Agricultural origins: A comparative analysis of the physical & cultural consequences arising from the introduction of agriculture into prehistoric South America and the island of Ireland

by Morgan L. Graumann

The Andean region of South America and the island of Ireland both adopted agriculture in wildly divergent manners, leaving distinct marks on their individual cultures. This study presents an overview of the contrast in agricultural adoption (that is, plant and animal domestication) in both the Andes and Ireland, as well as the subsequent respective cultural effects of those adoption techniques. In order to properly understand this relationship, certain factors must first be examined, specifically the available environmental resources at the onset of human occupation in each region, followed by the early experimentation with local resources leading to plant and animal domesticates, and concluding with a cultural analysis of each locale in the wake of agricultural adoption. Both regions began in similar landscapes, offering ample coastal and terrestrial resources for their respective nomadic settlers. While the Andes gradually developed their plant and animal domesticates independently, Ireland abruptly adopted Eurasian-born systems and adjusted their cultural trajectory along this alternative path. By comparing these two agricultural histories, an immense cache of traditions and diversities come to light backed by archaeological discoveries and decades of scientific work in both regions, overall illustrating how past agricultural traditions have a meerdirect and immense influence on finer cultural structure.

The adoption of agriculture transformed prehistory and initiated the journey toward modern societal complexity on both physical and cultural levels. These intricacies are illustrated through the diversity in both Andean and Irish agricultural origins. In order to present this vast history, the periods are broken down into an overview of the prehistoric environments to outline what was naturally available, followed by an introduction to each region's initial domesticates, an exploration of the height of agriculture including plants and animals, and concluding with the lasting symbolic and cultural implications of each individual journey. The purpose of this study is to present an overview of the contrasting agricultural adoptions in the Andes region and Ireland in order to examine the divergent cultural effects of their adoption techniques.

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Before proceeding, the areas of study must be properly defined. The terminology herein refers to geologic landscapes rather than political designations. "Andes" references the Andes region of eastern South America, which spans the length of the continent's western coastline and includes the Andes Mountain Range as well as the immediately adjacent pacific coastlines and inland valleys (Dillyhay 2011). This area runs through modern-day Venezuela, Columbia, Ecuador, Peru, Bolivia, Chile and Argentina (fig. 1). "Ireland" references the entire landmass comprising Ireland and Northern Ireland—the island as it exists apolitically (fig. 2) (Foster 1990). In contrast to the Andes, Ireland sports rugged, rocky shorelines surrounding lush, sprawling hillsides. Lastly, "domestication"

Figures 1 and 2. Illustrations of the Andes (top, red arrows) and Ireland (bottom, green) in relation to their neighboring countries and oceans. Figures created with ArcGIS, 2023 (M. Graumann).

references the intentional selections made on plants and animals that, over time, amassed to alter their phenotypic and genetic components. Overall, this analysis tends towards a gene-culture coevolutionary perspective while also considering gene-by-environment ideologies (Price and Bar-Yosef 2011).

Overall, a defining trait of humanity is the ability to transcend physicality in order to assign deeper meaning inversely embodied in these two cultures. More than mere sustenance, Andean crops equally influenced medicine, religion, status, and socio-cultural complexity (Dillyhay 2011). Conversely, Ireland has few individual symbolisms, valuing the physicality of farming as a whole (Kelly 1997; Masur 2012; Whitehouse et al. 2010: 16). The following examination contrasts the interlinked parallel technological, social, and agricultural evolutions of the Andeans, which formed lasting traditions and symbolisms, against the abrupt implementation of Near Eastern techniques throughout Ireland, which resulted in a fast- paced agricultural adoption which excluded interwoven cultural associations (Kelly 1997).

Before Agriculture: Understanding each Prehistoric Environment

It is generally accepted that initial indigenous South American settlers arrived in the Andean region between 22,000–16,000 BC with plant domestication following by 10,000 BC and animals evidenced around 5,000 BC (Graves 2001: 7–9; Leon 2014: 2; Stahl 2003: 471–473; Wing 1978: 18). Importantly, indigenous settlers existed as hunter-gatherers for over 6,000 years subsided by naturally available foods. Waterway mastery via boats and rafts is proposed as a driving influence for the earliest expansions down the South American coastline; however, until around 7,000 BC, the Andean coast lay 30 m lower than at present due to the additional seawater being trapped within thick terrestrial

glaciers (Leon 2014; Wing 1978). As such, any evidence for the earliest South American migrants and their initial resource usage is currently submerged. One of the oldest non-submerged nomadic sites sits along Ecuador's southwest coast, near plentiful clam-filled mangrove swamps surrounding an arid desert shoreline (Dillyhay 2011: 43–44). This site offers insight into one way South Americans survived before agriculture (Raymond 2008: 80). Another such site is the archaeological site of Monte Verde in southern Chile.

Bordering a portion of the south-central wetlands known for producing an abundance of year- round edible tubers, this site offered natural edible abundance to pre-agricultural nomads (Bonavia 2009: 32; Raymond 2008: 81). Moving inland, terrestrial cores indicate widespread dry, cool temperate forests around the mid-level mesolithic Andes, with an array of wild plants and animals allowing for plentiful broad-spectrum foraging; the highlands, however, remained uninhabitable due to glaciation until roughly 9,000 BC (Graves 2001: 93; Pearsall 2008: 112; Raymond 2008:80). On average, the Andes received ten inches of annual rainfall while being supplemented by over 2,000 fresh-water rivers meandering near mountainous valleys and caves, altogether making the region inviting for prolonged habitation (Leon 2014: 2; Wing 1978: 5).

Ireland's natural prehistoric fresh water was equally plentiful, with an estimated 12,000 lakes and rivers spanning the island (Ó'Fathartaigh 2014: 56–57; Meer, Reavy, and McCarthy 2013: 4–5; Westley and Woodman 2020: 223). The glacial Irish climate hindered northward human migration until 10,500 BC, at which time activity has been dated from an intentionally cut bear patella recovered from the Alice & Gwendoline

Figure 3. Ireland and Northern Ireland, with four sites discussed in this paragraph: Alice & Gwendoline Cave (green), Derry (purple), Coleraine (pink), and Belfast (blue). Figure created with ArcGIS, 2023 (M. Graumann).

Cave on the island's northwestern shore (Cornett 1966:239; Dunn *et al.* 2021: 4; Westley and Woodman 2020: 240; fig. 3). The first Irish settlers—called Ahrensburgians —were foragers who survived by hunting game and collecting the plentiful wild berries, plants, and hazelnuts (McLaughlin *et al.* 2016: 127; Westley and Woodman 2020: 241). Saltwater fishing was equally popular, particularly around the Irish Sea, with preserved mesolithic fish traps uncovered along the entirety of Ireland's eastern coastline (Ó'Fathartaigh 2014: 34–35; Westley and Woodman 2020: 241). Ahrensburgians were similar to Andeans in that they were quick to inhabit coastal areas in order to exploit the variety

of resources made available by such ecosystems (Kelly 2014:17). Rising sea levels have caused a great deal of coastal sites to become submerged, though tidal flow has luckily washed over a dozen stone tools ashore near Coleraine (Dunn e*t al.* 2021: 3–4; Westley and Woodman 2020: 232; fig. 3). Whereas South American migration is attributed to the water, initial Irish migration occurred over a land bridge (Meer, Reavy, and McCarthy 2013: 6–9). Thought to have connected northward to Scotland, the bridge continued to mainland Europe across the modern-day English Channel, creating a landmass estimated to have been passable until 5,700 BC (Meer, Reavy, and McCarthy 2013: 7; Dunn *et al.* 2021: 16). In Ireland, this route is evidenced by plentiful marine traps and tools spanning Belfast to Derry (Westley and Woodman 2020:227; Whitehouse et al. 2010: 16; fig. 3). Once detached from Scotland, the Ahrensburgians prospered as nomadic foragers (Meer, Reavy, and McCarthy 2013: 34). Prehistoric Ireland was fully forested and was therefore able to offer a wide breadth of natural subsistence options (Ó'Fathartaigh 2014: 24; McLaughlin *et al.* 2016: 120).

Figure 4. The location of the Las Vegas culture (green). World Travel Guide. 2022. Ecuador Facts and Geography. https://www.kids-world-travel-guide.com/ecuador-facts.html (Accessed December 20, 2022). Photograph.

In the time between this initial population and the introduction of agriculture, humidity increased slightly in both locales with the melting of terrestrial glaciers and subsequent rising sea levels, yet both environments remained the same terrestrially until agriculture began (Cornford 1966: 237; Kelly 2014: 7; Willett 1968: 1222). Despite the differences in terrain and climate, initial inhabitants of both the Andes and Ireland experienced similar benefits and challenges while adapting to their environments, entering their domestication journeys on similar footing.

Introducing Agriculture: Experimentation & Adaptation

Despite similar environments, these individual agricultural journeys contrasted deeply. In Ecuador's southwest, those to first domesticate plants were the Las Vegas people (Bonavia 2009; Raymond 2008: 83). These nomadic hunter-gatherers inhabited 32 currently known settlements over an area of 25 km^2 (fig. 4), some of which are known to feature early organic housing structures. This landscape coverage allowed them to utilize and experiment with both marine and terrestrial resources (Graves 2001: 9; Raymond 2008: 84). Dated to 10,000 BC from human-altered macro botanical remains in over a dozen midland Ecuadorian and Peruvian caves, the first Andean plant domesticates were squash, gourds, potatoes, and manioc (Bonavia 2009: 43; Graves 2001: 18; Leon 2014: 2) These were likely introduced as supplements to an otherwise broad diet. Favored for their rich carbohydrate content, these crops were able to thrive at a variety of elevations (Leon 2014: 3; Wing 1978: 33–35). It appears manioc was the first crop to be

further subdivided into sweet and bitter varieties, based on cave macro remains of the two strains from pottery fragments in midland Peru (Pearsall 2008: 106). Through years of trial and error, Andeans were ultimately able to domesticate an assortment of crops to fit their lifestyle.

Figures 5 and 6. Top: Mount Sandel & Céide Fields sites, mapped with ArcGIS, 2023 (M. Graumann). Bottom: Diorama from Céide Fields visitor center, approximating the Bronze Age site layout. Céide Fields Visitor Centre. 2022. Marcon Heritage: Céide Fields Visitor Centre Overview. https://www.marconheritage.com/portfolio-item/ceide-fields-visitor-centre/ (Accessed December 23, 2022). Photograph.

In Ireland, early agriculture differed immensely. The practice itself had been developed and mastered by Near Eastern migrants, bringing with them the fully-formed process upon their arrival to Ireland between 4,500–4,000 BC (Ó'Fathartaigh 2014: 65; Guttman-Bond *et al.* 2016:11). As such, early Irish agriculture featured notably decreased experimentation in comparison to the Andes, instead focusing on cultivating widespread farmland (Kelly 1997:82; Whitehouse *et al.* 2010: 16). The earliest mesolithic nomadic site is at Mount Sandel (fig. 5), just across from Scotland on the northern coast and dated to 7,000 BC, while the west coast's Céide Fields is the oldest known sedentary site, dating to 3,500 BC (Guttman-Bond *et al.* 2016: 13; Westley and Woodman 2020: 237; fig. 5). The location of Mount Sandel enforces the narrative that initial humans migrated across a land bridge from Scotland, while the remains at Céide Fields illustrate that sedentary life began from migrants entering via a direct Atlantic landing, a secondary method of entry correlating to a secondary subsistence strategy (Dunn *et al.* 2021: 4; Westley and Woodman 2020: 230). Céide Fields includes the earliest known examples on the island of dry-stone field walls—that is, walls made with stones unearthed from the fields themselves and intricately overlaid to negate the need for mortar, serving the dual purpose of clearing the land and setting clear property lines—alongside stone remnants of early homes and vast deforestation for the purpose of developing farmland (fig. 6) (Graves 2001: 93; Kelly 1997: 41–42). Dry-stone field walls were produced in highest abundance during the Great Famine of the 19th century, built on wealthier properties as a way for lowerclassmen to earn a daily wage; their appearance on this Bronze Age agricultural site is therefore especially intriguing (Byrne 2018: 3;

Millar 2014: 7–8). Notably, Céide Fields features three rectangular stone houses (Guttman-Bond 2016: 4; Meer 2013: 54). Nearly identical layouts have been uncovered across Ireland, the specific architecture of which all date precisely to the 4,000–3,500 BC arrival of Near Easterners (Guttman-Bond *et al.* 2016: 29; Whitehouse *et al.* 2010: 16).This pattern either indicates a preservation bias for the inorganic stone or evidences the swift diffusion and application of the sedentary practice by Near Eastern newcomers. Pollen records correlate large-scale deforestation with Eurasian arrival, indicating a decreased viability of nomadic life as inland resources were rapidly removed for farmland (Guttman-Bond *et al.* 2016:30; Whitehouse *et al.* 2010:18). As the Ahrensburgians lived on an island of finite resources, they had far less opportunity to deny or fight against the subsistence practices of migrants (Ó'Fathartaigh 2014: 31). Ultimately, it remains unclear whether or not agriculture was willingly adopted by the indigenous population (Leon 2014: 1).

In both regions, fluctuations in climate and ocean levels, coupled with population increases and advancing socio-cultural complexity, encouraged greater dedication to mass food production through farming (Dillyhay 2011: 33; Leon 2014: 2). That said, small groups persevere as nomads in both the Andes and Ireland, such as the Pehuenche and Pavees, respectively (McLaughlin *et al.* 2016: 139; Stahl 2003: 480). With this understanding of agriculture's earliest introductions, this analysis can apply a more rigorous pace towards the heyday of agricultural expansion.

Settling in to Agriculture: The Pace of Plant Domestication

Reconstructing accurate chronologies relies largely on material evidence, with macro remains in particular. providing the basis of these Andean and Irish agricultural histories. Largely within the lowlands of Peru and Chile, Andean caves offer brilliant physical preservation for archaeological material, including tools, pottery, and organic botanical remains (Bonavia 2009: 63; Dillyhay 2011: 74). Following the four above initial Andean domesticates (squash, gourds, potatoes, and manioc) was the oca tuber, domesticated by 9,600 BC as evidenced by macro remains on pottery in Peru's El Guitarrero Cave (Graves 2001:82; Leon 2014:2). Subsequent South American plant domesticates include lima beans (9,600 BC—El Guitarrero) (Leon 2014: 2), peanuts (7,000 BC—Zaña Valley) (Masur 2012: 10), amaranth and quinoa cereals (7,000 BC —Ayacucho Caves) (Bonavia 2009: 81; Pearsall 2008: 107), arrowroot and guava (4,500 BC—La Paloma) (Bonavia 2009: 54; Pearsall 2008: 110), and cotton and tobacco (4,200 BC) (Leon 2014: 3; Pearsall 2008:108). These crops proved to be equally hearty and thrived in variable climates, allowing them to be swiftly traded (Dillyhay 2011: 31). Strains of these domesticates have since been found as macro remains within caves in every Andean country, specifically due to the magnificent preservation ability of the cave environment (Bonavia 2009: 90; Genty *et al.* 2014: 83; Wing 1978: 5). Peru later developed a uniquely Andean strain of maize (5,600 BC – Huaca Prieta), domesticated contemporaneously to Mesoamerican maize yet proving to be genetically unique (Graves 2001: 65; Leon 2014: 3). Andean farms typically grew between ten and twenty crop varieties, with cave remains in Peru and Ecuador indicating an initial focus on staple food production followed by the gradual addition of cultural materials, including cotton and tobacco (Dillyhay 2011: 32; Graves 2001: 43). Interestingly, the addition of cultural material correlates chronologically with human movement into open, flat, more easily inhabited areas

(Bonavia 2009: 76; Pearsall 2008: 113). Cotton fabrics became useful as pre-ceramic food storage vessels and as netting for marine use, permitting new technologies and trade goods (Dillyhay 2011: 45). Tobacco was reserved for ceremonial use, for which its expanded growth allowed more diverse ritual within the region (Bonavia 2009: 77; Masur 2012: 17). Inter-cultural trade began quickly, indicative of increased production volumes and complexities in social outreach (Dillyhay 2011: 63; Stahl 2003: 476). Trade included the Mesoamerican chili pepper and tomato plants—both introduced to the Andes around 7,000 BC—as well as Brazilian sweet potatoes, which moved westward by 6,000 BC (Bonavia 2009: 55; Leon 2014: 2; Pearsall 2008: 114; Raymond 2008: 52).

While Ireland's natural resources differed from South America, both populations utilized that which was available. Native Irish plants included cabbage, seaweed, bittercress, garlic, nettle, dandelions, chickweed, hazelnuts, and berries (Dunn *et al.* 2021: 53; Meer, Reavy, and McCarthy 2013: 14–15). After migrant arrival around 4,500 BC, island-wide remains quickly included domesticated strains of Near Eastern grains such as barley, oats, wheat, and flax, with rye remaining curiously absent until nearly 1,700 BC (Guttman-Bond *et al.* 2016: 21; McLaughlin *et al.* 2016: 147; Ó'Fathartaigh 2014: 42; Whitehouse *et al.* 2010: 18). Even given rye's late arrival, no wild strains of these grains have been uncovered on the island, indicating they were introduced as fully domesticated grains without the need for experimentation (Kelly 1997: 90; Whitehouse *et al.* 2010: 19). As a byproduct of increasing human populations, diseases began spreading more rapidly and domesticates became further employed as medicinal remedies, which placed additional dependance on increased surplus (Masur 2012: 16). Interestingly, alcoholic fermentation has been dated to roughly 4,000 BC from structural ruins in Kilkenny near Ireland's southwest coast, while the Columbian Kuna people created Chicha maize beer during the Bronze Age (McLaughlin *et al.* 2016: 132; Masur 2012: 3). Such findings indicate shared alternative cereal uses, illustrating a globally communal social application of domesticates.

Settling in to Agriculture: The Pace of Animal Domestication

Native Andean animal species involved largely assorted camelids such as guanacos and smaller mammals such as pudus and chinchillas (Bonavia 2009: 43; Wing 1978: 32–34). Andean camelids were the first animals to be adopted into human societies as domesticates due to their genial nature and general ability to aid in farm work (Graves 2001: 3; Wing 1978: 33). Unfortunately, camelids were not nearly as useful as Eurasian cattle for physical labour, except for certain breeds of larger llama, and were therefore mainly relied upon to produce milk, wool, and meat (Dillyhay 2011: 34; Stahl 2003: 470; Wing 1978: 36). Beginning by approximately 5,000 BC, guinea pigs were an additional animal domesticated in Ecuador. At this same time, local camelids were being artificially selected into modern-day llamas and alpacas around the Argentinian highlands (Bonavia 2009: 36; Stahl 2003: 472). Each of these animals spread quickly across the region, as providers of meat, with camelids additionally able to manage heavier workloads than humans (Bonavia 2009: 56; Dillyhay 2011: 22). As well, a range of camelids have been described in ritual ceremonies and depicted in rock artworks (fig. 7) suggesting both ceremonial and economic roles within their societies (Dillyhay 2011: 23; Mader *et al.* 2018: 261). Llamas may have served a more familial

purpose as well, with sites across Peru including La Florida and Collanco revealing intricate llama burials laid aside human family members (fig. 8) (Mader *et al.* 2018: 266; Stahl 2003: 471).

Figures 7 and 8. Top (7): Camelids depicted in rock art, Peru. Bottom (8): Llama burial, Collanco, Peru. Figures reproduced from Mader *et al.* (2018) under a CC BY-NC-ND 4.0 licence.

Native Irish fauna included ocean fish, birds, wild boar, badgers, deer, bears, and medium-sized canids, as well as the now-extinct aurochs (Dunn *et al.* 2021: 17; Meer, Reavy, and McCarthy 2013: 44; Westley and Woodman 2020: 234). Introduced Eurasian domesticates included cattle, oxen, sheep, and goats, with remains on the southwest coast's Dingle Peninsula revealing the presence of domesticated cattle and sheep by 4,350 BC, indicating that plant domesticates arrived roughly a century before large-bodied animal imports (Guttman-Bond *et al.* 2016: 24; Kelly 1997:4 3). These new domesticates expertly aided farm work in addition to providing milk and meat in a far more effective manner than was seen in the Andes (McLaughlin *et al.* 2016: 120; Ó'Fathartaigh 2014: 55). While some academics argue this aid was increased in Ireland due to the fully domesticated nature of the introduced species (Kelly 1997:45), others argue that the difference is based in the genetic physicality of the mammals (Dunn *et al.* 2021: 74; Ó'Fathartaigh 2014: 57). As animals became kept in closer proximity to human settlements, their manure was more reliably available and fertilizer became more consistently utilized (Dunn *et al.* 2021: 76–79).

Typically, fertilizer is created by blending manure with sands, soils, and clays, and can be found as either a macro-remain in itself or as a percentage of whichever plant material sprouted from the fertilized plot (Graves 2001: 9; Raymond 2008: 85). Fertilizer use became common as communities adopted sedentism globally because the need to yield stronger harvests amplified, with an ever-increasing penalty for failure (Dillyhay 2011: 63). Additionally, manure was a popular fuel source for fires, particularly around Irish moorlands (Kelly 1997: 30). While Ahrensburgians did preserve meat largely through fermentation, the introduction of Near Eastern pottery allowed for more efficient, updated storage technologies (Dunn *et al.* 2021: 28; McLaughlin *et al.* 2016: 131). At their earliest use, domesticates in both

locales were additions to an already broad diet; however, as populations expanded and urban centers developed, an increasingly greater surplus was required (Bonavia 2009: 54–55; Kelly 1997: 32).

Settling in to Agriculture: Harnessing Water

Initial experimentation with agriculture could be managed with natural rainfall and nearby streams, but as agricultural practices expanded there arose a need to divert additional water to crops in a manner which could be regulated and controlled (Meer 2013 :45). To aid river-fed fresh water, ground wells and simple irrigation systems began to supplement farms around 5,600 BC in the Andean Zaña Valley and by roughly 3,900 BC across Ireland (Leon 2014: 2; Whitehouse *et al.* 2010: 18). This further illustrates the progression discrepancy between gradual Andean adaptations versus quickly implemented Irish innovations, as the Zaña Valley can be distinguished as a specific site of irrigation integration, yet irrigation spread so rapidly across Ireland that sites cannot be distinguished by mere chronology. As Andeans moved into the highlands around 9,000 BC, they quickly implemented terraced farming—a practice observed in places such as China and the Arabian Peninsula (Dillyhay 2011: 42; Leon 2014: 3). Terraced farming served the dual purpose of conserving water in elevated, drought-ridden localities while equally working to produce stronger and more protein-heavy harvests, all while adapting to a unique, vertically based farming landscape (Pearsall 2008: 111; Wing 1978: 57). Despite Ireland's rugged landscape, terraced farming was not developed, as the need did not arise nor did the space permit (Ó'Fathartaigh 2014: 15). Overall, the introduction of resources into agriculture varied based on regional need and availability, illustrating the capacity of each population to understand and utilize their terrain while introducing man-made techniques to strengthen their harvests.

Putting It Together: The Lasting Cultural Implications of Agriculture

The previous similarities and differences in environment, innovation, and utilized resources are physical, but the greatest contrast between Andean and Irish agricultural practices lies in the respective cultural influence of agriculture. With an understanding of the agricultural progression in both the Andes and Ireland, more symbolic associations can be drawn between the domesticates and their respective cultures. Symbolism is important within the evolved complexity of our species—a means for deeper contemplation of the self while equally expressing traditions and values (Jung 1991:10). As steady farming facilitated rapid and centralized population growth, culture became redefined within these growing sedentary societies. Greater populations and increasingly available sustenance allowed the formation of formal customs, hierarchical division, and complex social institutions as early as 3,000 BC in the Andes (Dillyhay 2011: 54; Leon 2014: 1). Academically, Andean civilizations are considered "pristine" because their advancement occurred without external influence (Bonavia 2009: 41; Pearsall 2008: 117). Though—as previously illustrated by Mesoamerican chili peppers and Brazilian sweet potatoes—the Andeans were hardly alone. Yet their evolution to sedentary life would have been successful on their own merit, with trade relations simply a product of their overall evolving complexity (Leon 2014:1). Further, plants became symbolic entities in addition to nourishment. Lima beans

flourished in the fertile soil, but as representations of life and death they remained largely reserved for ceremonial and political use (Dillyhay 2011: 45–46). Similarly, peanuts held such prestige that they were often included in mortuary and religious ritual (Masur 2012: 23–27). Chili peppers grew well, but the exotic taste became synonymous with elite society as populations stratified (Pearsall 2008: 109). Tobacco was almost exclusively used for ceremonies, along with some strains of maize in Real Alto (Bonavia 2009: 45; Dillyhay 2011: 36). An additional domesticate, the coca plant, had medicinal and stimulant properties which allowed people to believe they were transcending the heavens (Pearsall 2008: 109; Raymond 2008: 88). Psychologist Carl Jung argued that these types of cultural structures of symbolism were "the key to the cure of souls" (1991: 10), allowing human groups to relate deeper to their surroundings and thereby each other. The Incans built on early Andean mysticism to create mythologies and ceremonies that survived Spanish conquest, still involving diverse agricultural products today (Masur 2012: 14; Wing 1978: 23). Potatoes were domesticated into over 4,000 varieties around the Andes as they were believed to bless childbirth and hold medicinal properties—a reverence still observed today (Graves 2001: 23–25; Pearsall 2008: 107). Alternatively, Andean feasts are rife with intensely specific tradition. Only elites were permitted exotic foods like llama and chili peppers, whereas commoners were served legumes and potatoes (Bonavia 2009: 53; Masur 2012: 2; Pearsall 2008:41). Every ingredient reflected a deeper symbolism: life, death, wealth, power, and so on; the economic dish value was less important than the ideological nature of each particular piece (Masur 2012:7; Raymond 2008: 85; Wing 1978: 94). Such complexity indicates the value of Andean agriculture, mirroring the effort spent to craft symbolisms against the time taken to diversify their crops (Dillyhay 2011: 52–54).

Altogether, the specific crops utilized and venerated in Andean society reflect the cultural evolution of the area, elevating the crops from forms of mere bodily sustenance to markers of social and cultural importance.

To contrast, the earliest Neolithic Irish culture has become essentially extinct, with foraging practices erased by sedentary agriculture and modern culture influenced by the Celts from 1,000 BC and later by the arrival of Christianity in 400 AD (McLaughlin *et al.* 2016: 130; Ó'Fathartaigh 2014: 56). With less cultural connection to individual crops, there was less need for diversification. Potatoes were presented to Ahrensburgians by Near Eastern migrants as a well-yielding crop for dietary purposes and, at their height, were only split into 200 varieties (Graves 2001: 43; McLaughlin 2016: 139). Placing less importance on individual crops, farming as a profession holds more value as a family-learned skill, passed traditionally through generations as a means to produce steady yield (Kelly 1997: 75; Westley and Woodman 2020: 241). Strong farms form hearty meals, shared by the family unit along with friends and neighbors. Conversely, the Irish place their cultural value on the full crop assortment because it reflects their history—a whole hoard of grains arrived at once, so they are valued as a whole. Moreover, growing agricultural complexity coincides with Irish population stratification, as emerging political reforms began to implement heavy crop taxes and began clearly setting apart families of different classes (Meer, Reavy, and McCarthy 2013: 42; Westley and Woodman 2020: 242). Additional evidence for early ranked and stratified societies in Ireland is in the discrepancy among burial wedge-tombs, a specific mortuary practice which dunnbegan around 3,000 BC and varied immensely in size and ornamentation based on

the social status of the deceased, coinciding with the social stratification observed agriculturally (McLaughlin *et al.* 2016: 132; Ó'Fathartaigh 2014: 45). Overall, the cultural adaptations made in each region illustrate a wide range of human variation regarding the building of societal values and the beginnings of stratified society—food was becoming more than just food, it was culturally symbolic and deeply representative. Altogether, Irish agriculture is a symbol of a family's strength and unity with no need for additional symbolisms.

Concluding Remarks

The Andes and Ireland followed very similar physical paths in their adoption of agriculture and sedentary living, with differences emerging in their Neolithic origins and Bronze Age cultural organization. Both regions began with water-fed and fertile forested landscapes featuring ample resources for their nomadic settlers. The Andes gradually developed their domesticates independently while Ireland abruptly adopted Eurasian-born systems. However, both regions evolved larger sedentary societies while maintaining farms with human-derived innovations. The opportunity for the Andes to work alone allowed for individual symbolic associations, ultimately influencing their culture, whereas Ireland regarded agriculture in its entirety. These methods of agricultural introduction have resulted in direct differences, observed in cultural traditions, archaeological diversity, and the overall agricultural and societal complexities exhibited by modern Andean and Irish cultures.

Show me your garden and I shall tell you what you are.

(Albert Austin 1896: 112)

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