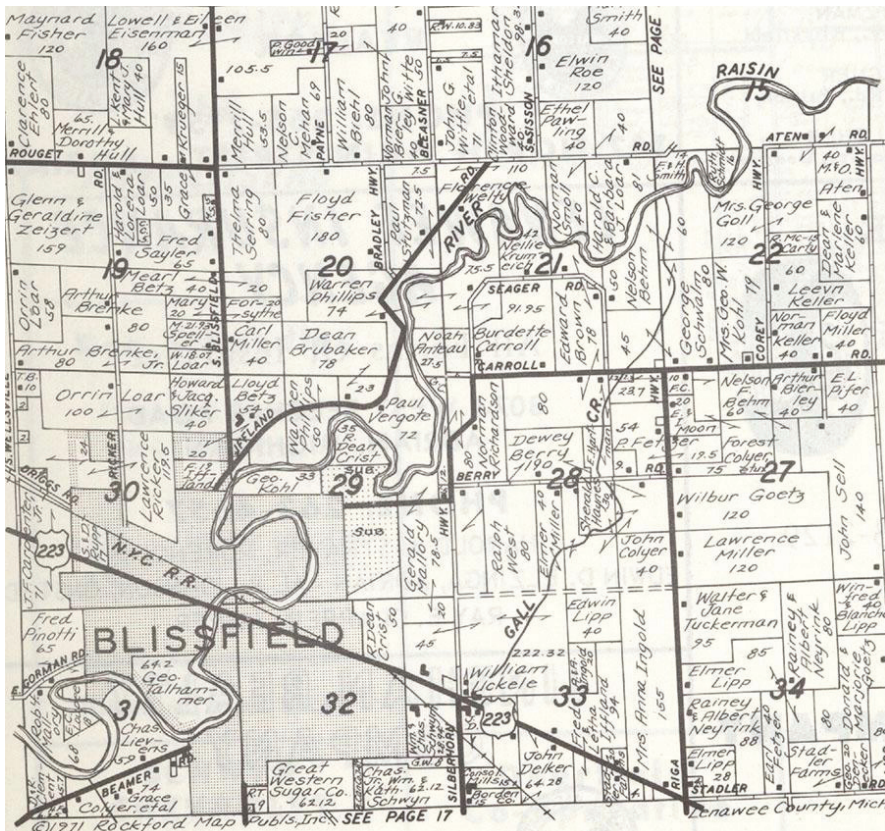
```
A = trapz(v)  
figure;  
plot(u,'k');  
hold;  
plot(y);  
hold off;  
hold;  
plot(c,'-r');  
hold off;
```

Appendix 2: Original Maps

a) Original 1892 Map of Blissfield and Deerfield townships. Hervey Bliss, 1862



b) Original 1971 Map of Blissfield and Deerfield townships. A. Grosvenor, 1971



Sweetland Prize for Excellence in Upper-Level Writing (social sciences)

Mines, Migration and the Confluence of Disease: The Story of South Africa

From AAS 495: William Benjamin Rogers

(nominated by Adam Ashforth)

This is a study of the impact of labor migration in South Africa on the spread of HIV. Mr. Rogers produced a remarkable piece of work, which not only reviewed the complex epidemiological literature on the South African epidemic, but also delved into the history of migrant labor, particularly in the mining sector, and the relation between migrancy and the history of apartheid.

Adam Ashforth

Mines, Migration and the Confluence of Disease: The Story of South Africa

“We cannot win the battle against AIDS if we do not also fight TB. TB is too often a death sentence for people with AIDS. It does not have to be this way.”
—Nelson Mandela

Introduction

A small virus has produced big action. HIV is prominent on the international agenda, demanding the attention of nations, nongovernmental organizations, and even multinational companies. In 2010, the AngloAmerican Corporation announced a contribution of US \$3 million towards the Global Fund to Fight AIDS, Tuberculosis, and Malaria at the G20 Summit (Global Fund, 2011). The AngloAmerican mining company is the largest private employer in South Africa, employing just over 90,000 workers (AngloAmerican, n.d.). Internally, AngloAmerican committed to providing free antiretroviral therapy (ART) to HIV-positive employees in 2002 (AngloAmerican, 2010). With an estimated 12,057 HIV-positive employees and 3,211 employees on ART in 2009, AngloAmerican achieved 51% employee enrollment in HIV management programs and a 27% ART treatment rate (AngloAmerican, 2010). AngloAmerican also engages its HIV-negative employees in voluntary counseling and testing campaigns, stressing the importance of behavioral change in response to AIDS (AngloAmerican, 2010). Both globally and internally, AngloAmerican has backed efforts to combat the worldwide HIV/AIDS epidemic, responding specifically to the high need of its South African employees.

AngloAmerican's actions may seem noble, but they are occluded by nearly a century of exploitation and extraction.¹ Founded in 1917, An-

¹ For the more complete story of AngloAmerican, see *AngloAmerican and the Rise of Modern South Africa* by Duncan Innes (1984)

AngloAmerican predated the early cases of AIDS. Yet, as a mining company operating in South Africa, AngloAmerican was party to a devastating and now increasing epidemic: that of tuberculosis (TB) (South African National AIDS Council, 2011). So, while AngloAmerican's substantial gift to combat HIV/AIDS and TB was urgently needed, one cannot ignore the historical context in which the South African HIV/AIDS and TB epidemics take place. The case of AngloAmerican perfectly highlights the intersection between the mining industry, the dual HIV and TB epidemics, and global actors in South Africa. The present analysis seeks to address the extent to which a system of historically migrant labor has escalated the HIV and TB epidemics, the impact of the epidemics on mining communities, and the local and global responses to HIV-TB co-morbidity in South Africa.

Scope

Globally, HIV/AIDS and TB are the sixth and seventh leading causes of death (WHO, 2011). Combined, they account for over 5.6% of deaths of adults ages 15-59 (WHO, 2011). Yet 'HIV/AIDS' and 'TB' rarely exist as separate categories; rather, they often simultaneously infect one individual (UNAIDS, 2011). The 33.3 million people living with HIV worldwide are 20-30 times more likely than HIV-negative persons to contract active tuberculosis, the main cause of death among HIV-positive individuals (UNAIDS, 2011). Responsible over 400,000 deaths in 2009, TB accounts for nearly 25% of HIV-related mortality (UNAIDS, 2011). It is this deadly confluence of HIV and TB that poses a threat to global health. Large in scope, the global burden of HIV and TB is magnified in developing regions.

In Africa, the burden of HIV/AIDS and TB is the greatest: 82% of the 1.1 million new cases of HIV-related tuberculosis in 2010 were reported in Africa (WHO, 2012). Persons living with HIV are at great risk for TB infection and may die from co-infection. HIV-negative persons may also contract HIV or TB, especially if many others carry the diseases. Together,

HIV and TB pose a threat to the public's health. The scale of the HIV and TB epidemics on the African continent is immense, placing the health of immuno-compromised persons at greatest risk.

Narrowing the Focus

Lost in continent-specific estimates of HIV and TB prevalence and mortality is the immense variation present within continents, regions, and countries. When 'Africa' is the denominator, HIV and TB prevalence is high. But a disparity emerges when distinguishing between the regions of Africa: sub-Saharan Africa experiences the highest prevalence of both HIV and TB (Hargrove, 2008; WHO, 2012). Of the many countries in southern Africa, South Africa is greatly affected by HIV and TB. Despite its relatively developed health infrastructure, South Africa faces the third highest incidence of TB in the world (SANAC, 2011). This burden that has increased 400% in the past 15 years, and the HIV epidemic is largely responsible for this increase (SANAC, 2011). South Africa is also home to the world's largest HIV epidemic. 5.6 million people are living with HIV in South Africa, or one per every six people with HIV worldwide (SANAC, 2011; UNAIDS, 2010). HIV and TB operate together, posing the greatest contemporary health challenge to South Africa.

It is difficult to explain why southern Africa, and South Africa in particular, experience such high HIV prevalence. Answering this question, famously posed in 2001 by *The New York Times* medical correspondent Dr. Lawrence Altman and reiterated by the African National Congress², has proven challenging to both politicians and researchers (Altman, 2001, Jan 30). Two of the most powerful predictors of HIV prevalence (the percentage of a population that is Muslim and the percentage of men circumcised) only

2 Published in *ANC Today*, an article titled "Questions that require answers" framed Altman's question as one denying HIV/AIDS science. The ANC demanded action: "As our President has insisted all along, this matter is very urgent and concerns the very lives of our people... Urgent answers, and not propaganda, are required to all the questions and issues concerned in this article" (ANC, 2001, February 22).

account for about two-thirds of the variance in HIV prevalence between African regions (Hargrove, 2008). To explain the other third, Hargrove (2008) proposes two additional factors: international highways and labor migration. Many migrants, compelled by labor conditions, relocate to South Africa and pursue employment in the mining industry. As evidenced by the girth of AngloAmerican (South Africa's largest private employer), mining is one of the largest industries in South Africa. Mining accounts for 6% of the South African gross domestic product and about 60% of its exports and employs a large number of foreign laborers (The Economist, 2011 December 3; Rees, et al., 2010). Migrant laborers have historically composed between 40-60% of South Africa's mining workforce and remain employed in the mining industry at high rates (Harrington, et al., 2004; Rees, et al., 2010). It is therefore difficult to disentangle mining and migration in South Africa.

Epidemiological evidence suggests that migration increases the risk of contracting HIV. One study found that labor migrants were 2.4 times more likely to have HIV, with migrant status predicting HIV infection after controlling for demographic variables (Lurie, et al., 2003). Short-term migrants are placed at an even higher health risk and account for an increasing portion of HIV/TB deaths in South Africa (Clark, et al., 2007). Migrancy is not a physiological condition, thus the increase in risk must be derived from migrants' social and economic environments.

Perhaps as a condition of migrant labor, HIV and TB are highly prevalent in South African mines (Corbett, et al., 2004; Rees, et al., 2010; Hargrove, 2008). While South African mines have long experienced high incidence rates of TB, the introduction of HIV to the mines resulted in a ten-fold increase in TB among HIV-positive miners between 1990 and 1999 (Chaisson & Martinson, 2008). The intersection of labor migration, HIV, and TB thus occurs within the context of South African mining, requiring a closer examination of historical, social and economic factors that produce high rates of disease. Above all, a structure of migrant labor, constructed at

the end of the 19th century, created conditions for the present day dual HIV-TB epidemic.

Historical Background

It is impossible to discuss the history of South Africa without describing the system of race politics in South Africa. The case of AngloAmerican presented in the introduction serves to highlight the role of race in shaping labor practices. One year prior to offering its employees universal access to ART, AngloAmerican piloted an ART program for higher-level permanent employees, the majority of whom were white (Marks, 2009). Sensing racial inequity in the provision of life-saving therapy, the National Union of Mine Workers threatened to strike, perhaps prompting AngloAmerican's shift towards universal coverage (Marks, 2009). The politics of race weigh heavy on the conscience of the mining industry, reflecting a history fraught with racial division, disease, and death. Here we consider which policies worked to create a system of migrant labor in South Africa that largely employed black Africans.

Discovery of gold in the Witwatersrand of South Africa in 1886 prompted the establishment of a large South African mining industry (Wilson, 1972). Diamond mines, formed in 1864 with the discovery of diamonds in South Africa, laid the model for the fledgling gold mining industry. In eight years, Kimberley mines³ had recruited 10,000 workers (Wilson, 1972). Gold mining magnates had a much larger goal: employ 100,000 men by the turn of the century. To do so, they would need to compete with the existing agrarian economy for labor, reflecting the conflicting interests of white farmers and industrialists in colonial South Africa (Packard, 1989). In that white South Africans were the extreme minority, industrialists and agriculturalists

3 Kimberley Mines, later incorporated by De Beers Consolidated Mines, was an important precursor to the migrant system of labor used by gold mines in the late 1800s. For an early history of Kimberley, see *South Africa's City of Diamonds: Mine Workers and Capitalism in Kimberley, 1867-1895* by William H. Worger (1987).

alike were left to ponder how to recruit black South African laborers. Self-interest guided their actions, which were initially aligned in the recruitment of labor. Both settled on a legislative approach and worked to craft a labor system of race-based policies.

The first of these policies enacted was the Glen Grey Act in 1894. Sponsored by South African industrialist Cecil Rhodes, the act imposed a 10 shilling tax on individuals not engaged in the formal economy and worked to compel black South Africans to work in the mining and agricultural sectors (Wilson, 1972). Corresponding with the introduction of the law, employment increased by over 500% between 1890 and 1898 despite a purposeful wage freeze (Wilson, 1972). By 1899, the gold mines employed 99,000 men, just short of their ambitious goal, and paid lower wage rates than in the prior decade (Wilson, 1972). Yet the mining houses faced two problems: (1) the Anglo-Boer War of 1899 and (2) a lacking recruitment mechanism. While the war drafted miners as soldiers, hindering recruiting efforts, the taxes imposed under the Glen Grey Act did not provide apply pressure to work in the mines (Jeeves, 1985; Wilson, 1972). The Rand Labor Association, formed in 1896 by the Native Labor Department of the Chamber of Mines, was unable to meet the extraordinary demands of the burgeoning industry, and the mining companies pursued individual recruitment processes to supplement their workforce (Jeeves, 1985).

Constrained by the strictures of an eroding workforce and limited recruiting potential, the mining houses turned to foreign labor. In 1904, mining companies recruited Chinese laborers; 50,000 Chinese workers had arrived by 1906 (Jeeves, 1985; Wilson, 1972). Fearing reduced opportunities, white miners met the arrival of foreign labor with reactionary policies meant to preserve white labor interests. An industry policy enacted in 1904 created a 'color bar,' reserving skilled and semi-skilled positions for 'white artisans' (Wilson, 1972). A white miners' strike in 1906 and 1907 worked to compound the emphasis on race in the mining sector (Jeeves & Crush,

1995). The strike sought to prove that the industry would fail without white labor, but instead had the opposite effect of illustrating the skill and scope of the black work force (Jeeves & Crush, 1995). The failure of the white miners' movement furthered efforts to produce a migrant labor system by demonstrating the need for migrant black laborers.

As Chinese labor left South Africa, mining companies sought to replace outgoing labor with black workers from the eastern Cape. Recruitment efforts in 1906-1907 were mammoth, employing incentives such as cattle and cash advances, producing an increase in the black mining labor force (Jeeves, 1985). Yet these efforts reflected a partial failure of earlier strictures placed on black South Africans that aimed to increase the mining labor force. If the Glen Grey Act were enough to compel black South Africans to sell their labor, such efforts would not have been necessary. Unable to sustain high-cost recruitment mechanisms, the mining houses again adopted a legislative approach to increase their labor supply.

In 1911 the South African government passed the Mines and Works Act and the Native Labor Regulation Act. Designed to protect white labor interests after the failed white miners' strike, the 1911 legislation reinforced the earlier 'color bar' in the employment structure of the mining industry and regulated the recruitment of black mine workers (Jeeves & Crush, 1995; Wilson, 1972). In practice, the Mines and Works Act ensured that white mine workers would hold more lucrative positions through a restrictive certification system and quelled remnant voices of the white miners' movement (Jeeves & Crush, 1995; Wilson, 1972). The Native Labor Regulation Act specified that black mine workers could not be recruited from certain white agricultural districts, easing tension between industrialists and farmers and formalizing the recruitment of rural black miners (Jeeves & Crush, 1995; Packard, 1989). Further, it made striking a criminal offense for blacks under labor contracts, quashing any potential for labor organization and collective bargaining (Wilson, 1972). The 1911 legislation thus established a racially divided system

of labor and consolidated the interests of white colonialists, cementing the migrant labor system into practice.

Next, the 1913 Native Land Act worked to restrict black South Africans' access to land. Under the law, blacks were allocated just 13% of South Africa's land (Wilson, 1972). This placed rural black Africans in the double bind of the Glen Grey and Native Land Acts: they could neither keep farmland nor afford the taxes imposed upon them for lack of formal employment. Faced with few employment options, many black South Africans were compelled to migrate to the mines. The number of rural black miners increased in the wake of the Native Land Act (Packard, 1989). This increase provided evidence to white mine owners that the system of race-based policies was working to restrict the agency of rural black Africans. A lack of representative democracy meant these policies would remain in place indefinitely, subject to change at the discretion of white industrialists and politicians.

The creation of a rural South African labor base in 1913 paralleled the erosion of international mine labor. International migrants from Mozambique were present in South African mines as early as 1904, and by 1912 Mozambican workers composed 48% of the mining labor force (Jeeves & Crush, 1995; Harrington, et al., 2004). Demand for foreign labor peaked in 1912 following passage of the Native Labor Regulation Act, which placed restrictions on the recruitment of South African labor and initially compromised efforts to build a large rural labor base (Jeeves & Crush, 1995). As a remedy, the Native Land Act of 1913 pushed rural South Africans towards the mines and produced a sharp decline in foreign mine labor (Harrington, et al., 2004). The balance between foreign and domestic mine labor was thus the careful product of the government, which weighed the interests of white farmers with those of white industrialists.

Over the next eight decades, the balance of foreign and domestic migrant labor shifted with the economic interests of South African mining companies and political interests of foreign governments. The combination

of economic depression in 1929 and Mozambique's restrictions on labor out-migration produced a shift towards a largely domestic mine workforce (Jeeves & Crush, 1995). In contrast, economic boom and lax migration policies in the 1960s led to an 80% foreign workforce in the early 1970s (Jeeves & Crush, 1995). The immense and often rapid variation in the composition of the mine work force allowed the industry to rapidly adjust to economic conditions. A migrant labor system was therefore economically attractive and remained a common practice.

Mining 'hostels,' which provided all-male short-term housing, were a condition of the migrant labor system. Mining companies had relied on migrant labor since their inception: Kimberley diamond mines pioneered the 'compound' system of housing,⁴ and inexpensive short-term housing became accepted as the industry norm (Wilson, 1972). Yet other industries challenged the hegemony of all-male housing; for example, nearly half of coal miners lived in married housing by the 1930s (Wilson, 1972). A movement to build family housing was briefly considered in the 1940s when AngloAmerican proposed a 10% residential labor force in the Orange Free State (Jeeves & Crush, 1995). Perceived as radical, these efforts failed to take root in the mining industry and were subsequently abandoned (Jeeves & Crush, 1995). The hostel system of housing remained dominant, with nearly 90% of miners living in 'hostels' through 1993 (Crush, 1995). Hostels are thus an artifact of migrant labor, inherited from the legislation of the early 1900s. Hostels are a health risk. Throughout the early twentieth century, extreme crowding in mine hostels facilitated increases in TB incidence from 1906-1912 and again in 1938 (Packard, 1989). Even when they are less crowded, hostels place miners in close contact and provide the perfect opportunity for TB transmission. Hostels have also been linked to the South African HIV epidemic. Migrant workers staying in all-male hostels solicit sex workers and

⁴ The early compound system was created to prevent diamond theft by black South African miners. See *Diamonds*, published in 1909, by Sir William Crookes for a primary account of the Kimberley compound housing system, specifically pages 36-43.

find new partners while away from home (Lurie, 2000; Hargrove, 1998; Williams, et al., 2003). Miners with multiple concurrent partners likely contract HIV quickly and spread the disease in the mining community, a phenomenon described as concurrency (Epstein, 2007).

Yet, as Hargrove asserts, concurrency may not fully explain the transnational spread of HIV. Concurrent partnerships at a local level accelerate the spread of the HIV virus, but they produce isolated epidemics. Transnational sexual networks are thus necessary for the rapid transnational spread of HIV (Hargrove, 1998). Evidence suggests that Malawi and Zambia were among the earliest southern African countries affected by HIV, which then spread to South Africa around 1985 (Iliffe, 2006). South African mineworkers were among the first to report the presence of HIV. In 1986, prevalence of HIV was 0.02% among national migrants but 3.76% among migrants from Malawi (Iliffe, 2006). This disparity in prevalence highlights the direction of spread: HIV was moving into South Africa, and mining communities were at risk.

Transnational labor migration remained high during the early years of the epidemic, reaching its peak in the late 1980s. In 1984, 42% of the mining labor force consisted of foreign migrant laborers, and migrant labor remained high throughout the entire decade (Harrington, et al., 2004). The total mining labor force then peaked at 480,000 in 1988 (Harrington, et al., 2004). This means that HIV was introduced to South African mines when they were at their largest and when transnational labor was near its peak. The inherited hostel system of housing, a historically migrant labor system, and a peak in mining employment combined to create the conditions necessary for a transnational HIV epidemic.

The South African government was not blind to the crisis. Recognizing the high prevalence of HIV among Malawian miners, the government enacted policies in October of 1987 to prohibit carriers of HIV from immigrating to South Africa (Chirwa, 1995). The next year, 101 Malawian

miners were repatriated without compensation after testing positive (without their consent) for HIV (Chirwa, 1995). While these early policies may have protected South African miners from an even larger epidemic, miners who migrated to South Africa prior to 1987 were unaffected by the policy.⁵ The reactionary legislation of 1987—clouded by ethical objections—likely did prevent some transmission of HIV, but the virus was already present and multiplying.

Another disease was resurging in the 1980s. Tuberculosis infections began to rise in 1976, increasing from 4 per 1,000 to 10 per 1,000 by 1978 (Packard, 1989). In the 1980s they fluctuated between 8 per 1,000 to 10 per 1,000, rates three to four times greater than those between 1965 and 1975 (Packard, 1989). Much of this increase was attributed to a highly foreign workforce and poor living conditions during peak mining employment (Packard, 1989; Harrington, et al., 2004). Though no data exists to document rates of TB among persons living with HIV in the early years of the epidemic, one can speculate that many HIV-positive miners contracted TB due to their biological susceptibility to the disease. With awareness of HIV came the collection of better epidemiological data, allowing for a closer examination of the contemporary epidemiology of HIV and TB in South Africa's mines.

The Epidemiology of HIV and TB

South Africa began to feel the impact of the dual HIV-TB epidemic in the early 1990s. Between 1990 and 1999, the incidence of TB in South African mines increased four-fold, and the prevalence of HIV increased from approximately 1% to between 24-30% of all miners (Corbett, et al., 2003). It

5 Elsewhere, Chirwa has argued that the repatriation of Malawian workers was less the product of public health concern and more the result of demands of industry (Chirwa, 1998). The large foreign labor force of the 1980s had become unsustainable, prompting an interest in 'labor force stabilization,' or a move towards a more national, long-term labor force. Chirwa argues that the true motivation for repatriating Malawian miners was pressure placed on the South African Chamber of Mines to recruit local labor and sever ties to Malawi.

is generally accepted that much of this increase in TB was due to HIV-TB co-infection (Corbett, et al., 2003; Glynn, et al., 2008; Sonnenberg, et al., 2004; Corbett, et al., 2004). The question then follows, what impact did HIV-TB co-infection have on the incidence of TB amongst HIV-negative miners? Epidemiologists have endorsed two conflicting answers: (1) that HIV-negative miners were unaffected by the increase in HIV-related TB or (2) that HIV-related TB increased the incidence of TB among HIV-negative miners.

Corbett and others (2003) found that TB incidence among HIV-negative miners remained stable throughout the 1990s despite large increases in HIV prevalence. While time predicted TB incidence for miners living with HIV in their analysis, it was not a significant predictor for HIV-negative miners after controlling for demographic factors (Corbett, et al., 2003). This analysis suggests that, while TB incidence rose during the 1990s, the increased burden of disease was largely borne by HIV-positive miners.

In contrast, two groups of researchers present evidence of an increase in TB in HIV-negative miners during the 1990s (Sonnenberg, et al., 2004; Glynn, et al., 2008). Sonnenberg and others (2004) note that the incidence of newly diagnosed cases of TB rose from 0.53% in 1991 to 1.0% in 1997 in their sample of miners from four South African gold mines. Like Corbett and others (2003), Sonnenberg, et al., attributed much of this increase to the large increase in HIV prevalence. Their analysis suggests that the portion of HIV-related TB cases increased from 0% in 1991 to 40% in 1997 (Sonnenberg, et al., 2004). But a decrease in the portion of HIV-negative TB cases does not preclude a decrease in incidence: in fact, the incidence of TB in HIV-negative miners doubled after 1995 in Sonnenberg's sample.

Using data from a 14-year cohort study of miners, Glynn and others (2008) provide a third analysis of the dynamics of HIV and TB in South African mines. They note that TB incidence among HIV-negative miners doubled from 1991-1993 levels, corroborating Sonnenberg's findings (Glynn, et al., 2008; Sonnenberg, et al., 2004). Further, Glynn and others attribute

half of the increase in TB during the 1990s to the indirect effect of HIV (Glynn, et al., 2008). The ‘indirect effect’ describes the notion that HIV increases the infectious pool of tuberculosis, thereby increasing healthy miners’ risk of contracting TB. The work of both Sonnenberg and Glynn thus documents evidence of an indirect effect.

How, then, can conflicting claims about the indirect effect of HIV on TB be reconciled? Here there are two possible explanations that likely work together. First, Corbett’s (2003) analysis separated the time analysis by year, using one-year intervals as predictors of TB prevalence among HIV-negative miners. Both Glynn (2008) and Sonnenberg (2004), however, use a binary notion of time, noting an increase between TB incidence in 1991 and at later time points. Glynn and Corbett thus capture the non-linear nature of the increase in TB and, arguably, better document the indirect effect.

A subsequent study by Corbett and others (2004) also helps explain these divergent findings. Using a sample of HIV-positive miners, Corbett and others found that HIV-associated tuberculosis was shorter in duration and, seemingly, less infectious before diagnosis than tuberculosis among HIV-negative persons. This means that Sonnenberg’s (2004) estimate of 40% of TB cases attributable to HIV in 1997 may be low, as shorter episodes of tuberculosis among HIV-positive miners may have gone undiagnosed. Further, this tempers the notion of an indirect effect with the understanding that HIV-related TB is less infectious than non-HIV related TB (Corbett, et al., 2004). In sum, TB among HIV-negative miners increased during the 1990s as an indirect effect of HIV-related TB, though half or more of this increase can be attributed to other factors.⁶

Other epidemiologists have focused on which groups of miners are at greatest risk for HIV and TB co-infection. HIV risk is largely determined by

⁶ The indirect of HIV on TB incidence among miners should not be interpreted to represent the population as a whole. Given miners’ close occupational proximity and high rates silicosis, the less-infectious HIV-associated TB may pose more of a health risk to miners than to the general population. See Egwaga and colleagues (2006), who suggest that HIV does not impact TB transmission at the population level amongst HIV-negative persons.

two factors: migrancy and hostels. Migration places both men and women at nearly double the risk for HIV infection in studies conducted in South Africa (Lurie, et al., 2003). Yet the bulk of miners are considered 'migrant,' living away from their families in mining hostels (Zuma, et al., 2003; Crush, 1995; Harrington, et al., 1994). A housing survey from AngloAmerican mines in 1993 indicated that 89% of miners lived in all-male hostels, compared with a married housing rate of just 2% (Crush, 1995). A search for more current estimates of housing trends yields no results, but researchers have speculated that most miners still live in hostels (Gebrekristos, et al., 2005b). In that miners are mostly migrants living in hostels, it is difficult to distinguish between HIV risks for migrant miners living in hostels, migrant miners living with families, and non-migrant miners. Using mathematical modeling, Gebrekristos estimated that family housing could reduce miners' annual HIV infection risk by about 2.5 to 3% (Gebrekristos, et al., 2005b). Hostel-style housing and migrancy place miners at higher risk for HIV, though these risks are borne by the large majority of miners.

TB risk is subsequently determined by HIV status and silicosis, a respiratory illness contracted from exposure to silica dust. Silicosis places miners at an estimated 2-30 times greater risk for tuberculosis (Ross & Murray, 2004). HIV-positive miners with silicosis are at a greater risk than their HIV-negative counterparts due to the immuno-compromising effects of HIV and the inflammation of lung tissue produced by silicosis (Ross & Murray, 2004). The interaction effect of HIV and silicosis on tuberculosis risk is far greater than the effect of silicosis alone (Rees, et al., 2010). The prognosis of silicosis is thus especially negative for HIV-positive miners, often resulting in tuberculosis infection and, potentially, death.

Low CD4 helper T-cell count also places HIV-positive miners at greater risk for tuberculosis. Despite receiving antiretroviral therapy, miners with a CD4 cell count of less than 100 cells/ml were 2.38 times more likely to acquire tuberculosis in a prospective study of HIV-positive gold miners

(Lawn, et al., 2005). This finding is important in noting variation in TB risk among HIV-infected individuals; it is often easy to lose focus on the diversity of outcomes within groups. Even with anti-retroviral therapy, HIV-positive miners and particularly those with low T-cell counts are at high risk for tuberculosis.

Unlike HIV, tuberculosis can be cured. Tuberculosis may completely resolve with treatment, or it may lie dormant and later relapse. Here it is essential to distinguish between recurrence, reinfection, and relapse: ‘recurrence’ refers generally to any secondary episode of tuberculosis, ‘reinfection’ is defined as contracting a new strain of tuberculosis, and ‘relapse’ describes recurrence due to the same tuberculosis strain. Evidence suggests that HIV-positive status predicts recurrence—especially reinfection (Wilkinson & Moore, 1996; Sonnenberg, et al., 2001). Tuberculosis patients living with HIV had higher fatality rates, were three times more likely to fail to complete treatment, and 2.4 times more likely to experience tuberculosis reinfection than HIV-negative patients across two studies (Wilkinson & Moore, 1996; Sonnenberg, et al., 2001). HIV is so strongly related to tuberculosis reinfection that it was the sole risk factor for TB reinfection in a study of South African mineworkers (Sonnenberg, et al., 2001). Taken together, these studies suggest that HIV-positive mineworkers experience especially poor treatment outcomes due to failures to complete treatment and immuno-compromised status.

Multiple Drug Resistance

The biological manifestation of poor tuberculosis treatment outcome is multiple drug resistance. Multi-drug resistant tuberculosis (MDR TB), often contracted via multiple infection or incomplete treatment, cannot be treated by isoniazid (a common anti-TB drug used in South African mining hospitals; Sonnenberg, et al., 2001). Of the 65 cases of recurrent tuberculosis present in Sonnenberg’s study of a South African mining hospital, 2 cases were

resistant to multiple TB drugs (Sonnenberg, et al., 2001). MDR TB merits particular concern because it vigorously resists treatment and often results in death. Dheda and others (2010) report high mortality (42.6%) for both HIV-positive and HIV-negative MDR TB patients. MDR TB is therefore a problem for all patients, but miners with HIV are particularly likely to contract the recurrent TB that produces MDR TB.

Research on MDR TB in South Africa is scant. Much of this small volume of research focuses on foreign concerns about the spread of MDR TB. In one case study, Cooke, et al. (2011) describe the international spread of MDR TB from South Africa by reporting the case of a health worker who died of MDR TB in the United Kingdom. The preponderance of the study describes the specific molecular epidemiology of the strain of TB in order to confirm its origin. Framing MDR TB as an 'international health' crisis relevant only to foreign health workers, the paper largely ignores the high burden felt by HIV-positive South African miners.

The increased risk of TB associated with the global HIV epidemic has produced a reemergence of MDR TB worldwide (Farmer, 1997). According to Paul Farmer (1997), this reemergence is shaped by the political economy of tuberculosis treatment, whereby those individuals with reduced access to tuberculosis treatment are placed at elevated risk for contracting multiple drug resistant strains. It is often the poorest and most marginalized people who cannot access treatment and contract MDR TB. Farmer describes MDR TB patients as victims of 'structural violence,' thrust into an illness produced by political and economic structures that limit access to life saving treatment. Applying Farmer's hypothesis to the case of mining in South Africa, one would predict that transnational migrant miners, miners with HIV, and miners with the lowest socioeconomic status would be the most likely to contract MDR TB. In the unfortunate absence of data, these predictions remain speculation.

Responses to HIV-TB Co-infection in South African Mines

The rising incidence of tuberculosis, rapid escalation of HIV, emergence of HIV-TB co-infection, and re-emergence of MDR TB in the late 1980s through the 1990s did not go unnoticed in South Africa. International governments and non-governmental organizations, the South African government, private businesses, and individuals all became involved in an ongoing effort to combat the dual epidemic of HIV and TB in South Africa as early as 1986, when evidence of the epidemic in the South African mines first emerged (Iliffe, 2006). In characterizing the response to HIV and TB, it is important to note that 1994 marks a crucial moment in South Africa's history: the end of Apartheid and the first democratic elections.

Early efforts against the transmission HIV in South African mines took place at the international level. Recognizing that Malawian migrants were far more likely than South African workers to have HIV, the 1987 Apartheid government banned the entry of HIV-infected persons into South Africa and repatriated HIV-positive foreign miners (Chirwa, 1995). The early response to HIV in South African mines can thus be characterized as a quarantine, wherein the government sought to keep HIV-positive migrants at bay through screening efforts.

The pre-1994 government then shifted away from a quarantine approach and adopted the language of human rights. The National Aids Committee of South Africa, formed in 1992, authored the national AIDS plan for what would become the new 1994 government dominated by the African National Congress (Schneider, 2002). Written before the 1994 elections, the early national AIDS plan overestimated economic and human resources available to the post-Apartheid government (Butler, 2005). A conflict-laden transition from Apartheid eroded the South African public health infrastructure, which greatly hindered the African National Congress's ability to implement HIV/AIDS policy (Butler, 2005). In short, the inherited political climate weakened governmental response to HIV-TB co-infection in the early 1990s.

Two interacting pieces of legislation worked to address HIV-related employment issues in South African mines. The Employment Equity Act of 1998 was the first law in South Africa to prevent discrimination in employment based on HIV status. The law specified that employers could not compel new applicants or current employees to take an HIV test, practices that were used in the 1987 expulsion of Malawian miners (Chirwa, 1995). In combination with the 1996 Mine Health and Safety Act, the law mandated that mines minimize occupational HIV exposure and comply with HIV-related workplace law (Department of Labor, 2000). Yet occupational-related exposure is a narrow term, defined to include only those exposures that happen while at work. Though the structure of labor (migrancy and hostel lodging) that elevated HIV risk for South African miners, their exposure could not be considered ‘occupational’ in the narrow sense of the law. Further, these laws failed to include a measure for protection from occupational exposure due to TB despite the high rates attributable to the direct and indirect effects of HIV. Both HIV-positive and negative miners were affected by occupational exposure to TB, yet their needs were largely unmet.

A 2003 HIV/AIDS Mining Summit marked the most substantive government response to HIV-TB co-infection in South African mines. Representatives of government, industry, and labor met at the Gallagher Estate in Midrand, South Africa to discuss a coordinated HIV/AIDS response for South African miners (Department of Minerals and Energy, 2003). The summit yielded a coordinated statement of intent, the only of its kind, sanctioned by all three parties. Opening statements note the role of the HIV epidemic in exacerbating tuberculosis management efforts and assert that poverty eradication, nutrition programs, traditional healers, and workplace wellness programs are necessary components to the response.

These statements fit squarely within then-President Thabo Mbeki’s denialist claims that malnutrition and poverty, rather than the HIV virus, were responsible for AIDS (Butler, 2005; Schneider, 2002). Mbeki’s focus on

traditional solutions and African-initiated science may be captured in statements recognizing the role of traditional healers in response to AIDS and in statements casting doubt on antiretroviral therapy (Schneider, 2002; Department of Minerals and Energy, 2003). Written just two years after Mbeki contested HIV as the cause of AIDS, it is plausible that the statement of intent adopted some of Mbeki's extreme views on AIDS science. Regardless of authorial intent, however, language related to traditional healers, malnutrition, and poverty robbed focus from the HIV virus in the governmental response to the HIV epidemic.

Actionable articles within the statement of intent, unlike its cryptic opening statements, worked to produce an evidence-based response to HIV in South Africa's mining communities. The three parties (state, labor, and industry) committed to four key actions: (1) workplace HIV/AIDS policies, (2) HIV/AIDS wellness programs in mining communities, (3) promotion of voluntary counseling and testing (VCT), and (4) a minimal set of services for those living with HIV/AIDS. All parties agreed to enact workplace HIV/AIDS policies by 2004 so that "every workplace in the mining industry [would] have HIV/AIDS policies and programs in place...aimed at an encouraging openness about the disease" (Department of Minerals and Energy, 2003, p.2). The package of services mandated under these workplace HIV/AIDS policies included: (i) a continuum of HIV/AIDS care, (ii) ongoing counseling, (iii) information and advice in accessing social grants, (iv) access to wellness programs that may include antiretroviral drugs, and (v) strengthened partnerships to promote the optimal use of healthcare facilities (Department of Minerals and Energy, 2003). Though no specific provisions were made for TB treatment, it could be classified as an 'opportunistic infection' for which care was mandated.

The 2003 HIV/AIDS Mining Summit thus worked to package care for HIV-positive miners. A search for an official audit of the summit goals yields no results, but evidence from corporations like AngloAmerican are

encouraging. AngloAmerican's universal provision of antiretroviral therapy to all employees predated the summit by one year, and policies enacted after the summit reflect the goals of the statement of intent (AngloAmerican, 2010). The three-party response to HIV and TB in South African mines reflected a high level of organization relative to other AIDS policies of the early 2000s (Butler, 2005). Mining companies created the system of migrant labor that amplified both HIV and TB, but they were also a key party in the summit responding to the dual epidemic and continue to be involved in the response. Studies conducted in South African gold mining hospitals have furthered efforts to treat and prevent TB among miners living with HIV. Routine use of chest x-ray to screen HIV-positive miners for tuberculosis has helped increase screening sensitivity, making TB detection quicker and more accurate (Day, et al., 2006). Early detection is crucial, reducing the delay between infection and treatment and thereby decreasing the window of infectiousness. Preventive isoniazid treatment for HIV-positive miners has also proven effective in combating tuberculosis, helping reduce the incidence of TB by 38% among HIV-positive miners (Grant, et al., 2005). Combined, active case detection, improved case diagnosis, and preventive treatment are three of the most efficacious strategies promoted by the World Health Organization to reduce HIV-related tuberculosis mortality (UNAIDS, 2011). The gold mining hospitals included in the aforementioned studies are therefore on the forefront of medical care for HIV-TB co-infection.

Gold-standard policies documented in some gold mining hospitals and packaged HIV/AIDS care outlined in the 2003 HIV/AIDS Mining Summit reflect an effective three party response to HIV-TB initiated in the 21st century. Unlike the abstruse language of occupational law, policies outlined in the summit statement of intent promised better care for HIV-positive miners. Yet no audit of the summit outcomes exists, and it remains unknown how many HIV-positive miners have access to TB screening and prevention programs. One might cautiously speculate that the summit adequately responded

to a growing burden of disease, but data to assess such claims are missing.

The Role of Antiretroviral Therapy (ART)

The South African Government has specifically recognized miners as an occupational group at elevated risk for HIV-associated TB (SANC, 2011). In the 2012-2016 National Strategic Plan on HIV, STIs, and TB, the government mandated full implementation of HIV and TB care integration guidelines in mining hospitals (SANC, 2011). Integrated care for HIV-positive patients with TB is important, but earlier intervention may be crucial in allaying HIV-related TB infection. While ART is recognized for its benefit in extending the lives of persons living with HIV, emerging research suggests that ART may also decrease TB risk for HIV-positive persons. Lawn and colleagues (2010) found that ART reduced TB incidence by 67% in a cohort study of over 37,000 HIV-positive patients. The question then follows—to what extent could the roll out of ART reduce the burden of HIV-associated TB in South Africa?

Using mathematical modeling, Lawn and colleagues (2011) estimated that ART would reduce HIV-associated TB by half within 5 years of full coverage, with a 95% reduction in HIV-associated TB achievable after 40 years. Though ART decreases TB risk, HIV-positive individuals still experience higher long-term risk for TB than their HIV-negative counterparts (Lawn, et al., 2010). Low rates of current ART coverage and ART initiation at low CD4 counts may also decrease the efficacy of ART in reducing TB incidence (Lawn, et al., 2011). ART will be a critical strategy for the reduction of HIV-associated TB, but it cannot replace horizontal interventions aimed at case detection and TB prevention. When combined with ART, isoniazid preventive therapy (IPT) decreased HIV-associated mortality by about half (Charalabmous, et al., 2010). The extent to which combined IPT-ARV intervention reduces TB risk remains unknown, though the gain is likely greater than those achieved with a single treatment. In sum, an integrated approach to TB

prevention and HIV management and integrated care of HIV-TB patients are critical in reducing HIV mortality and TB incidence in mining communities.

Individual Response and Behavioral Change

An understanding of the response to HIV/AIDS is incomplete without understanding response at the individual level. While governments and organizations may take efforts to combat HIV and TB, these measures often depend on changes in personal behavior to succeed. Notions of HIV risk emerged in mining communities soon after the 1987 expulsion of Malawian miners as reflected in interviews with Malawian migrants in the early 1990s. Malawian migrants noted that South Africans stigmatized them as a high-risk group (Chirwa, 1995), perhaps in reaction to the government's early quarantine. Miners, then, were aware of HIV during the early years of the epidemic.

Contemporary studies of mining communities have focused entirely on heterosexual transmission of HIV. Homosexual relationships were certainly present in South African mines. Reports of *bukhontxana*, or 'mine marriages' between older male miners and younger male 'wives,' date back to 1904 (Harries, 1994). Though no estimates of prevalence exist, it seems that 'mine marriages' were relatively common during the first half of the twentieth century, later decreasing in the 1970s (Moodie, 1994; Moodie, et al., 1988). Stricter compound administration in the 1970s restricted homosexual encounters to specific rooms, marginalized 'mine marriages,' and shifted sexual encounters towards transactional sex with commercial sex workers and 'town wives' (Moodie, 1994). There are three reasons to believe that homosexual partnerships did not greatly contribute to the early spread of HIV among miners: (1) *bukhontxana* encounters involved non-penetrative sex, (2) 'mine wives' were mostly engaged in monogamous partnerships, (3) 'mine marriages' were not a common practice after the 1970s (Harries, 1994; Moodie, 1994; Moodie, et al., 1988). Thus, while the modern research paradigm has neglected the possibility of homosexual transmission of HIV within mining

communities, understanding the knowledge, attitudes, and practices of male miners engaged in heterosexual activity may better inform HIV prevention efforts.

Among heterosexual miners, knowledge of HIV is high, yet perceived personal risk is low (Day, et al., 2003; Gilgen, et al., 2001; Williams, et al., 2003). Healthy male gold miners in one study unanimously identified sexual intercourse as a mode of HIV infection, and most (94%) knew that condom use was a prevention strategy (Day, et al., 2003). When asked if they would personally pursue voluntary counseling and testing (VCT) if free antiretroviral therapy were available, however, just 14% said yes (Day, et al., 2003). Miners perceived workforce prevalence HIV to be low, and just 48% identified partner reduction as an HIV prevention strategy (Day, et al., 2003). It is thus insufficient to say that HIV knowledge is high among male miners in South Africa. Rather, knowledge of sexual transmission of HIV and condoms is high, but gaps in knowledge of other prevention strategies are substantial and perceptions of workforce prevalence are inaccurate.

The low perception of HIV self-risk among male miners makes them an unlikely group to change behavior in response to the HIV epidemic. While intervention efforts have targeted male miners, these interventions may fail due to a lack of perceived need. Williams and others (2003) report the results of a 1998 intervention in the gold mining community Carletonville, South Africa, which sought to increase condom use among male gold miners. Knowledge of HIV was high after the intervention, yet condom use remained low and there was little evidence of behavioral change (Williams, et al., 2003). The intervention—a community based effort that followed the script of peer education, condom distribution, and syndromic management for sex workers, community members and mine workers—was a failure.

The missing explanation for the failure of the Carletonville intervention can be found in Helen Epstein's *The Invisible Cure*, in which she interviews the lead Carletonville investigator Brian Williams. Epstein notes that a

small portion of miners infrequently paid for commercial sex, and that those miners who paid for sex frequently used condoms (Epstein, 2007, p. 92). In contrast, nearly half of miners had long-term township girlfriends and, trusting their partners, infrequently (if ever) used condoms (Epstein, 2007). Condoms are loathed as an intervention, as evidenced by their low uptake in the Carletonville intervention. Qualitative interviews with South African miners suggest that condom use conflicts with masculine norms and sexual preferences, which are strongly constructed and reinforced within the all-male environment of South African mines⁷ (Campbell, 1997). Miners have thus been resistant to condom use despite the threat of HIV in mining communities.

Condom use among sex workers in mining communities has also been inconsistent despite intervention efforts (Williams, et al., 2003; Campbell & Mzaidume, 2001). Just 42% of sex workers from the Carletonville study reported consistent condom use with every sexual partner, a post-intervention decrease of twelve percentage points (Williams, et al., 2003). Sex workers participating in a community-based peer education program neighboring a mine hostel also reported low condom use despite high levels of HIV knowledge (Campbell & Mzaidume, 2001). The investigators noted, however, that AIDS-related deaths were low in the mining community identified for intervention. In that community salience of AIDS-related deaths may strongly motivate behavioral change, more contemporary studies of similar interventions among both sex workers and South African miners are urgently needed.

Behavioral change may also occur within the context of tuberculosis treatment. Tuberculosis and HIV commonly co-occur, thus voluntary counseling and testing (VCT) promotion efforts have targeted untested TB patients for intervention. In 2003 study conducted in a TB clinical in Durban,

7 Seeley and Allison (2005) propose that risk taking, the product of fatalism and masculine ideals, becomes an 'occupational sub-culture' for certain migrant labor groups, including truck drivers, Lake Victoria fishermen, and miners (p.691).

TB patients reported low knowledge of antiretroviral therapy (26% percent of respondents correctly identified ART, and all thought it only prevented mother-to-child transmission; Gebrekristos, et al., 2005a). When educated about ART, 91% reported willingness to participate in ART if eligible, implying willingness to take an HIV test (Gebrekristos, et al., 2005a). The possibility of HIV-prevention within the context of TB treatment in South African mining communities remains unexplored, but perhaps offers an important opportunity for intervention.

Mining companies have also initiated intervention efforts. Rispel, et al. (2010) report mixed outcomes of a HIV/AIDS community training partnership program that took place at five De Beers diamond mines. In creating an HIV/AIDS Community Training Partnership Program, De Beers and the non-governmental organization SoulCity worked to reduce HIV stigma, increase HIV knowledge, and promote HIV prevention strategies. The program, while successful in rural mining towns, did not incorporate target communities in its design (Rispel, et al., 2010). Further, the program did not incorporate any TB prevention messages, a missed opportunity. Corporate responsibility, expressed via the implementation of behavioral change programs, is encouraging, but future programs should incorporate local preference and TB prevention messages in their design.

Future Directions

Facing the dual epidemic of TB and HIV produced by a historically migrant system of labor, the South African government and private actors have enacted treatment and prevention efforts in mining communities. The extent to which these efforts have reached migrant miners is unknown, though increasing corporate responsibility is promising. In compiling evidence of a dual epidemic of tuberculosis and HIV afflicting the population of migrant gold miners one feels the need for urgent response. The national and international response to HIV-TB co-infection has met mixed success and

simultaneously generated important recommendations for public health practitioners and governments. This section is dedicated to addressing the urgent question *what is to be done?*

One emerging theme among the recommendations for future response is the integration of tuberculosis and HIV treatment services in South Africa. Both the World Health Organization and evidence from South Africa support recommendations for integrated HIV and TB services, including case-finding, prevention, and treatment, to reduce the delay between TB diagnosis and treatment (Coetzee, et al., 2004; UNAIDS, 2011; Corbett, et al., 2006; Pronyk, et al., 2001). These recommendations have been integrated into the South African government's 2012 National Strategic Plan on HIV, STIs, and TB (South African National AIDS Council, 2011). Government commitment to integrated prevention and treatment, as evidenced by the name of the strategic plan, is both strong and increasing.

Researchers in South Africa have also documented an evidence base for community-based, traditional responses to tuberculosis treatment. Traditional healers and community-based treatment programs reduce cost, distance, and barriers to treatment; they are more preferred and achieve high completion rates, making them especially appropriate for rural settings (Wilkinson, et al., 1996; Floyd, et al., 1997; Tanser, et al., 1999; Colvin, et al., 2003). Such interventions should thus be assessed for appropriateness in rural mining communities, where community-based treatment may be preferred to treatment in mining hospitals.

The words of the great Nelson Mandela are a call to action: "We cannot win the battle against AIDS if we do not also fight TB." The government of South Africa, its citizens, its companies, and international organizations are now present in the fight. Researchers have identified tools to combat HIV-TB co-infection, and mining hospitals are working to implement evidence-based solutions. Yet the legions fighting HIV-TB are working against the tide of a migrant labor system that is largely still intact. While companies like

AngloAmerican and De Beers push prevention and treatment efforts, they shy away from a larger investment in a residential system of labor and family housing. Whether government and private actors address the migrant system of labor may be pivotal in the war on HIV and TB. The response must move ever forward, as inaction remains the greatest peril.

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Fresh Food Financing Initiative: A Replicable Practice in Detroit?

From PolSci 411: Hayley Sakwa (nominated by Joel Clark)

Hayley's writing mirrors Hayley's personality and thought-process. Hayley's writing is straightforward, well organized, and often personal, even in this formal research seminar paper modeled on a scholarly journal article. Hayley is able to handle complex answers to knotty public policy questions without losing sight of the fundamentals. Hayley is persuasive without being preachy. She lays out the problem and potential solutions in a solidly organized fashion, and she writes with a style that is simple but not simplistic, with sentences in active voice and with paragraphs that have rhythm.

Joel Clark

Fresh Food Financing Initiative: A Replicable Practice in Detroit?

Abstract

Purpose I evaluated the community assets in Philadelphia in 2004 that contributed to the implementation of the Pennsylvania Fresh Food Financing Initiative (FFFI) in order to determine whether or not a replication of the FFFI model in Detroit would be successful at improving access to healthy food for low-income residents.

Methods Through an in-depth examination of the reports released by The Food Trust, The Reinvestment Fund, and other sources on the Fresh Food Financing Initiative (FFFI), I identified three key assets that were crucial in the successful implementation of the program. I then reviewed the current landscape of Detroit to determine the extent to which these assets exist and can be leveraged for the implementation of a program similar to the Fresh Food Financing Initiative in Detroit.

Findings Based on the example set by the FFFI in Philadelphia, the greater existence of three key community assets – evidence-based reporting, community partners, and government support and funding – positively impacts the success of implementing a FFFI model in a community. Detroit possesses two of these important assets but likely lacks the third asset, government support and funding, which was essential to the successful implementation of the FFFI in Philadelphia.

Conclusions Detroit currently has the same three issues – lack of access to healthy food for low-income residents, economic barriers to supermarket development, and negative health outcomes related to the lack of healthy food access – that afflicted Philadelphia in 2004 and created a need for the Fresh Food Financing Initiative. The similar need for a grocery retail financing program in Detroit is apparent; however the inability of city and state governments to support or fund the program poses a challenge to the FFFI

model and suggests the need for modifications in order for a similar program to succeed in Detroit.

Introduction

As a child growing up in West Bloomfield, a wealthy suburb in Metro Detroit, my day began very differently than many kids living in the inner-city areas of Detroit. Every morning, after waking up and getting dressed for school, I came downstairs to my kitchen for a bowl of cereal and a banana, and grabbed the lunch my mother packed – which included a PB and J on whole wheat bread, an apple, carrots, and a cookie – as I headed out the door. Conversely, a child in Detroit my age may have gotten up and dressed, checked the pantry, even though he knew it was empty, and left for school on an empty stomach. While I was able to pay attention throughout the day in class after eating a full breakfast and lunch, he struggled to get through that day on the bag of hot cheetos he bought from the vending machine during lunch. After school I came home to a meal cooked or carried in that included lean meat, veggies, and grains; the Detroit student got a cheeseburger off the dollar menu at McDonald's while his mother rushed to make it to her late night work shift. While I went to bed after a day of feeling full and having eaten all the nutrients needed to be a healthy growing child, this child in Detroit and many like him went to sleep on an empty stomach after a day of inconsistent high-calorie, low-nutrient meals. Although these two examples are not depictive of every child's experience in Detroit's city and suburbs, the contrast illustrates a very important policy issue to be addressed.

In America today, nearly 18 million households (14.9% of all American homes) are food insecure, or do not have consistent access to the food needed to lead a healthy, active lifestyle.¹ At the same time, if the rising trend of childhood obesity in American continues, one-third of all children born in the United States in 2000 and later will suffer from diabetes; this number is closer to one in two children in minority communities.² While nearly one in

three of all American children are overweight or obese, children do not have enough to eat in 10% of American households with children – and neither of these statistics is trending downwards.^{1,2}

These two points seem clearly contradictory: How can American children be overweight or obese and also not have enough to eat? These trends, obesity and food insecurity, in fact go hand in hand. When children and families do not have access to the foods that are necessary for full and balanced meals, the effect is often a shift in diet to high-sugar, high-fat, processed – but more easily accessible – foods. When consumed in excess, such foods increase the risk of obesity, diet-related diseases and early mortality.³ Thus, food insecurity is not simply a measure of the limits of food access on how much individuals have to eat – it is also about how food insecurity can impact what they are able to eat. For many Americans, especially people in low-income and minority communities, access to healthy and affordable food is not easy to come by. Multiple studies have shown that presence of supermarkets, as well as the amount of healthy foods sold in neighborhood stores, is comparatively lower in low-income, minority communities than in more affluent and predominately white neighborhoods.⁴ To illustrate, more than half of Detroit residents live significantly closer to a convenience store than to a large grocery store; these stores are mainly for “fringe retail” purposes and typically provide fewer healthy food options for customers.^{4,5} It is not just proximity to healthy food that matters. Low-income residents are also less likely to have access to transportation to reach more distant

1 Coleman-Jensen, Alisha, et al. *Household Food Security in the United States in 2011*. ERR-141, U.S. Department of Agriculture, Economic Research Service, September 2012.

2 “Learn the Facts.” *Let’s Move!* 17 Nov 2012 <<http://www.letsmove.gov/learn-facts/epidemic-childhood-obesity>>.

3 U.S. Department of Agriculture and U.S. Department of Health and Human Services. *Dietary Guidelines for Americans, 2010*. 7th Edition, Washington, DC: U.S. Government Printing Office, December 2010.

4 Karpyn, Allison and Sarah Treuhaft. *The Grocery Gap: Who Has Access to Healthy Food and Why it Matters*. PolicyLink, 2010.

5 *Examining the Impact of Food Deserts on Public Health in Detroit*. Mari Gallagher Research and Consulting Group, June 2007.

healthy food options, and thus often must rely on this fringe retail for much of their grocery shopping.⁴ Furthermore, these convenience stores and smaller food stores are typically more expensive and offer less variety than large grocery stores.⁶ The concept of healthy food access covers a range of factors, from cost to availability to transportation, and each factor plays a role in the level of food security for individuals and families who are limited in their access to these needs.

As does any complex social issue, food insecurity has elicited a range of practicing solutions. From building community gardens in vacant lots to advocating for more government funding of school lunch programs, there are multiple opportunities to increase food access at all levels. One such practicing solution to food insecurity is investing in grocery retail in urban and rural areas in an effort to increase residents' access to healthy, affordable food. Several studies have found correlations between distance to the nearest grocery store and the level of public health in that area, using a range of variables and testing in multiple environments.⁴ To address this issue, local and state governments have engaged in public-private partnerships that incentivize large grocers to build stores in underserved areas through loans, grants, tax credits, or changes in zoning regulations.⁷ Beginning in 2004, the Pennsylvania Fresh Food Financing Initiative (FFFI) was the nation's first statewide financing program of this kind. Over six years, the program dispensed \$88 million in public and private funds to finance 88 fresh food retail projects in 34 Pennsylvania counties.⁸ In response to this highly innovative program, leaders in the field urged policy makers to replicate this program in other cities, states and in the nation, resulting in the addition of a Healthy Food Financing

6 Karpyn, Allison et al. "Closing the Grocery Gap in Underserved Communities: The Creation of the Pennsylvania Fresh Food Financing Initiative." J Public Health Management Practice 14.3 (2008): 272-9.

7 *Grocery Store Attraction Strategies: A Resource Guide for Community Activists and Local Governments*. 2nd ed. PolicyLink and Local Initiatives Support Corporation, 2007.

8 "Pennsylvania Fresh Food Financing Initiative." The Food Trust. 2008. The Food Trust. 17 Nov 2012. <<http://www.thefoodtrust.org/php/programs/fffi.php>>.

Initiative into President Barack Obama's proposed budget for 2011.⁹ In 2012, the federal government awarded \$32 million in grants to increase grocery retail in low-income communities in 14 states.^{10, 11}

This national recognition has shed light on the success of the Pennsylvania FFFI model, and its potential value for other cities. As grocery retail financing programs gain more attention and support, this paper seeks to inform the discussion about the implementation of Pennsylvania's FFFI model in other locales, all which have distinctive community needs and assets that will influence the potential success of such a program in that area.

With this in mind, this paper will examine and compare the particular landscapes of Philadelphia and Detroit in order to answer the question: Can a grocery retail financing program similar to the FFFI model be implemented in Detroit to successfully increase access to healthy and affordable food for low-income residents in the city? Through a comparison of the two cities, I found that although an initiative like the Pennsylvania Fresh Food Financing Initiative is necessary in Detroit in order to combat its food access challenges, which are similar to those that existed in Philadelphia, a replication of the Pennsylvania model might not be feasible in Detroit. Detroit possesses two of the major assets that were influential in the implementation of this program in Pennsylvania in 2004; however Detroit would likely lack the third crucial factor, government support and funding. This poses a challenge to the model, which was founded on a public-private partnership, and suggests the necessity for modifications if it were to be replicated in Detroit.

To back up a couple steps, making the case for investing in healthy food retail in low-income communities requires an understanding that socioeconomic status, health, and food access are interrelated. By reviewing

9 "News Release: Obama Administration Details Healthy Food Financing Initiative." 19 Feb 2010. United States Department of Agriculture. 17 Nov 2012.

10 "OCS Awards 38 Community Economic Development Grants." Office of Community Services. 2 Oct 2012. Administration for Children and Families. 1 Dec 2012.

11 U.S. Department of the Treasury. Community Development Financial Institutions Fund. *List of Award Recipients*. 2012.

existing research on these subjects, I will lay a foundation for why grocery retail is an effective and important practice for increasing access to healthy and affordable food for low-income urban residents – and answer why it is necessary to address this issue in the first place. My analysis of the Pennsylvania Fresh Food Financing Initiative and its ability (or inability) to be successfully replicated in Detroit will add to this body of knowledge by illustrating the importance of identifying particular community needs and assets when seeking to solve food access issues through grocery financing. For this analysis, I will first delve into the similar characteristics that make Philadelphia and Detroit cities in which grocery retail investment programs are necessary and important to improving food access and health outcomes for residents. After determining the existing need for such a program, I will highlight three community assets in Philadelphia that were crucial to the program's implementation and success in 2004. I hypothesize that, based on the case study of Philadelphia, the greater existence of these key factors is correlated with a greater success of the implementation of the FFFI model in any city. In a larger study with more resources, I would examine all of the cities in which the national Healthy Food Financing Initiative was implemented to see if these characteristics were equally significant to the success of those programs; however, within the limits of this study, I will focus only on Philadelphia because it was the city that the program began in and was originally created for. After identifying the important assets in Philadelphia, I will determine the extent to which these factors exist in Detroit in order to judge whether or not the FFFI model could be successfully implemented there. I will use these findings to suggest policy recommendations for Detroit regarding grocery retail financing as a method of improving food access for city residents.

Connecting the Dots: The Food Access – Health – Income Connection

It is fairly undisputed at this point in today's research that poverty is bad for health. On an absolute scale, a lower material standard of living has

negative affects on level of nourishment, personal and environmental safety, access to health care, and more. It is also well recognized that relative poverty, or the economic inequality within communities, countries, and the world, has a significant impact on the health. Populations that are in lower socio-economic positions in society are more adversely affected due to lack of access to basic health-related needs and social services.¹² These two forms of poverty, absolute and relative, are compounded in places like the United States, in which cities and neighborhoods are heavily segregated on the basis of socioeconomic status and race. The individuals living in such neighborhoods bear the burden of their own poverty, as well as the social and economic effects of living in worse physical environments that lack services, threaten safety, and perpetuate a cycle of inequality.^{13,14} In particular, income inequality, which is likely informed by these personal and environmental factors, is proven to have adverse impacts on mortality rates within individual countries.^{15,16}

In order to make a broader case for the connection between income and health, many factors can be substituted into this equation to come to similar conclusions. For example, one could replace the factor of income inequality with more general economic and social indicators of poverty; broader assessments of this kind also found a correlation between poverty and health. For example, one study proved that social and economic hardships experienced in childhood such as family dissension and financial struggles (self-reported) have an impact on physical and mental illness as adults.¹⁷ In other

12 "Poverty." World Health Organization. 2012. WHO. 1 Dec 2012. <<http://www.who.int/topics/poverty/en/>>.

13 Kawachi, Ichiro and Bruce P. Kennedy. "Health and Social Cohesion: Why Care About Income Inequality?" BMJ 314 (1997): 1037-40.

14 Wilson, William Julius. The Truly Disadvantaged: The Inner City, The Under Class, and Public Policy. Chicago: University of Chicago Press, 1987.

15 Kennedy, Bruce P. et al. "Income Distribution and Mortality: Cross Sectional Ecological Study of the Robin Hood Index in the United States." BMJ 312 (1996): 1004-7.

16 Marmot, Michael. "The Influence of Income on Health: Views of an Epidemiologist." Health affairs 21.2 (2002): 31-46.

17 Lundberg, Olle. "The Impact of Childhood Living Conditions on Illness and Mortality in Adulthood." Social Science & Medicine 36.8 (1993): 1047-52.

research, the health variable has been substituted for other indicators of poor health, such as prevalence of preventable diseases, obesity and BMI, condition of the community, and other factors.^{16,18}

When considering the underlying reasons for why poverty negatively impacts health, food insecurity is a major contributing factor. To validate this statement, two things must be proven as true: first, food insecurity must be correlated with poor health outcomes; and second, limited access to healthy food must be an existing concern in low-income communities. The first claim, that a lack of access to healthy food is a contributing factor to poor health, has been proven in the assessments of food accessibility in multiple American cities, which were compiled by The Food Trust in a report entitled “The Grocery Gap: Who Has Access to Healthy Food and Why it Matters”.⁴ In Philadelphia, lack of supermarket access for residents corresponded with higher rates of diet-related death.⁶ In Los Angeles, those who traveled significantly further to reach a grocery store than the control group weighed on average .8 BMI units more, equating to nearly five pounds more for a 5’5” person.¹⁹ In Detroit, over half of city residents currently live in areas of “food imbalance”, which, as coined by Mari Gallagher Research and Consulting Group, exists when residents must travel at least twice as far to reach the closest mainstream grocery store as they do to reach the closest convenience store. In the census tracts that have the highest levels of food imbalance, there is on average an additional 11 years of life lost due to diet-related illness per every 100 people, as compared to the average in-balance tract. Race, income, and education were held constant in all of these statistics.⁵ Although it is often difficult to determine causality with complex social issues such as health, these studies provide a clear indication that access to healthy and affordable food is impacting the health of America’s most vulnerable populations.

18 *Food Geography: How Food Access Affects Diet and Health*. Philadelphia: The Food Trust, 2006.

19 Inagami, S., et al. “You are Where you Shop: Grocery Store Locations, Weight, and Neighborhoods.” *American Journal of Preventive Medicine* 31.1 (2006): 10-17.

In order to claim that food insecurity is a strong contributor to the correlation between poverty and poor health, we also must demonstrate that food insecurity is an existing issue in impoverished communities. According to the U.S. Department of Agriculture, food insecurity in America is strongly associated with income. Over 41% of households below the official poverty line are food insecure, as determined by a set of questions about conditions and characteristics that identify households who are struggling to meet basic food needs. The survey was conducted as a supplement to the Current Population Survey and reached 43,770 households across the nation.¹ In addition to this study, the USDA reported that neighborhood environment also has an impact on residents' level of access to healthy and affordable food. The report, *Characteristics and Influential Factors of Food Deserts*, identified the criteria for food deserts and called attention to the prevalence of such areas in American society. A 'food desert', the buzzword in current food access conversations, is an area that meets both low-income and low-access standards set by the USDA. In other words, a food desert is a community in which a certain percentage of the population is below the poverty line and lives a set distance away or further from the nearest supermarket. With these criteria in mind, the USDA identified 6,500 census tracts in America that qualify as food deserts. The study also illustrated that median income is significantly lower in food deserts than in non-desert tracts, and this difference is greater when comparing tracts in urban areas. It also notes that unemployment and vacancy rates are higher in food desert tracts than non-food desert areas, and that census tracts characterized as food deserts have a higher concentration of minorities (including Hispanics) than other tracts.²⁰ With these correlations in mind, it is clear that food access is deeply intertwined with poverty and its influencing factors including income, unemployment, race, and environment.

As more policy makers and community organizers discover this gap in serving the needs of the community, various schools of action have

20 Dutko, Paula, et al. *Characteristics and Influential Factors of Food Deserts*. ERR-140, U.S. Department of Agriculture, Economic Research Service, August 2012.

emerged in order to combat food insecurity and increase access to healthy and affordable food for low-income communities. Four major ways to improve access to healthy food retail are: investing in new grocery stores, improving selection at existing food vendors, building urban agriculture, and supporting farmers markets.²¹ Since each community has particular needs and assets that make some solutions more needed and more successful than others, each of these methods are important and necessary for addressing different issues in different settings. This paper will focus on just one of these types of efforts, investing in grocery retail, because of the breadth of research that advances the important outcomes of such efforts. Research shows that those who have access to supermarkets are more likely than those without access to eat more fruits and vegetables, to maintain a healthy body weight, and to live longer.²² Grocery retail options provide a healthier and wider variety of food options, often at lower prices than “fringe” locations, or convenience and corner stores.⁶ In addition, investing in new retail provides the opportunity for economic development by creating jobs and tax revenue,⁴ increasing walkability,²³ and retaining spending dollars in the community that would otherwise be going to outside grocery stores.^{24, 25} Although these outcomes show merit in this particular solution, I will focus my research on investing in grocery retail as *one form* of increasing healthy food access for low-income families with the understanding that a successful eradication of food insecurity must stem from a combination of all of these efforts rather than just a single one.

21 “Improving Access to Healthy Food.” PolicyLink. 17 Nov 2012. <http://www.policylink.org/site/c.lkIXLbMNJrE/b.7718791/k.4526/Tools_for_Healthy_Food_Access.htm>.

22 Karpyn, Allison, et al. “Policy Solutions to the ‘Grocery Gap.’” Health Affairs 29.3 (2010): 473-80.

23 Zick, Cathleen, et al. “Running to the Store? The Relationship Between Neighborhood Environments and the Risk of Obesity.” Social Science & Medicine 69.10 (2009): 1493-500.

24 “Detroit Grocery Incubator.” Fair Food Network. 2010. The Fair Food Network. 15 Dec 2012. <<http://www.fairfoodnetwork.org/what-we-do/projects/detroit-grocery-incubator-project>>.

25 “Access to Supermarkets in Inner-City Communities.” The Reinvestment Brief 5 (2008).

Research Design: Examining Philadelphia and Detroit's Needs and Assets

In order to answer the question of whether or not the Pennsylvania Fresh Food Financing Initiative (FFFI) is a necessary and feasible program to increase healthy food access for low-income families in Detroit, two pieces of the puzzle must be addressed. First, Detroit's current situation must mirror Philadelphia's in 2004 in terms having of a pressing need for a grocery retail financing initiative to exist. Making this claim requires evidence that limited access to grocery retail exists in low-income areas and affects the health outcomes of residents in the city, as well as proof that providing financing opportunities will indeed attract more grocers to these affected areas. In addition to an existing need for a grocery retail financing initiative, there are particular community assets that are necessary in order to make the implementation of such a program possible and successful. The three major community assets that were essential to the creation of the Fresh Food Financing Initiative in Philadelphia, based on an evaluation of the program's reports, were: 1) evidence-based reporting on the food access and health needs of the city's residents, 2) community partners that have the knowledge and capacity to play crucial roles in the implementation of the Initiative, and 3) local and state government support and funding. I hypothesize that a greater existence of these community assets will lead to a more successful implementation of the Fresh Food Financing Initiative model. This hypothesis is based on the example set by the Philadelphia Initiative, which relied heavily on these three factors throughout the creation and execution of the program. If this hypothesis is proven correct, then an investigation of the existence of these assets in Detroit will be a strong indication of whether or not a similar model to FFFI could be successful in addressing the current food access and health needs of Detroit residents.

Similar needs *and* assets must exist between Philadelphia and Detroit for the Fresh Food Financing Initiative to be a model worth replicating in

Detroit. If Detroit has the needs that call for a grocery financing initiative but does not have the assets necessary to make it successful, then city stakeholders should seek to develop an alternate program that can capitalize on assets that do in fact exist in the city in order to effectively address residents' needs. Conversely, if the positive factors that were essential to the success of FFFI in Philadelphia are present in Detroit, yet the need is either non-existent or different, then the FFFI program would not be the correct solution to match the particular needs of Detroit residents. It is not completely black and white, however. If only some of these important needs and assets exist in Detroit, it is still likely that city planners and community stakeholders can borrow the general concept or pieces of the FFFI model as a foundation for creating a specialized program that is better suited for Detroit.

The Fresh Food Financing Initiative in Pennsylvania was needed in 2004 to address three key issues in the city of Philadelphia: limited access to healthy and affordable food for underserved families, the existence of barriers to supermarket development in low-income urban areas, and the negative health outcomes that stem from these residents' lack of access to healthy foods. While there are other factors that existed in the city that compounded the need for efforts to increase food access, such as the interconnected role that race plays in income, health, and access, these three issues were the most often addressed in reports on the Initiative and combined to illustrate a clear need for a grocery retail investment program in the community. The Food Trust, the community organization that urged stakeholders and policy makers to fund the FFFI, pointed to the existence of these issues in Philadelphia communities in a report they produced in 2001, which used six maps to demonstrate the strong connection between income, food access, and health in the city of Philadelphia. This publication and other follow-up reports played a major role in gaining the attention of the public and policy makers, convincing them that these problems could no longer be ignored, and acquiring the needed buy-in for the Fresh Food Financing Initiative model

to succeed.⁶ The Food Trust's focus on these three issues, and their ability to gain support from many influential players through this focus, demonstrates that together these three core issues make the strongest case for why a grocery retail financing program was needed in Philadelphia in 2004.

Reports on food access in Detroit have shown that these three challenges also exist for Detroit residents today. As was true with Philadelphia, the presence of these issues – limited access to healthy food, health concerns correlated with lack of food access, and economic barriers to supermarket development – demonstrate a strong need in Detroit for a program that will incentivize supermarket executives to build grocery stores in the low-income urban areas that need them most. A deeper understanding of these core issues, as they existed in Philadelphia and as they currently exist in Detroit, will help determine whether or not the Fresh Food Financing Initiative can be successfully replicated in Detroit to address the food and health needs of Detroit communities.

Issue #1: Lack of Access to Healthy Food The first major need in Philadelphia identified in The Food Trust reports was increased access to healthy and affordable food, particularly in low-income areas of the city. This variable of 'food access' is difficult to define in a comprehensive way since many factors go into food access, from the existence of grocery stores to the prevalence of federal food assistance programs to the availability of transportation and more. For the sake of this study, limited healthy food access in Philadelphia will be defined as The Food Trust defines it in their report: by the relative absence of adequate grocery stores in low-income areas compared to wealthier areas in the city.⁶ It is important to note that many people feel that the existence or lack of supermarkets alone is not an accurate indicator of access to healthy food because it ignores the positive impact of smaller, neighborhood grocery stores that are culturally specific and well integrated into

the community.^{26, 27, 28} Navigating this discussion could be another research paper within itself, with valid and important arguments on both sides. In addition, I recognize that it seems a bit deceptive to define limited food access in a way that ensures the need for the solution I am proposing (in other words, to argue that more grocery stores is the solution to better food access by defining limited food access as a lack of grocery stores). Even with these caveats in mind, however, this paper will operate under the conclusion that access to a grocery store is in fact a significant indicator of healthy food access and health, especially in Philadelphia. This is because of strong case made by The Food Trust's reports, which found that in Philadelphia communities that lacked access to supermarkets, residents were more likely to suffer from diet-related death than in other not affected communities.⁶ Furthermore, several state and nation-wide studies coincide with this claim, concluding that there are significant correlations between presence of supermarkets in communities and rates of fruit and vegetable consumption, obesity and BMI, and diet-related disease and death.⁴

Access to adequate grocery retail options in Philadelphia is measured in this paper based on the method used in The Food Trust report, which used the concentration of supermarket sales as an indicator of food access. Using a one-mile distance to distribute grocery store sales, The Food Trust report mapped the weekly grocery store sales volume onto a map of the city. The results showed that supermarket sales in Philadelphia were concentrated in a small number of areas in the city.⁶ By using this measurement, rather than

26 Kolata, Gina. "Studies Question the Pairing of Food Deserts and Obesity." The New York Times. 17 Apr 2012. The New York Times Company. 16 Dec 2012. <http://www.nytimes.com/2012/04/18/health/research/pairing-of-food-deserts-and-obesity-challenged-in-studies.html?_r=0>.

27 Stephens, Noah. "The Food Desert: Food Availability in Detroit." The People of Detroit. 25 Oct 2012. The People of Detroit Photodocumentary. 16 Dec 2012. <http://www.thepeopleofdetroit.com/2012/09/the-food-desert-food-availability-in_25.html#more>.

28 Devries, Danny and Robbie Linn. "Food For Thought: Addressing Detroit's Food Desert Myth." The Common Denominator. 8 Sept 2011. Data Driven Detroit (D3). 16 Dec 2012. <<http://newsletter.datadrivendetroit.org/2011/09/08/food-for-thought-addressing-detroit's-food-desert-myth/>>.

simply counting the number of grocery stores and looking at their location (although absolute numbers also showed that the highest-income areas in Philadelphia had more markets than the lowest-income areas by a ratio of 3:2), the report was able to illustrate two important concepts. One, by proving that supermarket sales are clustered in a few areas of the city, the report conveyed that a large number of Philadelphia residents were unsatisfied with the food options in their neighborhood and traveled a sizeable distance to shop for food elsewhere. Secondly, focusing on supermarket *sales*, rather than absolute numbers, brings to mind the economic impacts of having grocery retail in underserved neighborhoods. One example of economic benefit is added jobs – a study by The Reinvestment Fund shows that employees of grocery stores often live in the neighborhoods near the stores in which they work. In addition, the report notes that grocery stores can serve as “retail anchors”, or contribute to the neighborhood’s overall economic growth, by bringing traffic to surrounding stores and increasing the purchasing power of residents, who can now spend a smaller amount of their budget on food due to supermarkets’ lower priced and higher quality food.²⁵ Since grocery stores are not the only distributor of food in a community, the absence of adequate grocery stores in itself is not proof of a neighborhood’s limited access to healthy food; however the report also found that the areas with fewer supermarkets were many of the same areas in which low-income Philadelphia residents were more likely to suffer from diet-related health problems. This correlation is a powerful argument for increasing the number of grocery stores in low-income areas as a method of improving access to healthy food.

Similar to Philadelphia residents in 2004, many Detroiters are also currently limited in their access to healthy and affordable foods. According to the Mari Gallagher report, *Examining the Impact of Food Deserts on Public Health in Detroit*, over half of the Detroit population lives in areas that are considered “out of balance” in terms of every day food availability. This particular measure means that residents are twice as far or further from the

nearest grocery store than they are from the closest fringe location, such as a convenience store or fast food. To determine the areas of Detroit that have ‘food imbalances’, the report measured the distance between the geographic center of each block and the locations of each food venue in the area, and weighted each block to reflect the number of people living there.⁵ While this definition is different from the definition used to determine Philadelphia’s food access issues (which looked at concentration of supermarket sales), it remains within the same concept that having adequate access to a grocery store is a major component of having access to healthy and affordable food. In addition, this food balance statistic is particularly fitting for the city of Detroit because many Detroit residents currently buy their groceries from these “fringe” locations, which often have fewer healthy options and higher prices, rather than a more distant grocery store.⁶ Furthermore, since Detroit does not have a comprehensive public transit system and many residents cannot afford private transportation, this statistic’s focus on distance (rather than sales or number of stores) highlights these important concerns.

When discussing grocery stores versus fringe food stores, many community members and scholars raise the point that while Detroit has very few mainstream grocers, many of its smaller grocery stores and even corner stores are good providers of a healthy selection and wide variety of food. Honey Bee Market in Southwest Detroit is one such example of a fully stocked, culturally appropriate neighborhood grocery store that provides healthy and affordable options, but likely does not fall into the category of mainstream supermarket. To account for this, the Gallagher report included small and medium size grocers in their definition of supermarkets for the city of Detroit. Even with this adjustment, over half of the city’s residents were considered to live in areas of food imbalance. Furthermore, in a city that has 30% of its residents using federal food assistance benefits, these grocery stores (large and small) make up only 8% of the food stamp retailers, or retail locations that

accept food stamps as payment.²⁹ These are important statistics when considering Detroit's current need for better access to healthy food and the positive impact increasing grocery retail could have on this issue.

Issue #2: Economic Barriers to Supermarket Development The next variable that demonstrated a need for the Fresh Food Financing Initiative in Philadelphia was the existence of economic barriers to supermarket development in low-income urban areas compared to suburban areas. This is an important point in proving that FFFI was the right course of action for Philadelphia because it made the case for why a financial support program was needed to incentivize developers to build grocery stores in the area. In other words, if the disproportionate lack of grocery stores in urban neighborhoods was not based in economic disincentive, than a financing initiative would not have been the right solution. This, however, was not the case. Significant economic barriers to supermarket development did (and do) exist in low-income urban areas in Philadelphia. This refers specifically to higher start-up and operating costs for supermarkets in urban areas relative to their suburban counterparts. By examining the costs of multiple Brown's ShopRite (BSR) supermarkets in both urban and suburban Philadelphia, The Reinvestment Fund found that it costs nearly seven times more to train employees and five times more to cover security-related positions in their urban stores. In addition, operating costs such as ongoing staff training and maintenance are higher in their urban locations. Lastly, The Reinvestment Fund mentions Pennsylvania real estate taxes as another contributing cost that is higher for stores in urban areas.²⁵ These numbers indicate that the potential loans and grants provided by the Fresh Food Financing Initiative would successfully mitigate extra costs and thus encourage more grocery retail growth in low-income areas in the city.

These economic barriers to supermarket development are not unique to Philadelphia – they are obstacles that impact most American cities, includ-

29 "Equity." Fair Food Network. 2010. The Fair Food Network. 17 Nov 2012. <<http://www.fairfoodnetwork.org/food-system/equity>>.

ing Detroit. In urban areas, where there is often a less well-trained work force and higher crime rates, workforce training and security costs are likely to be higher than in suburban areas. In addition, supermarkets in urban areas must account for larger shrinkage (loss in product between point of purchase from supplier and point of sale) because of increased theft, as well as for potentially smaller profits due to the lower income levels of many of their consumers.³⁰ Yet even with these obstacles in place, urban residents need access to the healthy and affordable food that is sold in such grocery stores. This contrast in supply and demand demonstrates the need for a financing program in Detroit that would assist grocers in overcoming some of the financial burdens of building a grocery store in underserved areas. In addition to addressing important food access and health needs of Detroiters, bringing more grocery retail into Detroit communities would create needed jobs and earnings for a city in which nearly 35% of the population is currently living under the poverty line.^{31, 32}

Issue #3: Negative Health Outcomes of Limited Food Access The third key issue in Philadelphia that led to the creation of the Fresh Food Financing Initiative was the connection between residents' health and the presence (or absence) of grocery stores in Philadelphia neighborhoods. This was perhaps the most important of the three issues because it illustrated the negative impacts that stemmed from limited access to healthy food options in Philadelphia and called for urgent action. As previously mentioned, the Food Trust report found that lack of supermarket access corresponded with higher rates of diet-related death in Philadelphia, and these results are supported by other research outcomes across the nation.⁴ From increased mortality to increased health care costs, the negative social and economic impacts of poor health are obvious. Even so, exploring the economic return on investment

30 Berman, Marvin. Personal Interview. 12 Dec 2012.

31 *Poverty in Southeast Michigan*. Data Driven Detroit (D3), 2012.

32 Shuman, Michael H. *Economic Impact of Localizing Detroit's Food System*. Fair Food Foundation, 2010.

is also an effective way to encourage the implementation of food and health related policy. In order to do this for the FFFI, the Philadelphia Social Innovations Journal identified two potential positive health-related impacts of the program: reduction in chronic disease expenditures and increased worker productivity. A 10% reduction in both chronic disease expenditures and loss of worker productivity due to diet-related disease in Pennsylvania, which were seen as conservative estimates of the potential health impacts of FFFI, would result in \$2.13 billion in cost reductions. After factoring in jobs created and program expenditures, the Journal estimated a return on investment of over \$2 billion.³³ These estimates, coupled with the correlation between supermarket access and health outcomes in Philadelphia, indicated that the existence of a grocery retail financing program would be extremely beneficial in alleviating diet-related health issues in the city and the negative economic impact of these issues.

Similarly, the Gallagher report also concludes that as Detroit blocks become more “out-of-balance in terms of food access,” there are greater rates of diet-related illnesses and deaths. This finding, as in Philadelphia, suggests that a grocery retail financing program would have strong positive impacts on the health of city residents. The report uses “Years of Potential Life Lost” as a measurement for this correlation. This statistic is calculated by the total number of life years lost due to premature death per 100 people in a population from a particular cause, in this case diet-related death. When considering the many other contributing factors of health such as poverty, education, violence, eating and exercising behavior, safety of environment and more, it is impossible to determine how large a role the level of food access in a community played in the health outcomes found in this study. Researchers

33 Chirouze, Nicole Apollon, et al. “The Food Trust and the Fresh Food Financing Initiative: Eliminating Food Deserts.” *Philadelphia Social Innovations Journal*. May 2010. Philadelphia Social Innovations Journal. 15 Dec 2012. <http://www.philasocialinnovations.org/site/index.php?option=com_content&view=article&id=177%3Athe-food-trust-and-the-fresh-food-financing-initiative-eliminating-food-deserts&catid=21%3Afeatured-social-innovations&Itemid=35>.

addressed this issue by holding constant income, race, and education in order to account for some of these other determinants of health.⁵ Though they cannot determine causality, the high correlation between number of diet-related deaths and distance to the nearest grocery store is a strong indication that food access should indeed be included on the list of important factors that influence of health – and thus should be addressed through policy initiatives such as FFFI. These health needs, combined with the lack of healthy food access and the economic barriers to supermarket development in low-income urban areas, demonstrated a strong need in Philadelphia for the creation of the Fresh Food Financing Initiative in 2004 and point to the same need for the city of Detroit today.

After determining the need for a community-wide program, such an initiative requires leverage of existing community assets in order to be successful. In this study, I will analyze the effect of three community assets – evidence-based reporting, community partners, and government support – on the successful implementation of the FFFI. I hypothesize that a greater existence of these assets in the community will lead to a greater success of implementing the FFFI model in that community. To test this claim, I will be looking particularly at the model as it was implemented in the city of Philadelphia. Examining the model in the context of Philadelphia will yield the most helpful outcomes because Philadelphia was the first city in which the Fresh Food Financing Initiative model was implemented, and thus it is certain that existing community assets in Philadelphia played an influential role in the formation of the model. In other words, if I am seeking to analyze the community assets that were most essential to the success of the Initiative, the assets that the Initiative was built around in the first place are a likely choice.

Although focusing my study on the city of Philadelphia allows me to draw important conclusions about the role that community assets play in the implementation of the FFFI model, analyzing only one city limits the conclusive statements I can make from my research. In order to come to valid

conclusions about variance and correlation, one would typically do a comparative study of multiple cases to determine whether or not a greater existence of one variable in fact leads to a change in the second variable. Due to limited time and resources, however, I will only be examining the Initiative as it was implemented in Philadelphia. While this limits the causal arguments I can make, an in-depth study about the community assets that were influential to the FFFI in Philadelphia still brings to light important details to consider when seeking to replicate the model in other areas such as Detroit. An understanding of the important role that these three community assets – evidence-based reporting, community partners, and government support – played in the implementation of the model in Philadelphia is helpful in determining whether or not a similar FFFI model would be successful at alleviating food access issues in Detroit.

Asset #1: Evidence-based Reporting The first step identified by The Food Trust in the process for planning and implementing the Fresh Food Financing Initiative model is to ‘prepare and inform’, in order to convince stakeholders that the FFFI is a necessary and appropriate program to address important issues of food insecurity in your community.²² The Food Trust report, *The Need for More Supermarkets*, in 2001, was an essential piece in convincing stakeholders of the importance of implementing such an initiative in Philadelphia.⁶ In addition to illustrating the need to improve access to healthy food for city residents, the report identified stimulation of supermarket development as the solution that policy makers should focus on to solve this program. This narrowed focus allowed partners to rally around one particular policy goal and logically guided policy makers from a serious problem to a straightforward solution.

This report, issued in 2001, gave The Food Trust the proof that it needed to spur attention and action on this issue. The report motivated Philadelphia City Council to hold public hearings and convene a task force to identify potential policy initiatives into increase supermarket development

in the city. The City Council's dedication to the issue gained the attention of state representatives, which led to more public hearings and the issuing of a report by the Pennsylvania House Committee on Health and Human Services detailing the negative impacts of the "grocery store gap" statewide. All of these actions, prompted by The Food Trust's report in 2001, led to a state allocation of \$10 million in 2004 to create the Pennsylvania Fresh Food Financing Initiative.⁶ This trajectory, of which The Food Trust's report was at the very beginning, clearly illustrates the importance of issuing and publicizing an evidence-based report as a first step to implementing the FFFI model. In order to gain the attention and buy-in of needed stakeholders, the report must: a) prove that there is a lack of access to healthy food for low-income families by identifying the shortage of grocery stores in underserved neighborhoods, b) make the connection between lack of food access and negative health outcomes in the affected communities, and c) close with a clear policy suggestion that stimulation of grocery store development in the area would improve residents' access to healthy and affordable foods and subsequently improve health outcomes. These three arguments were evident in the 2001 report and in other follow-up reports, and were crucial to securing support from the next essential asset: community partners.

Asset #2: Community Partners The community partners in the Fresh Food Financing Initiative – The Food Trust, The Reinvestment Fund, and the Philadelphia Urban Affairs Coalition – each played a crucial role in the success of the program's implementation.^{22, 33} The Food Trust had a nuanced understanding of Philadelphia communities and a long history of advocacy for food and social justice issues. As the experts on food access problems and solutions, they were able to spread the message that the FFFI was a necessary and feasible policy for Philadelphia. In addition, during the program's implementation, The Food Trust worked with the supermarket industry, developers and communities, as well as evaluated applications for funding. The second partner, The Reinvestment Fund, is an innovative com-

munity development financial institution whose social investments expertise was crucial to putting the money in the right places to create impact. The Reinvestment Fund was responsible for aggregating the capital to fund projects, managing the grant and lending processes, and providing technical assistance to borrowers/grantees. While the State of Philadelphia allocated \$30 million for the Fresh Food Financing Initiative, The Reinvestment Fund leveraged these state funds to acquire another \$90 million in private funding.⁶ Without these finances, the Fresh Food Financing Initiative would simply have been an idea. Third, the Greater Philadelphia Urban Affairs Coalition worked to integrate FFFI into the Philadelphia community and maximize the social benefits of the program. Among other things, they contracted employment opportunities for women and minorities in the newly funded grocery stores.

Community partners such as these are crucial to the success of a comprehensive program such as the FFFI for a couple reasons. First, they have the capability to accomplish important tasks that the government body funding the program cannot, such as working with partners on the ground and leveraging private funding. Secondly, these community leaders are trusted by members of the community to understand and advocate for the specific needs of their neighborhood.³⁴ This trust and shared vision helps to smooth the tensions of integrating a new policy that impacts many community members, from store owners to neighborhood residents. Based on the example set in Philadelphia, it is clear that an FFFI model is more likely to succeed if the community has 1) an organization that understands the existing food access issues of the community and knows what action is needed to address the problem, 2) a financial institution that can aggregate and dispense funds, and 3) a group that can advocate for provisions in the Initiative that will address the needs of underserved populations, such as ensuring that new employment opportunities are being extended to minority groups in the community.

34 U.S. Department of Health and Human Services. Center for Faith-Based and Neighborhood Partnerships. *Let's Move Faith and Communities: Toolkit for Faith-Based and Neighborhood Organizations*. 2010.

Without these community pillars, a program of this scale and type would fail to gain the support of the community and would struggle to knowledgeably execute the program on a ground level.

Asset #3: Government Support and Funding In addition to community-based partners, the city and state governments in Pennsylvania played an essential role in the successful implementation of the Fresh Food Financing Initiative. Between 2001, when The Food Trust report was published, and 2004, when the FFFI was funded on a state level, city-wide public hearings and support from government officials helped to disseminate the message that there was an imminent need for a grocery retail financing program in Philadelphia. It was this sustained local government support that captured the attention of state officials and eventually led to the allocation of \$30 million over three years to fund a statewide program.⁶ In addition to this funding, which was crucial in leveraging the other \$90 million in investments, the FFFI was housed in State's Department of Community and Economic Development. This office acted as a hub to convene community partners, monitor the program, and ensure sustained government support.²² As shown, the government in Pennsylvania played an important role in the success of the FFFI model not only through funding, but also through local support that brought food access issues to the forefront of policy conversations. These conversations, propelled by task forces of community partners, have led to funding on a city or state level in New York, Illinois, and Louisiana.²²

As confirmed by an in-depth examination of the Pennsylvania Fresh Food Financing Initiative, evidence-based reporting, community partners, and government support and funding were community assets that were essential to the successful implementation of the Initiative in 2004. This case study illustrates that a greater existence of these three assets will likely lead to a greater success of the implementation of the FFFI model in any city. As mentioned, if some or pieces of these assets are present, it is likely that the program can be modified to fit the community's particular needs and as-

sets; however the success of this particular FFFI model strongly relies on the existence and strength of those three factors. In confirming this, I can now explore the Detroit community to discover whether or not these community assets exist, and thus determine the extent to which the FFFI model could be successfully replicated in Detroit.

Although the Detroit community could provide the essential partners and the evidence-based report that would be necessary to the success of an FFFI model in Detroit, it is unlikely that they would be able to gain the state or city-wide funding to make this public-private partnership model possible. With that said, if stakeholders were able to develop an alternate funding plan that could sustain the program, the majority of the FFFI model could prove to be successful at increasing food access to low-income residents in the Detroit area. First, the previously mentioned Gallagher report, *Examining the Impact of Food Deserts on Public Health in Detroit*, is an existing evidence-based report that could provide the needed arguments and credibility for the implementation of a Fresh Food Financing Initiative in Detroit. Based on The Food Trust report on Philadelphia's food access landscape, such a report should contain three things: 1) proof that there is a lack of access to healthy food by identifying a shortage of grocery stores in low-income areas 2) statistics that show the connection between food access and health outcomes by comparing affected and non-affected areas, and 3) a clear policy suggestion for increased grocery retail as a method to alleviate these food access and health concerns. Following these parameters, the Gallagher report is somewhat but not entirely fitting. The report clearly indicates food access issues in the city and their connection to negative health outcomes. In addition, the report also stresses that grocery stores are an important piece of healthy food access and urges policy makers to take action. Even so, the authors do not explicitly argue that incentivizing grocery retail should be pursued as a policy option – an important step in guiding policy makers to pursuing the FFFI model as a solution. Furthermore, this report is more scholarly in its language

and research than The Food Trust report, which was written in simpler terms in order to be understood by diverse audiences. In order for the Gallagher report to succeed at convincing multiple stakeholders in Detroit of the importance of a Fresh Food Financing Initiative, it must be modified and expanded to include these key factors. This follow-up report must highlight the important conclusions made in the Gallagher research in easy-to-understand terms, as well as draw a clear line from the city's existing health and food access issues to the policy solution of grocery store financing. This simple step would help to capture the support of policy makers and community members, and is crucial to realizing the goal of implementing the FFFI model in Detroit.

Secondly, there are many important players in Detroit that could fulfill the necessary roles that The Food Trust, The Reinvestment Fund, and the Greater Philadelphia Urban Affairs Coalition took on in Philadelphia. From the Fair Food Network to the Kellogg and Kresge Foundations, there are multiple community organizations and funding sources that are dedicated to improving the city of Detroit and the quality of life of its residents. These organizations recognize the food access and health needs of the community, understand the cultural nuances of the various Detroit neighborhoods, and are respected by city residents. In addition, Fair Food Network has already begun the process of stimulating grocery retail development in the city through their Detroit Grocery Incubator Project, which provides training and technical support to new grocery entrepreneurs in Detroit.²⁴

Yet even with these community partners in place, it is likely that Detroit will lack one other important stakeholder and the third necessary community asset: government support and funding. Detroit and Michigan, more than most, are struggling economically to continue to run basic public functions such as schools and existing social programs. In this harsh economic environment – which would likely be looking to cut, rather than increase, spending – it is unlikely that proponents of the FFFI model will find the government support and funding that is needed for the implementation of the

program. In addition, there are people and organizations that challenge the concept that Detroit struggles with food access issues and seek to dispel the “Food Desert Myth.”^{27, 28} These competing messages will also make it difficult to get city and government officials on board and comfortable with dedicating funding to the program.

Based on the results of my analysis of the Fresh Food Financing Initiative in Philadelphia, a successful replication of the model in Detroit would require needs and assets in Detroit that are similar to those existing in Philadelphia in 2004. Similar to Philadelphia residents in 2004, Detroiters face issues of limited access to healthy and affordable food options, economic barriers to supermarket development in urban areas, and negative health outcomes related to food access. In addition, Detroit possesses two community assets – an evidence-based report and community partners – that are crucial to the successful implementation of a FFFI model in the city. Even though all of these characteristics line up, Detroit lacks the third community asset that was essential to the implementation of the Initiative in Philadelphia: government support and funding. This poses an inherent challenge to the public-private FFFI model and suggests that its implementation might not be feasible in Detroit’s current economic situation.

With that said, the potential for a grocery retail financing program in Detroit is not entirely lost. There are many foundations and other organizations in Detroit that have continued to invest in the city and provide needed services for residents, even in the absence of government funding. Although the public-private partnership was a key piece of the Pennsylvania Fresh Food Financing Initiative, it is possible that Detroit could modify the model and instead foster a partnership between all private entities to begin this important work. If a program like this was implemented, it is likely that the outcome would be increased access to healthy food in underserved communities and positive health outcomes resulting from this improvement.

Future Considerations

As more research is published about the connection between poverty, food access, and health, considerations about various ways to solve food access issues will continue. Through this analysis of the Pennsylvania Fresh Food Financing Initiative, I have uncovered a few important lessons to contribute to these deliberations. First, utilizing existing community assets is a crucial piece of implementing any program aimed at addressing community-wide needs. Second and more specifically, the Fresh Food Financing Initiative model is likely to be most successful when those assets include evidence-based reporting, community partners, and government support and funding – although the model can be adjusted to fit communities that may not be equipped with these important assets. Lastly, while the city of Detroit has a strong need for an initiative similar to the FFFI and possesses some of the community assets that are essential to implementing such a program, its struggling economy will pose a challenge to obtaining the government funding that is a major component of the public-private FFFI model. Instead, community leaders should look at alternate sources of funding when considering the possibility of implementing a Fresh Food Financing Initiative model in Detroit. Lastly, the implications of this study extend outside of the cities of Detroit and Philadelphia. As community leaders across the nation consider the concept of a grocery retail financing program, they can replicate this comparative process in order to determine how compatible their communities are with the FFFI model based on the extent to which they possess these crucial community assets, and subsequently gauge the potential success of investing in such a program.

In addition, there are other factors of food access to consider that were not addressed in the small space of this particular study. Investing in grocery retail is not the only solution to address food access needs in a community. In Detroit in particular, there are many community organizations that are working to solve similar needs in different, but in no less important

ways. For example, Fresh Corner Café brings healthy food options to Detroit residents by expanding the selection of healthy foods at existing convenience stores in the city.³⁵ Also, Earthworks Urban Farm and other community gardens in the city help to strengthen community, educate children and adults on healthy eating, and grow fresh produce for community members in need.³⁶ These are just a few examples of the many community partners in Detroit, all of which are important voices to be included in a community-wide discussion about the best ways to address the food access and health needs of Detroit residents. As community leaders move forward with this effort, these important considerations will impact the success of implementing a Fresh Food Financing Initiative model in Detroit.

35 Fresh Corner Café. 15 Dec 2012. <<http://www.freshcornercafe.com>>.

36 EarthWorks Urban Farm. 2008. Capuchin Soup Kitchen. 15 Dec 2012. <<http://www.cskdetroit.org/EWG/>>.

Sweetland Prize for Excellence in Upper-Level Writing (humanities)

To Find a Voice

From Writing 300: Rachel Kalayjian (nominated by Lila Naydan)

Rachel's essay impresses me in part because of how far it came over the course of the semester. She worked hard to find a sophisticated voice as a creative writer, and as this final essay shows, she succeeds. She explores her Armenian family background in her piece and the struggle Ruthie undergoes to be heard and understood. The interior monologue reminds me, as a reader, of all the unspoken ideas that reside beneath the surface of our exchanges with others in the world. And the conclusion to her narrative—the fact that it's so abruptly someone else's turn to share a story—suggests the degree to which we commodify narratives and want to cycle through them as part of a mechanical process that seems to leave little space for reflection and understanding. I'm so impressed with what she says and leaves unsaid here. She leaves me thinking.

Lila Naydan

To Find A Voice

“I’m delighted to see so many familiar faces here today, but for those of you who are joining us for the first time, welcome to Mersop Boyajian Library’s monthly writing convention. As some of you might know, these workshops are held in the honor of Genvieve Masoovian, who was a brilliant novelist and patron of the library. She devoted her professional career to developing deep compassion for her characters, and in an interview shortly before she passed, Masoovian left her readers with one parting request: open your ears to silence. With that said, I’ll open the floor to anyone who’d like to share first!”

Ruth made it a habit of attending these conventions. She would sit for hours listening to the stories that were told, jotting down the words and phrases that resonated with her. This was the first time that she had something of her own to share. Ruth noticed that nobody ever wanted to go first, and she was dying to get this off of her chest. Her hands were shaking and her left foot was tapping uncontrollably to a frantic beat that was paralyzing her thoughts. She looked around at the small group of strangers and reasoned to herself that they wouldn’t be too critical of a first-timer. She grinned with a forced confidence, tied her hair back into a bun, and thought, “let’s see what they think.” She began.

“There’s a solemn beauty in silence. It resides on the bent and rusted nails stapled into light posts, in the rips and tears of an old soccer jersey, in the beaten planks of an old park bench. Silence lies upon wrinkled brows, resides within the tissues of a scar, and hides beneath the sudden flashes of light that render one breathless and shaken in a mid-night’s terror. Silence is the untold story lost in a heavy state of drunken love and resigned to the sorry crevices of an empty womb. Rarely does it beg for a glorious resurrection in some halleluiah story, and vulnerable it remains to be manipulated, twisted, and contrived into revealing some righteous defense or novel revelation. In

cautious reverence and thoughtful pause, silence graces the humblest of heart with a parcel of its truth.”

Ruth paused for a moment, looked around at the group of strangers in the circle, and continued to read.

Story One

Eve caught the solemn gaze in her father’s eyes as he approached the altar with an awkward gimp and a slight forward arch in his back. Her father never stood very straight.

“A reading from the Book of Job,” he began in a gentile articulation.

“O that my words were written down! O that they were inscribed in a book! O that with an iron pen and with lead they were engraved on a rock forever.”

She recalled the slight treble of his voice and how the thoughtful pause he gave to the final word of each phrase seemed to brazen them with grave reverence. It was with this same thoughtfulness that he would read to Eve tales of the Native Americans and of European conquest. He never intended that his daughter would come to understand the immense sorrow of history’s tragedies from the way that he told the victim’s story.

“For I know that me Redeemer lives, and that at the last he will stand upon the earth; and after my skin has been thus destroyed, then in my flesh I shall see God.”

Her father raised his teary eyes to the stained glass window overlooking the pews in an austere solemnity. His tired body was humbled by a mysterious, unspoken faith, and graced by a purpose larger than himself.

It took Eve a while to understand her grandmother’s outburst after dinner that one autumn evening. There was nothing significant about that day, nothing out of the ordinary had happened, but she noticed that sorrow had hug itself into the deepening lines above her Meme’s brow in the few moments she took to slowly sit at the table and cradle her forehead in with-

ered hands. Meme's attempt to clear her thoughts was in vein. Hearing her brother's voice at the end of the phone that afternoon was all it took to resurrect memories of her childhood—of the war, of the mother she never met, of the family she left behind at nineteen years after she ventured to the United States, fell in love and bore three children—only to find herself a single mother in a foreign country when Charlie died four years after their first kiss.

"I'm doing this out of love. Don't you know what love means?" she screamed at Eve when she insisted that her Meme not wash the dishes.

Eve held her Meme tightly as she walked into the funeral service, pouring every ounce of energy into a deep concentration to retain control of a tired and shaken frame. Funerals never went well after Charlie died. Her eyes were clenched tightly, her knees were giving way, and the diamond on her wedding ring was piercing itself into Eve's palm. Not a day went by that her Meme took her rings off. The scars remained in her heart, and on the temples of her face as burns from the shock therapy—a last resort to cure her depression.

It was a frustrating reality that Eve couldn't count on conversation to reveal the stories of her family's past. A thick French accent only reminded her Meme that she was a foreigner, and the only stories that her father could tell without a stutter were ones that were not his own. The murmured tragedies of the forgotten genocide of her Armenian people had been resigned to dusty albums and eventually lost to the pain of their resurrection. Untold tales of hardship that marked her father's childhood slipped silently through the cracks, yet remained in his mind as fragmented memories of a broken boy. Through silence, Eve was taught the beauty of an untold story.

Ruth paused to look around at a sea of blank stares. She got nothing from her audience. No feint indication that they were the slightest bit confused, engaged, or utterly bored. Was it too wordy? Overly dramatic? She never really clarified that Eve's Meme was the mother of her father. Did she need to? Did they catch that the parceled and fragmented story was inten-

tional? “A little sympathy wouldn’t hurt,” she thought to herself. Ruth cleared her throat and carried on.

Story Two

Every day, Jonah’s hands reminded him of the story that he would never be able to tell. He spent fifty-seven minutes that evening, and the three before, fumbling in a desperate attempt to fit his key into the pad lock on his side door after a ten-hour shift at the local dairy store. Terse lips, strained back, aching shoulders would have only revealed a glance to passersby of an austere perseverance that could have drafted novels and conducted orchestras—had it only resided in a more sympathetic frame. But it was 9:35pm and his body betrayed him once again.

He wasn’t asking it to rescue him from the prying hands of tormentors this time or to propel him away from oncoming traffic—and yet, his body was crumbling under the anxiety of a broken soul, and suffocating by the anguish in his lonesome heart.

A cold sweat engulfed Jonah. His eyes rolled into their sockets and almost harmoniously, the story of what could have been played out in his head.

They found him the next morning sitting at the kitchen table inside of his apartment, slumped over in his motor-chair with an empty bottle of Ativan lying at his feet.

Johan was a quiet man, and in his forty-seven years had never found the words to transcend the insurmountable fear that overcame him on a daily basis, to capture the meaning of his suffering, or to do justice to the inexplicable causes of his pain. Only after finding the strength to pry his worn frame onto the musty, stained mattress did they look square in his bloodshot eyes, peer with a raging betrayal at his broken, malformed limbs and placed the earphones of his CD player he had on his lap. A bumper sticker was wrapped around its circumference, “Mean people suck.”

Playing on repeat was a song that resonated like some omnipotent narrative, a distant voice that exposed a fraction of Jonah's reality. They were the only words that spoke to him, and that spoke for him.

"This is not the sound of a new man, or a crispy realization. It's the sound of the unlocking and the lift away. Your love will be... safe with me."

The only thing that Ruth could think of at this moment was the reactions she got when reading this particular passage to a few people. "What the hell is Ativan?" her best friend asked her. "Hunny, I'm concerned. This is beautiful, but you have to understand why it's worrisome for a mother to hear her daughter write about suicide!"

Ruth hoped that this audience would hear her message. Perhaps it wouldn't only be the Bon Iver fans who would understand the reference to "Re: Stacks" by Justin Vernon, and who would realize that Jonah carried love for life in his heart even despite his need to escape it. He had not made any new revelations, but needed to lift himself from his sorrow.

Ruth knew the feeling of self-doubt all too well. After her head stopped racing, she would tense up, bite her lip raw, and await the onslaught of criticism. What she dreaded the most was the depressed state of self-defeat that would set in soon afterwards. For some reason, she had not learned to become the empowered, self-assured, and strong-minded woman that she so admired. She needed a reader's approval like the air that she breathed.

In the moments after she finished reading this particular piece, however, a bizarre feeling overcame Ruth. The room full of bewildered and confused eyes did not inspire fear or anxiety, and a calm relief left her feeling strangely satisfied.

"These are all really interesting stories you've told, but I'm a bit confused. How do you plan on tying them together in your future draft?"

Ruth knew this was coming. It was the one question she had asked herself repeatedly, and had tried to answer when she revisited each story desperately searching for transitions, creative twists—anything to tie the plots

together. This question gnawed at her, but she decided to just let it be and to leave open the possibility that the connection was there somewhere, waiting to be found.

In the thirty-seconds of silence she took after the question was asked, eyes were nervously wandering around the room, and the mediator stole a glance at the clock.

“They are stories which had been resigned to silence, and it was in moments of silence that I found them. There is nothing really more than that,” she proclaimed.

But what Ruth really found, however, were pieces of her own story—fragmented ideas, thoughts, miniscule details, and inspirations that ultimately revealed the purpose why she writes.

The perplexed stares of these writers that she so much admired as a youth only confirmed one thing: Ruth would have to learn how to believe in her own voice if she wanted people to hear it.

The moderator assumed his role in the workshop by clearing his throat and writing down a few notes on a legal pad.

“Thank you, Ruth. Who would like to speak next?”

Ezra Pound, Aura, and the Memory of Time-Past

From English 340: Sam Walker

(nominated by John Whittier-Ferguson)

I'm going to put my end-comments in here. I should add that Sam got an A on every paper in the course and was an all-around extraordinary student in every way in the course.

"Sam, This is a stunning piece of work. You're laying out ideas across a range of Pound's career that are ambitious and capacious enough to sustain an entire honors thesis. Your writing is characteristically powerful, and your readings of particular moments in the poems are all first-rate. But / and what really distinguishes this essay is your articulation of big ideas that help put all of Pound's work into perspective. Thanks for your wonderful work this term. I don't know what you're going to be writing your thesis on in our department, but I'll just say that I don't think anyone's ever had the nerve to take on Pound! Maybe a first . . . Keep in touch, and have a wonderful summer."

John Whittier-Ferguson

Ezra Pound, Aura, and the Memory of Time-Past

Throughout the Middle Ages the citizens of Rome had a tendency to take architectural vestiges of classical/pagan buildings and utilize them in the construction of (then) contemporary buildings, including, ironically, the earliest Christian basilicas. This process is referred to as spoliation, and one historian notes that “when someone removes the hide of a building or tears out its innards, he resembles a cannibal. A cannibal does not devour his enemies mainly because he wants to nourish himself but because he hopes that in so doing he will acquire his destroyed enemy’s strength” (Brenk, 3)¹. Might this idea be applied to Ezra Pound and his Cantos? After all, Pound’s Cantos represent a near constant consumption and transformation of historical materials. He is, by the above definition, the ultimate poetic spoliator. It seems necessary to distill Pound’s incessant accumulation into something like a motive or cohesive, singular sentiment. For all of Pound’s “gathering up” of materials (spolia) an equal tendency in his work is to find a coherent, binding cord or strand (see, for instance, his fascination with Chinese symbols). The word I would put forward as the distilled center of the Cantos is “aura.” An etymological analysis of the word tells us that its current meaning includes the notion of “subtle emanation,” and its earlier origins come from “breath or breeze.” What we are looking at, then, is the “breath” of history, or the true “feeling” of a historic utterance. We will find that Pound’s dependence on historical aura changes, and throughout his Cantos he re-imagines the place and purpose of “aura” in his work.

Pound spends the earliest part of his Cantos on a quixotic search for the illumination of authenticity. His search takes him through various canons of literature, episodes of history, and a multiplicity of languages. The thing that makes this search “quixotic,” however, is his removal from original context. Without an attempt to capture the original situation of a work of

1 Brenk, Beat. *Spolia from Constantine to Charlemagne: Aesthetics versus Ideology*. Washington (D.C.): Dumbarton Oaks Research Library and Collection, 1987. Print.

art, the hope of capturing its original aura is near-impossible. Walter Benjamin, in his essay “The Work of Art in the Age of Mechanical Reproduction” writes that “even the most perfect reproduction of a work of art is lacking in one element...its unique existence at the place where it happens to be” (Benjamin, 1235).² What does Pound do to escape this anxiety of “out of place-ness”? From Canto 1 we see him attempting to revive old poetic forms and situations. The first lines of the Canto, “And then went down to the ship,/Set keel to breakers, forth on the godly sea, and/We set up mast and sail on that swart ship/Bore sheep aboard her, and our bodies also,” establish us in a place of historic weight and depth. Pound deliberately sets up his first Canto as a rebirth of the story of Odysseus’ descent into Hades, though interestingly he attempts to capture the aura of a Latin translation of “The Odyssey” by Divus suggesting, I think, that the “authenticity” of myth is a ductile idea. Despite his near-complete spoliation of this poetic situation from the Odyssey, Pound still feared that he missed something of the “aura” of the original in his translation, and wrote that “of Homer two qualities remain untranslated: the magnificent onomatopoeia...secondly, the authentic cadence of speech.” (Pound, 305).³ There is a fear, then, in Pound’s usage of classical situations, characters, and texts that something might be lost which cannot be found again. The fear for the loss of this “missing element” of history seems to me to be a fear of loss of aura.

Pound’s poetic spoliation continues throughout the early Cantos. Perhaps the most poignant example of this can be found in Canto IX. The focus of this Canto is a patron of the arts named Sigismondo Pandolfo Malatesta (1417-68). This character becomes emblematic for Pound because of his role in the “genesis” of various creative works. Pound, so fascinated with those who “make” and how they come to “make,” sees a certain histori-

2 Rivkin, Julie, and Michael Ryan. *Literary Theory, an Anthology*. Malden, MA: Blackwell, 1998. Print.

3 Pound, Ezra, and Richard Sieburth. *New Selected Poems and Translations*. New York, NY: New Directions Pub., 2010. Print.

cal vitality in the figure of Sigismondo. He attempts to capture the original aura of the figure by including, in their entirety, letters from the mailbag of Malatesta. Though these letters can seem unpoetic, and are chiefly prosaic, they reflect Pound's urge to recapture the illumination of the past. One brief example can stand as indicative of the whole attempt:

“Magnificent and exalted Lord and Father in especial my
lord with due recommendation: you letter has been pre-
sented to me by Gentilino da Gradara and with it the bay
pony (ronzino baiectino) the which you have sent me,
and which appears in my eyes a fine caparison'd charger”

Out of these ruins of seemingly insignificant discourse, Pound finds the story of one man who attempted to add splendor to the world. Canto IX ends with Pound looking at “old sarcophagi,/such as lie, smothered in grass, by San Vitale” (Pound, 149). In this verse we see Pound working through “fragments” and “ruins” of history, attempting to construct an original aura (by including the “letter bag”) through which he might better understand the illumination of “making”. Pound is intent on resurrecting the authority of these letters, and more largely the authority of his collected narrative of history (the Cantos) for, as Benjamin writes, “what is really jeopardized when the historical testimony is affected is the authority of the object” (Benjamin, 1236). Though Benjamin is mostly talking about the proliferation of art through mass-media (television, mass-printing, etc.), we see Pound grappling with many of these same questions of historical authority. Thus he includes historical dialogues and artifacts (the letters) in order to re-assert the authority of the past,

I think that at a point Pound's grand project of spoliation or “aura gathering” changes. This point seems to be Canto LXXIV. Where before Pound was obsessed with cataloguing the mythos of the past, at the point of

this Canto Pound begins cataloguing the mythos of the present. From the first stanza of Canto LXXIV we are made aware that this moment in history, the moment of Pound's capture, is something unique and reverential. He brutally recreates the murder of Mussolini and his mistress Clara, writing "Thus Ben and la Clara a Milano/by the heels at Milano/That maggots shd/ eat the dead bullock...but the twice crucified/where in history will you find it?" (Pound, 203). At this point in the Cantos there is no need to rely solely on the recovery of lost items from the past because history becomes present and fully realized. That question, "where in history will you find it?" asks us to consider the historical moment of fascism and its violent end as worthy subjects of history. Pound is in a unique position because he was a direct witness to the historical aura of Mussolini's reign. Where before he was forced to recapture the context/situation of historical/mythic situations, his position with respect to the historical subject of fascism provides him with direct perspective. Following this first stanza of Canto LXXIV there is a significant space after which Pound takes us into his "present" at the allied internment camp. We must understand, however, that Pound's present still involves a strange dance of mythos and reality. In the second stanza, after the significant space, Pound places us "under the tent flaps" and then, in beautiful flowing verse writes, "A lizard upheld me/the wild birds wd not eat the white bread/ from Mt Taishan to the sunset/From Carrara stone to the tower/and this day the air was made open/for Kuanon of all delights,/Linus, Cletus, Clement" (Pound, 203). Here Pound references the "Great Mountain" in China and the construction of the tower of Pisa. Thus, the contents of Pound's present, situated under a tent, a captive in Italy, are intermingled with Chinese myth and Italian history. He is able, then, to continue to spoliage from the past whilst constructing, for the first time, a notion of "aura" within the events of his life-time.

We must understand, however, that the light of authenticity Pound

is able to recover from his present is often a fractured, hysterical light. Pound begins to see luminous visions in minor events around his prison camp which becomes a fascinating poetic space. A key example of this occurs in his description of “Mr. Edwards,” an American soldier who shared a bit of charity with the captured poet. Pound writes “and Mr Edwards superb green and brown/in ward No 4 a jacent benignity,/of the Baluba mask: ‘doan you tell no one/I made you that table/methenamine eases the urine/and the greatest is charity” (Pound, 206). Firstly, the language of this section is truly striking. Where before Pound found it necessary to capture high, archaic language (see “The Seafarer,” for example), here Pound makes poetry out of a regional American dialect, thus presenting a far different “subject” of history. Mr. Edwards is upheld as an example of charity and he is given a voice in the Cantos alongside Homer, Virgil, and Malatesta. Simple actions like the making of a table become, for Pound, heightened into historically necessary acts. The soldiers around Pound’s camp play an important role later in Canto LXXIV. Sitting in filth “with Barabbas and 2 thieves” beside him Pound writes of “the slaver as seen between decks/ and all the presidents/ Washington Adams Monroe Polk Tyler /plus Carrol (of Carrolton) Crawford” (Pound, 208). The common soldier’s around the camp, Pound notices, share their names with American presidents. Thus American mythos is evoked amongst the incessant madness and pain of the camp (referred to as a “pig sty” in line with the story of Odysseus and his crew being transformed into swine in *The Odyssey*).

Based on the examples I’ve illustrated above it seems that Pound found it fit to include his historic “presence” in his grand document of human history (The Cantos). The paradox of this break from history is that Pound becomes the “subject” of history by virtue of a crisis concerning historical remembrance. The death of Fascism (with the death of Mussolini) represents, in Pound’s conception, a loss of the order/historical coherency

that Pound so treasures. Ronald Bush writes that “*The Pisan Cantos* became a poem devoted to shoring up a collective memory not only of the monuments that the Allies had so lamentably defaced but of an Italian culture rooted in antiquity and revitalized by Mussolini” (Bush).⁴ Pound becomes an increasingly desperate and isolated figure in Canto LXXIV. The physical destruction of the monuments which stood so profoundly at the center of his poetic project (and less profoundly at the center of Mussolini’s fascist project) presented Pound with the ultimate poetic crisis. Pound as restorer was faced with the allies as “destroyers” of the historical lineage which gave him his poetic subject and force, and it is precisely this crisis which allows Pound’s present to emerge as such a meaningful poetic space. Towards the middle of Canto LXXIV Pound writes “I surrender neither the empire nor the temples/ plural/ nor the constitution nor yet the city of Dioce/ each one in his god’s name/ as by Terracina rose from the sea Zephyr behind her/ and from her manner of walking/ as had Anchises/ till the shrine be again white with marble/till the stone eyes look again seaward” (Pound, 207). This is resilient, nostalgic verse. Notice, for instance, its formality compared with the free use of diction/syntax exhibited by the “soldier’s section” of Canto LXXIV. Here Pound evokes “lost” locations of antiquity: Dioce, the well-ordered city, and Terracina, the birthplace of Venus. He demands restoration of these destroyed, ideal places, asking that the “shrine be again white with marble”. It is at this point of destruction, when restoration seems so far gone, that Pound enters into his verse in his “present” state.

This desperate calling for restoration is manifested beautifully at the end of Canto LXXIV as well. Pound writes at the end of his Canto “dust to fountain pan otherwise /Hast ‘ou seen the rose in the steel dust/ (or swans-down ever?)/ so light is the urging, so ordered the dark petals of iron/ we who have passed over Lethe” (Pound, 210). Restoration becomes distilled into the image of the “rose in the steel dust,” referencing the natural order/pattern

4 Bush, Ronald. “Art Versus the Descent of the Iconoclasts: Cultural Memory in Ezra Pound’s *Pisan Cantos*.” *Modernism/modernity* 14 (2007). Print.

that forms when steel is rearranged in a magnetic field. Sieburth's notes tell us that Lethe is the "river of forgetfulness in Hades" and we see the tension between remembrance and forgetfulness that Pound is so acutely aware of in his captivity at the allied prison camp. The "rose in the steel dust" becomes increasingly less visible throughout the Canto, and this final push at beauty seems to be more of an elegy for things past than a hope for things to come.

So far I have tried to establish the unique significance of Pound's move from a focus on the myth of time-past to his intermingling of time-past and time-present in Canto LXXIV. The catalyst for this move is Pound's desperation upon witnessing the crisis of destruction. That is the tensile burst or springing forward which allows Pound to emerge as a subject of history. Despite his attempt to shore up historical "auras" in order to add order and continuity to his project of history, it is in this Canto that he recognizes a certain disorder in historical memory. Along these lines, Thesis IX of Benjamin's "Theses of History" presents an image of the "Angel of History" taken from a painting by Klee called "Angelus Novus." Benjamin writes of the angel that "His face is turned towards the past. Where we see the appearance of a chain of events, he sees one single catastrophe, which unceasingly piles rubble on top of rubble and hurls it before his feet" (Benjamin).⁵ I see Pound standing at the base of this angel, desperately going through the rubble and trying to remake and give order to the meaningless ruin which forms the truth of history. This is the misguided goal of fascism, and this becomes the central goal of Pound as well. Looking at the version of Hell Pound constructs before his "Pisan Cantos" we find a place of filth and disorder. The urgency, quickness, and vulgarity of his verse illustrate the pain and fear of disorder which is so central to his poetic project. "The slough of unamiable liars,/bog of stupidities,/malevolent stupidities, and stupidities,/the soil living pus, full of vermin,/dead maggots begetting live maggots,/slum owners,/usurers squeezing crab-lice, pandars to authority,/ pets-de-loup, sitting on piles of stone books"

5 Benjamin, Walter, Hannah Arendt, and Harry Zohn. *Illuminations*. New York: Harcourt, Brace & World, 1968. Print.

(Pound, 153). Hell becomes a place that “does not cohere.” Knowledge is forgotten (the stone books) and filth begets filth in an unending cycle of aimlessness. In short, Hell becomes a place akin to the foot of Benjamin’s “Angel of History.” Pound’s futile task is to re-capture the order of the past through an appropriation of original “aura.” He is a grotesque historian in this respect, not minding the distance that any historian might say is necessary in the study of the past, but placing himself as grand “coherer” or “rememberer” of cultural/historical lineage. It is at the point of greatest desperation, the point at the allied internment camp where Bush writes that Pounds suffered “symptoms that included “violent and hysterical terror,” “claustrophobia,” “confusion,” and a temporary but “complete loss of memory,” that Pound’s “present” emerges as a fit subject for mythos and history. Only through complete destruction is Pound able to see some “aura” in time-present.

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