

EXPANDING CONTEXT: A LOOK AT THE INDUSTRIAL LANDSCAPES
OF ASTORIA, OREGON, 1880-1933

by

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This thesis examines the possibility of a broader approach to the concept of “context” within the practice of historic preservation by producing a more inclusive model for preservationists to use in reading dynamic cultural and environmental systems. The industrial landscape of Astoria, Oregon with its buildings and ruins of once dominant fishing and canning industries serves as a case study to explore this idea. The author examines late 19th century and early 20th century industrial development in terms of cultural influx, industrial landscape development, and vernacular architecture. This thesis explores how the landscape has responded to influences such as economic shift, environmental change, migrant populations, and technology, and how cultural landscapes and the natural environment combine to form a distinct human geography as reflected in

architectural and material remains. Many of the issues raised are specific to maritime, west coast, and extractive industrial settlements.

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To my parents

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CHAPTER I

INTRODUCTION

Kyllä työ tekijäänsä neuvoo¹

Cultural landscape concepts have a place within the field of historic preservation. To explain why certain forms came to be built as they were, and what effects, direct or indirect, disparate cultural elements had on those forms, has long been an important aspect of any preservation study. Both cultural landscape studies and historic preservation work with the translation of the cultural into the material, and are interested in the forces behind the production of cultural form. Differences between the two types of study are primarily related to the scope and emphasis of each, and much of that difference is related to the value of time. Preservation is primarily concerned with historic *objects*—individual structures that embody a specific social history; while cultural landscape studies seek to describe *systems*—the constantly evolving interconnections directing use and adaptation of cultural form within the environments they inhabit. Cultural landscapes imbed historic structures in their context, recognizing the landscape itself, and its ongoing changes, as the focus of analysis and evaluation.

While cultural landscape themes are beginning to have a larger presence in preservation thought, it is not a simple translation, nor is it necessarily common practice. Many in preservation feel that incorporating the wider angle of cultural landscapes could compromise the integrity of valuable historic structures and environments by disconnecting them from a

¹ Finnish saying, meaning “the task teaches the doer”

specific time period. Conversely, many who work with cultural landscapes do not necessarily recognize the value of preservation efforts.² Here again is the issue of relevant time period — some involved in cultural landscape studies view preservation as antithetical to the idea of a living landscape, preferring to maintain the movement and evolution of a landscape over an interpretation of historic integrity.

Effective analysis of cultural landscapes involves aspects from related but disparate fields of study such as history (document sources), architectural history (regional design influences), cultural geography (migration and spatial relationships), and archaeology (correlation and classification of material remains). All of these disciplines have established traditions for understanding historic and cultural material, context, and change, and each offers relevant and valuable methodologies and insight.

The development of Astoria, Oregon's salmon fishery, from 1880 to the 1930s, is used as a case study for this thesis. Maritime environments, especially those built on diverse immigrant labor, are especially difficult to analyze as a cohesive landscape. Specific questions regarding analysis, interpretation, and preservation of coastal communities are gradually being addressed, though their complexity can often be daunting. Resource extraction-based industrial communities like Astoria are necessarily complex, with multiple and shifting cultural and economic influences. Focused studies of specific cultures within a complicated landscape advance understanding of cultural expression, but also present a myopic view of life if left without describing multi-cultural interactions that shaped both place and experience.

Vernacular industrial forms, also, must be examined and treated differently than vernacular housing forms, but should not be completely removed from their cultural base, as they

² Melnick, *Preserving Cultural Landscapes*, 16

often are. Industrial forms and physical networks are specific to cultures, and as such need to be included in cultural landscape analysis. I chose to study and include concepts from these fields because my interest was to create a coherent, multi-disciplinary approach to viewing *context* more inclusively than traditional historic preservation practice. Preservation has evolved from an avocational, arguably aesthetically-inspired private pursuit to an academically codified study of material culture. It has done so by constant revision of its own concepts; critiquing and adapting conceptual approaches and techniques from other disciplines working with similar themes and material. Thus, historic preservation is by nature cross-disciplinary, regularly using ideas and methodologies from a wide array of fields.

Preservation remains, on the whole, a profession of advocacy. I have always understood its purpose to be one of advocating the retention and integrity of historic structures as vital element of communal space, in order to maintain an essential continuity of human history in our physical environment. Such advocacy continues to be necessary; especially with our vernacular landscapes, which generally lend themselves less to broad appreciation. These buildings and landscapes represent tangible and public evidence of our history, our craft, our industry, our culture — and we are among those who speak for them. We have fought, debated, convinced, learned from, and educated the public and ourselves as our essential professional purpose. But naturally the field changes, and is changing. There is a broadening of scope within historic preservation that recognizes more dynamic interrelationships, multi-disciplinary approaches, a longer sense of time/more inclusive memory, and increasingly places “context” on a par with the retention of structural integrity and/or basic physical presence. Increasing communication between professional disciplines that are concerned with understanding landscapes will better serve the landscape itself, by producing more integrated and more creative methods of handling our common environments. This study is intended to encourage that effort of inclusion.

CHAPTER II

FRAMEWORK

“Space is permeated with social relations; it is not only supported by social relations but it is also producing and produced by social relations.”¹

A basic inclusion into any preservation-oriented analysis is a discussion of context. Context describes the social and environmental influences that provide for the development of a particular building or type. Historic contexts typically provide background information about the patterns of history and development that shaped a particular geographical area, and links local patterns with important historic trends and themes.² Context includes who built and why, the prescriptions of the environment, the cultural background of the people or population the structure is intended to serve, and any affecting changes over a determined period. In general, historic contexts supply a summary history that relates significance by using documentary evidence to place a building within a sociocultural timeline.

The difference between context and cultural landscape lies in the scope and emphasis of each. Historic contexts describe the social and physical environment around a particular building, district, or architectural typology. The structure or structures are the focus. Cultural landscapes, by contrast, consider buildings an ancillary part of their cultural and physical surroundings, focusing instead on the patterns of landscape as a whole. While historic context is limited to the development and relationships of a specific material

¹ Henri Lefebvre. *The Production of Space*. trans. by Donald Nicholson-Smith. [Editions Anthropos/Blackwell Publishing, 1974] 52.

² U.S. Department of Interior, National Park Service. *National Register Bulletin #30: Guidelines for Evaluating and Documenting Rural Historic Landscapes*, by Linda McClland and Robert Melnick. [Washington D.C., 1989] Revised, 1999.

object, cultural landscapes seek to explain and describe the (ongoing) results of an interaction between culture (people), landscape (region/environment), and time.

Definitions of cultural landscapes tend to be general and broadly inclusive. Though disciplines that deal with cultural landscapes create their own nuanced definitions, “cultural landscape” commonly denotes the results of an interaction between people and place; any and all human-made forms or changes imposed upon or reacting to a natural environment. Essentially, “. . . cultural landscapes exist virtually everywhere human activities have affected the land.”³ While landscape studies in general describe the natural environment altered by cultural production and response, a specific cultural landscape might more specifically describe a relationship between particular cultural patterns and a particular environment. Regardless of whether the focus is general or specific, studies of cultural landscapes seek to explain and describe the “transformation of natural space into social space” or the interrelationship of physical geography to cultural geography in both functional and associative terms. Basically, the purpose of cultural landscape studies is to examine how the landscape impacts people, and how people impact the landscape.⁴

Cultural landscape studies has only recently begun to appreciably impact Historic Preservation scholarship and practice.⁵ Historic preservation has traditionally been concerned with the protection and conservation of individual or interrelated collections of architectural structures. While there is a strong contextual emphasis in understanding and assigning cultural significance to historic architecture, both the generally accepted guidelines

³ Robert Z. Melnick “Considering Nature and Culture in Historic Landscape Preservation,” in *Preserving Cultural Landscapes in America*, edited by Arnold Alanen and Robert Melnick. [Baltimore and London: The Johns Hopkins University Press, 2000], 3.

⁴ Paul Groth, “Frameworks for Cultural Landscape Study.” in *Understanding Ordinary Landscapes*, eds. Paul Groth and Todd Bressi. [Yale University, 1997]

⁵ Although cultural landscape ideas have been included in geography, landscape architecture, and vernacular architecture studies since the 1980s, it has not been a primary theme in preservation study. see Richard Longstreth and Robert Melnick.

and material approach have been geared toward working with either a single, independent structure, or groups of independent structures. Cultural landscapes, by contrast, are comparably more dynamic, presenting a very different set of issues in addressing their preservation. One of the primary conflicts between traditional western historic preservation practice and the study of cultural landscapes is in how change is addressed. Preservation has largely sought to arrest change, usually by selecting a period of significance and restoring or maintaining the historic resource as close to that state as possible.⁶ Using preservation criteria for cultural landscape preservation quickly becomes problematic, as cultural landscapes are composed of elements in a state of constant change, elements that “grow, mature, erode, move, die, and revive.”⁷ Change is viewed as an essential theme in cultural landscapes, and as a destructive force in historic preservation. If cultural landscape concepts are to be incorporated into preservation theory and practice, some adjustments in preservation approach and shaping of cultural landscape’s broad definitions are needed. System of analysis must be created that can both “respond to changing details of landscape,”⁸ yet are contained enough to offer workable models for preservation application.

“because we are too interested in continuity and authenticity, we tend to ignore change and ambiguity... We should turn our attention away from a search for the authentic, the characteristic, the enduring and the pure, seeking settings that are ambiguous, multiple, often contested, and examining points of contact and transformation...”⁹

Though different criteria and emphasis of historic preservation and cultural landscape

⁶ David Lowenthal “Age and Artifact: Dilemmas of Appreciation” in *The Interpretation of Ordinary Landscapes: Geographical Essays*, edited by Donald Meinig, [New York: Oxford University Press, 1979.]

⁷ Arnold R. Alanen “Considering the Ordinary; Vernacular Landscapes in Small Towns and Rural Areas,” in *Preserving Cultural Landscapes in America*, edited by Arnold Alanen and Robert Melnick. [Baltimore and London: The Johns Hopkins University Press, 2000.], 3.

⁸ Melnick, *Considering Nature and Culture*, 35.

⁹ Dell Upton, “The Tradition of Change” *Traditional Dwellings and Settlements Review* 5 (1993), 14.

studies offer the appearance of conflicting goals, broader landscape evaluation has become increasingly important in preservation practice. Familiarity with cultural landscape concepts offers preservation increasingly inclusive interpretations of context, including once peripheral components such as paths of circulation, water sources, and landforms, as well as culturally associated meanings of place. Expanding context to emphasize landscape systems allows for new perspectives and new possibilities in analysis, evaluation, and treatment of valuable cultural/vernacular historic landscapes. However, incorporating cultural landscape ideas into preservation thought presents some interesting challenges. For example, cultural landscapes are generally comprised of larger, more temporally and spatially dynamic systems (of which historic structures are a part), which can make selecting a single significant period difficult if not generally inappropriate. As Architectural Historian Richard Longstreth noted, “changes that may have eroded the historical value of a place may nonetheless be important contributors to a cultural landscape.”¹⁰

Another issue might be the respective values placed on material culture, and differences in the interpretation of landscape integrity. In preservation, integrity is a distinctly physical component. It represents the “authenticity of a property’s historic identity, evidenced by the survival of physical characteristics that existed at a particular time in the past.” Integrity is thus fundamentally connected to material coherence, and as such can be difficult to translate into an inclusive, fluid understanding of landscape change.

The conflict between historic preservation and cultural landscape systems of thought can be characterized as object-centered versus process-centered. Methods of analysis and evaluative criteria are needed to shift focus from exclusively buildings to the wider landscape, looking at historic structures as “significant not only as relics representing a

¹⁰ Richard Longstreth, *Cultural Landscapes: Balancing Nature and Heritage in Preservation Practice*, [Minneapolis: University of Minnesota Press, 2008]. 2.

particular point or period in time but also for their fluidity, endurance, and subtle presence in the face of ongoing physical and ideological change.”¹¹ Inclusion of process-based evaluation should be undertaken without entirely abandoning the value placed on preserving intact material history within the landscape.

Terms used by various professional fields to distinguish contributing elements of cultural landscapes, to separate the symbolic from the material, the functional from the associative, are sometimes vague and often contentious and overlapping. *Cultural, vernacular, ethnographic, historic, industrial*, are terms that can be useful in distinguishing different components of cultural landscapes, but can also vary widely in their definitions depending on the focus of the person using them.

Defining some of these terms may be useful here. “Vernacular” is intended to describe something organic or indigenous, that essentially belongs to a people, place, and time. In architecture it denotes a folk-derived material form, as well as the process for arriving at that form. Vernacular describes the most common techniques, features, materials, and technology of a particular historical period, area, or group of people. In vernacular construction the builder is usually anonymous; the built form is not immediately responsive to changes in popular style or structural innovation beyond the practical realities of environment; and it is often built by the owner and composed of familiar forms/patterns and available materials. Informal rules of design and traditions of construction are the primary governors of its form. Vernacular architecture is thus defined largely as a communal and cultural construct, rather than as an individual, professional, or aesthetically designed form.

Vernacular landscapes, by extension, also evolve unintentionally and usually represent

¹¹ Melnick, *Considering Nature and Culture*, 35.

multiple layers of time and cultural activity.¹² In this sense, they are indistinguishable from cultural landscapes. Indeed, in many cases the broad definitions of vernacular and cultural landscape appear to be relatively synonymous. The term “vernacular landscape,” then, offers a shorthand descriptor of (in)formal, organic architecture within a particular setting, and of the methods of material construction which may have been involved. Function also plays a significant role in vernacular landscapes. Essentially, a vernacular landscape is a landscape that “evolved through use by the people whose activities or occupancy shaped it.”¹³

Specifically cultural elements, including both the tangible and the intangible, might be better described as an ethnographic landscape. Ethnographic landscapes involve the shaping of form or attribution of meaning that essentially describes a “distinctive way of transforming nature into culture.”¹⁴ Some, like Anthropologist Donald Hardesty, offer a clear distinction between vernacular and ethnographic landscapes. In his view, vernacular landscapes “generally reflect, often unintentionally, repetitive human activities such as farming or mining, [while] ethnographic landscapes mirror the systems of meanings, ideologies, beliefs, values and world-views shared by a group of people.”¹⁵ His intent is to distinguish unique cultural forms (ethnographic) from universal human activity (vernacular). This distinction may be useful in separating out landscape components within specific studies, but it notably characterizes industry as a social function somehow outside of culture, which it is not. Industrial organization is also a uniquely cultural approach to

¹² Alanen, *Considering the Ordinary*, 5.

¹³ Melnick, *National Register Bulletin* #30, 7.

¹⁴ Donald Hardesty, “Ethnographic Landscapes; Transforming Nature into Culture.” in *Preserving Cultural Landscapes in America*, edited by Arnold Alanen and Robert Melnick. [Baltimore and London: The Johns Hopkins University Press, 2000.]

¹⁵ Hardesty, *Ethnographic Landscapes*, 169.

a particular landscape, as any comparison between Native American fishery development and Euro-American fishery development could demonstrate. As John Damron noted in his dissertation on the development of salmon trolling on the Columbia River, the “development of a fishery is a cultural response to the presence of a resource, and a decision to exploit it based on economic values.”¹⁶

It should be noted, then, that terminology, usually intended to distinguish the different aspects of cultural landscapes, often serves to render it exclusive to one particular focus or another. While this may be unavoidable, it should not be unconscious. That said, considering the social and material complexity of cultural landscapes, analytical models must be constrained in some manner to function effectively. This study draws its boundaries with concepts taken from the fields of cultural geography and industrial archaeology.

Cultural Landscapes and Cultural Geography

“...when a person faces the environment he may see alternately an operational farm, a pleasant scene, and a type of social order. Should these clues amalgamate into a vividly coherent whole in the mind's eye, what he sees is a landscape.”¹⁷

Explaining the transformation of landscape and the physical environment as a product of culture has traditionally fallen to cultural geography. Expressions of social organization are explored primarily in spatial patterns and imported cultural forms. Adaptations of building form and landscape organization are seen as a direct cultural response to regional topography and climate. How a space is organized can both reflect and determine cultural perceptions; “. . . a social group and its spaces, particularly the spaces to which the group belongs, and from which its members derive some part of their shared identity

¹⁶ John Damron, “The Emergence of Salmon Trolling on the American Northwest Coast: A Maritime Historical Geography.” [PhD diss., University of Oregon, 1975], 11.

¹⁷ Yi-Fu Tuan, “Thought and Landscape: The Eye and the Mind's Eye.” in *The Interpretation of Ordinary Landscapes: Geographical Essays*, edited by Donald Meinig [New York : Oxford University Press, 1979.], 97.

and meaning.”¹⁸ Natural environments become distinctly creative elements within a culture; defining use, encouraging adaptation of form and identity, and offering settings for the expression of social meaning.

Within the field of historic preservation, the most familiar definition of cultural landscape follows the theories of cultural geographer Carl Sauer. In his influential work, *The Morphology of Landscape*, he presented an understanding of cultural landscapes as a visible, physical, material setting altered by a cultural overlay. “Culture is the agent, the natural area is the medium...the cultural landscape the result.”¹⁹ He focused on the observation of landscape forms, including population, housing, and transportation networks, to trace change and decipher the layers of human occupation. As methodology, Sauer stressed field work, primary sources, migration, and diffusion patterns, as well as the intensive study of the “development of regional cultural areas and human interaction with environment.”²⁰

In her essay, “Landscape Preservation and Cultural Geography,” Julie Riesenweber follows the evolution of cultural geography as it is applied (or ignored) by historic preservation.²¹ Riesenweber traces Sauer’s influence in studies of vernacular architecture and preservation, following it through Fred Kniffen’s work with folk architecture and regional housing diffusion, and Henry Glassie’s studies concerning material culture and vernacular architecture. Through Kniffen and Glassie, the study of vernacular architecture as an element of material cultural was legitimized, but their methodology and focus on cultural

¹⁸ Groth, *Frameworks*, 1.

¹⁹ Carl Sauer, *The Morphology of Landscape*. [Berkeley: University of California Press, 1938]

²⁰ Groth, *Frameworks*, 13.

²¹ Julie Riesenweber, “Landscape Preservation and Cultural Geography” in *Cultural Landscapes: Balancing Nature and Heritage in Preservation Practice*, edited by Richard Longstreth. [Minneapolis: University of Minnesota Press, 2008], 23-33.

objects served to isolate structures from the landscapes they inhabited. Sauer's observational model of the relationship between physical environment and cultural form, applied to vernacular building by Kniffen and Glassie, and translated to the architecture and landscape design fields by J.B. Jackson, became the basis for historic preservation analysis.

According to Riesenweber, although development of cultural landscape theory within the field of preservation effectively stopped at Sauer, geographers continued to challenge assumptions of culture and its relationship to its environment. They began to conceive of landscape in increasingly abstract terms; as a sociocultural idea as much as a physical place. Ideas of "landscape as epistemology" or culturally symbolic representation, as a way of experiencing the world developed by and meaningful to certain social groups were increasingly explored. Geographer Denis Cosgrove, for one, asserted that these symbolic dimensions of landscape are not accessible through observation alone. Cosgrove critiqued Sauer's morphology as leaving the landscape a static object, stating that "compositional elements and their relationships become susceptible to objective identification, classification, and measurement."²² To Geographer Donald Meinig, the cultural meanings embedded in landscapes are fluid; their interpretation shaped as much by the participants as by the observer and circumstances surrounding the interpretation. Landscapes reflect commonly held interpretations shared within social groups, dominant definitions often becoming preferential and eventually concrete. Here the discussion of cultural geography slips into a discussion of social power, as dominant social and cultural beliefs are translated into physical forms that serve to codify certain power relationships.²³ The study of landscapes within cultural geography thus moved increasingly to an

²² Denis Cosgrove, *Everyday America: Cultural landscape Studies after J.B. Jackson*, edited by Chris Wilson and Paul Groth, [Berkeley: University of California Press, 2003], 14.

²³ Donald Meinig, *The Interpretation of Ordinary Landscapes: Geographical Essays*, [New York: Oxford University Press, 1979]

anthropological social science view of landscape, away from Sauer's visible landscape-centered, physical-geography-based model.

Landscapes are important not just for what they reflect about culture but in what they shape. Geographer Richard Schein uses the example of ethnically segregated neighborhoods to explore how a landscape can shape cultural expression. Understanding landscape's place "in the social relations and spatial arrangements of daily life" involves questions about how one "particular and identifiable cultural landscape in this place is related and connected to landscapes and social processes in other places."²⁴ According to Schein, "normative" landscapes operate at structural level, unconsciously promoted, familiar, and unrecognized as anything other than common sense.²⁵ Schein's interpretation recognizes that embedded cultural structures and networks contained in a landscape can form social organizations of space as much as they reflect them.

What ideas taken from cultural geography offer, essentially, is an increasingly broader physical and symbolic view of context. "The culture of landscape studies is a culture of everyday actions and social structures, a culture that humans mold through conscious and unconscious actions, a culture in which power, class, race, ethnicity, subculture, and opposition are important considerations."²⁶ While some conceptual explorations within the field of cultural geography may be beyond the applicable range of preservation studies, others certainly offer valuable perspectives and critical approaches to cultural landscapes for use in preservation analytical and evaluative goals.

Cultural geography ideas are effectively employed in this thesis, ideas such as *cultural*

²⁴ Richard Schein, "The Place of Landscape: A Conceptual Framework for Interpreting an American Scene." *Annals of the Association of American Geographers* 87, no. 4 [December 1997], 660.

²⁵ Schein, *Normative Dimensions*, 214

²⁶ Groth, *Frameworks*, 10

ecology; the view that culture is an adaptive system, a “uniquely human method of meeting physical environmental challenges.”²⁷ and *pre-adaptation*, the idea that certain cultural groups had established skills and traits that allowed them a competitive advantage in their new environment. Pre-adaptation would lead particular cultural groups to “fit” certain types of industry. Finnish and Scandinavian immigrants’ pluralistic approach to employment in the Lower Columbia region provides a good example of this. Also, the concept of ethnic territories, areas of claim or restriction within the industrial landscape that are fundamentally tied to ethnicity, was developed using ideas and methodology taken from cultural geography.

In this study, divisions of Astoria’s industrial landscape are the most indicative element of cultural presence, and while these divisions of space are essentially formative, they are not expressly visual. Sauer’s approach, and that of industrial archaeology, offers an understanding of how the landscape came to look as it does; what environmental, technological, economic, and social forces influenced its creation, development, and change. By including a critical cultural geographic view, we might look closer at the life inside the landscape. How, for example, did disparate cultures occupying the same space compete with each other socially and economically, or how might they have exchanged information in ways that influenced their surroundings. We know, for example, that in late 19th century Astoria, Chinese immigrants were largely restricted to cannery work; that they kept vegetable gardens and pig pens to augment their company/contractor food rations; that few if any non-Chinese were allowed within the China House (workers’ bunkhouse). The visual representations of these specifically cultural spaces on the landscape may have been minimal or unobtrusive, but the meanings of these spaces, and ideas about their development, are dramatically altered through awareness of cultural spatial divisions.

²⁷ Terry Jordan, “Cultural Pre-adaptation and the American Forest Frontier: The Role of New Sweden” in *Re-Reading Cultural Geography*. [University of Texas Press, Austin, 1994], 114.

One of the predominant architectural forms of Astoria's industrial landscape, the cannery building, constitute a recognizably vernacular form, but would not necessarily be generally considered culturally derived. Industrial buildings like canneries are usually viewed as pragmatic, lacking much of the symbolic architectural details or arrangement that allows cultural attribution to other architectural forms. But their lack of specifically attributable cultural details does not exclude them from the broader cultural landscape. Indeed, industrial forms are a ubiquitous and vital landscape component, reflecting some of the most basic aspects of cultural organization. Systems of use as well as associated functional and spatial organization can be cultural signifiers.²⁸ A particular landscape or element within a landscape might be simultaneously significant to people holding very different cultural traditions, creating overlapping interpretations of cultural importance.²⁹ In this case study, ethnically distinct and insular groups occupied the same spaces during different periods of industrial use, and attribution of meaning and shifts in organization can be found on the landscape. Intangible ethnic spaces, including restrictions or claims of privileged use, significantly informed the development of Astoria's cultural/industrial landscape.

While the inclusion of intangible layers of cultural form and meaning serves to deepen any cultural landscape study, historic material is pivotal in preservation. Materially-based approaches such as Sauer's still seem appropriate to apply, at least as part of a critical analysis of a particular cultural landscape. To observe change over time by tracing the evolving relationships between cultural and landscape forms in order to describe and explain human cultural development remains an applicable practice in preservation. Though more abstract concepts of cultural space and meaning should be included in landscape

²⁸ Hardesty, *Ethnographic Landscapes*, 184.

²⁹ Groth, *Frameworks*, 5.

analysis, the physical landscape remains the foundation for both cultural geography and historic preservation study.

Industrial Archaeology

“The dominant element in any industrial landscape is the process itself.”³⁰

The basic fact that material culture is the manifestation of cultural values and traditions, both as specific physical objects and cumulative landscapes, lends itself to a hands-on examination of available field evidence. Indeed, an essential component of understanding the historic built environment is the field analysis of material tradition and historic use within context. To this end, certain principles of industrial archaeology have been employed in analyzing the processes behind the development of Astoria’s fishery.

Methodology used by industrial archaeology is well adapted for use in some cultural landscape studies. Archaeology has had a long tradition of working with physical evidence, often in the absence of written history or documentation. Considering the time period that generally concerns industrial archaeology, there are often more above-ground remains available for study.³¹ Industrial archaeology, more so than (prehistoric) archaeology, focuses on wholistic interpretation of sites, structures, and landscapes rather than artifactual material. Incorporation of written histories and other documentary material is also more common. Naturally, industrial archaeology recognizes industry itself as the dominant factor in landscape creation, which it regards as an interconnected system. Understanding industrial landscapes means understanding processes. Industrial archaeology, developed for the study of industrial landscapes, is thus concerned with physical systems

³⁰ Barrie Trinder, *The Making of the Industrial Landscape*. [London: Weidenfeld & Nicolson, 1997], 7.

³¹ Industrial Archaeology falls under the category of Historical Archaeology; it deals with eras after the widespread development and use of writing.

of production. Certain analytical questions and goals endemic to industrial archaeology are also valuable here:

— *What are the sources of raw materials, the methods of processing and transport, and the social context of production?*

— *What determined the location of the industry, and what events (including technological innovations) shaped its development?*

— *What are the spatial relationships between industries, interdependent industries, and development pattern of settlements and transport?*

Similar in some ways to Sauer's approach to cultural landscapes, industrial archaeology focuses on the physical evidence of context and change. Under an industrial archaeological viewpoint, the landscape is regarded as a system, linking material evidence such as buildings, networks, technology, and adaptation over time.

Probably because industrial landscapes traditionally fall under the purview of industrial archaeology, there is a notable lack of consideration of cultural influence on industrial landscapes. There is an assumed practical foundation behind design and construction choices in the development of industrial building forms. Often the regularizing force of industrialization is considered anathema to the formation and maintenance of ethnic landscapes. While it is relatively true that industrial buildings are practical structures, responding to the requirements of industry without a great deal of ornament or symbolic inclusion, they nonetheless represent a specifically cultural approach to a landscape. Industrial buildings do, in fact, require a different analytical approach than that of residential, commercial, communal (public) structures. Since each type of structure reflect different choices and serve different functional and symbolic needs, tailoring the analytical approach seems appropriate.

Three principles have been adapted from industrial archaeology:

1. Stratigraphy: recognition of patterns of change (over time). Based on geological idea of build-up of layers, stratigraphy measures changes in landscape as well as in individual buildings by looking at the position of objects and relative adaptations.

2. Spatial Patterning: setting information in contemporary, spatial context. Information can be found in *where* an object is, as well as in *what* an object is. It links buildings to a wider landscape setting by patterns of relative location.

3. Typology: classification of objects, grouped by materials and form. Systematic comparative analysis performed in order to identify significant patterns of tradition and variation over space and time. It can describe the social, economic, and cultural context of use.

All three of these principles achieve a measurement of the landscape, and each offers an organized method to analyze field evidence. Relationships between natural landscape and human activity are best deciphered through evidence taken directly from the field.³²

Advantages offered by including field evidence in examining cultural landscapes are fairly clear. In some cases, available written accounts and accepted histories may be misleading. For example, in order to retain a competitive advantage, fishermen were often reluctant to reveal information about a particular type of gear or innovative boat construction technique. Material evidence, the product itself, shows through examination how it was actually made. Other aspects of landscape arrangement may have seemed to those participating in it to be “common sense,” and not worth relating in written form. Ethnically segregated neighborhoods were commonly known, but the reasons behind patterns of settlement were not as often discussed.

³² Judith Alfrey and Catherine Clark. *The Landscape of Industry*. [London: Routledge, 1993]. 8.

In order to examine forces that shape a specific industrial landscape, Astoria, Oregon was the site selected for this case study. Astoria's fishing/canning industry was one of the earliest and most significant in the Pacific Northwest in terms of industrial innovation and early 20th century maritime development. Although there have been some important specialized studies done of Astoria's larger cultural groups, there hasn't yet been an in-depth analysis of their cumulative effect, or any real examination of Astoria's industrial structures beyond general survey.

Astoria, Oregon presents a unique combination of natural elements (such as the Columbia River), and human activity (such as the canning industry), and so it can and should be analyzed as a cultural landscape. The complexity of Astoria's extractive-industrial landscape is such that it is better understood as a combination of many cultural landscapes, each contributing to a larger industrial system. Essentially, the industrial landscape of Astoria can be viewed as a vernacular cultural landscape, gradually built, altered, and destroyed, as shifting cultures, economic change, technological advancement, and environmental conditions impose different requirements on the space.

In general, the physical landscape of Astoria's industrial history has had little attention. Created by the cumulative efforts and skills of numerous immigrant groups. While there have been valuable studies done on specific cultural groups, as well as some (mostly dated) investigations into Astoria's fishing and canning industries, the links between Astoria's various cultures and its industries have not been adequately studied — especially in terms of vernacular architecture. This study thus recognizes industry as a unifying factor within a dynamic regional cultural landscape, and focuses its material analysis on cannery building as a primary material presence within the landscape. Rather than looking at a single cultural identity and its influence, this study looks at the concerted impact

of multiple cultural identities creating a unique industrial system, and how that system is reflected in spatial patterns.

There is an advantage to using the industrial landscape as a centerpoint in this case study. It offers a common focus to a complex and multi-layered cultural landscape, a filter through which to relate disparate cultural traditions and evolution. In Astoria, all social and cultural threads run through the fishing and canning industry.

Physical environment, time, immigrant populations, imported and inherited cultural forms, economic and industrial exigencies, technological innovation — all are integral pieces of Astoria's cultural, and thus industrial, landscape. By designing an approach that is marked by multiple views and concepts, I hope to allow the existing resources to inform the study as far as they are able, and put together a thesis that is both geographically specific and applicable to a broader more theoretical understanding of complex cultural and industrial landscapes.

Concepts taken from industrial archaeology concepts and cultural geography are allowed to bleed into one another. Ethnic spaces and cultural organization, for example, are described as systems. Using the traditional tools of geography, maps and photographs, spatial patterns have been analyzed under an industrial archaeology conceptual framework. The intent is to create a merged conceptual system that translates well to historic preservation application. Cultural Geography and Industrial Archaeology each offer relevant frameworks that can be readily applied as part of preservation analysis.

Quality analysis is naturally exclusive; it requires at least some degree of separating out parts from a whole to examine in detail. But places themselves are sums of multiple and shifting dynamic relationships between people and environment. No single aspect, however important or unimportant, remains unaffected by its surrounding elements. How to

organize an effective analytical approach to encompass as much relevant information as possible is the interest here. A few conceptual approaches have been selected from a wide range of possibilities, in order to suggest an alternative framework for analyzing the context of a specific site. It is one combination, and could easily be reworked using different approaches, with a different focus. The idea is to apply a multi-disciplinary set of tools to a specific landscape analysis in an effort to establish a wider base for evaluation. Whatever the conceptual approach, academic and applied studies that encourage and explore the conceptual overlap of preservation and cultural landscapes are needed in order to develop more inclusive, flexible, and creative methods of working with our material history.

Exclusions and Limitations

Information has been purposefully omitted from this study. Native American tribal use and occupation of the Lower Columbia region predates Euro-American presence by thousands of years. It is likely that their material influence is present within the landscape, but inclusion would have increased the size of the study beyond the time allotment and resources of the researcher. Specific industrial structures have been given considerably more attention than housing types and settlement patterns. Again, inclusion of an in-depth housing analysis, while unquestioningly valuable, would have made this study too large for a Master's thesis. Astoria's largely overlooked housing patterns deserve an dedicated analysis. Additional study is also needed on the diffusion of cannery building typology into Washington, Alaska, and possibly British Columbia.

This study comprises one of two parts on the cultural landscape of Astoria. My thesis covers the first part: the development of the Lower Columbia River salmon fishery in terms of vernacular architecture, spatial patterns, and cultural organization. A second study is needed, to further explore changes in the fishery from the 1930s to the present

day, including the development of tuna canning on the Columbia River. It should also be noted that this thesis addresses a fairly closed circuit of power, exploring overarching group consolidations, as well as some informal relationships and power structures between immigrant groups. Local relationships between capital and labor have not been explored here in any significant depth. Other studies are available which have more extensively covered this dynamic.³³

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Apart from a conceptual introduction and a concluding chapter, four chapters are dedicated to different aspects of Astoria's development. The first is a general geographical and historical overview, describing location, and tracing early settlement patterns, organization, and industrial evolution. The second details immigrant communities and specific cultural patterns of migration and settlement. The third follows waterfront landscape change over selected years. The fourth and last chapter focuses on cannery buildings as a dominant industrial building form, documenting the patterns of use which modified and conditioned the survival (and destruction) of these buildings in the area.

³³ Paul George Hummasti, "Ethnicity and Radicalism: The Finns of Astoria and the Toveri, 1890-1930." [Oregon Historical Society Quarterly 96, 1995],362-393; Courtland Smith, *Salmon Fishers of the Columbia*. Corvallis [Oregon State University Press, 1979]

CHAPTER III

PHYSICAL GEOGRAPHY & INDUSTRIAL DEVELOPMENT

This chapter offers a background and general overview of Astoria's environmental circumstances, initial social and technological influences, and patterns of its early industrial development. Explaining the introduction of technology and industrial organization is necessary to understand the community's regional adaptation and influence, and describing the geographic and environmental conditions is vital in explaining some of the elemental forces shaping the development of the fishing and canning industries along the Columbia River. The intention here is to offer insights into how Astoria rose and fell in prominence within the fishing and canning industries of the Pacific Northwest. Certain themes related to culture and technology introduced in this chapter will be examined in greater detail in subsequent chapters.

Physical Geography — Lower Columbia Region

The town of Astoria is located on the Oregon side of the Columbia River, about seventeen miles inland from the Pacific Ocean (Figure 1). The river forms the border between Washington and Oregon states, and is generally referred to by section. The Lower Columbia, running from the mouth to roughly the Cascade Rapids; the Middle Columbia, stretching from the Cascades to Celilo Falls; and the Upper Columbia, running from Celilo Falls to the mouth of the Snake River. At over 1,200 miles in length, the Columbia is the largest river of the Pacific Coast and the fourth largest river in the U.S by sheer volume of water. The river drains a 265,000 square mile watershed known as the Columbia Basin, funnelling approximately twenty smaller tributary rivers and emptying into



Figure 1. Map of the Columbia River. Source: Taylor, *Making Salmon*, 162. Political pamphlet.

the Pacific Ocean between Clatsop Spit (OR) and Cape Disappointment (WA). A shifting sand formation known as the Columbia River Bar lies at the mouth of the river, the result of accumulations of silt washed down by its waters. The bar makes navigation into and out of the river difficult and extremely hazardous, and helped create the reputation of the mouth of the Columbia River as being the “Graveyard of the Pacific.”

Because of the incredible number of anadromous fish (fish that live in both fresh and salt water) that spawn in its headwaters and tributaries, the Columbia has effectively hosted more salmon than any other river in the world.¹ Essentially, the river serves as a pathway between the smaller tributaries and lakes where the salmon spawn, and the ocean, where the fish spend most of their adult lives. Given the combination of dependably spawning salmon and the river’s accessibility by both land and ocean, it is unsurprising that humans have inhabited sites along the Columbia River for thousands of years. Radiocarbon-dated

¹ John Cobb, *Pacific Salmon Fisheries. Appendix XIII to the Report of the Commissioner of Fisheries for 1930*. U.S. Bureau of Commercial Fisheries. [Washington: U.S. Government Printing Office, 1930]. 428.

evidence of Native American occupation has been found to extend back to about 3500 BP, with artifact evidence dated to even earlier.² Since the arrival of Euro-Americans in the mid 19th century, the Columbia has been heavily developed for commercial and industrial use, supporting various resource-extraction based industries as well as developing as a shipping and distribution center for both extraction and surrounding agricultural industries. By the mid 20th century, the Columbia River had become the largest producer of hydroelectric power in North America, with a series of fourteen hydroelectric dams placed at regular intervals along its route.

Settlements along the river, (and there were many) were grouped both socially and economically by conditions imposed by their physical setting, the accessibility of natural resources, cultural affiliation, and industrial organization. Most of these settlements remained small; concentrated almost exclusively around the canneries they supported, and were widely dispersed along the Columbia. The river itself was the natural focal point for all of them; all industry, shipping, transportation, and communication between these settlements relied upon the river, as did all shipping and distribution to commercial markets along the Pacific Rim prior to the region's connection to the transcontinental railroad in 1898.

Though the industry itself was unavoidably tied to the river, by the first few decades of the 20th century many investors in the expanding fishing and canning industries had established brokerage and headquarters in the larger cities of the west coast — in Portland, Seattle, and San Francisco, where “labor and finance were concentrated and where waterborne and inland transportation met.”³ San Francisco was the primary destination for west

² Rick Minor, email message to author, June 1, 2009.

³ Clark Patrick Spurlock, “A History of the Salmon Industry in the Pacific Northwest.” Master’s thesis, [University of Oregon, 1940], 14.

coast international shipping, and so became an early prominent source for capital and labor. Portland was situated at a transportation crossroads; with the Columbia leading out to the Pacific Ocean, the Willamette River connecting the Valley agricultural production through Salem and Eugene, and the railroad stretching East. Seattle served its own fishery based in the Puget Sound, as well as the Alaska fisheries initially developed by Columbia River canners. All three cities served as major distribution hubs for the canned salmon commercial market, and each was a significant source of investment capital and immigrant labor for all Columbia River fisheries.

While the river was fished from the mouth of the river to Celilo Falls 200 miles inland (Figure 2), most commercial fishing on the Columbia took place within 40 miles of its mouth. The main gillnet drifting grounds ran from the mouth to about 20 miles above

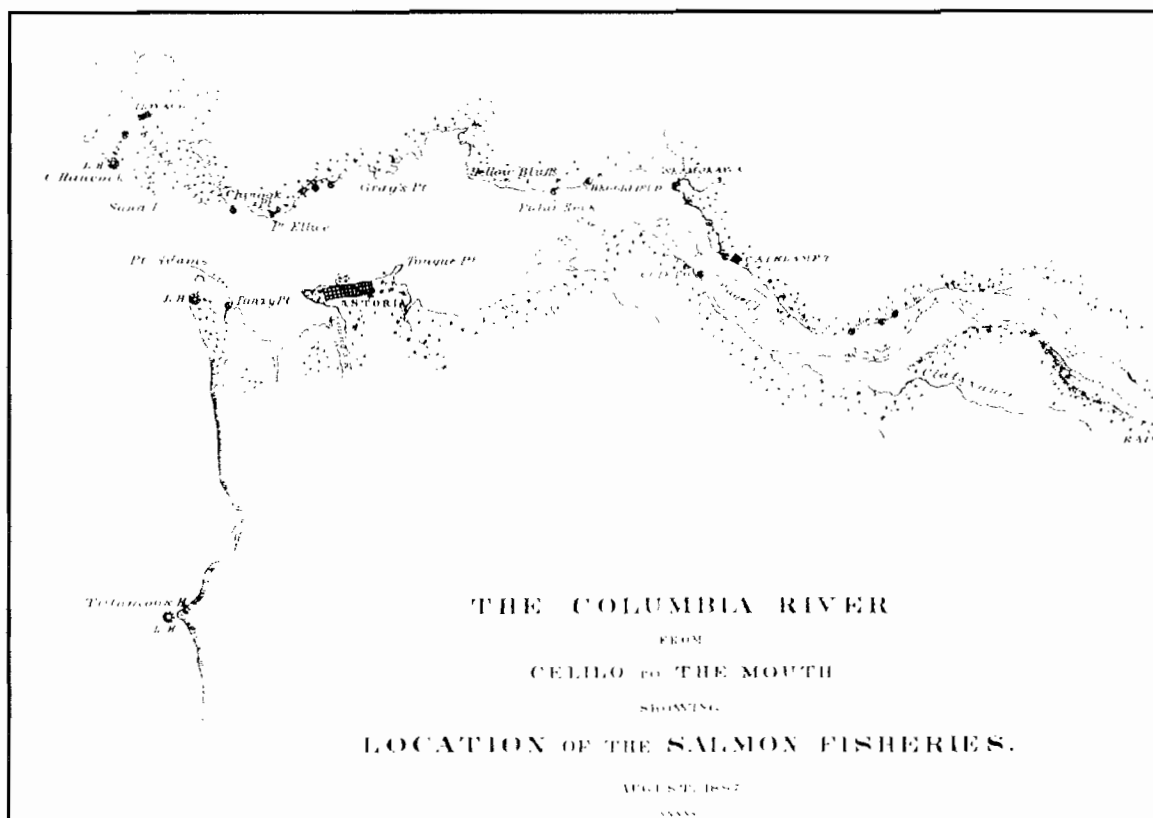


Figure 2. 1887 Map showing the location of various salmon fisheries along the Lower Columbia River. *Source: Smith, Salmon Fishers, 32.*

Astoria.⁴ Horse-driven haul seines were located on the sand bars in the river near Astoria, which were uncovered at low water. Because of its proximity to the mouth of the Columbia, its accessibility to both river shipping lanes and good fishing grounds, and its role as a base for river pilots and as a distribution center for regional lumber operations, Astoria became the most prominent settlement on the Lower Columbia.

Astoria

Located seventeen miles inland from the Columbia River Bar, Astoria is located on the north edge of a flattened peninsula, bordered to the west by Young's Bay and to the east by Cathlamet Bay. The site was first (and temporarily) settled in 1811 as a fur trading post by New York's Astor Company, thus earning the name. In the 1820s, the British Hudson Bay Company took over the area's fur trading outposts, trading primarily with regional tribes and shipping to the Sandwich Islands (Hawaii). Abandoned as a fur trading post in the mid 1840s, Astoria was settled again in the 1850s by migrating homesteaders and companies milling and shipping lumber to California to serve the gold rush demand.⁵ As trade increased through the Lower Columbia, more lumber mills and shipping amenities sprang up in Astoria, and more immigrants arrived to settle it, bringing with them more resources, skills, and connections.

Astoria's early concentration of capital and labor made it an incubator and technological center for nascent Pacific Northwest fishing and canning industries. Though there was some small export of fresh and salted salmon, it wasn't until the 1860s that a commercial fishery was feasible on the Columbia. Canning technology developed in east coast fruit industries was introduced to the Columbia River region by a small emigrant group from

⁴ Cobb, *Pacific Salmon Fisheries*, 433

⁵ Cleveland, *Social and Economic*, 131

Maine, who established a crude commercial fishery on the Washington side of the Columbia. By the 1870s, the first viable large-scale commercial fishery in the Pacific Northwest had begun to coalesce there, making it briefly (but influentially) the center of the Pacific Northwest fishing and canning industries. By 1875, only ten years after the first canning operation was begun and before its peak in production, Astoria was already being called the “salmon center of the world.”⁶

The town initially developed in two distinct sections divided by a shallow inlet known as Scow Bay (Figure 3). These rival settlements, known as Upper and Lower Astoria,⁷ were both physically and economically oriented toward the river, and each concurrently developed the same industries with similar populations. Though some ethnic settlements

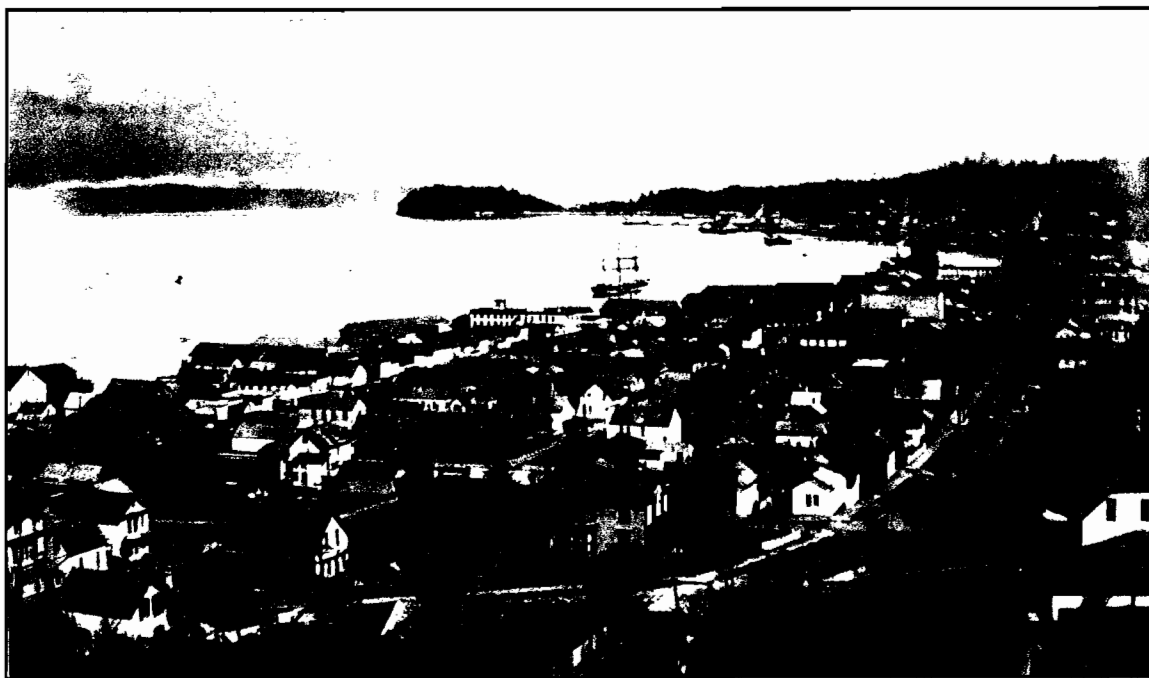


Figure 3: Lower Astoria, looking east along Marine Drive, circa 1885. *Source:* Clatsop County Historical Society (CCHS)

⁶ Miller, *Clatsop County*, 237.

⁷ Different areas of Astoria also known by plat addition names, such as Shivley’s Addition and Adairsville.

remained divided into Upper and Lower, the two halves of the town were formally consolidated as a single Astoria in 1891. Canneries, and the populations that served them, were located in both sections, but the primary commercial center developed in Lower Astoria.

Astoria had a unique building pattern. The land along the riverbank was comprised of shallow tidal flats, which lead immediately into steep forested hills. Given so little room between the river and the forested hills, and dependent as it was on the river for communication, transportation, and economic viability, the bulk of Astoria was originally built on pilings sunk into the riverbank tidal flats. Oiled timbers were driven into the shallows near the bank of the river, planked streets built over them. Canneries were constructed nearest the river, often with long planked docks connecting them to the streets of the town. The railroad, when it came, ran on short trestles between the cannery buildings and the riverbank, picking up freight and passengers by short spurs that led in and out of various wharves. Houses, bunkhouses, and commercial buildings were located along the plank streets, setting into the hills behind the town's commercial center as the town grew. Much of the early seasonal migrant fishing population was "floating;" living in floating cabins haphazardly anchored along the wharves on the Columbia.

The first fire to destroy much of the downtown and waterfront of Astoria occurred in July 1883 (Figure 4). Since most of this area was built on oiled wooden pilings, fire got underneath streets and buildings easily and spread without obstacle. The town was rebuilt quickly, but unfortunately in exactly the same manner. Again on wooden pilings over the river, entire blocks of the downtown area burned in 1922, the fire spreading unimpeded from building to building under the plank streets. After the second round of destruction, town planners decided to fill in the areas over pilings, replacing wood with river-sand fill held in place by a rock sea wall. Neither fire caused significant damage to cannery



Figure 4: Rebuilding of Astoria's wood planked downtown streets after 1883 fire. *Source:* CCHS

buildings, which remained perched out over the water.

Because of its position along the Columbia River trade route, Astoria was not as isolated as many of the other fishery settlements along the river. By the 1870s, sailing vessels and daily steamship routes carried freight and passengers through Astoria to Portland, Seattle, and San Francisco, as well as to international ports.⁸ The Astoria & Willamette Valley Railroad was incorporated in 1858, linking Astoria to Oregon's interior, and in 1898

⁸ Joseph A. Craig and Robert L. Hacker, U.S. Bureau of Commercial Fisheries. *Bulletin of the Bureau of Fisheries*, Vol. XLIX, No. 32. *The History and Development of the Fisheries of the Columbia River*. United States Government Printing Office, Washington D.C. 1940], 158.

the Astoria & Columbia River Railroad connected Astoria to Goble, a terminus of the transcontinental Northern Pacific Railroad, finally directly connecting Astoria's canned salmon exports to the East Coast of the United States.

Astoria grew rapidly in the last quarter of the 19th century. Between the years 1874 and 1876, Astoria's population doubled, reaching two thousand permanent residents and two thousand additional seasonal population every summer fishing season. An article in the *Daily Astorian* dated May 1877 states, "Last month two thousand six hundred and twenty eight bona fide immigrants landed at Astoria by steamers. About one thousand seven hundred proceeded inland in search of homes."⁹ Astoria's population in 1890 was over six thousand; in 1900 over eight thousand.¹⁰ Columbia River fisheries, and its attendant influx of seasonal labor, were governed by the annual salmon runs. Runs of the favored canning salmon species, Chinook and Sockeye, effectively set the fishing season between April and July. Oregon's official fishing and canning season typically opened April 1 and closed August 1. Industrial production occurred around these dates, comprised mainly of preparation work such as can making and net repair.

Settlement periods can be divided into categories; migrant dominated, year-round settlement, and second-generation ethnic groups. Astoria's early working population was predominantly migrant labor. Its small year-round population was increased exponentially by the summer "floating" population, which reached as many as two thousand in the summer months.¹¹ Like many late 19th century western industrial towns, Astoria earned a

⁹ Emma Gene Miller, *Clatsop County, Oregon: Its History, Legends, and Industries* [Portland: Metropolitan Press, 1958], 193. The *Daily Astorian*, May 5, 1877. Since May was near the start of the spring fishing season, the large numbers of immigrants were likely seasonal workers.

¹⁰ Alfred Cleveland, "Social and Economic History of Astoria." [*Oregon Historical Quarterly* 4], 146; U.S. Census, *Population of Clatsop County*, 1910.

¹¹ Miller, *Clatsop County*, 235.

quick reputation as rough place, full of rowdy, usually drunk, single immigrant fishermen. A large proportion of migrant workers labored in other extraction industries in the off-season; as lumbermen, farmers, dairymen; or as skilled artisans such as carpenters and masons. Most of those who travelled seasonally traveled on “circuits” between Portland, Seattle, San Francisco, and whatever industry in which they could find work.¹²

The architecture of the town; houses, canneries, warehouses, mills, and auxilliary structures, were built as quickly as possible in the late 1870s and early 1880s to accomodate its rapid expansion. The first cannery was built in Upper Astoria in 1873; by 1877, there were eleven canneries in operation on Astoria’s waterfront, and over a thousand fishing boats in use on the river.¹³ By 1880, there were fourteen canneries. Most of the canneries in operation along Astoria’s waterfront were built between 1875 and 1885. Given the high perishability of the fat-rich salmon, which required immediate processing to preserve, the canneries were set as close to their resource supply as possible, giving the waterfront its distinctive arrangement as its industrial structures extended out into the river.

The salmon industry on the Lower Columbia had reached its peak of production by 1883. Because of overfishing and habitat destruction, the decline of the annual salmon runs caused the number of plants in operation to quickly decrease as companies consolidated or failed. By 1908, only fourteen canneries remained in operation along the Columbia, eight of which were in Astoria. The first world war improved market conditions enough to briefly increase production, but after the end of the war canned salmon production along the Columbia River resumed its gradual, uneven decline. After the bulk of the

¹² Details about cultural background, settlement patterns, and employment practices are presented in upcoming chapters.

¹³ Cleveland, *Social and Economic*, 141; Miller, *Clatsop County*, 236; Chris Friday, *Organizing Asian American Labor: The Pacific Coast Canned-Salmon Industry, 1870-1942*. [Philadelphia: Temple University Press, 1994]. 56.

salmon runs were finally destroyed by the installation of hydroelectric dams along the Columbia, Astoria canneries turned to Albacore (tuna) processing to maintain its industry. The last seafood processing plant in closed in 1980.¹⁴

Early Industrial Development

Lumber dominated the Pacific coastal trade from early to mid-1800s. Britain's Hudson Bay Company (HBC), primarily fur traders, shipped both lumber and small amounts of salted salmon from Fort Vancouver on the Columbia River to The Sandwich Islands (Hawaii).¹⁵ Early Columbia River trade distribution centered on Hawaii and China, though there was some exchange between HBC and the Pacific Islands and South America for raw sugar, molasses, and salt.¹⁶ HBC traders relied on salted or pickled salmon for their winter food supply, for which they traded with local Native American tribes.¹⁷ Prior to the adaptation of canning technology, preserving salmon for lengthy shipping was problematic, though repeated attempts were made to develop a commercial industry through various salting, smoking, and pickling preservation methods. Frequent shortages of salt and barrels were a major impediment to local salteries, and resulting spoilages contributed to the limited market and bad reputation of Columbia River salmon exports in the early 19th century.¹⁸ Shipping around Cape Horn was also an obstacle; salted salmon distribution mainly followed routes established by the Hudson Bay Company,

¹⁴ C.V. Hollander, "Historic Fish Cannery Closing," *Daily Astorian*, February 13, 1991.

¹⁵ Karl Jack Bauer, *A Maritime History of the United States: The Role of America's Seas and Waterways*. [Columbia: University of South Carolina Press, 1988], 129.

¹⁶ Daniel DeLoach, *The Salmon Canning Industry*. [Oregon State College, 1939], 9.

¹⁷ Bauer, *Maritime History*, 221.

¹⁸ Spurlock, *History of the Salmon Industry*, 27.

including local and regional trading, as well as shipments to China and the Hawaiian Islands.¹⁹ When the first commercial canning operations began on the Columbia River in the mid- 1860s, a few functioning independent salteries remained, operating into the 1880s. Salted salmon never comprised a significant industrial preservation method, however, and was therefore easily displaced with the advent of more reliable canning technology in the mid-1870s.

The California Gold Rush demanded large amounts of lumber, and sawmills were quickly built throughout the region to meet market demand for resources.²⁰ Grain grown in the Willamette and Umpqua Valleys was also an important regional export. Portland and Astoria both served as primary distribution points for lumber and agricultural exports.

Fishing & Canning Industry

Though Native Americans had been fishing and trading on the Columbia River for thousands of years, large-scale commercial fishery development began with the arrival of the Hume Brothers, who started the first crude cannery operation on the Lower Columbia River, Hapgood, Hume, & Company, at Eagle Cliff, Washington, about 40 miles above Astoria.²¹ Initially drawn to the Sacramento River with the U.S. acquisition of California in 1850, this small group of fishermen (and tinsmith) from Maine began experimenting with canning technology in the nascent fishery there. Though fruit canning had already been developed as an export trade out of California by the 1860s,²² the technology of canning was still fairly crude when the Humes began experimenting with it to can salmon.

¹⁹ Joseph Taylor, *Making Salmon: An Environmental History of the Northwest Fisheries Crisis*. [Seattle: University Washington Press, 1999], 63; Miller, *Clatsop County*, 223.

²⁰ Cleveland, *Social and Economic*, 133.

²¹ Cobb, *Pacific Salmon Fisheries*, 429.

²² DeLoach, *Salmon Canning Industry*, 11

Only a few years after their arrival on the Sacramento River, Hapgood and the Humes were compelled to relocate north to the Columbia by overfishing and the destruction of salmon spawning beds in California, and they brought experimental technology, as well as their New England-based fishing skills and materials, with them to Oregon.

When the Humes (George, William, Robert, and Joseph) and Andrew Hapgood arrived in 1865, the only established preserved salmon trade was that of the small salteries. In coming to the Columbia, the Humes were leaving the failed fishery of the Sacramento River, as they had left the failing Atlantic coast fisheries a decade earlier, bringing with them inherited and adapted fishing skills and technology. The importation of gear such as the gillnet (a similar form of which may have been used by Native American fishers), and the double-ended Columbia River gillnet boat²³ have been attributed to the Humes.

“William Hume came to California in the spring of 1852, bringing with him a salmon gill net which he had made before leaving his home in Augusta, Maine. ...William Hume had been salmon fishing in the Kennebec River in the State of Maine with his father, where his father and his grandfather had been engaged in the same business since 1780..”²⁴

The technological transfer from Atlantic coast fisheries, through California, to the Columbia River and Northwest fisheries was fundamental in the development of the Pacific Coast fisheries, laying the technological and organizational base upon which all Pacific Northwest fisheries would function until the second World War. Hapgood, Hume and Company effectively combined “...efficient capture methods, (dis)assembly line

²³ Craig & Hacker, *History and Development*, 165. Different origins have been claimed for this regionally distinct type of gillnet boat. Without a specific typological study, an accurate statement cannot be made as to how it came to be on the Columbia. Numerous sources claim it was built in San Francisco for the Humes, possibly developed from east coast fishing boat models. The first use of the gillnet on the Columbia was credited to Hodgkins and Sanders, an earlier group from Maine, in 1853.

²⁴ Robert Hume, “The First Salmon Cannery,” 1916 Pacific Fisherman Yearbook

processing, canning technology, and global marketing...²⁵ to create a viable commercial extractive industry on the Columbia River.

With the Humes' success, other industrial canners and fishers took notice. In 1866 there was only one cannery along the Columbia; Hapgood, Hume, & Co., and the pack that year was 272,000 pounds. By 1884, the peak of the Columbia River canning industry, thirty-seven canneries packed a total of forty two million pounds of salmon.²⁶ Nearly all of the early canners in Astoria (as elsewhere along the Columbia) can be connected to the Hume Brothers. Many canners held positions as directors, superintendants, brokers, or partners in multiple Hume canneries, selling company shares both to each other and investors moving west to take advantage of the expanding industry. Often, individual canners owned and operated multiple plants in different locations on the Lower Columbia. Hume & Company, for example, maintained their original plant in Eagle Cliff, Washington, while opening new canneries in Astoria in the mid-1870s. In the later decades of the 19th century, many of the same canners would pioneer fishery operations in Alaska.

As the fishery sought to weather bad seasons, control production, coordinate marketing, and establish stronger political/economic positions, the corporate form of company management became common. In 1899, the canneries of Samuel Elmore, Marshall Kinney, J.W. Seaborg, J.O. Hanthorn & Co., Fishermen's Packing Co., and Scandinavian Packing Co, consolidated with other Columbia River cannery owners to form the Columbia River Packers Association (CRPA).²⁷ Former owners sat on the board in the association, while retaining some individual holdings. Samuel Elmore, a prominent early Astorian canner,

²⁵ Taylor, *Making Salmon*, 38.

²⁶ 1913 Pacific Fisherman Yearbook, 37.

²⁷ Cobb, *Pacific Salmon Fisheries*, 433.

had five canneries in Oregon and Alaska in addition to his CRPA shares.²⁸ Cannery company consolidation was in part a response to damaging competition between canneries, which glutted the market and drastically reduced individual company returns. It enabled the canneries to increase production efficiency, choosing which canneries to operate depending on the condition of the salmon runs. Consolidation also provided a measure of political power, intended to offset the effects of both the fisherman's unions and restrictive federal and state legislation. Consolidations continued into the 1900s, shrinking the number of cannery operations as the salmon runs began to decline and the industry was forced to adapt. W.H. Barker and George H. George, for example, both connected to the Humes and various canneries, formed George & Barker, buying out first the Port Adams Packing Company in 1885, and three others with the next five years. More successful companies like George & Barker routinely bought defunct cannery buildings, reusing them as boat and net storage for their fishing fleet. These same buildings were increasingly adapted into cold storage buildings with the development of fresh and mild-cured specialty salmon markets.²⁹ Under the CRPA, operations were centralized in particular former cannery buildings. For example, Elmore became the primary cannery, Hanthorn was used for cold storage, and Scandinavian used primarily for boat-building and repair.

Arc of Industrial Production

The rapid expansion of the salmon fishery along the Columbia from its beginning in the mid-1860s to the mid-1880s is due to a number of complementary factors. As in many early period natural resource-based industries in the Pacific Northwest, the supply of raw material (in this case, salmon) seemed inexhaustible. So much so that in particularly large runs, fish were routinely discarded when processing could not keep pace with the catch.

²⁸ Roger Tetlow, U.S. Department of Interior. *Samuel Elmore Cannery National Historic Register Nomination*, [1996], 6.

²⁹ Sanborn-Perris Insurance Company Maps, 1888-1948.

Other resources, such as lumber and labor, were relatively easy to procure, so initial capital investment was moderate and the return on that investment (in the early years) was relatively high.

Early industrial success was advertised, and more investors became interested in the industry. As could be expected, the rush led to over-saturation of the market and over-exploitation of the resource.³⁰ Fish packers remained competitive primarily through power sharing agreements and constant technological innovation, relentlessly seeking ways to streamline distribution and processing. Those packers who failed were absorbed by those more successful.

Catches declined by 50% between 1884 and 1889, rebounded briefly in the mid-1890s, then fell again.³¹ It begins to be clear as early as the 1890s that the fishery was changing. In 1889 there were twenty-one canneries on river, down from thirty-seven only two years earlier. Both the capital side of the industry (canners), and the labor side (fishermen), sought to unionize during the last two decades of the 19th century to protect their interests on the river.

Runs of Chinook salmon, the most valuable of the canning species and the most abundant along the Columbia, steadily declined after the 1880s. This decline of spring and summer Chinook runs was masked by fishing fall runs and the increased use of other less valued salmon species, like Sockeye and Steelhead.³² Still, many statistics of the period report an increase in volume of catch, but these increases were primarily due to increased fishing

³⁰ Craig & Hacker, *History and Development*, 151. Smith, *Salmon Fishers*, 15.

³¹ 1931 Pacific Fisherman Yearbook, 48.

³² Though steelhead is actually a trout, it was a commonly canned fish and was included in most fishery statistics.

ranges — fishing the tributaries for example — and canning less desirable species. After WWI, with its brief and temporary peak in production, prices collapsed, and new cannery combinations formed as large canneries bought small failing companies. By the mid-1920s, fish processing in Astoria were run as subsidiaries or divisions of national food processing and distribution firms.³³

Astoria, the “historic center” of the salmon canning industry, was superseded in commercial distribution and trade early by Portland and in production later by Alaska. Columbia River canners like the Humes, Kinney, and Hanthorne began expanding into Alaska by 1878 (southeast), 1882 (central), and 1884 (western),³⁴ shifting most fishery production there by the early 1900s. Though Astoria was still considered the center of the industry, by 1888 Alaska fishery production had overtaken that of Columbia River.³⁵ 1880, Columbia River canneries were producing almost 80% of annual pack, by 1900, Columbia River produced 29% of Pacific Northwest pack.³⁶ Though its prominence within the Pacific Northwest canning industry was short-lived, the Columbia River fishery set the mold for the whole of the Pacific Northwest; innovations in fishery technology, labor, and production would continue to evolve as fisheries expanded into Alaska.

³³ Patrick O’Bannon, “Technological Change in the Pacific Coast Salmon Industry.” PhD diss., [University of California, 1983], 252.

³⁴ Smith, *Fisheries as Subsistence Resources*, 218.

³⁵ DeLoach, *Salmon Canning Industry*, 17; 1913 Pacific Fisherman Yearbook, 37.

³⁶ O’Bannon, *Technological Change*, 72.

CHAPTER IV

CULTURAL MIGRATION & SETTLEMENT

“To study the West as a place and process...one must consider the ethnic histories of the residents, migrants, and immigrants involved in the extraction of the region’s natural wealth.”¹

Though all the immigrant groups who came to Astoria in the late 19th and early 20th centuries were attracted to the Lower Columbia River by available economic opportunities, the methods by which the different immigrants came to Astoria varied widely. During Astoria’s early industrial development period, immigrant populations matched or outnumbered those migrating from other regions of America. “Astoria...is a cosmopolitan city of about ten thousand inhabitants, composed largely of foreigners...”² Though seemingly vast and resource-rich, the American West was unable to extract its wealth without importing labor. Thus the Pacific Northwest regional culture was shaped by social and economic interactions between ethnically diverse individuals and groups. This chapter examines relevant systems of cultural movement, ethnic settlement, and exchanges of industrial information within Astoria’s migrant labor.

As outlined in the preceding chapter, much of what has become institutional industrial practice in the Pacific Northwest fisheries was experimented with first on the Columbia River, and Astoria, as the largest regional concentration of people, industry, and ideas, was the at the heart of the region’s nascent industrial development. Astoria’s industrial fishery effectively set a template, serving as an experimental center where successful

¹ Friday, *Organizing Labor*, 7.

² Cleveland, *Social and Economic*, 149.

patterns emerged to inform entire Pacific Northwest fishing/canning industry. These industrial patterns of technology, distribution and marketing, labor relations, and to some extent, architectural form, all can be traced back to the rapid industrial expansion of the late 1870s and 1880s on the Lower Columbia River.

“By 1870, canners and their workers had established three central and lasting features that would characterize the industry over the next seven decades: internal labor markets largely distinguished by ethnicity; a lower tier within that labor market in which canner workers provided structure and organization, in which they established their own informal hierarchy; and financial, marketing and labor recruitment practices that tied the industry into a larger global pattern.”³

Though many of the cultural and industrial developments in the fishing and canning industries were unique to the Lower Columbia, the forces behind the movement of people and resources were nationally and internationally felt, affecting and responding to global currents of economic development and change. The mid- to late 18th century mass European and Asian migration to the United States was a result of a combination of forces, concurrently pulling workers toward America’s expanding economy and pushing them out of their home countries for equally compelling economic reasons. Depressed, developing, or turbulent economic and political conditions. “...tied the region into a global economic system that pushed and pulled people around the world.”⁴ A migrant multi-ethnic work force seasonally appeared in Astoria during its early industrial period.

Immigrant manuals and promotional booklets were circulated around the U.S. and Europe in the 1870s and 1880s, promoting the Columbia River industries, extolling the good life of those already emigrated, in the attempt to attract capital and labor.⁵ The U.S. Commissioner for Fisheries Reports, begun in the 1870s, were also a major source of regional

³ Friday, *Organizing Labor*, 23-24.

⁴ *ibid*, 6.

⁵ Martin, *Legacy*, 34

fishery information, tracking gear research and development, fish stock assessments, potential areas of investment, and the overall potential of U.S. fisheries, disseminating this information throughout Europe.⁶

After some initial migration was underway, a force known as the “stock effect” became influential in increasing immigration to specific areas and industries. Immigrant communities built on themselves, establishing networks that guided later migrants toward existing ethnic community infrastructure. This effect tended to make seeded immigrant communities stronger and more stable, enabling them to more effectively influence their surroundings. Immigrant populations formed their own semi-autonomous social networks, creatively interacting with existing (and constantly forming) industrial and social structures. Though Astoria’s ethnic divisions were physically and socially well defined (Figure 5), their point of convergence was around the Columbia River fishing and canning industries. All immigrant groups establishing themselves in Astoria worked with the same set of natural resources. In this manner, smaller cultural systems shaped by each immigrant group contributed to the same overall economic/industrial system.

Thus, Astoria’s complicated and dynamic cultural landscape can effectively be described as a collection of small (cultural) systems revolving around and feeding into a larger (industrial) system. Exchanges of information occurred through ethnically disparate spheres, along networks of subculture structures. Each ethnic sphere had its own hierarchy, method of social exchange, and industrial organization. Each was separate from other smaller ethnic social systems but integrally linked into the overarching fishing and canning industry. They were like eddies — segregated but integral.

What was created as a result of this practice was a uniquely segregated pattern of cultures within the industrial landscape, based on ethnic ties to specific industrial positions. There

⁶ *ibid*, 36.

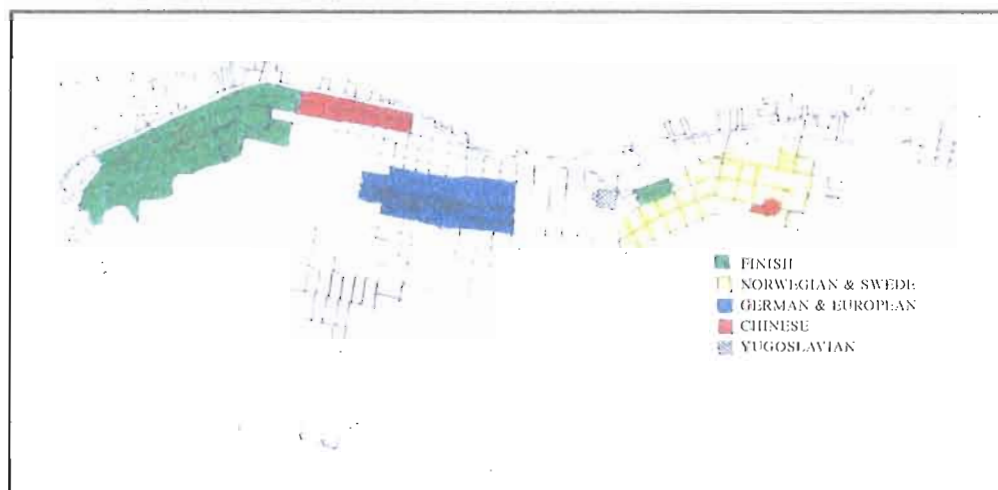


Figure 5. Astoria's ethnic neighborhoods, 1900. *Source:* CCHS

were, in essence, ethnic territories of employment, where political and social power was guarded and exchanged within smaller, semi-autonomous cultural systems, and between these disparate groups and the industry as a whole. This cultural separation and interaction was noted in all early reports, both popular media and governmental, on the Columbia River fishing and canning industries.

“White men do the greater part of the fishing for salmon...Scandinavians and Italians predominat[ing] almost everywhere. The native-born American is not often found actually engaged in fishing, but frequently is the owner of the gear or has a responsible position in the packing plants.”⁷

Segregated but interconnecting cultural systems influenced and restricted each other, and their impact on the landscape can be seen. Given the high turnover of migrant fishermen, especially in the last decades of the 19th century, ethnic composition analysis that relies on a diennial census tends toward inexact statistical description. It is clear that more settled

⁷ Cobb, *Pacific Salmon Fisheries*, 498.

immigrant communities began to emerge by the late 1880s, and to sort themselves into distinctly ethnic neighborhoods.⁸

Multiple interconnected cultural landscapes centered around a single industry, as was the case in Astoria, offer a unique opportunity to examine how cultural systems interact with and are tied to regional industrial development.⁹ While there have been more extensive studies of British Columbia and Alaskan Fisheries,¹⁰ studies of the Columbia have generally centered around the histories of specific immigrant groups, related to but set apart from the industrial landscape as a whole. The lack of a cohesive more contemporary study of the Columbia River fishing industry is interesting, since the better-studied northern fisheries grew directly out of the fisheries on the Columbia; often people who gained experience on the Columbia moved north, to finance canneries and work in them. That being said, there exist a number of valuable studies on specific immigrant groups and their relationship to the fishing and canning industries of Astoria. Two books in particular have been repeatedly and gratefully referenced in the composition of this chapter. Chris Friday's *Organizing Asian American Labor*, and *Legacy and Testament* by Irene Martin. Given the intensely dynamic cultural elements involved in the development of Astoria's industrial landscape, a study attempting to examine an industrial setting as an interconnected cultural landscape is only possible with existing sources of reliable research.

⁸ Clatsop County Historical Society Neighborhood Maps.

⁹ Wilbur Zelinsky, *The Cultural Geography of the United States*. Englewood Cliffs: Prentice-Hall, 1973: 5.

¹⁰ Some examples of Pacific Northwest fishery studies: Donald Guimary, *Marumina Trabaho: the History of Labor in Alaska's Salmon Canning Industry*, 2006; Patricia Roppel, *Salmon From Kodiak: a history of the Salmon Fishery of Kodiak Island, Alaska*, 1986; David Reid, *Development of Fraser River Salmon Canning Industry*, 1973; Gladys Blyth, *Salmon Canneries: British Columbia's North Coast*, 1991.

Cannery Workers

Labor in Astoria's fishing and canning industries can be effectively divided into two distinct but interconnected groups. Employment, settlement patterns, and organization of each group is notably different, and should be discussed separately. The first group is that of the fishermen, who will be examined later in this chapter. The second group are the cannery workers, the labor force responsible for processing the fish and rendering it marketable.

The practice employed in the first fifty years of the industry was to hire ethnic immigrant crews, at first comprised almost exclusively of Chinese workers. In the early days of canning "workmen came and went as common laborers do in the wheat fields of the West."¹¹ Laborers needed to run the canneries was initially drawn from extremely limited local or migrant sources that were not generally reliable. Inadequate transportation to the canneries along the river just exacerbated the problem. Cannery owners, looking to expand quickly, needed a dependable labor pool to effectively run their lines, and in the late 1870s they found it first in the Chinatowns of Sacramento, San Francisco, and Portland.

Chinese

From the mid-1870s to the turn of the century, Chinese immigrant crews formed the overwhelming bulk of cannery workers in the fisheries along the Columbia (Figure 6). Comprised overwhelmingly of young single men, the use of Chinese crews gradually declined after the enactment of the 1882 Chinese Exclusion Act¹², as the law slowly cut off the supply of migrant Chinese workers. To make up for the lack of skilled Chinese crews,

¹¹ Cobb, *Pacific Salmon Fisheries*, 499.

¹² The U. S. Congress passed the Chinese Exclusion Act in 1882, suspending all immigration from China for ten years. Ususally seen as a response to a depressed post-Civil War American economy, widespread anti-Chinese sentiment on the west coast, and the political rise of nativist "Workingmans Party."



Figure 6. Chinese butchers in cannery, circa 1890. *Source:* Oregon Historical Society (OHS) Website, *Oregon History Project*. Photo #28194.

labor contractors and canners filled cannery lines with Japanese, Filipinos, Mexicans, Puerto Ricans, and eventually, (American) women. Superintendents, foreman, machinists, watchmen, and owners were predominantly white men.

Small numbers of Chinese laborers were already in the Pacific Northwest by the 1860s, working on railroad lines around the Columbia River Basin, mining operations in Southern Oregon, and in paper, iron, and woolen industries outside Portland.¹³ The Burlingame Treaty of 1868 proved an important impetus to emigration, since it offered Chinese citizens preferred status and privilege in immigrating to the United States, allowing Chinese

¹³ Friday, *Organizing Labor*, 22.

workers to escape socioeconomic turmoil in southern China.¹⁴ Regional railroad construction projects were completed just as cannery expansion began in earnest in the 1870s. With completion of the railroad, many Chinese laborers ended up in Portland, a major recruiting hub for the canneries.¹⁵ Anti-chinese violence in California in the 1870s also contributed to a push north.

The Humes' cannery operation on the Sacramento River, prior to their relocation to the Columbia, was situated across the river from Sacramento's Chinatown. George Hume was the first to use Chinese as cannery workers, hiring a small crew through his (Chinese) cannery cook with connections in Portland's Chinese community. When early cannery owners and investors, rushing to take part in the expanding industry, wanted to increase production, or build new or larger plants, they followed precedents set by Hume, so Chinese crews quickly became the industry norm.¹⁶ Hume began with thirteen Chinese laborers in 1870; by 1881 there were over four thousand Chinese workers in cannery crews along the Columbia, over sixteen hundred of whom worked in Astoria.¹⁷

Strong cultural and family ties, as well as powerful community and labor organizations, known as *Tongs*,¹⁸ already established in the Chinatowns of West Coast cities, helped pull large numbers of Chinese laborers into Astoria. The use of organized Chinese crews served both parties. For cannery owners, the crews were an interconnected, dependable, and mass labor force; for Chinese immigrants, this system offered regular seasonal

¹⁴ *ibid*

¹⁵ *ibid*, 26.

¹⁶ *ibid*, 20.

¹⁷ *ibid*, 17, 26; U.S. Census, Clatsop County, 1880.

¹⁸ Initially resisted by Columbia River cannery owners, powerful Chinese *Tongs* based primarily in San Francisco, were active in Astoria by the 1880s.

employment as part of an established Chinese community with (limited) political power within the canning industry.

From their earliest use, Chinese cannery crews were hired through independent Chinese contractors, recruiting from cultural centers in the larger cities along the coastal zone - primarily San Francisco and Portland. These independent contractors furnished whole seasonal labor crews for the canneries, negotiating seasonal per-case wages, food, and lodging for the crews. Based on the estimated size of the annual salmon pack, the company guaranteed a certain number of cases, paying a set rate per case. Should the pack exceed this amount, additional cases would be paid the same rate. If the pack came in at less than expected, the wages would remain at the estimated pack level. The company transported the workers to and from Astoria, and provided bunkhouses, fuel, water, and salt. The contractor was responsible for the food.¹⁹ This system, while reasonably effective in terms of providing a dependable labor source, was open to widespread abuse, most often by the contractor middlemen. Limiting provisions of food was one of the ways for the contractors to increase their profit; contractors would provide basic rations of rice, then operate side “stores” for other goods at inflated prices. The self-contained nature of the Chinese labor force did not help in dealing with abuse of the system by their Chinese superintendents.

“Nearly all the workers are ignorant men; in most cases they have but little knowledge of English, the language in which the contract is printed, and as no paternal Government watches over them to see that they understand thoroughly the terms of the contract and that it is fulfilled on the part of the employer, as is done in the case of the sailors and fishermen, some of them discover at the end of the season that their pay does not come up to the glowing promises of the agent who recruited them...”²⁰

¹⁹ Cobb, *Pacific Salmon Fisheries*, 500.

²⁰ Cobb, *Pacific Salmon Fisheries*, 501.

Many Chinese had small gardens to supplement their diet, and larger “truck” gardens were operated on the outskirts of Astoria by Chinese merchants recognizing the need for additional provisions. The Chinese district, with some Chinese bunkhouses and small cottages, often had attached pig pens and garden plots.²¹

During the season, Chinese crews averaged between seventy and one hundred men, though prominent canneries’ crews could be considerably larger.²² The crews usually arrived in February or March, before the April opening of the fishing season, to prepare the canneries by making cans, knitting nets, and setting up living quarters. Though the fishing season officially closed in August, the canning season extended into the late summer months employing small numbers of Chinese laborers to case and label cans of salmon for shipment.²³

At the cannery, a “China Boss,” or foreman, was assigned by the contractor,²⁴ whose responsibility was to relay orders to the non-english speaking crew. His function was to act as an intermediary between the racially divided labor-management systems. Though the foreman was not considered management, he was held responsible for the behavior and production of the crew he supervised. In effect, this created a semi-autonomous sphere of Chinese laborers, as they were self-assigned and self-regulated, strengthening racial segmentation and territorialism within industry labor.

Within this internal ethnic subsystem, a social hierarchy was created based both on

²¹ John Fagan, “The Chinese Cannery Workers of Warrendale, Oregon, 1876-1930.” in *Hidden Heritage: Historical Archaeology of the Overseas Chinese*. edited by Priscilla Wegars. [Amityville: Baywood Publishing Company, 1993], 219.

²² Friday, *Organizing Labor*, 28.

²³ *ibid.*

²⁴ On the 1880 Census, the Chinese foreman was listed as “head of household”, and the crews he supervised were listed under him as servants.

imported Chinese cultural values and cannery line position. Butchers, can makers (tinsmiths), and can testers made the most, often receiving twenty-five to fifty percent more pay than general line workers.²⁵ Cannery line speed and production capacity depended on the speed and skill of the butchers, so they became one of the highest paid non-management positions. Market quality and reputation depended on the ability of the tinsmiths and testers. These skilled positions were guarded as sources of social and political power, and thus skills training and information availability was restricted through highly selective apprenticeships.

Under the Butchers and can testers lay tiers of skilled to unskilled cannery positions, ranging from graders, slimers, and fillers, to fish pitchers, gang-knife operators, retort workers, to the various lowest paid assistants. Since the crews decided among themselves who received skills training and position, cultural values, such as preferential treatment based on age, played an important role in the internal organization of cannery labor.

Though Chinese were not allowed to unionize or officially go on strike, work stoppages formed the primary bargaining power of the cannery crews. Given the perishability of salmon and the short length of the season, any significant disruptions could be economically disastrous for the owners. Before the railroad link to Portland in 1898, transportation to and from Astoria was relatively slow and indirect, so labor could not be quickly imported to replace a skilled crew. Their overwhelming numbers, cultural solidarity, and hold on key positions within the cannery helped protect the Chinese laborers against more egregious industrial abuse. The need to keep the crews at least minimally satisfied helped govern the quality of the contractor (thus ensuring provisions of food and final payment), employed by cannery owners.

²⁵ Friday, *Organizing Labor*, 31.

In Astoria, Chinese laborers occupied positions that were generally not competitive with Americans or European immigrants. Since there was little or no displacement of other workers, violent anti-Chinese sentiment never found an especially strong audience in Astoria, and the town came to be known as a “safe haven” for Chinese periodically persecuted and expelled from other cities such as San Francisco and Portland. It was generally understood in Astoria that if the Chinese were harassed or expelled, with so little replacement labor available, the primary economic machine of the town would fail. Though there was little direct violence aimed at the Chinese population, the Chinese workers and attendant community were strictly segregated both physically and socially from other ethnic groups serving the same overall industry.

An obvious example of this was in the avenues of employment closed to Chinese in Astoria. Commercial fishing, for Chinese, was off limits. “The only Chinese engaged in fishing were in Monterey Bay.”²⁶ Other ethnic groups, specifically the Scandinavian and Finnish fishermen, became overtly hostile whenever Chinese attempted to compete for jobs within the industry by fishing commercially. Though there were no official or legislated restrictions regarding who could fish;

“Chinamen dare not fish in the Columbia, it being an understood thing that he would die for his sport...”

“...there is no law regulating the matter, but public opinion is so strong in relation to it, and there is such a prejudice against the Chinamen, that any attempt on their part to engage in salmon fishing would meet with a summary and probably fatal retaliation.”²⁷

A few Chinese found work as assistants (rowers or “pullers”) on Gillnet boats owned by the canneries, as cannery owners at the time thought using lower paid Chinese labor

²⁶ J. W. Collins, U.S. Commission of Fish and Fisheries. *Report on the Fisheries of the Pacific Coast of the United States*. Washington D.C., 1892 [microfiche], 204.

²⁷ Goode, U.S. Bureau of Fisheries. *The Fisheries and Fishing Industry of the United States*, [Washington: Government Printing Office, 1884-87], 201.

would reduce costs. Fishermen, also, occasionally hired Chinese as pullers, since they could pay them less than those of their own ethnic group. In 1888, with well over a thousand Chinese laborers in the canneries, there were ten Chinese working on boats.²⁸ This practice ended with the formation of the Columbia River Fisherman's Protective Union (CRFPU) in 1886, which accepted Chinese workers in canneries but not on boats. Owners obliged.²⁹

Increasingly after 1890, with the gradual unavailability of Chinese due to the early effects of the Exclusion Act, women and children from local European-American fishermen families were hired to perform generally the lowest-paid unskilled work in the canneries at piece or hour wages.³⁰ Both, it was generally agreed, could be paid less than men. As exclusion policies began to have major impact around the turn of the century, non-Chinese cannery labor entering the market increased proportionally.³¹ While the contractor system was comprised of a single ethnic group, the Chinese, it remained an entrenched labor hiring system within the industry. Introduction of other nationalities into this contracting system complicated and finally disrupted it completely. The (aging) Chinese workforce had a small but prominent presence by the 1930s, often holding highly-skilled positions within the canneries, but ceding cultural dominance to incoming Japanese and Filipino workers.³²

²⁸ Collins, *Fisheries*, 207.

²⁹ Friday, *Organizing Labor*, 69.

³⁰ *ibid*, 43.

³¹ The Exclusion Act, though passed in 1882, was not felt for nearly two decades after its passing, since many Chinese workers, forewarned that the Act was coming, emigrated before it took effect. This created a temporary surplus in Chinese laborers.

³² U.S. Census, Clatsop County, 1930.

Early Chinese settlement in Astoria grew in proportion to the canneries. In 1880 there were 2,122 Chinese in Astoria, with three-fourths (1,639) of them working in the canneries.³³ Owners lined the waterfront with canneries extended on pilings over the river, placing the Chinese bunkhouses in a nearby row behind the canneries, often on the bank or wharf.³⁴ Chinese merchants, tailors, laundry, gardeners, residences and other businesses were crowded into a small section of downtown Astoria, next to the cannery bunkhouses, to cater to the Chinese cannery workers. Eventually, as the population declined, bunkhouses were converted to other uses and Chinese quarters were incorporated into the Chinese neighborhood.

“The old ‘China’ house, in which was housed the whole oriental gang like rabbits in a warren, has been largely superseded by cottages, each housing from 8 to 16 men, and these are numerous enough to permit of the various nationalities flocking by themselves.”³⁵

Surrounding neighborhoods of immigrant fishermen, again mostly Finnish and Scandinavian, helped restrict Chinese settlement within a proscribed area. Upper Astoria housed over seven hundred Chinese workers in 1880, but had no attendant Chinese district to serve them. Though the year-round Chinese community continued to diversify and grow into the first decades of the 19th century, the 1898 railroad link to Portland made Astoria’s Chinese community something of a satellite to Portland’s Chinatown.

Japanese

With decline of Chinese workers due to the Exclusion Act, and the continued expansion of the fishing industry into Alaska and along the tributaries of Columbia, canners explored new technology and pressured contractors to keep their lines staffed. New

³³ Friday, *Organizing Labor*, 56.

³⁴ Sanborn Insurance Maps, 1888-1948.

³⁵ Cobb, *Pacific Salmon Fisheries*, 502.

technology, in general, was less desirable than a flexible labor force since it tended to require large capital investments and was initially too experimental to be dependable. The alternative was to hire outside the traditional Chinese crews for cannery labor. Japanese workers began to appear around 1910 as part of contracted (still primarily Chinese) crews as a result of Chinese labor scarcity.³⁶

Before 1900, there were few Japanese in the United States. The first wave of Japanese labor began to emigrate from Hawaii and Japan beginning around 1890. Like most other emigrating nationalities coming to the U.S. from the mid 18th to the early 19th centuries, their motivation was a combination of difficult economic or political circumstances at home and the opportunities offered by an expanding American economy. In this case, emigration was a result of the Japanese Government's push toward rapid industrialization, largely at the expense of the agricultural economy and populations. In 1885 the Japanese government legalized emigration to relieve some of the economic pressure it had created, and Hawaiian sugar planters began recruiting from the poorer agricultural regions of western Japan. Hawaii then became a starting point for further Japanese emigration into the U.S. mainland. In the Pacific Northwest, Japanese labor started being used on railroad crews in the last few years of the 18th century, and they began appearing as railroad "section men" on Astoria's census records by 1900.³⁷

The experience and impact of Japanese immigration was necessarily different than that of the Chinese. The Japanese workers were entering an already established system of ethnic labor, with all of its internal divisions and entrenched interests. They also brought more women with them than had the mostly single migrant Chinese workers, and established

³⁶ Friday, *Organizing Labor*, 82; U.S. Census, Clatsop County, 1900-1910.

³⁷ U.S. Census, Clatsop County, 1900.

year-round community networks more quickly.³⁸ Before the effects of the Chinese Exclusion Act, Chinese contractors and entrenched crews limited other ethnic groups' access to cannery jobs. Even after inclusion of Japanese into crews, Chinese contractors and laborers attempted to guard their more valuable skills through restricting access to training. Because of their inexperience and ethnic tensions between Chinese and Japanese workers, Japanese were initially hired at lower rates than Chinese labor. Chinese dominance of higher paying skilled positions encouraged Japanese to enter other industries, showing higher populations working in timber industry, for example, than working in the cannery.³⁹ By 1910, Astoria had several hundred Japanese year-round residents, and Portland had fairly large Japanese community.⁴⁰ Between 1910 and 1920, Japanese labor made up about a quarter of the contract crews.⁴¹ By 1920, the numbers of the two populations working in the canneries had equalized.

Japanese workers initially gained power within the canning industry through subcontracting; essentially serving as an intermediate recruiter and foreman for contractors hiring crews. As demand for labor increased with the expansion of the Alaska fishery, and available Chinese laborers grew scarce, Japanese contractors began to appear, independent of the Chinese. The contractor position offered more political and economic power and protection for their population. Immigration restrictions were levied against Japanese nationals in 1908. But as there already were communities established in Astoria and Portland, resident immigrants and the second generation of Japanese continued to be a force

³⁸ Friday, *Organizing Labor*, 92-94.

³⁹ Friday, *Organizing Labor*, 97; U.S. Census, Clatsop County, 1910-1920.

⁴⁰ *ibid.*

⁴¹ *ibid.* The 1910 Census lists 237 Chinese and 49 Japanese cannery workers. By 1920 the numbers are 104 and 98, respectively.

on cannery crews until the 1942 Japanese internment laws came into effect at the outset of World War II.

Ethnic antagonism between Chinese and Japanese laborers created issues in cannery housing. Often, canneries provided independent or segregated housing for the two groups. Japanese laborers were initially considerably fewer in number, and arrived later in the season, than Chinese crews, so they tended to get lower quality housing.⁴² Frequently, single Japanese workers were housed in compartments of existing Chinese bunkhouses, and so do not appear on maps of the buildings or streets.

Filipino

Filipinos migrated to the west coast of the United States in small numbers beginning in the mid-19th century, working for various railroad and mining operations.⁴³ Following the Spanish-American War of 1898, the Spanish-occupied Philippines was ceded to the United States as part of the Treaty of Paris, negotiated the same year, which parcelled out the last of Spain's colonial territories. After a brief war for independence, the Philippines became part of expanding American territorial holdings in the Pacific. Now under an American-appointed government, migrant Filipino laborers began to be recruited for Hawaiian sugar plantations in 1906. Immigration continued west to the agricultural fields of California, and to the canneries of Oregon, Washington, and Alaska (Figure 7). Though the west coast Filipino community was centered in Seattle, with cannery workers seasonally travelling to Alaska for cannery work, some travelled to the canneries of the Lower Columbia. Chinese and Japanese contractors recruited Filipino workers for the CRPA in Astoria as well as for the Alaskan Packers Association. Numbers of Filipinos in Astoria

⁴² Friday, *Organizing Labor*, 112.

⁴³ *Filipino-Americans: Discovering their Past for the Future*. Documentary Videotape, Filipino-American Historical Society, Seattle, Washington, 1994.



Figure 7. Filipino CRPA cannery workers. *Source:* CCHS

never matched those of Chinese workers, but by 1930 the Filipino population was on par with the Japanese.⁴⁴

Other Groups

Koreans, Hawaiians, Portuguese, Puerto Ricans, Peruvians, Chileans, Turks, Indians (Hindus), Mexicans, African-Americans; all entered the cannery industry to fill the gaps left by declining Chinese crew workers. They were usually relegated to the lowest paying, least skilled, and least desirable canneries. None were in large enough numbers to affect change within the cannery system (other than disrupting the Chinese contracting

⁴⁴ U.S. Census Clatsop County, 1930.

system), and none had representatives as contractors.⁴⁵ A few of the ethnic groups, like the Indians and Turks, were more evident as workers in the lumber industry, filling in cannery jobs as needed during the season.⁴⁶

Women

After 1890, women from local European-American (usually fisherman) families worked at piece and hourly rates on the sliming lines and filling tables, and as “extra hires” during the peak of the season (Figure 8). By the 1910s, women made up as much as twenty-five percent of the crews in Astoria canneries, and that percentage increased in subsequent de



Figure 8. Women can fillers at Elmore, 1901. *Source:* OHS Oregon History Project. Photo #23221

⁴⁵ Cobb, *Pacific Salmon Fisheries*, 499; Friday, *Organizing Labor*, 101; U.S. Census, Clatsop County, 1900-1930.

⁴⁶ U.S. Census, Clatsop Cannery, 1920.

cares.⁴⁷ Cannery lines came to be entirely dominated by women by the mid 1940s, in part because of declining immigration and employment opportunities of the Depression era, in part because of the drafting of men overseas during WWII.

Fishermen

Compared to the importation of Chinese labor, Fishermen who migrated to the Columbia to work did so relatively independently. The bulk of the fishermen on the Lower Columbia were Finnish, Scandinavian and Southern European.⁴⁸ During the 1880 fishing season, there were 1,293 fishermen working on the river out of Astoria, 90% of whom were single and living in boarding houses. Large transient “floating” populations appeared every spring season, 84% of which derived from various immigrant populations.⁴⁹ Most were involved in what Irene Martin refers to as a “pluralistic adaptation,” where various seasonal livelihoods are employed in combination, in a manner similar to their original cultural patterns of industry. In the early years of industrial development, when the population was still overwhelmingly migrant, workers formed circuits following the seasons of various regional extractive industries, travelling to fishing, logging, mining, or farming jobs as seasons began and ended. When immigrant populations settled, this manner of combining seasonal work often continued, though generally closer to home.

“During the winter months most of the fishermen are employed carpentering, street building, as workers in the mills and factories or engaged in knitting nets and preparing gear for next season.”⁵⁰

⁴⁷ Cain Allan, *Women Can Fillers, Elmore Cannery*, Oregon Historical Society, online Oregon History Project, 2006

⁴⁸ Damron, *Salmon Trollers*; Martin, *Legacy*. 35. “Southern European” in this case is predominantly Greek, Yugoslavian, and Italian

⁴⁹ Smith, *Fish or Cut Bait*, 5

⁵⁰ Cleveland, *Social and Economic*, 147

Finns, for example, formed farming communities around the Columbia Basin, continuing to travel back to Astoria for the summer fishing season.⁵¹ This cultural and regional habit of multiple livelihoods was not reflected on the diennial census forms, but was described in many of the oral histories of those working and living in Astoria during the early to mid-20th century.

Finns

Astoria held the largest Finnish population west of the Mississippi, earning the nickname “Helsinki of the West”. Though a small number of Finns had been in the area since 1800, working for Russian fur trading companies, they arrived in the U.S. in larger numbers the two waves of immigration during 1864-1900 and 1901-1927.⁵² In the first wave, both Finnish and Scandinavian immigrants were part of a mass European labor force emigrating to the Pacific Northwest; in part because the availability of land and expanding resource-extraction industries; in part because of the building of the Northern Pacific Railroad. Like the Chinese emigrating during the same period, the initial economic draw for Finnish workers was the railroad and lumber industry. Finnish sailors provided the base for chain migration. Sailors “wintered over” in Portland, and some of them came to serve as funnels for emigrating Finns as the industries on the Columbia expanded.⁵³

⁵¹ Neilsen. *Finnish Architecture*, 8.

⁵² Susan Lewis, “Finnish American Women as Socializers.” PhD diss., [University of Oregon, 1993], 95.

⁵³ Lewis, *Socializers*, 103.

The Finnish community, though strongly unified by language and custom and fairly self-contained, was split between Swedish-Finns (white/church) and Russian (red) Finns. Within this division lay some occasionally conflicting linguistic and political differences.⁵⁴

Two thirds of the Finns who migrated to the United States were tenant farmers and agricultural laborers, for whom it was customary to supplement income with seasonal non-agriculture work.⁵⁵ Nationally, emigrating Finns showed a marked preference for extractive industries like fishing, logging, and mining, settling in places like the Lake Superior mining districts in Michigan, rural settlements and farmsteads in Wisconsin, Minnesota, and South Dakota, and logging districts of Maine, Michigan, and the Pacific Northwest.⁵⁶ It was not accidental that Finnish settlements were located in areas with a proximity to various seasonal work. Finnish workers would move around these centers as industries required, switching from fishing, to logging, to mining, and finally, to farming.⁵⁷ Finnish farming settlements in Columbia Basin is a good example of this trend; emigrating Finns worked in seasonal extractive industries like fishing to raise capital, then bought farmland in the upper Willamette Valley and Columbia Basin southeast of Astoria.⁵⁸

⁵⁴ Finland is neighbored by Sweden to the west and Russia to the east. Politically, Finland was considered part of Sweden until 1809, when it became a duchy under the Russian Empire. Finland declared its independence near the end of WWI. The first wave of Finnish emigres were primarily from northern and central-west Finland villages, in province of Ostrobothnia. These tended to have a strong Swedish influence, often including speaking Swedish language. The second wave was still predominantly from Ostrobothnia, but also brought migrants from southern and southeastern Finland. This second wave tended to be more political in orientation and motivation, immigrating both for economic reasons and to escape czarist Russian political repression. Hummasti, *Finnish Radicals*.

⁵⁵ Martin, *Legacy*, 36.

⁵⁶ Kaups, *Finns*, 242.

⁵⁷ According to Massi (246), farming was a second stage migration, an actual transition from migrant labor to settlement. Around Astoria, however, Finns tended to continue to fish seasonally even when their farms were established.

⁵⁸ Neilson, *Finnish Architecture* 22; Kaups, *Finns*, 242.

Most of Astoria's early migrant Finnish fishing population was comprised of seasonal workers recruited in or circuiting back to San Francisco. The "winter headquarters" for Columbia River Finnish fishermen was Berkeley, California, located on the east side of the San Francisco Bay.⁵⁹ Similar to Chinese, Scandinavian, and most of the fishery-centered ethnic populations, the majority of Finnish fishermen throughout the 1870s and 1880s were single men, usually working in Astoria only seasonally and living in boarding houses in Uniontown and Upper Astoria.

"The Finns are very clannish, which accounts for their almost exclusive Finnish settlement in West Astoria. It is their custom to send for their relatives in their own country as soon as they have earned the necessary money. In this way the foreign-born population is steadily increasing."⁶⁰

The increase of the Finnish population in Astoria was rapid, often coming close to making up a quarter of the total population of the town. A 1905 count of Astoria's population lists Finns numbering 2,027 out of a total population of 11,045.⁶¹ By 1910, Finns made up the largest single ethnic group in Astoria. In 1920, there were nearly 4,000 Finns out of 14,027 total. By 1930, Astoria had a total population of 21,124, 20% of which was Finnish.⁶²

In settlement regions throughout the United States, Finnish immigrants tended to form "ethnic islands," small, homogeneous populations linked by cultural tradition and linguistic commonality. Unlike the Scandinavians, it was not so much the village of origin but the Finnish language that formed the basis of the community tie. There is also a (related)

⁵⁹ Michael Passi, "Fishermen on Strike: Finnish Workers and Community Power in Astoria, Oregon 1880-1900." in *The Finnish Experience in the Western Great Lakes Region: New Perspectives*, edited by Karni, Michael Karni, Matti Kaups, Douglas Ollila. [Turku: Institute for Migration, 1975], 94.

⁶⁰ Cleveland, *Social and Economic*, 148.

⁶¹ Hummasti, *Finnish Radicals*, 84, 96.

⁶² Neilson, *Finnish Architecture*, 20.

cultural tendency toward cooperatives; in commerce, residential organization, and industry. Finns, for example, were the driving force in the 1896 founding of the Union Fisherman's Cooperative Packing Company, organizing and building the cannery as an independently-run alternative to the political and economic power of the "combine", or Columbia River Packers Association (CRPA). While the co-op cannery was both Finnish and Scandinavian, Finns owned 172 out of 200 shares in the company. Finns were also instrumental in forming the Columbia River Fisherman's Protective Union (CRFPU) in 1889, in an effort to have a stronger negotiating position in determining the price of salmon.

Finnish settlement concentrated in Astoria's west end in what became known as "Uniontown," reportedly named for Samuel Elmore's 1884 cannery wharf, originally called the "Union" cannery.⁶³ Uniontown was located south of West Bond street (directly to the west of the Chinese District) and extended westward along Taylor avenue (now West Marine Drive).⁶⁴ Begun as a boardinghouse district for single Finnish fishermen, Uniontown was the commercial and social center of Finnish community in Astoria. Of the immigrant neighborhoods once in Astoria, Uniontown is the only one still relatively intact.

Scandinavians - Norwegians and Swedes

Norwegians came to the U.S. as part of the early to mid 19th century European mass immigration, although later than other northern and western European emigrants. The greatest migration of Norwegians was to the northern region of the Midwest, but many gravitated to the Pacific Northwest because of its environmental similarities to Norway's

⁶³ U.S. Department of Interior. *Uniontown-Alameda National Historic District Nomination*, 1988.

⁶⁴ Refer to ethnic neighborhood map, figure 5, page 43.

coastline and opportunities to earn a living in commercial fisheries.⁶⁵ Norway has one of the longest and most complicated coastlines in the world, bordering the Arctic Ocean, the North Sea, and the Skagerrack Strait. From here came generations of fishermen, sailors, and shipbuilders, many of whom would bring their skills with them to regions in the United States. Like the Finns, Norwegians combined seasonal fishing with dairying, logging, and agriculture, “in a manner suggestive of ways of life on the Norwegian west coast.”⁶⁶ Though Norwegian immigrants were prominent in Pacific Northwest trade and shipping, they did not come to play a large role the Pacific Northwest fishery until after the turn of the century. While they were the third-largest ethnic fishing population in Astoria (after the Finns and Swedes), Norwegians in the Pacific Northwest fisheries concentrated in the Puget Sound area of Washington State.⁶⁷

Swedish immigration was also part of a general mid-19th century European migration to the United States. Swedes came over earlier than the Norwegians, with their second (1860-1870) and third (1880-1890) waves making up the bulk of Swedish migration to the Pacific Northwest. Like the other immigrant ethnic groups profiled here, they were responding to the “pull” of an expanding American economy, and the availability of cheap land under the Homestead Act of 1862. The “push” was an industrializing and agriculturally depressed Swedish economy. The 19th century Swedish population was 80% agricultural,⁶⁸ and in the late 1860s and early 1870s Sweden experienced major crop failures. From 1860 to about 1890 the majority of Swedish immigrants came from agri-

⁶⁵ Damron, *Salmon Trolling*, 27.

⁶⁶ Kenneth Bjork, *West of the Great Divide: Norwegian Migration to the Pacific Coast, 1847-1893*. [Northfield: Norwegian-American Historical Association, 1958], 543.

⁶⁷ Einat Haugen, *The Norwegians in America: A Student's Guide to Localized History*. [New York: Teacher's College Press, 1967], 5.

⁶⁸ Nils Hasselmo, *Swedish America: An Introduction*. [Minnesota: Brings Press, 1976], 11.

cultural backgrounds.⁶⁹ Immigrants came from all parts of Sweden, though the earliest and heaviest migrations came from the poorest agricultural areas of southern and western Sweden.

Like Norwegians, Swedes concentrated their earliest U.S. settlement in the Midwest, initially in urban areas.⁷⁰ After 1890, Swedish immigrants began to settle farther west, some coming directly from Sweden, others migrating from established settlements in the Midwest. The availability of land and economic opportunities in extractive industries in Colorado, Montana, and the Pacific Northwest drew immigrant populations farther west. Before 1890, only 5% of emigrating Swedes settled in the Pacific States, and were highly distributed throughout Washington, Oregon, and California. By 1930, the proportion of Swedes settling farther west had increased to 13%, with the highest concentration in Washington's Puget Sound.⁷¹

Combining farming with logging, fishing, and lumber industries was as common in Sweden as it was in Finland and Norway.⁷² In Sweden as elsewhere, those with a "pluralistic" combination of livelihoods were better able to respond to shifting economic pressure. But limited agricultural land, downturns of local fisheries, and various other economic problems served to continue to encourage Swedish and Norwegian emigration to the geographically and economically expanding U.S.⁷³

Like the Finns, Scandinavians were relatively independent within Columbia River

⁶⁹ Sten Carlsson, *Swedes in North America, 1638-1988: Technical, Cultural, and Political Achievements*. [Stockholm: Streiffert & Company, 1988], 31.

⁷⁰ Hasselmo, *Swedish America*, 19.

⁷¹ Carlsson, *Swedes*, 43.

⁷² Hasselmo, *Swedish America*, 53.

⁷³ Martin, *Legacy*, 38.

fishery organization, and operated comfortably in communal political labor organizations. They were not restricted to a specific hierarchy or position; Scandinavians reportedly owned three canneries — the Scandinavian Packing Company in Upper Astoria, as well as the West Coast Cannery and the Pacific Union plant, both out of operation by the late 1880s.⁷⁴ Also, a higher percentage of Scandinavians owned their own boats, as opposed to renting gear from the canneries, and because of this played an important role in developing the trolling fishery after the introduction of gasoline motors in 1912.⁷⁵

When the Scandinavians settled in Astoria, they created neighborhoods northeast of and inland from the canneries, in an area east of Scow Bay known as Uppertown.⁷⁶

Southern Europeans

As stated in earlier in the chapter, the ethnic makeup of Astoria's fishermen were predominantly Finnish, Scandinavian, and Southern European. The three largest groups of southern Europeans appearing in Astoria during its early industrial development were Yugoslavian, Italian, and Greek.⁷⁷ The Austro-Hungarian Empire, including Yugoslavia, Poland, Hungary, Austria, and parts of Czechoslovakia and Italy, were undergoing similar agricultural and fishery difficulties as Sweden and Norway in the 1870s.⁷⁸ Italian immigrants also utilized a "pluralistic adaptation" in constructing their livelihood, combining fishing and other types of seasonal work.⁷⁹ Italian fishermen were in Portland as early

⁷⁴ Bjork, *West of the Great Divide*, 554; Sanborn Insurance Map, 1892.

⁷⁵ More will be said on this topic in the upcoming chapter.

⁷⁶ Cleveland, *Social and Economic*, 147.

⁷⁷ U.S. Census Records, Clatsop County, 1920-1930.

⁷⁸ Martin, 39

⁷⁹ *ibid*, 41

as 1860, and working in the Sacramento River fisheries even earlier. Sacramento River seasonal salmon runs complemented those on the Columbia, so Italians would fish the Columbia in the summer and go south to the Sacramento at the end of the season.⁸⁰ Eventually, many moved north to continue the seasonal work circuit between California and Alaska. Italians, Yugoslavians, and Greeks tended to remain migrant workers for a longer period than did the Finns and Scandinavians, renting boats and gear from the canneries as needed for the season.⁸¹

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Each ethnic group migrating to the Lower Columbia to work in the fishing and canning industry brought with it established cultural values, social organizations, various skills, and patterns of livelihood. These cultural patterns were adapted for use in Astoria's industry, forming the basis for how each separate ethnic sphere organized itself. Each immigrant group occupied distinct and quickly institutionalized positions within the Columbia River fishery. These areas of employment, or ethnic territories, were vital to the success of the industry as a whole, though they remained highly ethnically and industrially segregated.

⁸⁰ *ibid*, 42.

⁸¹ Damron, *Salmon Trolling*, 22.

CHAPTER V

THE SHAPING OF AN INDUSTRIAL LANDSCAPE

“The dominant element in any industrial landscape [is] the process itself.”¹

Principles used by industrial archaeology to analyze landscapes provide a basic framework for examining the physical evolution of Astoria’s industrial landscape. Following the major themes outlined in chapter one, these principles consist primarily of ordering documentary and physical evidence based on time (stratigraphy), space (spatial patterning), and form (typology).² The first two of these, stratigraphy and spatial patterning, will be considered in this chapter, while the third, typology, will be examined in the chapter five. Here we are looking at the *process* of physical industrialization in terms of its location; the result of a specific combination of physical environment, built structures, applied function, and cultural life. Not enough above-ground physical evidence remains in Astoria to focus on it exclusively, so for this chapter, historic town maps, Sanborn Insurance maps, and historic photographs form the bulk of comparative material.

Existing studies of the development of Pacific Northwest fisheries usually include the Columbia River, Alaska, Puget Sound, and occasionally British Columbia as representative of overarching Pacific Northwest regional trends. Given that both Alaska and Puget Sound fisheries developed at least in part under the influence of Columbia River canners and fishermen, the similarities of industrial practice in this region are somewhat unavoidable. But because of the timing of their respective industrial development — the

¹ Trinder, *Making*, 7.

² Judith Alfrey and Catherine Clark. *The Landscape of Industry*. [London: Routledge, 1993]

Columbia River fisheries in the 1870s through the 1880s, and the Alaskan fisheries from the 1880s through the turn of the century — there were subtle but significant differences in local fishery development. These developmental differences were reflected in local technological and architectural choices which were evident in the industrial landscape. Industries used power, needed storage, and were shaped by changing patterns of demand and development of new technologies.³ Most, if not all, changing industrial needs impacted the landscape in some way.

In order to analyze the development of Astoria's industrial landscape, I have divided this chapter into four basic and interrelated components: physical geography, systems of transportation, built form, and cultural geography.

Environment/Physical Geography

Located seventeen miles inland from the Columbia River Bar, Astoria is located on the Oregon side of the Columbia River. The town was settled on the north edge of a flattened peninsula, bordered on the west by Young's Bay, on the north by the Columbia River, and on the east by Cathlamet Bay. There have been a few periods of settlement on that site, but for the purposes of this study, the relevant development period began in the 1870s when larger-scale industrial production began, first with lumber mills, then with salmon canning.

Fishing and canning industries along the Lower Columbia River concentrated in Astoria because of its nearness to fishing grounds, existing industrial infrastructure (primarily lumber mills), and accessible shipping lanes. Salmon fishing was an extractive industry, one which followed the migratory path and spawning habits of various species of

³ Trinder, *Making*, 21.

salmon.⁴ Fish processing operations had to be located near their resource, since the high fat content of fish caused rapid degradation once caught and killed. Gillnet boats and seines would either deliver their catch directly to the cannery itself or to intermediary cannery scows anchored near the fishing grounds. The canneries' position on pilings over the river facilitated boat delivery, as fishing boats could dock alongside cannery wharves. Boats then unloaded their catch into bins or elevators that would deposit the fish directly into the butchering area. Cannery location and subsequent ease of access for fishing vessels thus helped reduce valuable transportation and processing time.

Astoria's position near the mouth of the Columbia, where the river drains into the Pacific Ocean, was also significant. Salmon stop eating upon entering freshwater en route to their spawning grounds, so fish caught nearer the mouth were higher quality due to their higher fat content. Fishermen regularly took chances in drifting their nets near the Bar, attempting to catch larger and higher-quality Chinook. With adoption of the gasoline engine after the turn of the century, gillnetters and trollers⁵ were finally able to extend their fishing grounds past the Columbia River Bar, chasing higher quality fish over longer distances out into the Ocean.⁶

As mentioned in Chapter Two, steep hills immediately bordering the Columbia left little flat land available in Astoria for development. Thus most of the commercial and industrial areas of the town, as well as much of the worker's housing, were initially built on wood-planked surfaces extended out over the river and supported by oiled pilings driven into the riverbed. This building practice also enabled canneries to position themselves near deep water lanes for shipping. It clear that since good portion of the early town was

⁴ Refer to Appendix A for descriptions of the different salmon species.

⁵ Refer to Appendix C for fishing boat types and descriptions.

⁶ Damron, *Salmon Trolling*, 7.

constructed entirely of wood, large quantities of lumber was readily available for local construction as well as for export.

The natural landscape in and around Astoria was a hindrance as much as it was a resource. In maritime industrial environments this is uniquely true. Unlike manufacturing, or even other extractive industries like logging and mining, fishing was an uncertain occupation. The availability of fish and accessibility of fishing grounds were dependent in part on natural conditions, both climactic and seasonal. Migrations of fish species like salmon are cyclical and can be tracked with some accuracy, but yearly runs and catches fluctuate dramatically, and bad years were economically disastrous.⁷ Fishermen and canners mitigated the fundamental instability of the physical landscape as best they could, with cautious technological innovation, formal and informal associations, and diversifying use and employment.

Systems of Transport - River and Railroad

Large-scale shipping and access to markets required a deepwater harbor. Booster pamphlets expressing Astoria's early competition with Portland for regional economic dominance cited its harbor as well as its proximity to the Pacific Ocean.⁸

Aside from its location near the Pacific Ocean, and having an accessible, deep-water port, Astoria was well positioned along Columbia River shipping routes to Portland, as well as other urban centers along the west coast and international markets. It became part of a circuit of shipping between Alaska, Seattle, Portland, San Francisco, and various international ports. In this manner, Astoria, functioning as a distribution center for regional

⁷ James Acheson, "Anthropology of Fishing." *Annual Review of Anthropology* 10, [1981], 276.

⁸ Sidney Dell, *Astoria and Flavel: The Chief Seaport of the Columbia River Watershed*, [Astoria: City Booster Pamphlet, 1893]; Peter Donan, *Astoria, The Peerless Maritime Metropolis of the Golden Northwest*. [Buffalo: Matthews-Northrup Co., 189?]

lumber and canning industries, effectively tied the region into an international production network, linking local resources, exports, and industries to an international labor pool and overseas trade.⁹

Early railroads along the Columbia River were limited to local and regional networks. The Astoria & Willamette Valley Railroad was incorporated in 1858, linking Astoria to parts of Oregon and Washington. The Astoria and Columbia River Railroad was built in the mid-1890s, connecting the waterfront industries to each other and to other west coast towns in Oregon and Washington. In 1898 the Astoria & Columbia River Railroad connected Astoria to Goble, a terminus of the transcontinental Northern Pacific Railroad, directly connecting Astoria's canned salmon exports to the East Coast of the U.S.

Built Form - Cannery Buildings

Cannery buildings and their attached net wharves were the dominant and most clearly identifiable element of Astoria's industrial landscape. The third principal of Industrial Archaeology, *Typology*, the classification of objects by material, form, and significant patterns of change, will be discussed in the following chapter.

People/Cultural Geography

Interactions between the physical landscape and the cultural landscape are most often described as a kind of sculptural overlay — cultural forms superimposed on existing natural landforms. Later immigrants then imposed their own modifications on the cultural and natural landscapes they found. Whether the predominant forms were natural or cultural, the landscape was inherited. Along the Columbia River, the relationship of the population to the landscape was necessarily intimate. Industrial work was tied to the exploitation of natural resources, and so ultimately dependent on the physical environment. Ethnic

⁹ Taylor, *Making*, 47.

groups migrating to the Lower Columbia established themselves in specific, and segregated, patterns within the industrial landscape. Those that followed either conformed to existing cultural landscape patterns or subtly altered them to suit their needs. Most of these landscape divisions were not necessarily visibly evident, and are recognized primarily through tracing cultural dominance in sections of industrial work.

Don Hardesty's analysis of western mining industry patterns in *Social Approaches to an Industrial Past*, is a useful model for examining the formation of Astoria's cultural landscape, especially concerning how divisions of that cultural landscape translate into divisions in the physical landscape. He described patterns of cultural "islands" within extractive industrial communities, consisting of workers bringing with them imported cultural and social environments.¹⁰ Despite the geographic remoteness which characterized the early development many of these western industries, each of these cultural islands was linked to transportation, communications, cultural, and economic networks on a national and international scale. Relevant migration networks that brought workers to Astoria were discussed in chapter three, but those networks included mobile labor and migration, material transportation, and interconnected systems of production and trade.¹¹

According to Hardesty, populations of mid- to late 19th century western American extractive industries were generally comprised of "highly mobile, predominantly male, cosmopolitan, laissez-faire individualists;"¹² a description that comfortably fits European, Finnish, and Scandinavian fishermen. Chinese cannery workers, however, fit this model only partially. Chinese crews were certainly comprised primarily of young single men, most of whom came to work in Astoria's canneries seasonally. Also like the Finnish, European,

¹⁰ Hardesty, *Power and Industrial Mining*, 172.

¹¹ *ibid.*

¹² *ibid.*

and Scandinavian fishermen, Chinese workers followed economic opportunity, circulating through urban communities and other extractive regional labor industries depending on the time of year and availability of work. The difference becomes apparent when comparing recruitment practices and migration methods. Chinese cannery crews were hired in groups by a Chinese contractor headquartered in a regional urban center. Crews were hired for specific canneries, working and living as a crew for the season. Insular and tight-knit, Chinese communities in Astoria and elsewhere assisted labor migration and seasonal settlement. Thus, the experience and habits of Chinese workers were distinct from those of ethnic fishermen, primarily in the organization of seasonal migration and labor.

Hardesty's concept of cultural islands can be translated into a fairly strict segregation of workspaces within Astoria's canneries. Ethnic territories, or culturally-defined spaces, are evidenced by segregation and divisions of landscape, both physical and social. Divisions of the landscape can be seen in the creation of ethnically homogeneous neighborhoods and in the strict separation of types of work, such as Chinese cannery workers and Finnish/Scandinavian fishermen. Ethnic dominance of a particular fishing method was prevalent; Austrians made up seining crews, for example, and nearly all Finns were gillnetters (although not all gillnetters were Finns).

Access to portions of the landscape, even those sections already restricted to specific ethnic groups, was additionally controlled through "exclusively allotted and increasingly formalized spaces."¹³ Fishing areas, for example, were not formally owned, but neither were they held in "common" as openly public grounds (Figure 9). One example of this

¹³ Taylor, *Making*, 140.

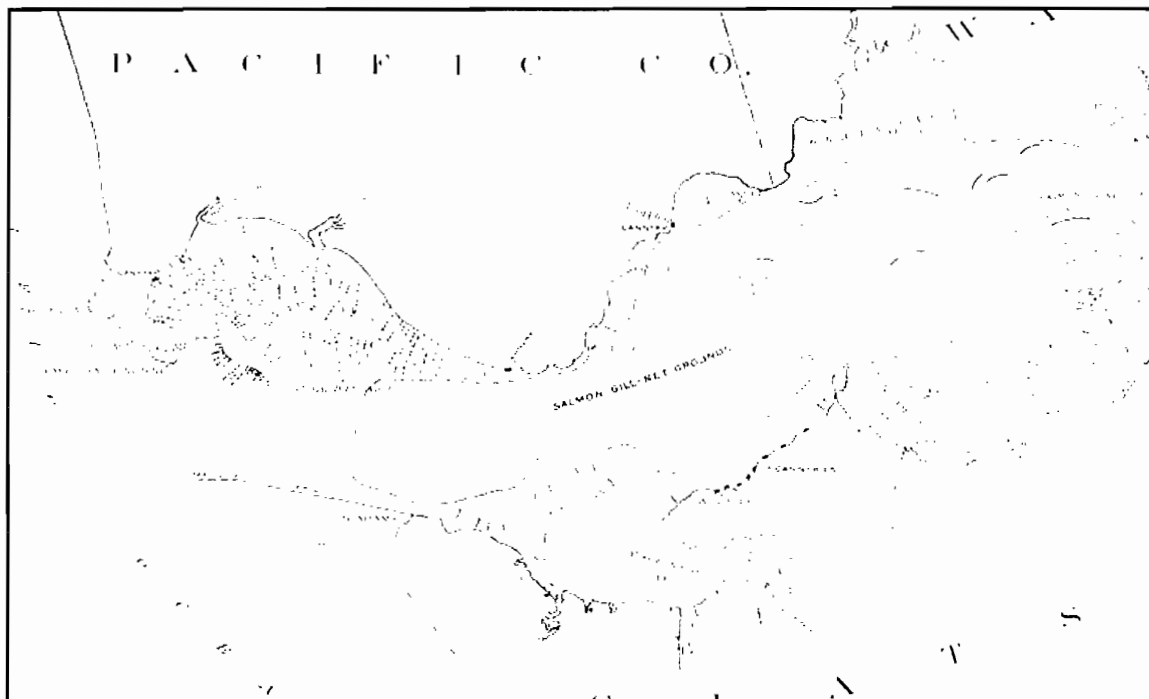


Figure 9. Chart of Lower Columbia fishing grounds. *Source:* OHS, Oregon History Project

kind of spatial claiming was in the formation of informal associations by gillnetters working the fishing grounds immediately north of Astoria. In this case, the development of the diver net enabled salmon fishing along the river bottom. Fishing along the riverbed brought with it the necessity of clearing the river of stumps and snags that could damage nets. Small groups of gillnetters would pool money to hire a diver to clear snags, and subsequently claim that stretch of the river for their exclusive use. Salmon was unofficially free to whomever could pull it out of the river, but access to the river was allocated through informal claim and privileged information.¹⁴ In this manner, groups of fishermen formed “snag unions”, with their territorial claims referred to as “drifts.”¹⁵ Members held “drift rights” to this part of the river, and though there was no claim of formal ownership,

¹⁴ Acheson, *Anthropology*, 281.

¹⁵ Irene Martin, *Legacy and Testament: The Story of the Columbia River Gillnetters*. [Pullman: Washington State University Press, 1994]

would defend their space against encroachment by other fishermen. These rights could be sold or inherited, and were often maintained within ethnologically homogeneous groups of fishermen. Finns controlled the Smith Channel and Black Spar drifts, for example, and the Swedes held drift rights at Tongue Point.¹⁶ Snag unions' apportionment of Columbia River fishing grounds was an informal, but very real, type of landscape division.

TURFS, or Territorial Use Rights in Fisheries, is the United Nations acronym for the kind of landscape created by fishermen on the Columbia River.¹⁷ Those who emigrated from Europe were already familiar with territorial use rights, though specific customs of organization varied from country to country.¹⁸ The drift right, local manifestation of territorial use, designated specific stretches of river to members of the snag unions for the duration of the fishing season, or for an extended period covering multiple seasons. Maintenance of river bottom to provide access to fish was one of the requirements for drift membership,¹⁹ ethnicity was another.

Gear use and ownership also divided fishermen, in some cases raising issues of class. Seine crews, for example, tended to be cannery hires, since additional gear and larger organized crews required more capital. Gillnet gear was a mix of private and cannery owned, often boats were leased to fishermen for a portion of their catch, while nets and gear were owned individually. With the exception of highly-skilled butchers and tin-smiths, Chinese workers were paid less than white workers. Immigrants that eventually replaced the Chinese in the canneries were paid even less than the Chinese, and had sig

¹⁶ Taylor, *Making*, 140.

¹⁷ Martin, *Legacy*, 100. United Nations Food and Agricultural Organization uses the term TURFs. "Community held rights of use (or tenure) and exclusion over the fishery resources within a specific area and for a period of time. Accompanying these rights might be certain responsibilities for maintenance and proper management of the resource base, as well as restrictions on the exercise of the rights of use and exclusion."

¹⁸ *ibid*, 101.

¹⁹ *ibid*.

nificantly less presence on the landscape, both in terms of settlement patterns and in political influence over their industrial workspace.

Some social divisions were relatively clear — divisions between the Chinese cannery workers and Finnish/Scandinavian fishermen, for example, were both racial and cultural. Other divisions were not as obvious. Finns tended to group linguistically and separate politically.²⁰ Scandinavians tended to gather into houses or neighborhoods according to region of origin. Groups of fishermen were distinguished by types of gear, or whether they were independent or employed by the cannery. Social divisions were based on race, ethnicity, class, geography, and/or type of gear used; every division translated into some sort of physical arrangement.

Cultural background informed social structure. Chinese workers were recruited as whole crews; Finnish and Scandinavian fishermen tended toward pluralistic employment. Declining salmon runs, recognized as early as 1880, served to increase competitiveness and solidify social and physical divisions within the industry, encouraging different uses and/or perceptions of the same space. Culturally defined spaces translated into clear divisions in the landscape.

Those involved in the canning and fishing industries on the river were in constant negotiation with the surrounding environment. Advances in canning technology and fishing gear improved efficiency of catching and processing salmon, in turn placing more pressure on an already overtaxed resource. Competition rose as additional fishermen came to the Columbia to work the river, so informal associations, such as the gillnetter snag unions, were formed to restrict access to resources. Cannery associations like the CRPA consolidated once independent canneries as corporate stock companies and controlled

²⁰ Paul George Hummasti, *Finnish radicals in Astoria, Oregon, 1904-1940 : A Study in Immigrant Socialism*. [New York: Arno Press, 1979]

industry competition and annual pack output. Political fighting between associations of types of fishermen, between gillnetters and trapmen, for example, often included underlying cultural or class-related conflicts, as each sought to limit the amount of salmon the other took from the Columbia.

So in Astoria's industrial landscape, it can be said that space was divided into spheres of cultural influence; each cultural "island" or ethnic territory had its own separate and insular system of hierarchy and regulated access to resources. However self-consciously separate these cultural associations attempted to be, each remained tied to the same industrial system and each contributed to the overall composition of Astoria's industrial landscape.

Landscape Evolution

Stratigraphy is the study of the build-up of material layers on a site left by an extended period of use. The accumulation of layers in Astoria's waterfront occurred laterally; it is not so much that structures were removed and rebuilt, or built over one another, but that existing structures were consistently adapted to and reused for different but related functions as the needs of the industry changed.

While a few fish processing buildings were built after 1890, such as S. Schmidt's Cold Storage and the Fisherman's Cooperative Cannery, most in use during the period of 1880 to 1930 were constructed between 1875 and 1885. Consolidation and expansion of successful cannery companies, along with the closure or buyout of smaller and/or struggling companies, encouraged the reuse of neighboring closed or abandoned cannery structures. Some were taken over and adapted to other (related) industrial or commercial interests. By 1892, the Clatsop Mill had taken over defunct I.X.L. Cannery structures. Joe Hume's Cannery, one of the Astoria's earliest, became the Astoria Exchange, a mercantile building which housed offices for some of the larger cannery companies' Alaskan operations.

Some, such as the original Kinney Cannery buildings, became warehouse space for the same cannery company as it expanded or changed from canning to cold storage. Others, the majority of the closed or abandoned structures, were subsequently used as “fishing stations,” boat and net repair and storage facilities.

Structures built after 1885 tended to be expansions of attendant industrial complexes; companies related to cannery production like can and box factories, warehouses, saw-mills, power plants, and iron works. The majority of these were located either between earlier cannery structures, sharing wharf space, or on the fill streets near the end of the cannery wharves.²¹ Most cannery structures themselves changed surprisingly little, additions largely consisting of extending net wharves (docks where gillnets were laid out across tiers to dry or be repaired) out over the river, and/or adding smaller structures and deck space onto their docks. A few of the more successful, such as the Kinney Cannery (CRPA), rebuilt their cannery operations at the river end of their docks, reusing the older cannery buildings along the shore as storage. While the number of operating canneries in Astoria decreased between 1888 to 1908 from twenty-three to nine, and their use and arrangement subtly changed, those buildings still operating as canneries did not increase substantially in size. Closure and/or consolidation left enough of a ready supply of industrial structures available to expanding canneries, fishing stations, and for new or adapted cold storage facilities. Turnover and consolidation of cannery structures occurred fairly rapidly. Judging from the period of peak fishing seasons of the early 1880s to the first decades of the 20th century, cannery companies rose and fell within 5-10 years, with the more successful companies consolidating into an overarching cannery association, the Columbia River Packers Association (CRPA), swallowing most remaining smaller companies, and stabilizing by the 1890s.

²¹ Sanborn Insurance Maps, 1884-1948.

A possible reason for the major wharf additions was the dramatic increase in gillnet boats on the Columbia. Between 1880 and 1900 the number of gillnetters fishing the river increased from 900 boats to over 2,400.²² These additional gillnet fishermen needed space to tan²³ and dry their nets between drifts and areas for minor boat repair and storage. Until the widespread use of gasoline engines in gillnet boats and trollers around 1910, canneries owned a good percentage of the boats fished on the river. Period maps show two- to four-hundred-foot wharf additions (marked as “net racks”) to nearly all remaining cannery structures in the early 1890s, as well as numerous stand alone net rack wharves between buildings.²⁴

The Astoria and Columbia River Railroad (ACRR) track, which connected all industrial buildings along the waterfront, was built in the mid-1890s, though the railroad from Astoria was not connected to Portland until 1898. The ACRR was built on low trestles over the river and parallel to the shore, connected to each industrial structure by short spur tracks that ran through or alongside storage structures. Wharf and dock space built up around these spurs, decreasing open space between neighboring buildings. The combination of wharf construction, attendant industry growth, and increased space taken for transportation, resulted in an increasingly dense waterfront district, despite the fact that actual operating canneries significantly decreased in number during the same period.

Along with the gradual structural crowding of Astoria’s waterfront in the last two decades of the 19th century, the shoreline itself was extended by slowly filling in the space around pilings, pushing “solid” land out into the Columbia. Plank streets initially laid out over

²² Taylor, *Making*, 139.

²³ Linen nets required a sulphur treatment bath, called “bluestoning” to keep from rotting.

²⁴ The number of boats on the river reached its height around 1915, to over 2,800, before dropping back down to 1,600 by the late 1920s. The additional boats did not necessarily lead to higher packs - the number of fish caught per boat declined from over eight thousand in 1870 to about fifteen hundred in the 1880s.

the river became a part of the town, as various fills slowly swallowed the space between the town and the waterfront industries.²⁵ After the fire of 1922, the space under planked road pilings was completely filled in, leaving only some of the canneries, and none of the town, on open pilings over the river. So the waterfront industrial district, once hung on the side of the town by wooden-planked roads and wharves, became the solid shoreline of Astoria.

Technology often plays a major role in how an industrial landscape evolves. In fact, industrial archaeology has traditionally focused on the use and evolution of technology in analyzing industrial landscapes. While technology is not the only factor directing change, it tends to carry more weight in industrial history than it necessarily might in history, cultural studies, or geography. In his dissertation, “Technological Change in the Pacific Coast Canned Salmon Industry,” Patrick O’Bannon noted three significant periods of technological advance in the Pacific Northwest fishing industry from the 1870s to the 1920s. Each of these periods was started by a “leading” transformative technical invention that produced what he referred to as waves of smaller “following” innovations.²⁶ Each of these inventions, The steam retort, the Smith fish cleaner (known as the “Iron Chink,” as they were supposedly intended to replace highly paid and highly skilled Chinese butchers), and the sanitary can, as well as their following improvements, were responses to bottlenecks in production capacity of the canning plants.

O’Bannon’s model of leading and following innovations within the industry applies to Astoria’s canning production only intermittently; the steam retort, butchering and filling machines, sanitary can, and subsequent “following” innovations, were all used to some extent in Columbia River canneries, but because of the specialized markets served by

²⁵ Sanborn Maps, 1884-1946.

²⁶ O’Bannon, *Technology*, 90.

Columbia River salmon, machines did not completely replace skilled hand work or revolutionize early industrial production as they did in the Alaskan and Puget Sound canneries. Which innovations were adopted depended on the particular needs of the local industry, and for a variety of reasons the canning industries along Astoria's waterfront came to use some canning machinery much later than did the more technologically progressive Alaskan and Puget Sound canneries.

Columbia River canneries' slower shift to machinery was not for lack of availability. Astoria Iron Works, founded by John Fox, was one of the first machine shops on Pacific Coast to specialize in cannery machinery. By the early 1880s, Astoria Iron Works had begun to manufacture steam retorts, butchering, and filling machines.²⁷ With innovations in machinery effectively removing bottlenecks in the production line, annual packs per cannery in some Pacific Northwest fisheries increased exponentially. It is certainly true that Alaskan canneries grew stunningly fast in the last two decades of the 19th century, doubling their output between 1884 and 1891, and again from 1895 to 1903.²⁸ Alaska surpassed the Columbia River pack yield in 1888; by 1900 packing 1.5 million cases to Columbia River's three hundred fifty thousand.²⁹ But correlative pack increases around availability of technology is not apparent in Columbia River statistics. This is more likely to be the result of a significant decline in salmon runs, which had begun to be recognized as early as 1880. Technology, when finally adopted, was able to make remaining processing lines more efficient, but did not itself make a major impact on the physical or cultural landscapes of Astoria canneries until after the 1930s, when other major transformations in regional fishing industries began to make themselves felt.

²⁷ *ibid.*

²⁸ 1913 *Pacific Fisherman Yearbook*, 37.

²⁹ *ibid.*

Market preference for and availability of Chinook salmon had an effect on the use of technology in Columbia River canneries. Once the only fish canned on the river, as late as 1910 Chinook still made up over sixty percent of the Columbia River pack.³⁰ Chinook reach significantly larger size than Sockeye or other regionally available species of salmon, and butchering machines like Smith's Fish Cleaner were unwieldy and difficult to adjust to dramatic changes in size. Most canneries along the Columbia invested in the "Iron Chink" much later than their counterparts in Alaska and Washington, and retained skilled (Chinese) butchers to handle higher-end aspects of production which included Chinook.

Foreign markets, too, affected local adoption of technology. Filling machines succeeded in filling cans but left them unappealing aesthetically. Three-fourths of Columbia River production was high-quality Chinook packed for English markets, who tended to be more influenced in consumer choice by the appearance of the fish in the can.³¹ Thus, fillers were not adopted in many Columbia River canneries until a significant domestic market developed around the turn of the century, and even then hand fillers remained employed to serve the demand for cleanly packed, high quality cases of Chinook.

Astoria's industrial landscape changed in function faster and more subtly than it did in its physical layout, and this reflects what kind of change was occurring within the industry itself. Physical expansion of individual cannery buildings due to increased production, brought by the adoption of new technologies, was not as clearly seen in Astoria's waterfront as it might be in Alaska or Puget Sound. Some larger canneries, mainly those consolidating, did expand their spaces, taking over defunct cannery buildings or building new facilities on existing wharves. But most canneries did not significantly enlarge their

³⁰ O'Bannon, *Technology*, 218; Cobb, *Pacific Salmon Fisheries*.

³¹ O'Bannon, *Technology*, 119.

main buildings, electing instead to add small auxiliary structures as needed to accommodate production changes and technology. Because of the local availability of Chinook, the canning industry in Astoria began to fill niche markets for higher quality, alternatively processed salmon rather than increasing overall cannery production. Thus, what becomes apparent in Astoria's changing industrial landscape is the inclusion or conversion of canneries into cold-storage facilities beginning in the late 1890s.

Mild curing, a process of curing salmon in a cold stored barrels of salted brine, began production in Astoria plants around 1897. Again, the determining factor was the availability of Chinook. The largest fish with the highest fat content, Chinook were the best suited for the mild-curing process, and was used for both mild-cured and fresh salmon markets. S. Schmidt and Company, opening in 1897, was the first permanent plant in Astoria to be wholly dedicated to the mild-curing processing technique. By 1908, all other Astoria firms had either added cold-storage facilities to their cannery structures, or converted one of their structural holdings entirely to cold storage. Aside from the smaller dedicated cold-storage companies, such as Schmidt and Lindenberger, barrels of mild-cured salmon never reached a significant percentage of the salmon exports of the Columbia River canneries.³² Development of alternative processing and niche markets, while not necessarily a predominant export, nevertheless made an impact in the structural landscape and technological evolution of Astoria's canneries.



Industrial Archaeology's term for context is *Spatial Patterning*. Where specific features or landscape elements were located, and in what relationship to each other, offers valuable information for landscape analysis.

³² 1916 Pacific Fisherman Yearbook. At the height of mild-curing, between 1910-1915, Astoria canneries like Sanborn, Tallant, and those under CRPA typically produced about one tenth their total pack as mild-cured or fresh.

Cannery buildings were extended out over the river on pilings to allow for easy loading and off-loading of fish by both shipping and fishing vessels. Cannery complexes were built close to each other along Astoria's waterfront, concentrated as nowhere else on the Columbia into a five mile riverfront stretch. Early rush of economic competition, the availability of capital and labor, proximity to the mouth of the river and necessary resources, as well as established distribution networks by river and rail all combined to headquarter regional commercial fishing in Astoria, and consequently focus early cultural and industrial resources there. As the salmon runs declined and the industry consolidated into larger corporate associations, the close placement of industrial structures allowed for reuse of nearby failed or abandoned canneries by those more successful. Expanding attendant industries, like the Clatsop Mill and Astoria Iron Works, located next to or nearby canneries, and also utilized vacant buildings.

Settlement patterns of fishermen and workers, too, show clear relationships between the cultural "islands" formed by workers and the overall industrial landscape. Boardinghouses, fishermen's cabins, Chinese mess halls and markets; all clustered near or on the end of cannery wharves. Chinese and Finnish settlements were located along the shoreline, on pilings, which shared dock space and planked roads with the cannery buildings themselves.

The following waterfront map series, with information taken from Sanborn Insurance maps of the town, shows the evolution of Astoria's industrial landscape from 1888 to 1908, its primary years of development, expansion, and consolidation. (Figures 10-13) Spatial relationships between structures in the industrial landscape are shown clearly in the series. Both concepts of stratigraphy and spatial patterning are visually represented well in comparing historic area maps, and this series shows the increasing density, consolidation patterns, and dominant relationships of Astoria's industrial waterfront during these years.

1888



1. Washington, 1882
2. Elmore (Union), 1881
3. Cutting, 1875
4. *West Shore Lumber Company Sawmill*
5. Joe Hume's Salmon Cannery, n/d
6. *Net Wharves*
7. M. J. Kinney, 1876
8. *Warehouses*
9. George Hume's Cannery, 1875
10. *Oregon Railroad & Navigation Company Dock*
11. J.A. Devlin & Company, 1875
12. *Clatsop Sawmill*
13. I.X.L., 1882
14. Pacific Union, 1882
15. Columbia Canning, 1882
16. Occident Packing, 1880
17. West Coast Packing, 1880
18. A. Booth, 1874
19. Badollet & Company, 1873

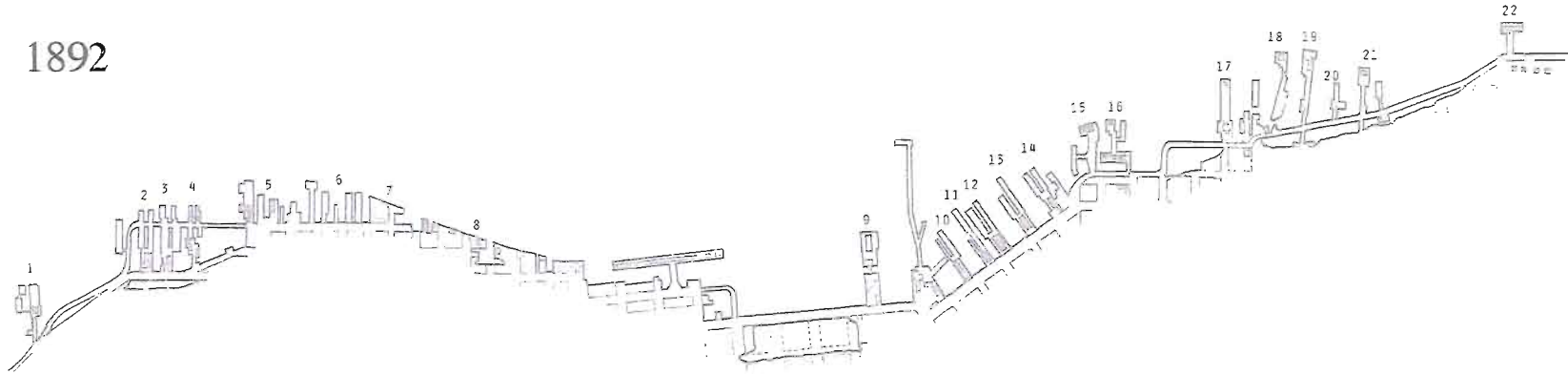
Not Shown:

In Lower Astoria
Seaside Packing (Thistle), 1884

In Upper Astoria
George & Barker's (Point Adams) Cannery, 1883
Astoria Box Company (Connected to G&B Dock)
White Star, n/d
Fisherman's, n/d
J.O. Hanthorn, 1876
William Smith, n/d
Anglo-American, n/d
Eagle (Thomas & Knowles), n/d
Scandinavian, 1876

Figure 10. 1888 Astoria waterfront map. (All canneries are active.) *Source:* Sanborn-Perris Insurance Company

1892



1. Elmore & Co. Fishing Station (Seaside, Closed 1884)
2. Fishing Station (Washington, Closed 1888)
3. Elmore & Co. ("Union") Cannery
4. Columbia River Packing Company (Cutting)
5. Astoria Packing Co. Fishing Station (Joe Hume's Cannery)
6. Net Wharves
7. Astoria Packing Co. Cannery ("Kinney")
8. Astoria Exchange (George Hume's Cannery)
9. Astoria Packing Co. Cannery ("Devlin")
10. Clatsop Mill Lumber Wharf (I.X.L.)
11. Astoria Packing Co. (Pacific Union)
12. Columbia Canning Co., Closed 1889
13. Occident Cannery, Closed 1890

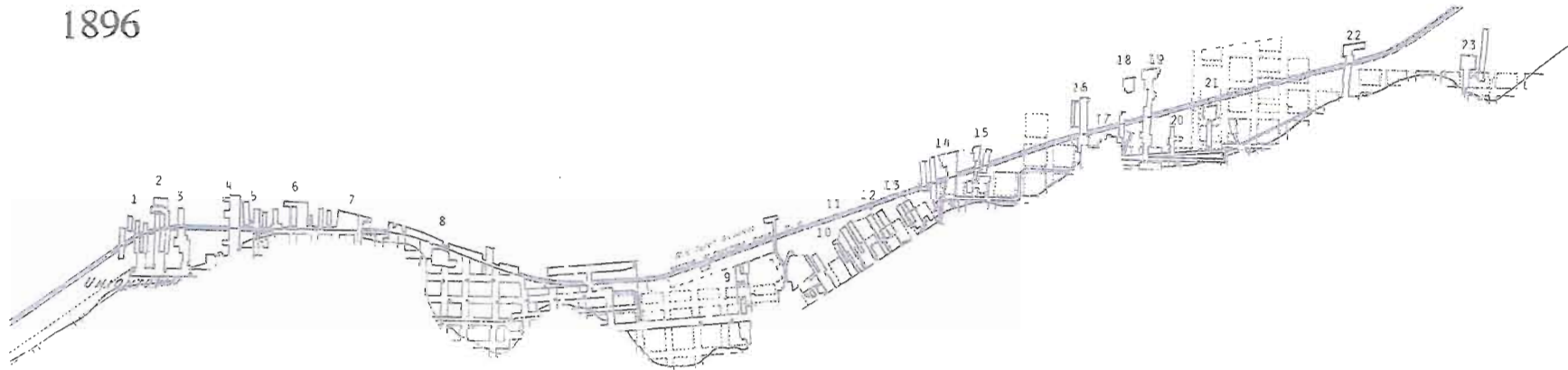
14. West Coast Packing Co., Closed 1888
15. A. Booth & Co.
16. Badollet & Co. Closed, n/d
17. George & Barkers/Astoria Box Company
18. Fisherman's Packing Co. Cannery, Abandoned, n/d
19. J.O. Hanthorn & Co.
20. Wm Smith's Cannery, Closed, n/d
21. Anglo-American Cannery, Abandoned, n/d
22. Fishing Station (Eagle)

Not Shown:

Fisherman's Packing Company Cannery (Scandinavian)

Figure 11. 1892 Astoria waterfront map. (Canneries listed in red are active.) *Source:* Sanborn-Perris Insurance Company

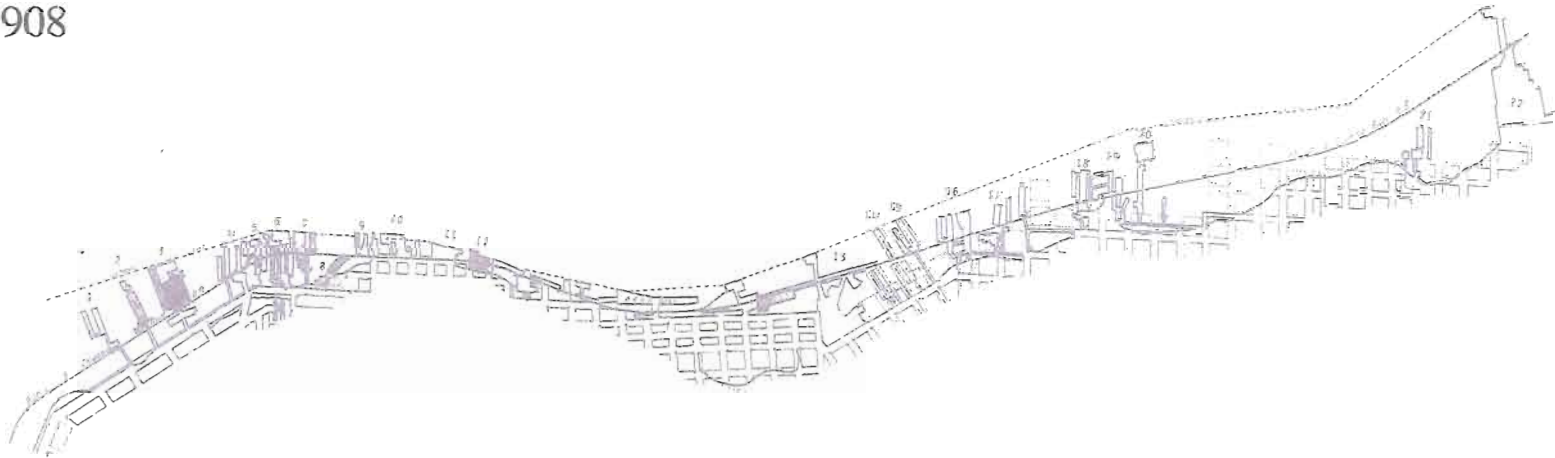
1896



1. Columbia River Packing Co. Net and Boat Storage
2. Elmore ("Union") Cannery
3. Columbia River Packing Co. Cannery
4. West Shore Sawmill/Columbia Oil Works
5. Astoria Packing Co. Net and Boat Storage
6. Pacific Can Company
7. Astoria Packing Co. Cannery ("Kinney")
8. Warehouses
9. Astoria Packing Co. Cannery ("Devlin")
10. Astoria Packing Co. Fishing Station (Pacific Union)
11. Aberdeen Packing Co. Cannery (Columbia)
12. Fishing Station (Occident)
13. Abandoned Net Wharves
14. A. Booth Salmon Cannery
15. Fishing Station (Baddollet)
16. George & Barker's/Astoria Box Company
17. Astoria Electric Company
18. Abandoned Cannery (Fisherman's)
19. J.O. Hanthorn
20. Net and Boat Storage (Wm Smith)
21. Abandoned Cannery (Anglo-American)
22. Fishing Station (Eagle)
23. Fisherman's Packing Co. (Scandinavian)

Figure 12. 1896 Astoria waterfront map. (Canneries listed in red are active.) *Source:* Sanborn-Perris Insurance Company.

1908



1. Net Wharves
2. Fishing Station, Warren Packing Co.
3. Union Fisherman's Cooperative Packing Co. (UFCPC) Cannery
4. Net Wharves
5. Tallant-Grant Packing Co. Cannery and Cold Storage
6. Columbia River Packer's Association (CRPA) "Elmore" Cannery
7. Sanborn-Cutting Cannery/American Can Company
8. Astoria Electric Company Power Plant
9. S. Schmidt & Co. Cold Storage
10. Astoria Wharf and Warehouse Co.
11. CRPA "Kinney" Cannery
12. J. Lindenberger Inc. Cold Storage
13. Clatsop Mill (Expanded)
14. Fishing Station, CRPA
15. Fishing Station, UFCPC
16. A. Booth & Co.
17. Net Rack and Boat Storage Wharves
18. CRPA Fish Receiving Station (George & Barker's)
19. Astoria Box Company
20. CRPA "Hanthorn" Cold Storage
21. Fishing Station (Scandinavian)

Figure 12. 1908 Astoria waterfront map. (Canneries listed in red are active.) Source: Sanborn-Perris Insurance Company

The 1888 waterfront outline shows the basic pattern of the waterfront industrial landscape. It shows twenty three operating canneries, as well as the sawmills, warehouses, transportation docks, and net wharves located around and inbetween them. Individual structures are easily distinguished.

On the 1892 outline, the nine canneries still operating are listed in red below the map. Three of those have consolidated under the “Astoria Packing Company.” Four former canneries have become fishing stations attached to other canneries. Seven others were listed as closed without specifying intended use. Plank roads and bridge connections are beginning to be seen more clearly connecting buildings. Square dotted outlines on the town side of the waterfront line represent development or coming development, as structures under construction fill spaces between the shore and the canneries and between the canneries themselves.

In 1896 there are still nine canneries in operation, generally under the same names and organization. The most obvious addition to the landscape is the Astoria and Columbia River Railroad, with its tracks running roughly parallel to the shoreline and connecting all the industrial structures along it. Structures under construction begin to push out past the railroad track. Industrial buildings now seem to merge into one another.

By 1908, there were eight canneries in operation, as well as two dedicated cold-storage companies. There are new canneries apparent on the 1908 map, including the Union Fisherman’s Cooperative built in 1897 by an association of gillnet fishermen in response to CRPA price controls. The Kinney, Elmore, and Hanthorn canneries, the three largest remaining canneries outside of the Union Cooperative, were consolidated under the CRPA in 1899. Attendant industries such as the Clatsop Mill, the Pacific Can Company, and the Astoria Box Company have expanded, taking over abandoned or defunct cannery

buildings. The original shoreline was slowly filled in, pushing out solid land under the waterfront piers, and the railroad track begins to be incorporated into the shoreline in Lower Astoria. Individual industrial structures are more difficult to distinguish, as wharf expansion and build-up between buildings fill open the space between them.

The next available detailed waterfront maps are the 1931 and 1948 overlays of the 1908 Sanborn map. The 1931 map reflects some changes, the largest being the sand fill in the tidal flats, filled in following the 1922 fire. A rock sea wall was also constructed parallel to the shoreline in Upper Astoria. Additional unrelated industrial structures are shown, such as Astoria's Flouring Mill. A pattern of leasing out canneries to newer companies is also seen. Tallant-Grant was leased to Vendsyssel Packing Company, and S. Schmidt was leased to Barbey. Burke Packing Company, not evident on any waterfront map before or after, is listed as a "ruins of fire" in former warehouse spaces in the 1931 map. Small smokehouses also begin to show up in processing complexes, suggesting a new market for salmon.

Changes in the waterfront by 1948 are much more drastic, as the industry as a whole shifted from salmon to tuna production and new technology and materials transformed the industry following WWII. Some original companies, like Elmore and Kinney (both CRPA) expanded significantly, but most were replaced by new companies taking over older structures. Van Camp Sea Foods bought S. Schmidt, Lindenberger became New England Fish Company, Paragon replaced Tallant-Grant. Many of the companies running fish processing facilities in Astoria by this time are national processing or distribution firms. Aside from company shifts, some additions of fishing stations, and specific cannery expansion, the 1908 waterfront landscape pattern holds well into the mid-20th century.

In his examination of ethnographic landscapes, Don Hardesty discusses an essential creativity in how humans effectively “transform nature into culture...”³³ Through ideological principles, cultural influence, environmental exigencies, technological innovation, economic shift; the landscape is constantly reformed through creative and/or reactive human agency. Change is endemic to the human landscape. Examining physical manifestations of change over time can reveal volumes of information regarding the history, the story, of a particular place and the people inhabiting it. Stratigraphy; the study of material layers in the context of time, and spatial patterning; the study of the physical location and relationships between material remains, are two effective conceptual tools to use to order and interpret the various processes that go into creating an industrial landscape. In the study of Astoria, changes in the industry are clearly reflected in the physical changes in the landscape, and can be “read” in the structural sequences it manifests over a period of time.

³³ Hardesty, *Ethnographic Landscapes*, 2.

CHAPTER VI

INDUSTRIAL VERNACULAR FORM - CANNERY BUILDINGS

“Adaptability is the governing thought in the construction of a cannery; and architectural features, not absolutely demanded for the business, are not only unconsidered, but it would probably be deemed quite unwarrentable by the sensible matter-of-fact packers. If the structure (or structures) is of suitable size to accommodate the force, the machinery and the pack--or, at least, such portion of the latter as remains unshipped at any time--and if the building is situated so that it is easily reached on the water side, the more necessary requirements are met. The frame packing houses stand on wooden piles. The length of the wharves varies materially, as the water may be deep or shallow near the shore.”¹

In historic preservation, individual structures or collection of structures serve as the focal point of analysis and evaluation. While the purpose of this study is to expand preservation’s object-centered basis of analysis, a specific and historically important architectural resource, purposefully placed within a larger cultural landscape, offers a focal point around which to work. The cannery was the pervasive image of Astoria’s industrial waterfront; altogether, twenty-five separate canneries were constructed along a seven-mile stretch of waterfront. Surrounding industrial structures usually had a direct relationship with the canneries; for example, box and can factories, lumbermills, and warehouses. Maps in the preceding chapter showed many of these relationships clearly.

As has been explained in preceding chapters, within Astoria’s industrial landscape, cultural influences are more definable in terms of space rather than form. Cultural landscapes are essentially formed by the intersection of the tangible landscape and the intangible landscape, and both are necessary to form a coherent picture of how a cultural landscape developed. The third chapter on cultural migration and settlement, and the fourth chapter

¹ Collins, “Salmon Fishing on the Columbia,” *Popular Monthly*, 1897, 11.

outlining ethnic territories established in Astoria, explored intangible landscape elements. This chapter examines a predominant tangible feature of Astoria's industrial landscape.

The third overarching concept adapted from Industrial Archaeology for this study is the principle of Typology.² Typology is the classification of objects, grouping similar aspects or themes in order to recognize and interpret patterns of influence and adaptation. In essence, cannery design was informed by the functional requirements of the building, the previous experience of builders, environmental prescription, and influences of interested groups such as insurance companies and, in some cases, fishermen and cannery workers. The resulting commonalities in cannery structure suggest a building type; one that can be deconstructed and analyzed as a distinct building form. To define this building type, structural elements, materials, and patterns of spatial arrangement must be classified and related as a group.

Analyzing vernacular industrial structures requires a different framework than that of residential vernacular buildings. While not completely divorced from prevailing architectural stylistic influence, design and construction choices result from different pressures than those defining residential architecture. Both vernacular industrial and residential architecture perform a specific function, respond to the environment, and in many early western industrial landscapes, both kinds of structures were built by the same people. The design of industrial buildings, however, is dominated by functional considerations rather than stylistic or cultural patterns. In industrial architecture, the demands of space, strength, and light determine form.

The story lies in the forces behind building development; what combination of influences or agencies produced this specific type of building? Functional influences on design

² The principle of typology is also used in vernacular architectural history and material culture studies.

choices are relatively clear. For example, the combination of Astoria's topography and a need for deep-water access pushed cannery structures out over tidal flats on pilings. Indications of building period, such as siding materials or window arrangement, were also essentially functional, dependent on material availability or occupational needs. But other influences on structural design are also evident. Fisherman's Union Cooperative cannery buildings, for example, were distinctly different from surrounding cannery structures. They tended to be larger buildings, three stories in height and wider than most late 19th century canneries. These structures kept the center raised monitor roof theme, but shallowed the pitch of the shed roofs and eliminated the bank of windows along the vertical walls of the monitor. Union buildings were also painted red, in contrast to the general use of white paint. The reasons behind these noticeable structural and stylistic adaptations are not immediately obvious, but it is clear that a trend existed that distinguished Union Cooperative buildings from other canneries on Astoria's waterfront.

Documenting the names of individual cannery carpenters and builders is difficult. As is the case with most vernacular architecture, financiers (individuals and/or companies) are often named in records, as are architects, but those who actually constructed the buildings are rarely identified.³ During Astoria's primary industrial development period, cannery builders were local carpenters and craftsmen. Many Finnish, Scandinavian, and European immigrants arrived in Astoria as highly skilled workers and artisans in various construction trades. Though few came from an industrial background, some had experience erecting larger, multi-use, utilitarian structures such as barns.⁴ Though elements of style and design that might indicate the cultural background of the builders are absent in the cannery buildings, it can be argued that this practical experience with construction informed the builders.

³ Builders that have been identified are listed in the individual cannery descriptions.

⁴ Nielsen, *Finnish Architecture*, 15.

All canneries included specifically assigned spaces for necessary functions, whether they were housed in an independent structure or combined within one. The following structures were common to all canneries: (1) A wharf or dock, for fishing vessel access to the cannery as well as deep water access for shipping. On the docks were net racks, (wooden frames used for repair and drying nets between drifts) and bluestone tanks, used to treat nets in a copper sulphate solution to remove algae and protect linen nets from rot. (2) The main cannery building itself. Late 19th to early 20th century versions were usually long, narrow buildings, from one to two stories in height. Large, old-growth timbers were used in a post-and-beam frame to provide open, flexible spaces. These structures housed functions such as butchering, cleaning, filling, and lacquering. The second stories of cannery buildings frequently had lofts for storage or manufacturing functions. (3) A net loft



Figure 14. CRPA Elmore net loft, 1946. *Source:* “Salmon For All”, historic photograph weblog.

(Figure 14), where gillnets were selvedged and hung with leadline and corkline. (4) A can loft, first used by cannery (usually Chinese) tinsmiths, then converted to storage when canneries outsourced their can supply. (5) The boiler house (or room), which used wood and coal to create steam for the retorts used in the cooking process. (6) The main office was often within the cannery building, or fronting the street. (7) A machine shop to repair cannery machinery and gasoline engines. (8) A boat building shop, for cannery-owned and maintained fleets of gillnet boats. (9) Storage sheds, usually for excess cans, or canned salmon awaiting shipment. (10) A mess hall for the cannery crews and cannery staff living in bunkhouses. Often their quarters were in or near the mess hall, rather than in China House.⁵ (11) A bunkhouse for single (white) men in cannery crews. (12) The China House, for the Chinese cannery crews. These groups or complexes of cannery buildings functioned as working units. Larger canneries often became irregular collections of structures, sometimes interconnected to form a single sprawling structure. Smaller canneries usually did not expand, but were incorporated into larger cannery complexes.

Though there has been a significant amount written about fishery development along the Columbia River, especially on the various immigrant groups that migrated there, no in-depth academic study has been undertaken to date on the cannery buildings of the Pacific Northwest. While this study does not include analysis of Alaskan or Puget Sound canneries, connections exist that might suggest a diffusion of the Astoria cannery building type throughout the Pacific Northwest.

Considering that most of the fishery structures in Astoria have been destroyed, much of the information here is taken from documentary and photographic sources. The lack of standing physical evidence is unfortunate, although it is likely that a great deal remains to be discovered through archeological work. Though no archeological studies of the Astoria

⁵ On Sanborn maps the Chinese Mess Hall and China House buildings are often not distinguished.

waterfront have been performed to date, there have been cannery sites excavated down-river, and comparable information from those studies has been included in this section.

For clarity of analysis, the typology section is divided into four categories: materials, structure, form, and plan. Each category examines the associated patterns in cannery architecture, with the intent of highlighting commonalities in vernacular design. The second section of this chapter details individual canneries located along Astoria's waterfront, including brief histories and descriptions of each.

Typology

Materials

Though structures were added and adapted as needed, few new canneries were built after 1900. Innovation usually involved incorporation of advanced production machinery and the development of sheathing materials that could more effectively resist constant moisture. Corrugated metal, for example, treated with rust-resistant zinc, replaced board-and-batten siding. Composition roofing replaced cedar shingles. Concrete pads were poured as flooring, replacing the layered grid system of planks and joists. In all cases, it seems, wood was displaced. This shift was not only due to efforts to extend material longevity. The once ready supply of local old growth trees, trees with long, straight-grained lumber that structurally allowed for large spans and heavy load bearing, were less and less available. But in the beginning, and for decades into industrial development, wood was the predominant material used in Columbia River cannery construction.

Creosote-treated wooden pilings supporting the structural frames of buildings kept well in the freshwater of the Columbia River. Shipworm (*teredo navalis*), common to saltwater environments, could cause no damage to the wood below the surface of the water. Under the surface and embedded in the river's tidal flats, pilings lasted intact for decades. The

sections of pilings that projected above the water, however, were constantly subject to fluctuating moisture levels and would rot, so canneries had to replace decayed sections on a regular basis (Figure 15).⁶

Wood used in structural framing, including pilings, posts, beams, and studding, was likely old growth Douglas Fir.⁷ Astoria was surrounded by it. Forests in that region were comprised primarily of Douglas Fir and Western Hemlock, with stands of Sitka Spruce and Western Red Cedar interspersed nearer the coastline.⁸ Hemlock and Fir are the two strongest softwoods (woods from conifer trees), and are still commonly used in construction today.

A “make-do and mend”⁹ method of renovation and repair created materially complex structures. The adoption of new materials was gradual and piecemeal. Over their years of use, cannery structures evolved into haphazard collections of different types of material. In the 1880s and into the 1890s, the most common cannery siding was vertically hung 1” x 12” boards with 1” x 4” battens, following regional agricultural building styles of the period.¹⁰ Much of the original roofing material was cedar shingle. By the late 1890s, corrugated metal began appearing as siding and roofing of newly constructed canneries. Photographs from the 1930s show a widespread use of corrugated metal for cannery

⁶ Roger Tetlow, Library of Congress. *Historic American Engineering Record (HAER), Elmore Cannery*, [1991], 7.

⁷ Andrea Kennet and Cathy Peterson, “Elmore Cannery Burns,” *Daily Astorian*, January 26, 1993. Mentions salvaged 40’ beams were Doug Fir.

⁸ Andrew N. Gray, Vincente Monleon, Thomas A. Spies, *Characteristics of remnant old-growth forests in the northern Coast Range of Oregon and comparison to surrounding landscapes*. Gen. Tech. Rep. PNW-GTR-790. [Portland: U.S. Department of Agriculture, Forest Service, Pacific Northwest Research Station. 2009]: 45.

⁹ Phrase taken from *The Landscape of Industry*, appropriate in describing cannery maintenance approach.

¹⁰ HAER Record, 3.



Figure 15. Cannery pilings and substructure. *Source:* CCHS

roofing and siding, mixed in with unrenovated remnants of board and batten. Asphalt roofing also slowly appears in the 1920s and 1930s. “Genasco,” for example, was an early brand of composition asphalt roofing specifically listed in cold-storage blueprints.¹¹

Canneries were painted to protect the wood, although color(s) originally used are difficult to ascertain without a paint layer analysis. Colored postcards often depict canneries as painted red, though most appear lighter in color in black and white photographs. The paint itself was specified as lead-based or “cold water” paint, which may suggest white or

¹¹ I could find only one reference to Genasco, an Australian paper that described it as a “wool and asphalt” roofing product. In early asphalt shingle production, wool and cotton fibers known as “rag felt” were saturated with asphalt and cut into strips or shingles. Wilson, Richa, *Early 20th Century Building Materials: Siding and Roofing*. U.S. Dept of Agriculture. Popular American advertisements date use of Genasco from about 1910 to 1940.

off-white coloring.¹² The interior walls of the canneries were generally whitewashed.

An archaeological study was performed by Archeologist Rick Minor on a site downriver from Astoria near Skamokawa, Washington, where Robert Hume had operated a cannery from 1870 to 1915. During the excavation, nails were found in abundance. Shingling and siding nails were predominant, mostly machine-headed cut nails manufactured in America.¹³ A few hand-wrought nails were also found. Lacking the availability of standing structures of the earliest cannery period, the abundant presence of nails on a cannery site with an associated owner and of the same time period may indicate similar construction methods. In this case, it can be said that from the beginning nails were readily available to cannery builders in Astoria. Whether more complex and skilled joinery techniques were also involved in early construction is difficult to say without more material investigation.

Structure

Structurally, canneries were protected, open-plan workspaces. Following the basic requirements of space, strength, and light, heavy lumber was assembled in braced-grid patterns to create spaces capable of carrying loads, illuminating work stations, and allowing room for large awkward machinery. Interior structural framework was exposed.

Pilings ranged from 10' to 50' long, and were usually driven into the tidal flats ten feet apart. A base support grid of 10" to 12" square caps, and 4" by 10" sills rested on the

¹² Charles L. Uebele, *Paint Making and Color Grinding*, Chapter 33. The basic mineral pigments in cold water paint are usually chalk, kaolin (white pipe clay), magnesium silicate, or alumina. Economy prefers whitening. More difficult substance to use with colored pigments.

¹³ Minor, *Skamakawa*, 129. American made nails made up half of the imports immediately following the construction of the U.S. Customs house in upper Astoria in 1849.

piling.¹⁴ Caps ran at right angles to sills. Posts, drift bolted to the sills, were usually 8” or 10” square, 10’ to 12’ in height, and arranged on 10’ center grids.¹⁵ Plates and girders were usually 6” squares. Structural bents were sway braced, with 3” by 9” braces, and spiked to the sills and posts. Floor joists or “stringers” ranged from 2” to 4” thick by 10” to 14” wide. Planks were usually 2” to 3” thick, 12” wide. In the salmon canning areas on the first floor, planks were spaced 1¼” apart, to allow offal and water to wash through to the river below. One fish-room floor was described as having 3” by 12” planks “set edgewise and spaced.”¹⁶

Upper stories often had layered 2” to 3” thick plank floors, with thinner one-inch-thick wear boards over the planks. Tongue-and-groove flooring was found in the machine shop, and net storage areas often had hardwood floors, to reduce the possibility of snags that might catch the net webbing.

The most common cannery roof structure, once referred to as a “lantern” or “french” type roof, is now called a monitor. A monitor roof is a center (raised) truss supported gable section flanked by lower shed roofed sections. The vertical wall area separating the shed roof sides from the gable center section was filled with windows, providing natural light and ventilation. Some canneries had a full monitor, running the length of the building, some had an embedded monitor — single story shed roof sections on all four sides of the building. Sawtooth roof forms were also occasionally found.¹⁷

¹⁴ Structural Inventory, General Appraisal Company Records, CRPA Records, Columbia River Maritime Museum, 13.

¹⁵ HAER Record, 7-8. Contract between CRPA and local contractor to replace docks and net racks, 1900.

¹⁶ General Appraisal Records, 12.

¹⁷ Fire insurance companies could be quietly influential in construction methods. For example, on the upper stories of cannery buildings a continuous floor of 3” thick, tongue-and-groove planks was often covered with 1” replaceable wearing boards. Layering floor planking in this manner slowed the spread of fire. A flattened roof, not a generally common regional feature in residential architecture, was encouraged in industrial construction since flatter roofs contained fewer structural members to ignite and fewer inaccessible areas.

Form

Early canneries share appreciable characteristics that enabled them to function adequately, and later structures were modeled on successful earlier prototypes. The abundance of resources and need for speed and efficiency in a competitive industrial environment rapidly produced an “expected” or familiar type of building (Figure 16). What developed into the cannery form was industrially effective and continued to be used and adapted well into the late 20th century. Net wharves were long and relatively narrow, ranging between 200’ and 500’ in length, as was necessary to reach deep water. Earlier cannery buildings were located near the shore end of shorter wharves, but were later added on or relocated out over the river, often because of shoaling.¹⁸

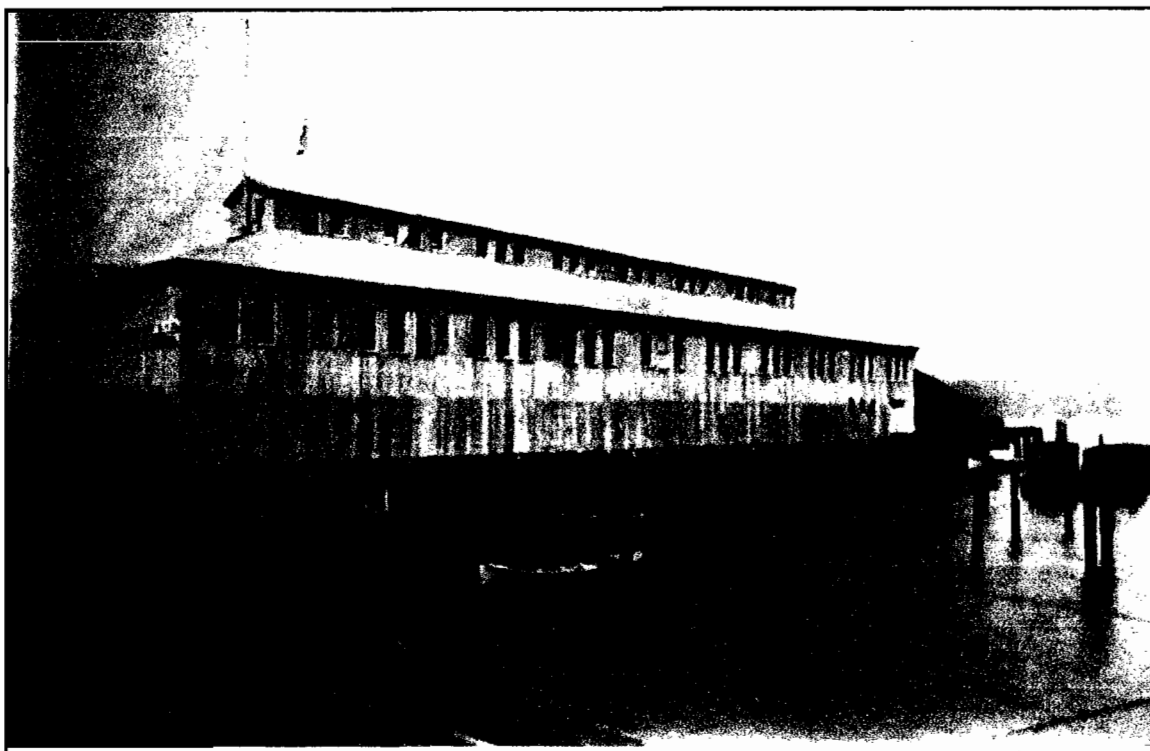


Figure 16. S. Schmidt Cold Storage Plant. Good example of cannery form. *Source:* CCHS

¹⁸ Elmore National Register Nomination, 7. Shoaling occurs as riverbeds are shallowed by accumulations of silt and debris. It was thought that the concentration of cannery structures, with their grids of piling, was a factor in the shoaling of south side of the river.

Cannery buildings were predominantly gable-roofed rectangular structures, long and narrow in form. Their maximum width was dependent on how deeply light could penetrate the structure, and usually ranged from 20' to 40'. Lengths were varied, often anywhere from 100' to 300'. Interior heights were generous, often from 10' to 12' depending on the floor.

Aside from their basic and repeating rectangular form, monitor roofs were the most distinguishing feature of cannery buildings. These centered, raised roofs created a second or third floor space. Additional roof construction allowed for more light intrusion into the interior than would a single large structure. Thus, canneries became irregularly constructed collections of frame buildings, often built as a series of parallel narrow rectangular structures connected on their long sides. Additional buildings were set perpendicularly to the main structure. The dominant image of a cannery was the front gable end or ends (facing the town), showing the raised, center-gable roof and flanking shed roof sides.

Though there were power stations located along the waterfront in the 1880s, cannery buildings were not electrified until near the turn of the century. Kerosene lanterns were still used until the late 1890s. Only the offices were artificially lit. Except during peak runs, work hours were from sunrise to sunset, and the need to get light into canneries required multiple openings in roof and walls. Windows were often in rows, but not necessarily evenly spaced, or the same type. Four-over-four double hung, six-over-six double hung, and multi-paned wooden casement were the most common. Later canneries had a more symmetrical fenestration, occasionally disrupted by structural additions.

Plan

Canneries were purposely built with open, flexible spaces, to accommodate machinery, fish stock, and workers (Figure 17). Functional arrangement was not arbitrary, however;

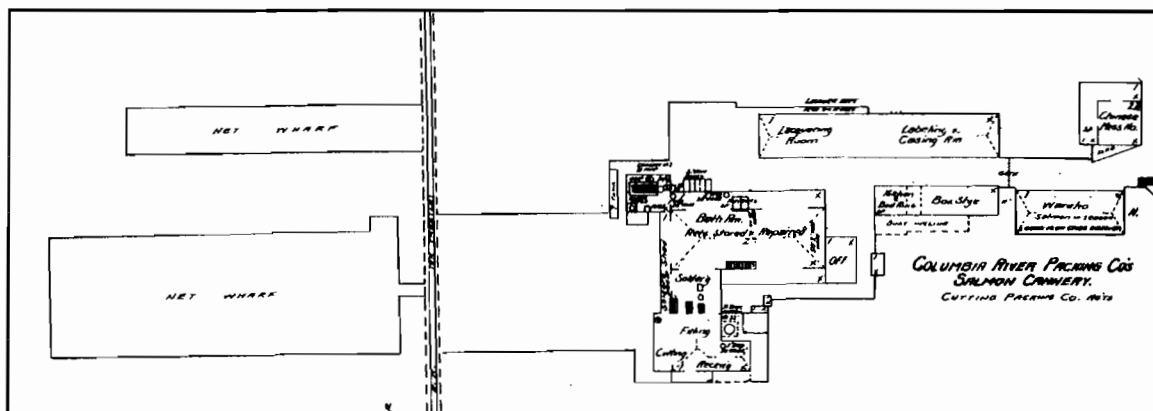


Figure 17. Sanborn-Cutting Cannery. *Source:* 1892 Sanborn Insurance Map.

production lines were set up in a very specific order to maximize efficiency of fish processing. Arrangement depended on the size of the cannery company and what space was available. Earlier and smaller canneries housed all functions in one or two buildings, later and larger canneries were complexes of structures, and often placed separate functions in separate buildings. In the winter, all cannery buildings were used for boat and net storage.

The main building housed the fish room (butchering and cleaning), the boiler and the retort or “bath” sections, as well as the filling and soldering areas. These functions/areas were arranged as an assembly line, and contained whatever machinery was available. Warehouses or storage areas were sometimes in the main buildings, as often set apart in outbuildings around the wharf. Lacquer rooms were similar; they could be part of main buildings, but were often set apart. Labeling and casing were usually housed in the main or in connected buildings.

Before the outsourcing of the can supply, the tin shop was always located on the second story of the main cannery building. Third floors were used as net or sail storage prior to the general use of the gasoline engine. The machine shop and the boat building shop were most often located in small separate outbuildings.

Chinese mess halls and boarding houses were usually located on the wharf at the shore end, or clustered around the end of the wharf on the plank road that served it. Fishermen's cabins were either separate dwellings around the end of the dock, boardinghouses on the shore, or rows of separated rooms with a single roof along the side of the wharf. Some early canneries had bedrooms on the second floors as well, presumably for white cannery workers, cannery management, or fishermen.¹⁹ As canneries closed and buildings became vacant, more fishermen's cabins appeared in the under used space.

Auxiliary Structures

Cold Storage

Cold-storage facilities were added to a number of operating canneries by the late 1890s. A few companies, such as S. Schmidt and Lindenberger, were exclusively devoted to cold storage, processing mild-cured, frozen, or fresh fish for specialized markets. Similar architectural requirements meant that these cold storage structures usually assumed similar forms as the cannery buildings. Often converted canneries, cold storage structures were long narrow rectangular buildings with inset monitor roofs. Plans show the framing structure to be the same as that used in canneries: 8" by 10" floor joists, 3" by 12" floor boards, 8" by 8" posts, with an open-braced, post-and-beam frame. Differences between the two types of processing structures were found in their interior construction. All had insulated-wall storage rooms. Wood shavings were used between layers of siding for insulation. As discussed earlier, Genasco asphalt roofing, is mentioned specifically in building plans. Interiors of buildings were divided into freezing and glazing rooms. Ice machines and boilers shared an open space with a series of long, thin, sharp freezers (Figure 18). Cooper shops on site to manufacture tierces,²⁰ and repacking wings were also

¹⁹ Chinese accommodations were notated as such on Sanborn maps.

²⁰ A tierce was a type of wooden barrel used to ship mild-cured fish.

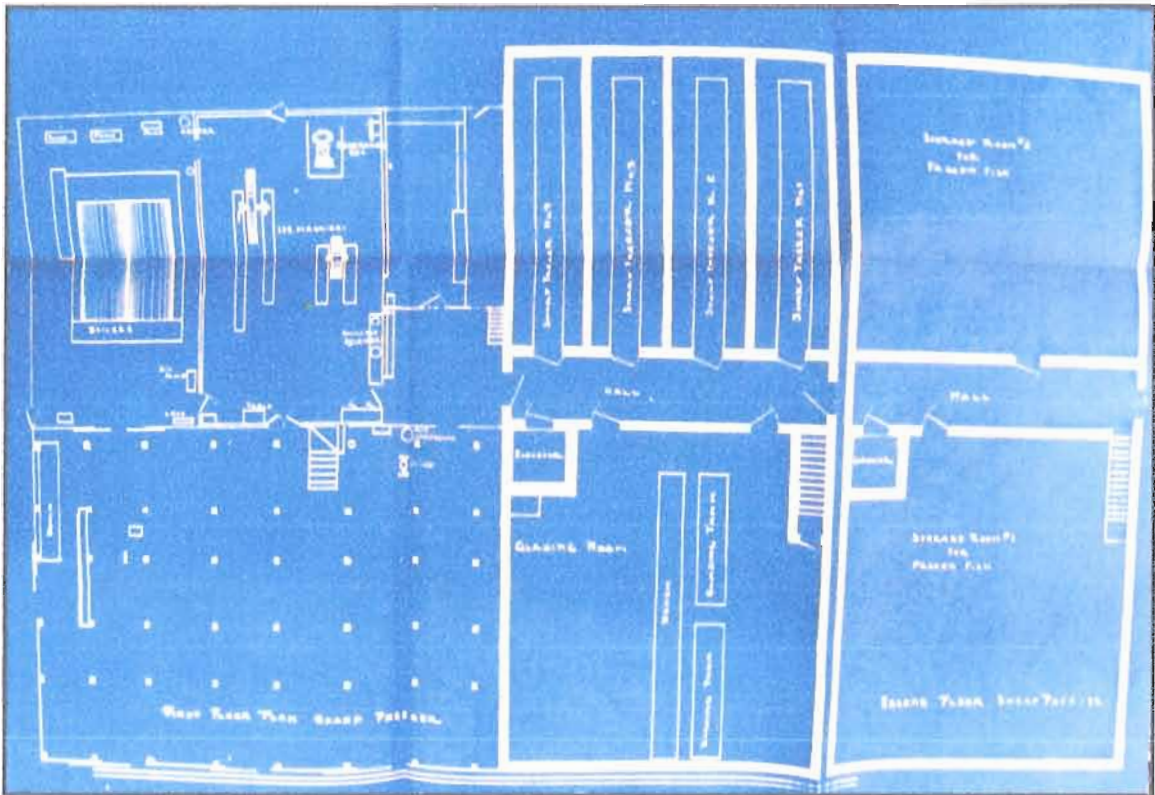


Figure 18. Cold storage building blueprints. *Source:* CRPA Records, Columbia River Maritime Museum (CRMM)

To perform its function, adequate insulation had to keep the fish frozen or cold enough for the mild curing process. Consequently, sharp freezers had 16" thick outside walls. These were framed with 2" by 8" studs, six layers of tongue-and-groove siding and two layers of paper. The space between the layers of siding was filled with wood shavings. The freezer's inside walls were 10" thick, using 2" by 6" framing studs, wood shavings, four layers of 1" by 6" tongue-and-groove siding, and three layers of paper. Ice storage room had walls 12" thick, 2" by 6" studs with wood shaving between them, three layers of tongue-and-groove siding, and two layers of cork board with alternate layers of paper and hot pitch between.

China House

Chinese bunkhouses, and/or mess halls, were located either on cannery docks near shore, or clustered around the end of docks along plank roads and bridges. In the first decades of the 20th century, these buildings began to disappear or be converted to other uses as Astoria's Chinese population declined.

Like other bunkhouses and early fisherman's cabins, not much descriptive material remains of Chinese Houses. Elmore Cannery insurance records describe a wood-frame, two-story structure, 28' by 60', with lean-to additions on three sides.²¹ East and west lean-tos were single story, with a 10' by 40' area, the rear addition was 20' by 26', and 20' in height. Framing was comprised of 6" by 6" posts and girders, with 2" by 4", and 2" by 6" fir studs. Two-inch-thick flooring ran throughout the building. It had a shingle roof and board-and-batten siding.²²

Often the Chinese mess hall and the China House were indistinguishable, since both types of buildings functioned as sleeping quarters for the cannery workers. Mess halls were far more prevalent on period maps, leading to the question of whether the nomenclature of the two structures was interchangeable. In any case, the Chinese bunkhouses were managed by the crew foreman, called the "China Boss." These houses were generally off-limits to non-Chinese. Inside, the houses had rows of wooden bunks, three high, closed in for privacy.²³ There was a common room for games and socializing. Outside, a vegetable garden augmented the workers' food supply, along with pigs kept in a nearby pen.

²¹ General Appraisal Records, 134.

²² *ibid*, 129.

²³ K. Mack Campbell, *Cannery Village, Company Town: A History of British Columbia's Salmon Canneries*. [Victoria: Trafford Publishing, 2004], 15.

Drying Docks (Net Wharves)

The net-drying wharf was the most ubiquitous element of Astoria's industrial landscape. These structures accompanied every cannery (Figure 14), extending as much as five hundred feet out over the Columbia River in the effort to reach deep water channels for loading fish.

Wharf platforms were usually made of beveled 1" by 12" planks, resting on 2" to 3" by 10" joists. Ten by 10" posts supported 4" by 10" caps or beams. Depending on the area of the river, round support pilings ranged from 10' to 50' in length, and were treated with creosote to delay rot. Nonetheless, wharf understructures often needed replacing, as underwater sections held up well over time, but those above water could quickly deteriorate.

Bunk House

A number of bunkhouses and boardinghouses remain scattered around Astoria, although those located along the waterfront or on the wharves are no longer in evidence. Like other late 19th century small, wood-frame utilitarian structures, few detailed descriptions exist of cannery bunkhouses. One listed on cannery insurance records for the Elmore Cannery offers a brief look at how they were put together. Twenty-four by 60' in area and 8' in height, it had ten rooms and two 4' by 60' porches with overhanging eaves. The floor was 1" by 4" decking, walls were constructed out of 2" by 3" and 2" by 4" stud framing, and sided with 1" by 8" shiplap inside and 1" by 6" v-rustic outside.²⁴

Fisherman's Cottages

Fisherman's cottages/cabins appeared in various forms. On the earliest town maps and population records, the seasonal migrant workers who streamed into Astoria every summer were referred to as the "floating" population, largely because cabins were often built

²⁴ General Appraisal Records, 140.

as simple rough scows floating on the river and anchored to cannery or town pilings.²⁵

Bunkhouses seem to be the most ubiquitous form of fisherman housing, but individual cabins were often built around the shore end of cannery docks (and in abandoned cannery buildings), and rows of cottages commonly appeared along the edges of cannery wharves. While cabins were fairly idiosyncratic, cottages tended to be built as a lateral row of single room structures all under a common roof. One row located on the Hanthorn cannery wharf was 16' wide, and 86' long. These had vertical board-and-batten siding, as well as an asphalt composition roof.²⁶ These structures were usually temporary, and were rarely described in any detail in cannery records.

Summary Cannery Descriptions

Though the numbers and names shifted often, there were a total of twenty-five separately built canneries along Astoria's seven mile waterfront. Most were constructed between 1875 and 1885, with few remaining under their original company names past 1890. This short descriptive list begins with the largest and most influential canneries. Building dimensions and photographs are included when available.

Union Fishermen's Cooperative Cannery

Built in 1897, this plant operated as a cannery until 1980 (Figure 19). The Fisherman's Cooperative was organized in 1896 in response to private cannery company price controls. Both the original cannery building and its net racks were built by the local Finnish and Scandinavian fishermen/carpenters who owned stock in the Cooperative. Frans Kankkonen was the architect and construction engineer, after construction becoming

²⁵ Gillnet boats also provided shelter, when the sail was draped over the boom to create a tent for the fishermen to sleep in while waiting for the tide.

²⁶ General Appraisal Records, 137

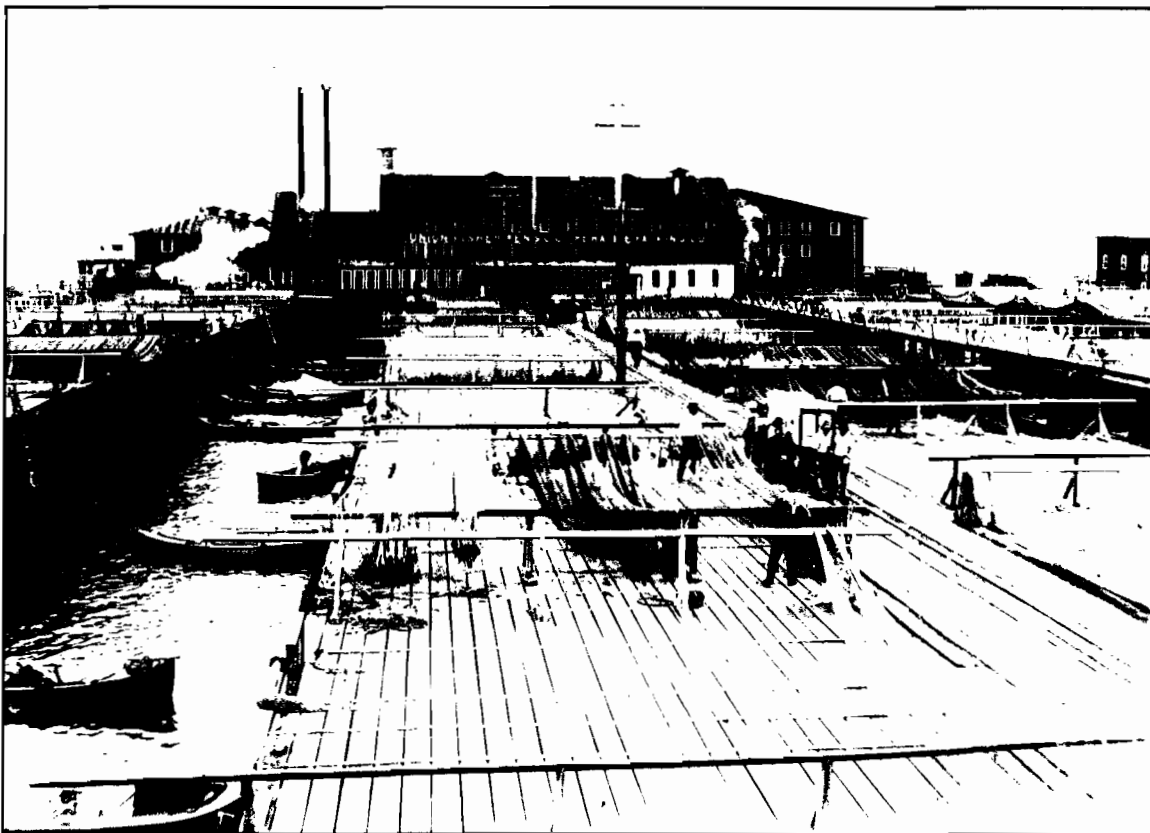


Figure 19. Union Fisherman's Cooperative Cannery. *Source: CRMM*

the first cannery superintendent.²⁷ The main plant complex was located on the river end of five net-rack wharves. There were seven long, gable-roofed, rectangular structures with separated functions, each two to three stories high. Five were perpendicular to the shoreline²⁸; these comprised the can factory, canning room, butchering, salting, cleaning, and cold storage. Two structures which were parallel to the shore were the net, boat, and canned salmon storage buildings. A machine shop, boat building shop, and a cooper shop were located in small shed buildings around the dock. All of the structures were painted red, with white trim highlighting the fenestration.

²⁷ Tetlow, *Alderbrook National Register Nomination*, 2; Niska, *Astoria's Union Fish*, 23.

²⁸ The term "shoreline" is loosely used in this section. All of the areas addressed here were initially built on pilings over the tidal flats of Astoria. The term "shoreline" indicates that the structures being discussed were near or part of the town street grid, without necessarily being on land.

Union Cooperative built numerous fish receiving stations along the Columbia, most of which were constructed during a short period of expansion in the first decade of the 20th century. Design styles of the Union Cannery fishing structures tended to be similar. Each was painted red, with relatively symmetrical white-trimmed fenestration. The cannery structures had center-gable roofs, while the fish-receiving stations like Alderbrook and the Net Warehouse had a center gable with low-pitched wings extending out on either side. All had vertical board siding.

The Cooperative built net-warehouse, boat-storage, and cold-storage buildings in 1903, and began mild-curing salmon in addition to their cannery operations. A tuna plant was built in 1938. In 1940, the entire operation was sold to an outside investor in Seattle.²⁹ By 1970, the Union Cooperative holdings were incorporated into the Barbey Packing Company, one of last Astoria canneries to close. Some of Barbey's cannery holdings were torn down by the Port of Astoria in 1987; the remainders were allowed to further dilapidate. The site of the former cannery is now occupied by the Cannery Pier Hotel.

Union Fish Uppertown Station

Nicknamed "Big Red," this building functioned as an Upper Astoria net warehouse for the Union Cooperative. It was built in 1903 during a period of company expansion. When the warehouse was in operation, fishermen could navigate their boats directly under the warehouse, hoisting their nets inside to be laid out and dried.

The net warehouse is similar in design as other Union structures: with a center, three-story section and flanking two story shed-roof sides, dormers to allow in light, but lacking a vertical wall between the center gable section and flanking shed lean-tos. All Union buildings were painted red with white window trim, and had relatively symmetrical

²⁹ Niska, *Astoria's Union Fish*, 34

fenestration. In 2002 the net warehouse was privately bought and divided up into artist studios. A storm in 2007 caused severe damage to the building.

Union Fish Alderbrook Station

Union Fishermen's Cooperative Packing company built the upper Astoria Alderbrook Station in 1903 as a 100' x 60' boat and net storage building (Figure 20). Built as an intermediary for the fishermen of Alderbrook, the station was intended to reduce travel time for fishermen who lived in Uppertown to access facilities for boat repair, supplies, and storage.

Alderbrook was a wood-frame structure, with three floors built on a 10' by 20' piling grid. Eight inch and ten inch floor beams ran east-west supporting 3" by 10" floor joists.

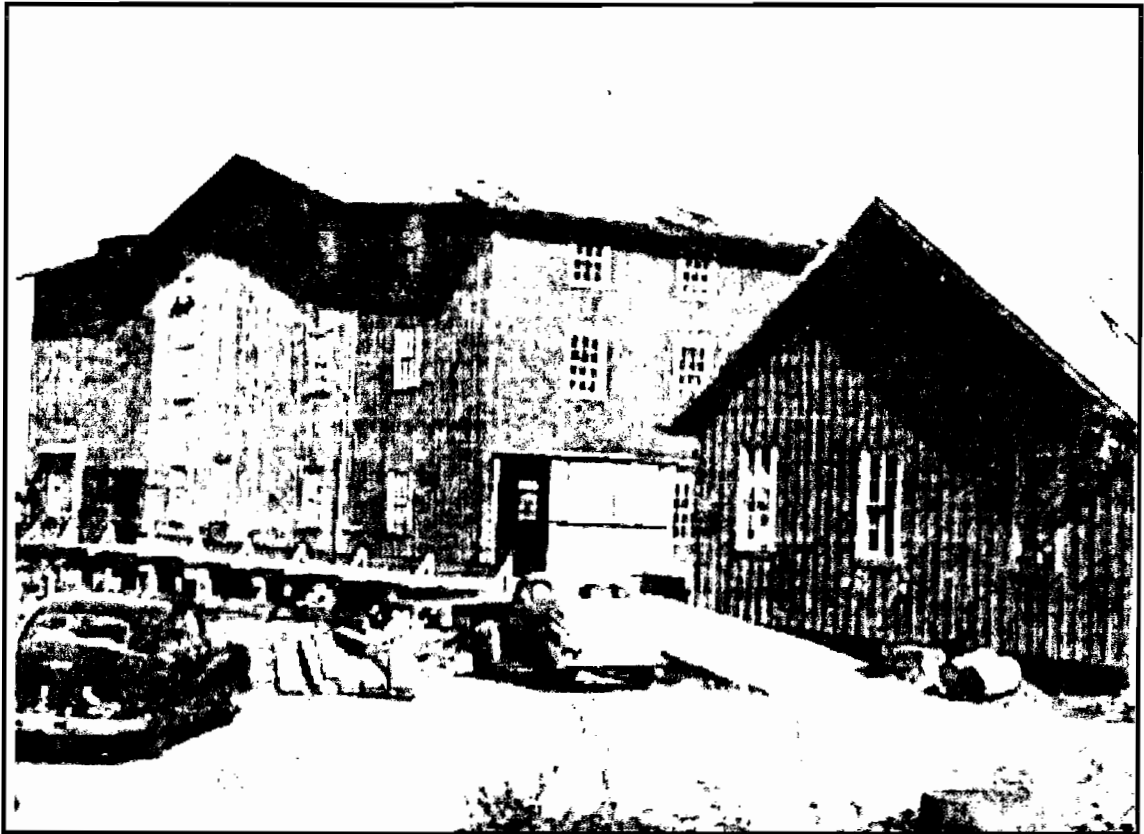


Figure 20. Union Coop Alderbrook Station. *Source:* Salmon For All, historic photograph weblog, <http://66.154.152.16/gallery/albums.php>

Some of the joists show fire damage, and may have been salvaged from another building and reused.³⁰ Two layers of 2” by 12” planks were laid for flooring. Thinner floor boards, 1” by 4” and 1” by 6” deck boards, were laid over the joists on the second and third floors. An 8” by 8” post grid carried the weight between floors. The property also included a 36’ by 36’ boat repair shed with the same vertical board siding and window pattern of the main building.

The first two floors were primarily used for net and boat storage. The third floor was originally used as a sail loft to repair and dry sails, then as net and gear storage after gasoline motors came into general use.³¹ Used as warehouse and storage building well into 1980s. Alderbrook is now a privately owned residence, offering short term rental spaces.

Elmore

Located a mile west of Astoria’s commercial district, the Elmore Cannery became the primary CRPA cannery in Astoria (Figure 21). Originally called the Union Packing Company (generally recognized association to “Uniontown”). The first cannery building was constructed in 1884, situated on a planked road later widened and named Bond Street. After constructing a second cannery building on the north end of the net wharf in 1896,³² Elmore used the first building for boat storage, publishing the local newspaper, *The Daily Astorian*, as well as a stable, and as a Methodist Church Sunday school. The original building burned in 1931.³³

Elmore Cannery grew through a constant series of additions, resulting in a fairly irregular

³⁰ Tetlow, *Alderbrook*, 6.

³¹ *ibid.*

³² There is some argument about the dates of construction for the second cannery. I am using the date 1896 because it is partially shown on the Sanborn Map of that year.

³³ HAER Record, 3.

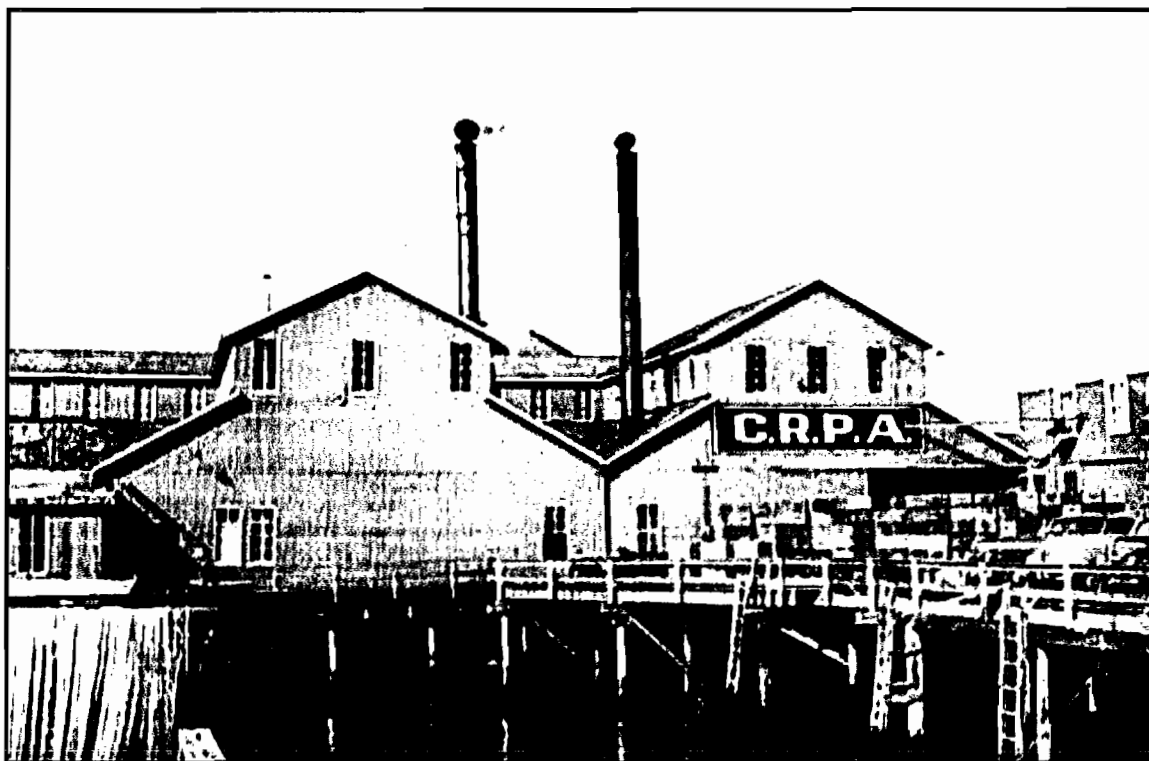


Figure 21. Elmore Cannery. *Source:* CRMM

structure. A second set of cannery structures was built in 1896, and the earlier buildings shifted function. The can shop became the boat shop, boat storage, and a machine shop. Another section was built on the north end of net-rack wharves, including additional housing, expanded cannery lines, lacquering and casing shops, a can shop, and a fish-receiving dock. North structures were added sometime between 1908-1921, and an east addition built in 1939.³⁴

Constant reconstruction produced a huge, inter-connected frame structure, with an area of 260' by 400'. Small fish-receiving docks were built on the north end, large net-rack wharves on east and south. Elmore was a growing complex of gabled rectangular buildings, long and narrow in plan. Its center buildings were parallel to the shoreline, the main facade was laid perpendicularly, connected on the north end.

³⁴ HAER Record, Elmore Cannery layout map.

Unlike many of the canneries along Astoria's waterfront, the architect who designed Elmore's 1898 cannery is known. John Antone Fastabend, who also built canneries for Elmore at Rooster Rock and Garibaldi, was selected for the new Uniontown cannery after Elmore sent out an advertisement in the local paper. Fastabend had come to Astoria in 1892 to build a railroad from Astoria to Portland. When his company went bankrupt, he became a contractor, primarily building maritime utilitarian structures such as canneries and lighthouses.³⁵

The twin gabled-roof sections shown above offer the dominant view of the front (south) facade. Originally the cannery had a cedar-shingle roof, then was re-roofed in asphalt. Corrugated metal is listed as siding as early as 1908, though the building is thought to have been originally sided with 1" by 12" rough boards with 1" by 4" battens. In 1910, the cannery dock and pilings were replaced by local contractor John Mattson.³⁶

Cannery windows varied in size and pattern, depending on the period of addition. Because of differences in processing, most canneries including Elmore had separate tuna and salmon canning facilities.³⁷ Tuna additions tended to have fewer windows, since plants were fully electrified by the time tuna became available as a marketable resource. The floors in the salmon canning section were 3" by 12" planks with gaps between, allowing for water and waste material to be flushed out to the river below. In contrast, the 1939 Tuna plant addition had a poured concrete floor.³⁸

Early Chinese workers were initially housed in a fairly large multi-building complex at

³⁵ Elmore National Register Nomination, 7.

³⁶ HAER Record, 7.

³⁷ Canning salmon is a "wet" operation, canning tuna "dry" one. Salmon brought into cannery fresh and unfrozen, cleaned and processed at the plant. Tuna was brought to the cannery frozen, cooked, then cleaned.

³⁸ HAER Record, 5.

the foot of the Uniontown canneries. It was converted to a boat repair shop as early as 1892. Fishermen's cabins dotted the shoreline south of the Chinese Hall. Another two-story bunkhouse for Chinese workers was built on site sometime after 1908, and was listed in a 1966 National Landmark Nomination for the Elmore Cannery. The bunkhouse was torn down in the mid-1980s for warehouse construction.

The CRPA's Elmore cannery closed its operations in 1980. Ten years after its closing, the northwest corner of the building and its support pilings collapsed, and in response the City of Astoria approved permits for its demolition in 1991. A stipulation in the demolition permit provided for the recordation of the building under Historic American Engineering Record (HAER) guidelines. The cannery was destroyed completely by fire in 1993.

Kinney

Located near Uniontown between 5th and 7th Streets, the 1879 Kinney Cannery became one of the largest and longest running canneries in Astoria (Figure 22). By 1904, Kinney was large enough to have three production lines (most canneries in the area had one or two).³⁹ The "old" cannery complex was divided into two units separated by a planked extension of 6th Street. A 200' by 170' wood frame warehouse stood on the west side. Here they stored marine engines (after 1910), cannery equipment, cans and labels, and housed the machine shop. Later, this section held the offices for Alaskan operations. On the east section of plant was an 80' by 150' two-story, semi-mill constructed can factory building.

The Kinney cannery operated as a cannery until about 1920, then functioned as a central machine shop and warehouse for the CRPA. It was listed on the National Register in 1989. While part of the cannery structure was destroyed in 1954 when a cargo ship

³⁹ Newell, 105.



Figure 22. Kinney Cannery. *Source:* CCHS

crashed into the wharf, some of the buildings remained standing and have been converted into local shops. Condominium development is currently under discussion for the remainder of the site.

Sanborn-Cutting

Built sometime prior to 1884, Cutting (later Columbia River Packing, then Sanborn-Cutting) was one of three early plants originally situated on a thin plank road along the northern edge of Uniontown.⁴⁰ Fishermen's and Chinese cabins, mess hall, and "sleeping rooms" were set at the foot of the wharf, or concentrated on the shoreline just south of the three canneries. The main cannery structure was an L-shaped two story structure,

⁴⁰ The other canneries in Uniontown were Washington and Elmore.

with primary cannery functions, like filling, soldering, and “bath,” on the first story, and net repair and storage on the second. Lacquering and labeling functions were housed in a separate building.

This cannery was similar in form as the surrounding canneries. Its monitor roof ran the full length of the building, allowing light into the building and creating a narrower second story. The cannery complex was a series of rectangular structures at right angles to one another. Between 1884 and 1896 the cannery changed very little. By the early 1890s, the Smith Point and Astor line (later Astoria & Columbia River) railroad ran through cannery property, bisecting the cannery buildings and the extended net wharf. By 1908, an additional plant had been constructed on the end of the net wharf farther out into the river. The original cannery structure was given over to boat and net storage, fishermen’s cabins, Chinese boarding, and cold-storage facilities. The new plant was a square, single-story structure. The American Can Company built their factory on the same wharf as the new Sanborn-Cutting plant in 1911, constructing chutes between the two production plants to supply the cannery with ready-made “sanitary” cans. By the 1930s, Sanborn-Cutting had been absorbed by CRPA’s Elmore cannery operation, which used its buildings for fish receiving, cooling, and storage.⁴¹

Seaside (Thistle)

Seaside began production in 1884. A small cannery located west of Uniontown, Seaside Cannery became a fishing station for the Elmore Cannery around 1890. After 1892, its net wharves were still in use, but the cannery structures no longer appeared on maps.

⁴¹ Sanborn Insurance Maps, 1888-1948.

Hume Canneries

Three of the Hume brothers also operated canneries in lower Astoria; George and William operated two salmon canneries on a single property from 1875 to 1888, with George becoming the sole proprietor by 1888. Their canneries were located within the town proper (though still on pilings), and had their net-drying racks set in open-lot areas throughout the property. Various dwellings, both for Fishermen and Chinese workers, were arranged haphazardly around the canneries. After 1888, George Hume's cannery became The Astoria Exchange, a center for Alaskan canning operation offices, as well as local produce storage and trade. Joe Hume's cannery became a fishing station for the Astoria Packing Company.

Tallant-Grant

Located directly north of the original Union (Elmore) cannery, near Uniontown in Lower Astoria. The south section of property still used as a cannery under Tallant-Grant was originally the Washington Cannery, built in 1882. Structural additions on the river end of the net wharf was constructed in 1902 under Tallant-Grant as an additional cold-storage facility. This structure was a twin-gabled, two-story structure parallel to the shoreline, containing the butchering and cleaning rooms as well as cold storage. Gable ends were sided with vertical boards, the remainder of structure with horizontal. Unlike the original cannery structure, the foundation of the later addition was concrete slab on pilings. Fishermen's cabins were built on a semi-circular arm extending out from the west side of the main cold storage complex. Following the line parallel to the shore, the Astoria and Columbia River railroad trestle bisected the property. Structures to the north and west were added in the late 1920s and early 1930s, and the last addition was completed sometime in

the 1940s. Tallant-Grant's cannery structures collapsed due to neglect in 1991.⁴²

Badollet & Co.

The first cannery in Astoria, Badollet was built in Uppertown in 1873, and operated until the early 1890s. *The Daily Astorian* offered this period description of the cannery:

“The buildings are constructed over the bay with the exception of the main boarding house, and covers a space 70 by 280 feet, divided as follows: Store 20 by 40; main shop 40 by 20 two stories; tin shop 40 by 100; bath house 36 by 47, with seven large circular kettles; coal house 12 by 24, etc. The boarding-house is 20 by 40 two stories high. ...62 men are employed besides ten boats fishing, with 20 men.”⁴³

Like other canneries along the river, Badollet was a series of interconnected structures, including a long, narrow, rectangular building parallel to the shoreline, and two conjunct smaller buildings perpendicular to the shore. Smaller sheds and outbuildings were set around the main structures and along the wharf. There were bedrooms on the second floor of the main building, and the Chinese mess hall was built apart from the main complex and connected by a narrow plank bridge. By 1888, the net wharves extended well out over the river, and all dwellings had been moved to clusters built onto the shoreline. The cannery was inoperative by 1892, occupied in the years after as an unspecified net and boat storage station. Eventually, the cannery structures became landed buildings within the town grid; it is unknown when they were demolished.

A. Booth

Built in 1874, the Booth packing company ran one of the longer lasting and more successful canneries in Astoria. Booth was a Chicago-based fish dealer, who had begun

⁴² Sanborn Insurance Maps 1884-1908; Dooly Insurance Records, 21.

⁴³ Liisa Penner, *Plowing the Raging Columbia: The Salmon Industry in the 1870s*. [Astoria: Unpublished, Clatsop County Historical Society, 1991], 39.

investing in Astoria canneries in the 1870s, eventually buying out his partners and taking over the company.⁴⁴

Booth's main cannery building complex was a series of four parallel, one to one-and-a-half story structures set out into the river perpendicular to the shoreline at the end of a long dock. A long two-story, narrow, rectangular building was connected to the series along the north side, a shorter rectangular building ran parallel to the shoreline along the south end. Single story narrow sheds outlined the primary cannery buildings. Following the general pattern of cannery arrangement, the Chinese mess hall/boarding house was positioned near the shore end of the cannery wharf. Between 1884 and 1908, the Booth cannery structure changed very little. Additional wharf space was added, and the town grid gradually moved closer to the cannery as the shoreline was filled out.

J.A. Devlin & Co.

Devlin's cannery was located in Scow Bay, a small fresh water inlet between upper and lower Astoria. The plant was operated as a cannery until the turn of the century, though by 1896 the cannery was used for canning one month of the year and functioned as a fishing station the rest of the year. Eventually the cannery complex was swallowed by the growing town, as Scow Bay was gradually filled in to accommodate development. By 1908, the cannery was located two blocks inland and vacant. Commercial Street ran through the middle of what was the cannery wharf. It is unknown when the structures were demolished.

Net wharf additions around the Devlin Cannery were more complicated than most, forming a square figure eight. There were seven structures total — all rectangular interconnected structures at right angles to one another. Only one was two story. Save a few small

⁴⁴ Cobb, *Pacific Salmon Industries*, 28.

storage buildings, the same buildings remained throughout the life of cannery. Fisherman's boarding houses were initially set closest to the shore, with the Chinese mess house located farther up the wharf. They were connected to each other and to the cannery by a thin plank bridge. Boarding houses were gone by 1892, as Clatsop Mill expanded and began taking over shore space and the few buildings at the shore end of the cannery wharf.

West Coast Packing

Another in a series, the West Coast cannery operated from 1880-1888. The cannery was a square structure with a full length, monitor roof framing a narrow second story. Other smaller buildings flanked the main structure, some connected and some standing apart. Like the other canneries in this row, the main buildings sat on the plank road with wharves extending about three hundred feet over the river. Boarding houses and the Chinese mess hall was located along both sides of the plank road. West Coast's cannery was used as a fishing station between 1888 and 1892, after which it was abandoned and left to slowly collapse into the river.

Occident

Located at the foot of 30th Street, Occident operated as a cannery from 1880 to 1890. Two net-rack docks extended over the river from shore, both sixty-two feet wide and between two hundred and four hundred feet long. The main cannery was a single structure with an inset monitor roof built on the shore end of the wharf. Dwellings were located on across a plank road that served the row of canneries on the east side of Scow Bay, including Occident.⁴⁵ After 1890 Occident's buildings were used as a fishing station, for boat and net storage. By 1908 the CRPA had built an additional fishing depot and fishermen's cabins at the end of the original cannery wharves (on the other side of the Astoria and Columbia

⁴⁵ The plank road was filled in and named first Hemlock, then Franklin.

River railroad track), maintaining Occident's cannery buildings as net storage and boat repair.

Columbia

Located at the foot of 30th Street, Columbia neighbored Occident as one of the closely set row of canneries in Upper Astoria. Columbia operated as a cannery from 1882 to 1889, then was briefly used as a fishing station.⁴⁶ Aberdeen Packing Company took over the property and reopened it as a cannery in 1895.

The cannery's two main structures were narrow rectangular two-story buildings set side by side, both with full-length monitor roofs covering a narrower second story. Smaller auxiliary buildings were set around the lower wharf. As with Occident, the cannery was just off a plank road, extending its two net wharves two hundred to four hundred feet over the river. The Chinese mess hall was built right next to the cannery, and some fishermen's cabins were located along the dock. By 1908 only the net racks remained intact. It is unknown when this structure was demolished.

Pacific Union

Also located at the foot of 30th Street, Pacific Union was another in the row of canneries on the east side of Scow Bay in Upper Astoria, all built and operated around the same eight- to ten-year period. Pacific Union's cannery was comprised of a single structure with an inset monitor roof, and oriented perpendicularly to the plank road/shoreline. The Chinese mess hall and fishermen's boarding houses were located near the cannery across the plank road.

Originally called G.G. Smith's, Pacific Union functioned as a cannery full time from

⁴⁶ Fishing stations were usually boat and net storage facilities. Occasionally they functioned as additional production space if the salmon runs were large.

1882-1888, then as needed when the salmon runs were high. It was used primarily as a fishing station after 1888. Nothing remained of the cannery after 1908.

I.X.L.

The westernmost cannery in the row on the east side of Scow Bay, I.X.L. operated as a cannery from 1882 to around 1890. The original cannery was a single structure with a full-length monitor roof covering a narrower second story. Like the other canneries in this series, the building was located on the plank road, oriented perpendicularly to the shoreline. Its net wharves extended three to four hundred feet over the river.

By 1892 the cannery structure and attendant wharves had been taken over by the Clatsop Mill Company and used first as a lumber storage area, then as a box factory. By 1908 the cannery structures were unrecognizable due to mill-related alterations.

Scandinavian

Located at the foot of 36th Street. Scandinavian was built in 1876, and operated as a cannery until around 1900 (Figure 23). Four long, narrow structures built side by side and laid perpendicularly to the shoreline comprised the main cannery structure. Only the one closest to the river was two stories in height, the remainder were single-story structures with gable roofs. A short pier connected the structure to the shore. The Chinese mess hall was near the shore on the pier; the fishermen's dwellings were on the shore near the cannery dock. The net wharf was completely separate from the cannery structures and connected by a narrow plank bridge. These structures changed very little during the life of the cannery.

After 1900, the cannery was used as a fishing station, and the CRPA focused its boat

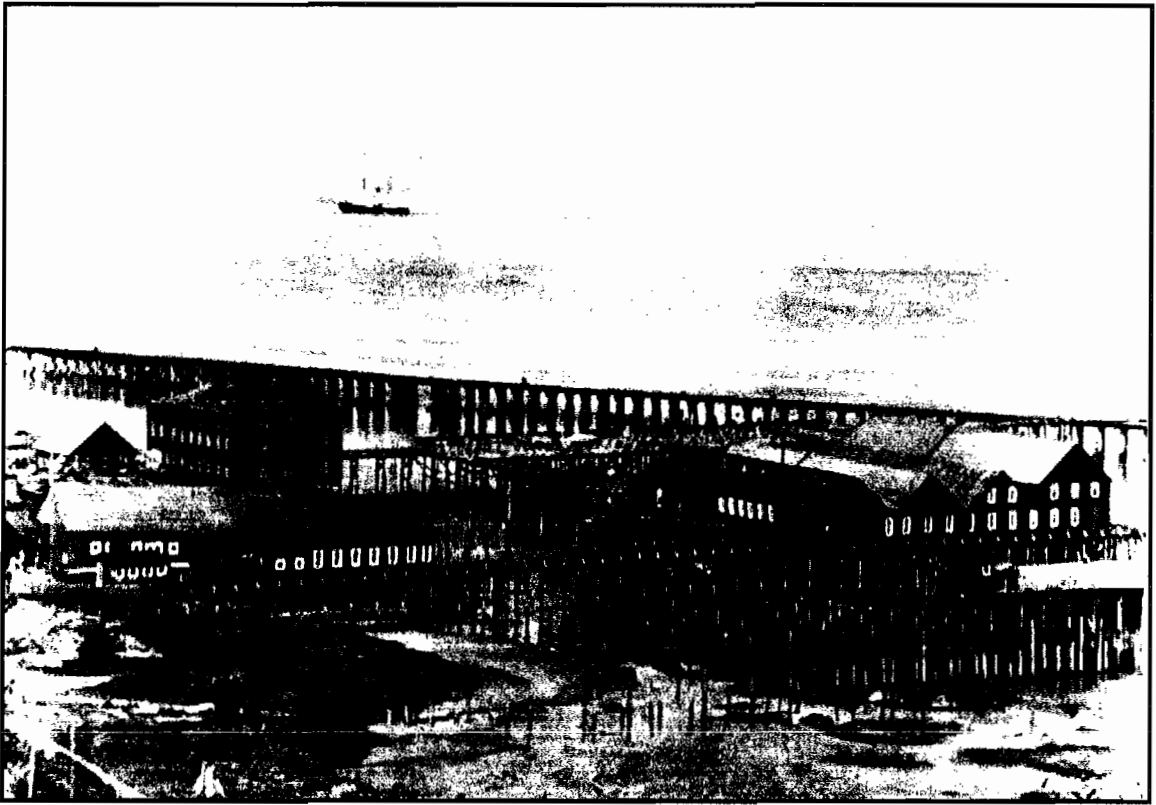


Figure 23. Scandinavian Cannery, with Alderbrook Station on the left. *Source:* CCHS

building facilities there. Company tugs and cannery tenders were built and repaired in a cluster of boat building and machine shops on the shore end of the cannery pier.⁴⁷ The boat-building complex was surrounded by bunkhouses, various dwellings, and a lumber shed. Two hundred feet offshore was a large frame warehouse building, 145' x 150' in dimension, used for the winter storage of gillnet boats. A second net rack was built next to the first, both reaching about three hundred feet over the river. A fish-receiving building was built at the end of a smaller third dock.

George & Barker

Located at the foot of 37th Street, G&B was originally known as the Point Adams Can

⁴⁷ Dooly Insurance Records, 6.

nery, built in 1883. It operated as a cannery until around 1900, then as a CRPA fishing station. Two narrow rectangular structures built side by side and laid perpendicularly to the shore comprised the main cannery building. A 42' x 90' boat-storage warehouse was located at the end of a five-hundred-foot net rack. Another 32' x 112' iron-clad warehouse used for storage of twine and nets was built near the shoreline. The main 100' x 160' structure became a two-story boat and net storage warehouse, with single-story shed additions on its north and east sides.⁴⁸ Two Chinese mess halls were originally built near the shore end of the cannery dock, and fishermen's dwellings clustered around a plank road leading to the cannery. By 1896 the Chinese mess halls were actually on the shore, as fill closed in the space between shoreline and dock. The Astoria Box Company built their plant closely neighboring George & Barker, using a wide plank bridge to connect to the cannery. By 1908 G&B was used by the CRPA as a fishing station, with boat-building facilities located on the shore next to the considerably larger Astoria Box Company. A second net wharf was constructed to the west of the first.

Fishermen's

Built prior to 1884, Fisherman's Cannery operated until about 1890. Three narrow rectangular structures were built side by side, capped with another two story, rectangular building on their north end. Mess halls were located at the shore end of the cannery wharf, with additional mess halls on the shore across a plank road. The cannery structures were abandoned after the closing of the company, allowed to deteriorate and fall into the river. By 1896 the Astoria Box Company and the Astoria Electric Railway Company had taken over and rebuilt some of the cannery net wharves, leaving the main cannery structures alone to disappear into the river around the turn of the century.

⁴⁸ General Appraisal Records, 21.

Wm. Smith

William Smith was a small, short-lived cannery situated between the Hanthorn and Anglo-American Canneries in Upper Astoria. Opening sometime in the mid-1880s, by 1892 the cannery was closed and abandoned, then used intermittently for boat storage and fishermen's dwellings. It had disappeared from waterfront maps by 1908.

White Star

Built before 1884, White Star was a small cannery to the east of the Astoria Box Company. The cannery was a single rectangular building with an inset monitor roof set about mid-way up a short net wharf. A mess hall was the only other separate building on the wharf, located at the end of it near a plank road. Other mess halls and dwellings serving the cannery were built along the opposite side of the road. By 1892, the Astoria Box Company had taken over the White Star cannery property, converting the buildings to lumber storage. The Astoria Electric Railway also located its power house on a dock connected to the west side of the White Star wharf. The cannery may have burned down in the 1960s.

Hanthorn

Located at the foot of 39th Street, Hanthorn cannery became the CRPA's main cold-storage plant after the turn of the century (Figure 24). Ice was made here for most of the other stations. Hanthorn also functioned as a fish-receiving station, processing all fish intended for the fresh-fish market, as well as preparing mild-cured and salted salmon. Also stored excess fish for later canning.

Originally built in 1875, the Hanthorn plant was first comprised of two long, narrow frame structures laid out in a "T" shape, set a thousand feet out from the shoreline. Suc



Figure 24. Hanthorn Cannery. *Source:* CCHS

cessive additions and roofed over separations eventually made it into a solid, irregularly shaped structure, 550' long by 150' wide. A Chinese mess hall and a row of fisherman's cabins lined the west side of the net wharf near the shore. A large eastern addition for tuna processing was constructed in 1939, separated from salmon operations by a railroad spur track.⁴⁹ It is the only complete cannery structure still standing in Astoria at this time.

Anglo-American

Built sometime prior to 1884, the Anglo-American cannery operated until the early 1890s when the plant was abandoned. By 1892 the western structure had blown down, and although the wharf was in poor repair, the northern structure was used intermittently as a fishing station. All structures were gone by 1910. The main cannery was comprised of

⁴⁹ Dooly Insurance Records, 17-19.

two long, narrow rectangular structures laid out in an upside-down “L” shape located at the river end of the net wharf. A few small outbuildings sat around the main structure.

Eagle

Originally known as Thomas & Knowles, the Eagle cannery was built in the early 1880s and operated as a cannery until the early 1890s. Occupied as a fishing station for a few years, left vacant, then either torn down, burned, or allowed to decay and collapse. Nothing remains of the cannery after 1908.

Comprised of one long, narrow, rectangular structure parallel to another one about half its length, the cannery was situated about three hundred feet out over the river on the end of a short net wharf. The Chinese mess hall was on the end of the wharf, about half way down towards the shore. Fisherman’s cabins were built on floats close to the shoreline.

There is often a close relationship between vernacular architectural design and a general perception of building use. Structures used in various, and sometimes unrelated, industries may have similar pragmatic building requirements, but are developed as a distinct and distinguishable form because of inherited ideas about what this building “should” look like. Patterns in architectural structure, form, plan, and materials in Columbia River canneries indicate a specific typology of vernacular building. In Astoria’s cannery buildings, overall structural and organizational requirements were met for industrial use. Cannery buildings were situated over Columbia River tidal flats to facilitate access to deep water for shipping and off loading catch. They were long, rectangular buildings, usually built as a connected series. Light was brought in through high ceilings and windows. Open flexible spaces were created with post and beam grid patterns, supported by heavy timber substructures and a layered plank floor.

Cannery buildings were only used two to four months of the year, the remainder of the time (winter months) usually used for storage or net repair space. Changes in material use were piecemeal but consistent throughout the industry, such as a shift to corrugated metal for siding and asphalt composition roofing, for example. Use of the monitor roof form was the earliest common type, with the narrower center-gable roofs running either full length or inset. Second stories thus contained less square footage of space than main floor, and were first used for tin smithing, then net and gear storage. Machine and boat shops usually separate structures. Interior structural elements were exposed, composed of truss systems, supported by a series of braced and nailed post and beams. The use of nails most likely dating from earliest canneries.

Finnish settlers were building their Columbia Basin barns in a traditional log style, and comparison between types of vernacular structures offered no discernible connection with the cannery buildings in Astoria.⁵⁰ Some cannery boarding houses had similar elevations and roof style as some of the later canneries, with a high gable center section flanked by flattened wings; in residential architecture often referred to as Gothic. Occasional (though rare) stylistic details apparent on cannery buildings, such as early board-and-batten siding, were consistent with concurrent architectural trends. Formal architectural influences can be seen, including interesting similarities to some regional barn types. Though there were marked similarities in all of the cannery structures along Astoria's waterfront, design coherency was seen most clearly with the Union Fisherman's Cooperative Cannery buildings, most of which were built over five year period, and likely by the same people.

Considering the methods by which fishery technology and development spread throughout the Pacific Northwest, through Astoria-based entrepreneurs and companies, a study tracing the diffusion of cannery building typology would be both interesting and valuable.

⁵⁰ Neilsen, *Finnish Architecture*.

CHAPTER VII

CONCLUSION

“History is not the past. History is a story about the past, told in the present, and designed to be useful in constructing the future. The past is vast, and it is gone. Almost all of it is gone utterly, leaving no trace in the mind or archive. We know the past only through things that chance to exist in the present: old books, broken pots, disturbed memories.”¹

Cultural Landscapes and Historic Preservation

For historic preservation analysis, inclusion of a broader cultural landscape approach offers distinct advantages. A more comprehensive understanding of complex cultural, technological, and economic interconnections is made possible with increased attention to cultural meanings and physical landscape evolution. Recognizing the physical impact of cultural networks vastly improves contextual analysis and subsequent evaluation and interpretation. Forces impacting the development and evolution of historic structures are better understood with a more dynamic approach to context. In short, inclusion of cultural landscape themes can benefit preservation analysis.

What the incorporation of cultural landscape thought entails is a basic shift from an understanding of objects to an understanding of systems. This study accomplishes this shift by using conceptual approaches from cultural geography and industrial archaeology. By incorporating ideas from cultural geography, analysis of cultural spaces takes on emphasis and depth. Techniques long familiar to cultural geography, many of which originated in the 1920s with Carl Sauer, are relatively familiar to preservationists and remain applicable to preservation work. Including more contemporary analytical approaches, such as

¹ Glassie, Henry, *Material Culture* [Bloomington: Indiana University Press, 1999], 6.

searching for non-visible cultural meanings within the landscape, and relaxing the period of significance to more accurately reflect the accumulation of cultural layers, gives the study of historic landscapes a significantly increased depth of analysis, evaluation, and interpretation.

Combining industrial archaeology's analytical principles of stratigraphy, spatial patterning, and typology has the effect of "placing each distinct class of evidence firmly in its physical context and drawing out spatial and chronological relationships between them."²

The traditional focus of archaeology is material evidence, thus industrial archaeology has developed frameworks for looking at physical landscapes that are both relevant and applicable to preservation work. What industrial archaeology offers is the study of interconnected, physical systems, recognizing both spatial networks and temporal change as important elements in understanding landscapes. A great deal of valuable information can be gained from examining the shape and structure of the land and the modifications made by human occupation, including the physical evidence of industry and its buildings, organization, and evolution.

The development of the industrial landscape in Astoria illustrates the processes of physical change through cultural (and economic) agency; the landscape was uniquely formed through the social constructions, livelihoods, and cultural forms of the people who inhabited it. This study examines the origins, growth, and decline of the Lower Columbia River salmon industry, through the focus on its historic center; Astoria, Oregon.

In this case study, utilizing conceptual approaches taken from cultural geography and industrial archaeology have lead to the following conclusions:

— Technological transference to the Columbia River from New England fisheries,

² Alfrey, *Landscape of Industry*, 3.

through California fisheries, by a small emigrant group from Maine. The Humes and Andrew Hapgood set the stage for cannery development in the Pacific Northwest, by bringing fishing and canning technology to the region; establishing a viable canning process, creating market distribution networks, and importing immigrant labor. Regional introduction of the gillnet and Columbia River double-ender gillnet boat are both credited to the Humes, as is the first use of Chinese cannery crews.

— Mid-to-late 19th century period of development and imported technology made the Columbia River canneries, specifically those around Astoria, a technological and cultural incubator and template for all the Pacific Northwest fisheries. Technology and industrial organization were exported to Puget Sound and Alaska fisheries, both of which surpassed Columbia River in production by the turn of the century.

— The canning industry reacted to technical innovations according to local conditions. Though many early cannery technological innovations occurred in Astoria, the adoption of technology occurred at a slower pace in Columbia River canneries. Chinook, the highest quality salmon variety, varied too dramatically in size for cleaning machines like the “iron chink” to handle. Mechanized fillers were also slow to be used, since the European market, vital to Columbia River trade, was more exacting about product appearance, and hand fillers could make the fish more appealing in the can. Columbia River canneries, the most reliable source of Chinook in the Pacific Northwest, became more specialized around the turn of the century, as it increasingly served higher-end, mild-cure and fresh salmon markets.

— Ethnic territories rapidly developed within Astoria’s complex industrial landscape. Disparate immigrant groups, the bulk of which arrived in the 1880s, formed highly segregated, interlocking cultural systems, each filling an established role within the industry.

These extensive “informal” divisions, often not visually apparent on the landscape, were pivotal in understanding cultural attribution of spatial meaning.

For some immigrant groups, informal divisions of “common” land were already culturally understood. The fishing community developed their own body of rules and customs. TURFS, or Territorial Use Rights in Fisheries, is the United Nations acronym for the kind of landscape created by fishermen on the Columbia River.³ Those who emigrated from Europe were already familiar with territorial use rights, though specific customs of organization varied from country to country.⁴ The drift right, a local manifestation of territorial use, designated specific stretches of river to members of “snag unions” or “drifts” for duration of fishing season. Maintenance of the river bottom to provide access to fish was one of the requirements for drift membership,⁵ ethnicity was another.

Others, such as the Chinese, were recruited in crews, remaining in small, tight-knit culturally isolated groups throughout the fishing season. Separate sets of bunk houses and mess halls were built for the Chinese cannery workers, socially and physically separating them from others in the industry.

— Rapid early industrial expansion created a large “bank” or supply of industrial cannery structures, most of which were incorporated into larger companies. After the turn of the century, company consolidations, such as the CRPA, centered and separated operations into different canneries. Elmore Cannery, for example, became the primary cannery

³ Martin, *Legacy*, 100. United Nations Food and Agricultural Organization uses the term TURFs. “community held rights of use (or tenure) and exclusion over the fishery resources within a specific area and for a period of time. Accompanying these rights might be certain responsibilities for maintenance and proper management of the resource base, as well as restrictions on the exercise of the rights of use and exclusion.”

⁴ *ibid.*

⁵ *ibid.*

for the CRPA, Hanthorn became the main cold storage plant; the Scandinavian cannery became the CRPA main facility for boat building.

For this study I elected to incorporate concepts from cultural geography and industrial archaeology, framing them as compatible with historic preservation's format of "context." For reasons already stated, I felt their approaches translated well into an expanded definition of context, providing a relatively graceful way to shift focus from an object-centered historic context to a process-centered cultural landscape approach. In truth, there are many ways to accomplish such theoretical inclusion within historic preservation; this was just one. As all disciplines concerned with recognizing, understanding, and maintaining our cultural and historic landscapes continue to learn from each other, I hope to encounter many more, and many different, approaches in the future.

The Decline of the Salmon Canning Industry

Though sixty years and two hundred miles of intensive commercial (over)fishing on the Columbia River was most likely the primary reason for the decline of the salmon runs, the collapse of the industry can be attributed to a number of contributing factors.

In a story similar to that of the Sacramento River in California, extractive industries like mining, agriculture, and logging were profoundly destructive to Columbia River spawning grounds and riverbeds. "Mining and grazing had silted spawning beds, log drives had scoured streams, mills had polluted waters, and logging, irrigation, and power dams blocked waterways."⁶ Streambed dredges and mercury contamination, both methods of mining, destroyed salmon habitat and poisoned fish and other wildlife. Log drives, during which collections of logs were trapped behind a temporary dam and released all at once when water levels rose, destroyed everything in their path.

⁶ *ibid.*

Although overfishing and habitat destruction caused significant damage to the salmon runs, the most destructive human activity was the construction of hydroelectric dams along the Columbia in the 1930s and 1940s. Built to irrigate farms, control flooding, and provide cheap electricity to Portland's growing industrial base, hydroelectric dams, initially built without means for fish to pass through to the tributary rivers where their spawning grounds were located, killed the bulk of the remaining salmon runs. By 1933 it was estimated that fish spawning grounds had diminished by fifty percent.⁷ The Grand Coulee dam, constructed between 1933 and 1942 and built without fish ladders or elevators, alone blocked over six hundred miles of river to spawning salmon. Additional public and private structures built to divert or control water, buried, blocked, or rendered unusable nearly all downstream salmon habitat.⁸ Fish hatcheries, in use on the Columbia from the 1870s, helped mitigate overfishing but were never capable of fully restocking the wild runs.

Though the numbers of salmon had been declining for decades, seafood processing continued in Astoria well into the 20th century. In 1938, schools of Albacore were found off Pacific Coast, and the flagging salmon canning industry revived as salmon plants shifted to tuna processing. Salmon continues to be canned, cured, and frozen, but in exponentially lesser amounts than was previously produced.

Astoria's Waterfront

Astoria's waterfront is now a long stretch of exposed pilings; only four former cannery buildings or complexes remain (Figures 25-27). Hanthorn is the only fully intact cannery on the waterfront, now hosting a Rogue brewery and restaurant, offices, and boat storage. Sections of Kinney's box factory have been adapted to small local businesses, such as the

⁷ Taylor, *Making Salmon*, 175.

⁸ *ibid.*

Cannery Café. Big Red, the Union Co-operative net warehouse in Uppertown, is privately owned and was used as artist space until a storm ripped through the area in 2004, tearing off the roof and causing extensive damage to the structure. The Union Co-op Alderbrook Station is also intact, converted to private and rentable condo spaces in 2002.



Figure 25. Union Coop net warehouse, “Big Red.” Damaged by storm in 2004. *Source:* Author

An issue especially critical in maritime preservation is the rapid deterioration of historic resources. Architectural material has a notably lower rate of survival in maritime communities. Given the particularly corrosive salt-air (water) environment. If structures are not used, and adequately maintained, they quickly rot. If they remain in continual use, replacement becomes more common. Materials used in historic ocean and river vessels, for example, were often completely replaced as constant water contact rapidly rendered material

unusable. This becomes an issue in preservation in a variety of ways. Economic viability plays a prominent role in retention of historic structures. On one hand, lack of capital keeps historic structures, no money for replacement. On the other, depressed economic conditions can cause demolition through neglect, as has been the case with most of the cannery structures along Astoria's waterfront.

Many cannery structures disappeared into the river, neglected and rapidly deteriorating. Others were destroyed by fire, too often intentionally. Barbey Cannery, the former Union Fisherman's Cooperative Cannery, closed in 1980 and was torn down in 1987 to make room for the expansion of the Port of Astoria.⁹ The Cannery Pier Hotel, modelled on the former cannery design, now occupies the space and some of the old pilings. Wharf ruins



Figure 26. Kinney Cannery ruins. *Source:* Author

⁹ "Old Cannery's Days are Numbered," *Daily Astorian*, January 13, 1987.

of the former cannery remain. The Tallant-Grant cannery collapsed into the river in 1991.¹⁰ Hanthorn cannery, known later as Bumblebee Seafoods, the only complete cannery remaining, closed in 1991, after becoming a revolving door of seafood production companies in the 1980s.¹¹ Elmore cannery, the largest and most prominent in Astoria, burned in 1993.¹² Kinney cannery was partially destroyed by a cargo ship in 1954. The undamaged sections of Kinney were used as a warehouse until 1980, then partially renovated as the Cannery Café and other small local businesses.



Figure 27. Cannery ruins, lower Astoria. *Source:* Author

The last of the canneries closed in the 1980s, devastating an already depressed local economy. Astoria city planners implemented a series of Waterfront Revitalization Plans, designed to bring business and tourism into now delapidated areas of the waterfront. One

¹⁰ "Down It Goes," *Daily Astorian*, June 11, 1991

¹¹ "Historic Fish Cannery Closing," *Daily Astorian*, February 13, 1991

¹² "Elmore Cannery Burns," *Daily Astorian*, January, 26, 1993

of these early plans brought about a short trolley ride, active on weekends, and a four-mile stretch known as the Riverwalk, running from Alderbrook to Uniontown. The Kinney cannery was partially restored to encourage small businesses, and a river lookout built on its wharf. Interpretive signs, describing immigrant populations, river habitat, and fishing methods, were placed at intervals along the Riverwalk. Some of the former canneries remained, not yet entirely in ruin, and the remains of piling grids lined the waterfront in the tidal flats between standing buildings.

Since the primary focus was to develop commercial enterprise and tourism in the old industrial district, none of the early plans involved residential development along the waterfront. Another plan was drawn up in the late 1990s, however, that did. Called the Gateway Plan, it outlined a dense, mixed-use, urban pattern of residential and commercial development in the former industrial district. Few cannery structures remained by this time; Elmore had burned, Kinney, though practically restored, was in partial ruin, Hanthorn was intact, but closed. With the exception of Hanthorn and a couple of net warehouses, possible reuse of historic material was mainly limited to the ubiquitous grids of pilings.

The Gateway Plan opened the door to a number of condominium development projects on vacant lots and former cannery sites along the waterfront. By 2006, there were four separate multi-family residential projects approved by the Astoria Planning and Historic Landmark Commissions.

So far, two of these projects have been built or are under construction: The Cannery Loft Condominiums, on a vacant lot across from the Hanthorn cannery; and the Columbia Landing, a complex of townhomes near the Union Co-operative net warehouse. All condominium projects have been appealed by members of the community, concerned about

height variances that block public Riverwalk views, as well as the prospect that condo sales will bring in a seasonal (non-tax contributing) population of summer vacationers. At this point, Riverpark Suites, slated for the ruined half of Kinney Cannery, and the Englund Pier Condos, are both apparently on hold.¹³

¹³ Hip Fish Monthly Newsletter. <http://www.hipfishmonthly.com/issue103/103mondocondo.html>

APPENDIX A

SALMON SPECIES & HABITAT

Pacific Salmon are anadromous¹ fish that spawn in the rivers along the Northwest Coast. Unlike trout, salmon spawn only once and then die, returning to spawn in the streams and tributary rivers where they hatched. Salmon stop eating after entering fresh water, and the loss of fat stores and rapid deterioration make them a higher quality catch nearer the river's mouth or in the ocean.

Five species of salmon are found off the Pacific Coast: Chinook, Sockeye, Coho, Chum, and Pink. The largest is the Chinook (or King) Salmon. This species is found from Ventura River, California to Norton Sound, Alaska.² Chinook was the first (and initially only) species canned on the Columbia River, and it brought highest price on the market throughout the life of the industry. The deep red color of Chinook set the market standard for northwest salmon. In spring the body is silvery, in fall black or dirty red. Average weight is 22 pounds, though it often reached 50 or 60 pounds.

The Chinook ran on the Columbia three times a year, all to different areas to their spawning grounds. The second was the best run, entering the river during May, June, and the early part of July, spawning mainly in the headwaters. This was the infamous spring run, the huge salmon caught earning the nickname "june hogs." The third was the smaller fall run, happening during late July, August, September and part of October, spawning in the

¹ They live in both fresh and salt water.

² Cobb, *Pacific Salmon Fisheries*, 411.

tributaries of lower Columbia.³ After going to sea, Chinook salmon return to spawn after four to eight years.

Sockeye (called Red or Blueback south of the Columbia) was the next-highest quality species of salmon. Its maximum weight was around 12 pounds, averaging about 5. Sockeye enters the river with the spring run of Chinook, and it came to dominate various markets north of the Columbia River.

Coho (Silver) reached a maximum weight of 30 pounds, although it averaged 6. Coho usually appeared on the Columbia River in July, and could run as late as November depending on area. Coho runs occurred in alternating years.⁴

One of the lesser-valued species of salmon was the Pink (or humpback). The smallest at 3-11 pounds, these were found mostly in Alaska.⁵ Chum salmon, the least valuable species on the Columbia, reached about 16 pounds, averaging 8. Chum were initially used only for dog food, so nicknamed “dog” salmon. They run on the Columbia from mid-August until late November. Cheapest, light yellow in color. World War I created demand for additional salmon. Steelhead trout is often classed as salmon by Pacific fishermen. Average weight is 8-15 pounds, but can get up to 40. Steelhead were primarily for fresh and frozen markets and were caught with gill nets. They were abundant on the Columbia but their pale color made them less popular for canning.

The names given the various species of salmon were regional. On the Columbia, Chinook (or Spring) was called King salmon in Alaska. Blueback salmon was called Sockeye on

³ *ibid*, 412.

⁴ Spurlock, *History*, 28.

⁵ Cobb, *Pacific Salmon Fisheries*, 415.

the Puget Sound and in Alaska. Silver was called Coho in areas north of the Columbia. In all areas Humpback/Pink and Chum salmon were called by the same name.⁶

Not until the development of trollers with gasoline engines did the fishermen discover the range of salmon. Once thought to stay close to the mouth, tracking techniques and extended fishing grounds found them to travel fairly far away from their respective rivers.

⁶ Spurlock, *History*, 19.

APPENDIX B

CANNING PROCESS

The Columbia River fishing industry hinged on the canneries' capacity to process fish. Given the highly perishable nature of salmon, the processing lines had to be fast, and effective enough to keep the fish from spoiling during shipment. According to the demands of the market, the packed fish also had to be fairly consistent in weight and quality, and for some overseas markets, visually consistent and appealing. So essentially, technological "bottlenecks," or processing tasks that could not be sped up, helped pace the entire industry.¹ As machines were invented or improved upon to either replace cannery workers or speed the line, the processing capacity of the plants increased.

Bringing the catch to the cannery was the first task of processing. Large tally scows towed out by steamers (called "cannery tenders") were anchored near the fishing grounds. In order to spend more time fishing, the crews would deliver their catches to these scows, receiving receipts for their count. Those fishing near the cannery would deliver their loads alongside the cannery itself. Fish were initially unloaded by hand into bins on the wharf. By 1903, salmon were taken from boats and scows and loaded by elevator, which delivered the fish to chutes leading to the cutting room floor.

Cannery capacity was related to the number of "lines" in a cannery. "The machinery arranged so that the fish pass through all the operations from filling to double steaming is known as a line."²The Fish House, (essentially a butchery where the fish were cleaned)

¹ O'Bannon, *Technology*, 7.

² Cobb, *Pacific Salmon Fisheries*, 518.

prepared the fish for the line. Because of the broad range in fish size on the Columbia, the fish house remained dependent on hand methods far longer than any other part of processing.³ Essentially, two men made up a “butcher’s gang.” The number of gangs employed by a cannery depended on its production capacity. Boys unloaded the bins and placed the fish on cutting tables. One man cut off the head, the other removed the fins, tail, and viscera. Offal was thrown down a chute to be taken to another reducing plant — to produce oil, fish meal, and fertilizer. “Slimers” removed the thick mucus covering the fish’s skin. The “dressed” fish was then put into a tank of water, to be bled, scaled, washed, and scraped, then removed, washed, and scraped a second time. Skilled Chinese butchers could clean three to five fish per minute—from 2,000 to 3,500 fish per workday.⁴

The “Iron Chink” was invented to take the place of butcher’s gangs. Intended to displace the well-paid Chinese fish house workers, it was first used in 1903 in Washington State fisheries. The machine removed the head, tail, and fins, opened and cleaned the fish, and readied it to be cut into can-size pieces.⁵ Though often touted as one of the major revolutionary inventions in the salmon industry, it was not widely used on the Lower Columbia, since Chinook range from 5 to 60 pounds and were often too large for the machine.

After cleaning, workers moved the fish by basket or cart into main cannery building to be cut, packed, and cooked. First, the cleaned fish needed to be cut into sections to fit the various sized cans, and in the early days of the industry this too was done by hand. “The original method of cutting was by means of a long knife wielded by a Chinaman.”⁶ To speed the cutting process, sets of gang knives were attached to an axle and operated

³ O’Bannon, *Technology*, 174.

⁴ Smith, *Salmon Fishers*, 58.

⁵ Cobb, *Pacific Salmon Fisheries*, 519.

⁶ *ibid.*

by a lever, which cut the whole fish at once into chunks. Later, cutting machines were developed that sectioned the salmon. Those in use by 1930 were described as a “large wooden cylindrical carrier, elliptical in shape...ledges on the outside of the length of the carrier hold the fish...gang knives [were] circular, fixed on an axle at the proper distances apart. The carrier and gang knives [were] set in motion, each revolving on its own shaft.”⁷ Smaller canneries continued to cut by hand.

Workers or conveyor belts then carried the cut sections of salmon and dumped them into hoppers on top of the filling machines. The first filling machine was invented in 1883, by Mathias Jensen of Astoria, and manufactured by Jensen, Sylvester Farrell, and John Fox at the Astoria Iron Works.⁸ By 1930, most canneries used (improved) filling machines for at least part of their pack, though for flat or odd-sized cans were hand filled. Since Chinook was increasingly packed for a higher-end market, the Astoria canneries used the filling machines only for lower quality fish. (Hand packing kept the Chinook more visually appealing.) The filling machine was a “chute with a belt to which are attached wire racks about 4 inches apart.” Sections of salmon pass down another chute into what looked like a “hand coffee mill.” Passing into a smaller chute, the chunks of salmon are forced by a plunger into the can. Every can, before it was filled, was given a quarter ounce of salt, an additive to improve the flavor of the fish. After filling, the cans pass over a weighing machine, with small amounts of fish added or taken away to make weight. To hand fill the cans, fillers (usually women and children) stood on either side of a long table with a salmon-filled trough running its length, taking pieces from the constantly replenished trough to fill each can.

Cans were sealed after filling. The original method of getting air out of the cans before

⁷ *ibid*, 520.

⁸ Craig & Hacker, *History and Development*, 156.

sealing was to puncture a small hole in the top of the can, immerse the can in boiling water to force out the air, then solder the opening closed. This was a fairly labor-intensive method, requiring skill on the part of the workers to get a good seal and not contaminate the salmon with lead solder. The steam exhaust box was developed to replace the boiling method. Cans were placed on belts and heated with intensely hot jets of steam to expel the air. Double-seamer “sanitary” cans began to be used about 1910, requiring no solder as the cover was left unsealed. After the steaming, the cans were “double seamed”, to fasten the cover on with a double seam or crimp.⁹ The cans were then washed and moved into position for cooking.

Depending on the area and the size of the can, cans of salmon were pressure cooked at different temperatures for different lengths of time. These dry-steam cookers were called “retorts,” and the first wood version was patented in 1877. John Fox began making iron retorts at the Astoria Iron Works in 1882. Initially, the method was to cook the cans for an hour at 230 degrees, vent and re-solder, then cook again for an hour at 240 degrees.¹⁰ In the late 1890s the cooking process was reduced to one hour-long session in the retort. Imperfect cans found after cooking were repaired, and if possible, re-cooked. Ones that were too damaged to save, or had fish that had already begun to decompose, were thrown into the cannery dump.

After the retort, the cans were given a bath of lye, then washed and put into a cooling room. The tops and bottoms of cans contracted as they cooled, creating a popping sound for several hours after cooking.¹¹ Can seals were tested by tapping their tops with a piece

⁹ Cobb, *Pacific Salmon Fisheries*, 522.

¹⁰ Craig & Hacker, *History and Development*, 157.

¹¹ Cobb, *Pacific Salmon Fisheries*, 523.

of iron, making telltale sounds of a “good” or “bad” can. If bad cans were salvageable, they were set aside to be repacked.

After the cans cooled, they were lacquered. Initially, cans were hand painted with red (lead) paint. The British market, an early important market for Columbia River salmon, insisted on red cans for their shipments. Red cans for canned fish was common practice in the English market, and the paint helped protect the cans from rust, a major issue for cross-Atlantic shipping. Eventually, an asphalt-based lacquer was developed to replace the paint. To lacquer, crates of cans were dipped into large rectangular box vats and set aside to dry.

The last step along the line was labeling the cans with the appropriate brand label. Usually this was done by hand, and initially it was the work of local women (often immigrant workers’ wives). Labels with their brand appropriate to grade of salmon were glued onto the cans. Each company had a number of brands, reflecting their available grades and market preference. Chinook was the highest grade, pink and chum salmon were usually the lowest. Widespread abuse and faulty advertising inspired various state laws to be enacted in 1906, regulating the labeling and grading of salmon.¹²

A case of salmon contained 48 one-pound cans, or their equivalent in weight — 24 two pound cans or the like. Some canneries bought cans ready-made from outside companies such as the American Can Co., but just as often the cannery made their own out of sheet tin. In the 1880s and 1890s many of the Chinese crews would come before the start of the season, and stay after the season closed, to make cans. When cans were bought from outside companies, they were shipped flat, remolded into a round or oval shape at the cannery. One of the first dedicated can companies was the California Can Co. of San Francisco, started in 1881. Pacific Sheet Metal Works (Pacific Can Company) absorbed

¹² Cobb, *Pacific Salmon Fisheries*, 527.

California Can in 1893, and established a plant in Astoria. Shortly thereafter the American Can Co. bought Pacific Sheet Metal Works, and in 1897 the Astoria plant was moved to Portland.¹³

Mild Curing

Mild-curing as a commercial practice in Astoria began in 1897, with the arrival of S. Schmidt & Co. from Portland.¹⁴ The initial process of mild-curing used one-third sugar and two-thirds salt, but later only used salt. The salmon to be cured was carefully selected; all large, unbruised, and fat, and almost all Chinook. The fish were cleaned, bled, and lightly scored to allow the salt brine to permeate the meat. Cut into halves and rubbed with salt, the salmon was then placed in tierces, (a type of barrel), in layers with salt between. The tierce was filled with brine and placed in cold storage, kept at 35-38 degrees, for 20 to 90 days. Salmon was removed and dried, and put back in tierces without salt. The full tierces were kept in cold storage until shipped.

In the late 19th and early 20th century there was a high demand in Europe for mild-cured salmon, and until WWI most of the salmon cured at Astoria canneries was shipped overseas.¹⁵ After the railroad connected Astoria to Portland, the number of canneries producing mild-cured salmon increased rapidly. By 1905, eleven companies were mild-curing salmon; curing taking a considerable amount of the overall pack. With U.S. entry into WWI, the European market for mild-cured salmon was lost, never regaining the pre-war level of production.

¹³ Craig & Hacker, *History and Development*, 155.

¹⁴ Pacific Fisherman Yearbook [1903], 64.

¹⁵ Craig & Hacker, 161.

APPENDIX C

FISHING BOATS AND GEAR

“During the fishing season the fishermen live a good deal on board their boats. After the nets are hauled and the catch disposed of, the boats are often run into some cove or bay, where they are brought to anchor. The fishermen in each boat then unship the rudder and set it up amidships to support one end of the gaff, the other end of which rests upon the bow. The sail is thrown over the gaff, like an awning, and this constitutes the roof to an improvised cabin or cuddy, under which the crew sleep. (...) It is not uncommon to see hundreds of boats anchored in this manner along the coves or bends in the river, out of the way of passing steamers. Absolute quiet reigns, and one who for the first time sees such a fleet, literally sleeping upon the river, is little prepared for the sense of busy activity presented when it wakes with the turning tide, and the broad bosom of the great river is almost instantly covered with boats putting out from all directions.”¹

Boats

In the earliest days of the Columbia River fishery most of the boats used on the river were built in San Francisco, but that practice quickly changed as boat builders emigrated to Astoria. The bulk of boats used by Astoria fishermen were built by the canneries, all of which had boat building and repair facilities as part of their cannery complexes. Fishermen would rent boats and gear for the season, paying a percentage of their catch as a rental fee. Private boat builders were common in Astoria as well, usually catering to Finnish and Scandinavian fishermen, a higher percentage of which owned their own boats. One private boat builder was Wilson’s Shipyard, also called Kankkonen’s Shipyard, comprised of primarily Finnish boat builders.² Wilson’s employed 12 men in 1905, and expanded its operations considerably by the 1930s.³ In Uniontown, another smaller boat

¹ Collins, *Report on the Fisheries*, 1892, 206.

² Lewis, *Socializers*, 105.

³ Sanborn Insurance Map, 1931.

shop was Palo Brothers, which employed five men in 1905. Others were located throughout Astoria and along the small towns of the Columbia River and Pacific Coast. By the mid-1880s, there were between 1,200 and 1,400 gillnet boats on the river, and ninety percent of those were made in Astoria.⁴

Boat shops often served as centers for information exchange, and were generally restricted to fishermen. Communication between fishermen was vital, but heavily guarded.

Columbia River Gill Net Boats

“The boat used in the river and coast gill net fishery of the pacific is a distinct type, and differs from an other small craft employed in the fisheries of the United States...It is an open, carvel-built, centerboard craft, sharp forward and aft, the ends being shaped nearly alike. It has a long, low, floor, round bilges, flares slightly at the top. It has a very shallow keel, little or no rake to the stem and stern post, both of which are straight with the exception of the rounded forefoot. It is decked 2 or 3 feet at each end. It has washboards along both sides. A coaming 2 or 3 inches high runs around the inner edge of the washboards and the decked spaces...making the open part of the boat an oval form. A single mast is stepped well forward. Oars are carried when there is no wind.”⁵

The first “mass-produced” stock fishing boat on the west coast, Columbia River Gillnet boats were ubiquitous on the Pacific Northwest fisheries. (Figures 28 and 29) Use of the

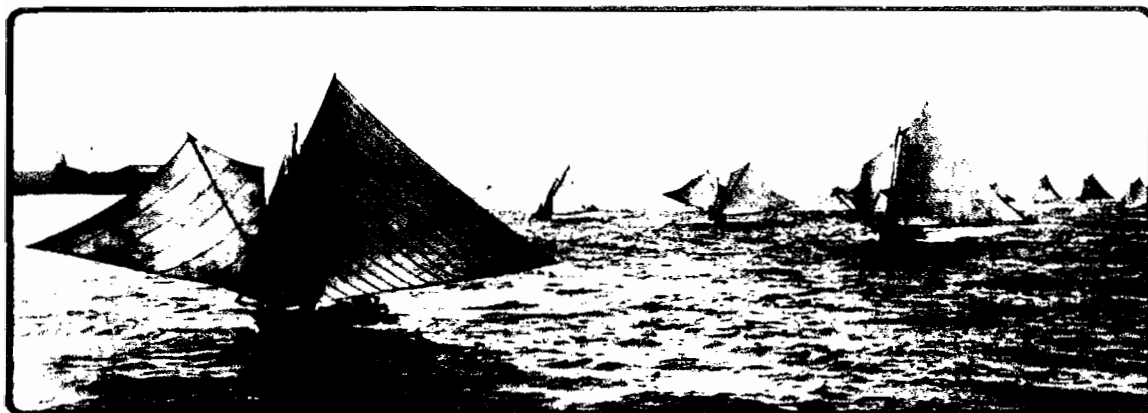


Figure 28. Sailing gillnetter “butterfly” fleet. *Source:* CRMM

⁴ Cox, *Lumber History*, 175.

⁵ Collins, J.W., “The Fishing Vessels and Boats of the Pacific Coast”, *Bulletin of the U.S. Fish Commission*, Vol. X, [1890], 38.

double-ended gillnet boat type spread to most other Pacific Northwest gillnet fisheries. The origin of design has been attributed to a San Francisco boat builder named J. J. Griffin,⁶ who in 1869 built one for George and Robert Hume, who brought it from the Sacramento River to the Columbia.

Average overall length of these boats ranged between 24 to 28 feet, the beam about 6 ½ feet, with a depth of 2 feet curving up to a 3 foot height at the ends. The sail was single mast, between 16 and 18 feet long. The sails and rigging could be taken down easily, and were used to provide shelter for the two-man crew by stretching the sail over the lowered



Figure 29. Motorized gillnet boats, known as “bowpickers,” circa 1930. *Source:* CCHS

⁶ Collins, Chapelle. Origin is contested by Craig & Hacker, Matrin places design origins in east coast fishing boat models, and Spurlock connects the gill net boat to small fishing craft used off Norwegian Coast.

mast (as a ridge pole). Sailboats rarely made more than one drift a night.⁷ Sails were replaced by gasoline engines by 1915, which began to appear first on cannery tenders in 1903. Columbia River fishermen were slow to adopt the motor because of a general belief it frightened fish away from nets.

The gasoline engine was the most important mechanical innovation after the turn of the century, significantly modifying gillnet boat design and allowing for the advent of salmon trolling. Gillnet boat design changed considerably. The shelter once created by the draping the sail over the mast was made into a permanent wooden cabin protecting the engine. Sailing gillnetters, when retrieving their net after a drift, pulled nets into the boat over the stern. In converting to a motorized gillnet boat, the net pull was shifted to the bow, leading to “Bowpicker” as the name for the adapted gillnet boat design. Bowpickers developed into one-man operations, where sailing gillnet boats had always required two men. Positions divided unevenly, a captain and a “boat-puller” who makes a smaller percentage of catch. 20% of the gross.⁸

With the increased range the motor allowed, the gillnet boat became a little larger. The beam increased to nine feet across to accommodate larger nets and more fish. A small cabin was added in the forward section of the boat to protect the engine. The cabin then shifted to the stern. Power from the motor was shortly connected to a roller, to make pulling in the net easier and single-man boat operation possible. Earliest motors averaged about four horsepower (hp).

Incorporation of the gasoline engine caused the first major changes to lines of the gillnet boat. A sail-driven double-ender was good at low speeds, but with added power the sharp stern tended to pull down creating “drag”. The solution to reduce this drag was a square-

⁷ Spurlock, *History*, 82.

⁸ *ibid*, 35.

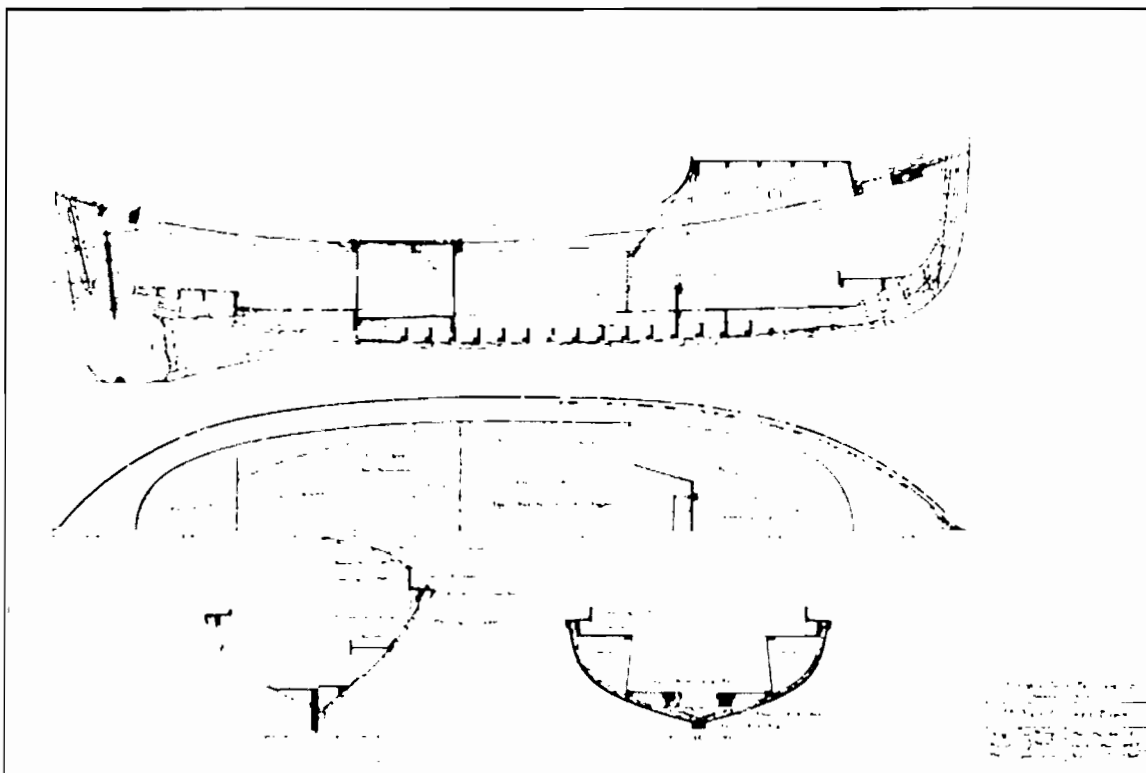


Figure 30. Sailing gillnet boat plans. *Source:* CRMM

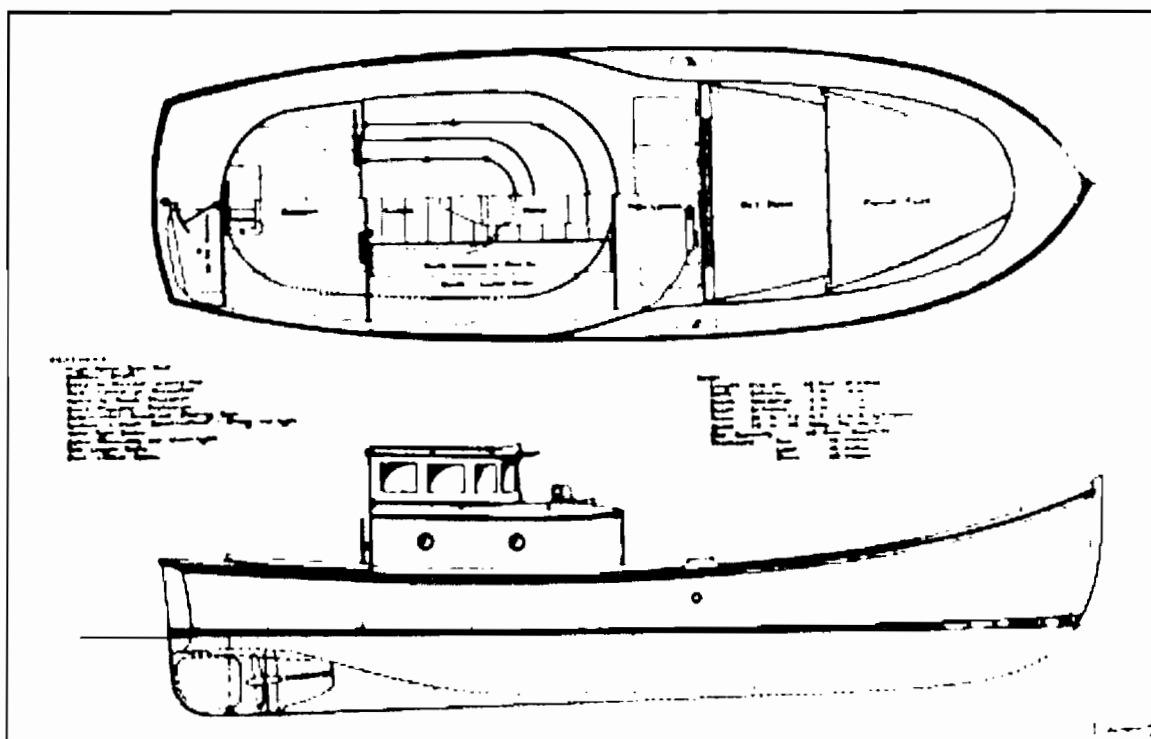


Figure 31. Motorized "bowpicker" gillnet boat plans. *Source:* CRMM

stern, and gillnet boats built after the 1930s were built this way. Engine power had significantly increased to 45-85 hp. Boat lengths had grown to thirty feet.⁹

Planking material was either port orford cedar or douglas fir, usually attached to white oak ribs.¹⁰ The fittings were copper and brass. Cannery-owned boats had an average working life of 10 to 14 years; the better cared-for privately owned boats could last considerably longer.

Trollers

The latest entry into the Columbia River fishery were the trollers which began to appear around 1912, with the introduction of the gasoline engine.¹¹ By 1915, there were 500 trolling boats off the Columbia, and by 1919 there were more than 1,000.¹² Gillnet boats were the ones first converted to trolling, initially by Norwegian and Finnish fishermen who owned their boats and wanted to fish out of season across the river bar.¹³ Trollers fished Chinook and Silver, which both took lures.

Trolling boats ran between 30' and 60' in length, with a deep end and round bottom profile. They remained a "double-ender" like the gillnet boat, and could carry a crew of three or more, though two was typical. One-man boats were also common. Fish caught by trolling gear usually brought higher prices, as most were caught for the mild-cure and

⁹ *ibid*, 85.

¹⁰ Howard Chapelle, *American Small Sailing Craft: Their Design, Development, and Construction*. [New York: Norton, 1951] 188; Jacob E. Thomas and Kent & Irene Martin, U.S. Department of Interior. *Double-Ended Columbia River Gillnet Boat, National Historic Register Nomination*, Altoona, Washington, 1977.

¹¹ Spurlock, *History*, 33.

¹² Cobb, *Pacific Salmon Fisheries*, 487.

¹³ John Damron wrote an excellent dissertation on the development of the west coast troll fishery.

fresh and frozen salmon markets.

Two types of trolling boats developed, known as Finnish or Norwegian trollers. Their primary difference was in their arrangement of poles.¹⁴ Trolling begins an hour or so before dawn. Four poles were lowered, front ones about 25' long and fastened to the foredeck with a pivoted-hinge at a 30 degree angle. When not fishing, poles are tilted upward and backward, supported by cross trees on the mast. the main poles were 10-15 feet longer than bow poles and held two to three lines each.¹⁵ Lead attached to lines to achieve depth. Above the lead, a spacer bar and swivel, then a piece of strong 18" piece of rubber, a linen leader, a 30-40" piece of piano wire, then finally spoon and hook.¹⁶ Power reels or "gurdies" pull in the lines. If the line is baited, it is baited with herring.

Gear

Fixed gear such as fish traps, pound nets, or fish wheels, once ubiquitous along the Columbia River, are not addressed in this study. This type of gear was legislated out of use by 1927, and there are no examples of either type remaining along the river.

More salmon has been taken with gillnets than any other form of gear. This type of net is the oldest and most popular net style used in the salmon fisheries of Pacific Coast.¹⁷ Its first known use on the Columbia was by two men from Maine, fishing near Oak Point, Washington in 1853.¹⁸ Before its use on the Columbia, fishermen on the Sacramento River in California had been experimenting with gillnets woven from different types of twine as

¹⁴ Refer to Damron for troller history

¹⁵ Spurlock, *History*, 39

¹⁶ *ibid*, 40

¹⁷ Cobb, *Pacific Salmon Fisheries*, 477

¹⁸ Craig & Hacker, *History and Development*, 165

early as 1849.¹⁹ Columbia River gillnets were originally made of flax or linen, and occasionally cotton. Fish can see natural fiber nets, like linen, in daylight and clear water, so fishing with these nets was performed at night. Nylon, the current material used to weave gillnets, can be fished during the day.

Gillnets were hung with a line of cork floats on top and a line of lead sinkers (weights) along the bottom, keeping the mesh of the net vertical in the water.²⁰ Curtain of webbing were held between a corkline and leadline. Floater nets fished the higher drifts, and had larger cork lines than lead lines. Diver nets fished the bottom currents of the river, and had heavier lead lines. (Figure 32)

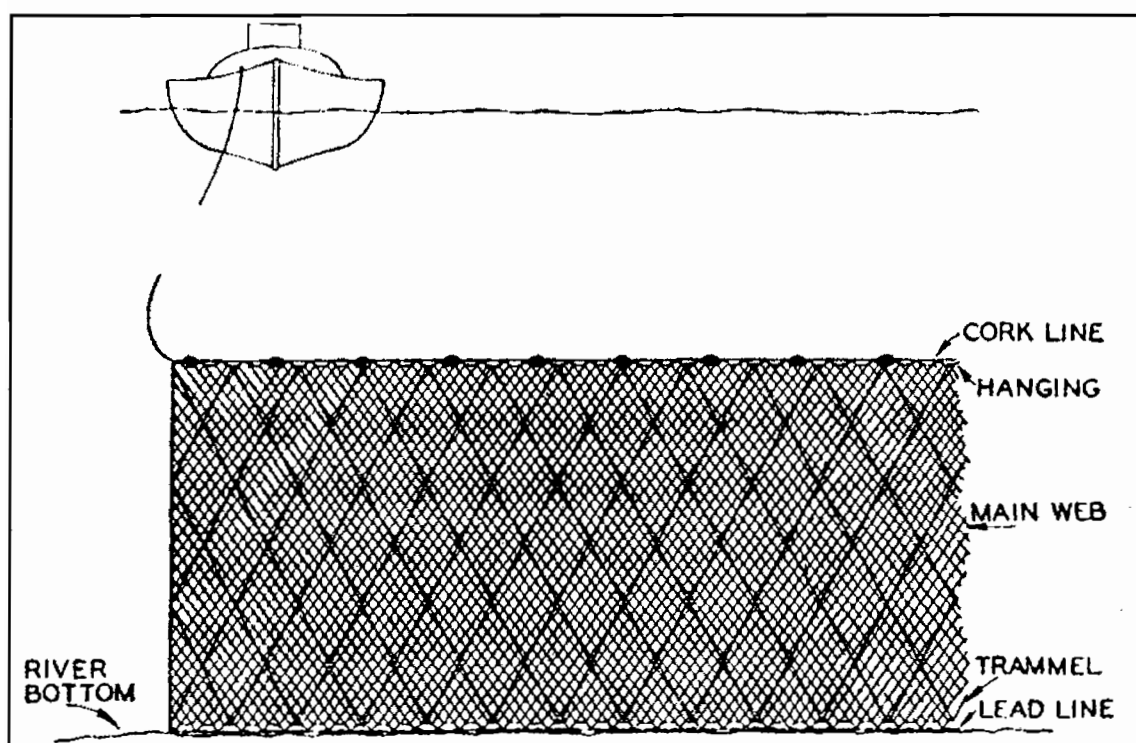


Figure 32. Drawing of a diver net. Source: Craig & Hacker, *History and Development*, 166

¹⁹ Arthur McEvoy, *The Fisherman's Problem: Ecology and Law in the California Fisheries, 1850-1980*. [Cambridge: Cambridge University Press, 1986], 70

²⁰ Cobb, *Pacific Salmon Fisheries*, 477

Size and length of drift nets varies according to the fishing channel. On the Columbia, fishing for Chinook, nets average about 250 fathoms in length and have a mesh of 9-9½ inches. Dimension of mesh openings determines what fish was caught, since gillnets function by allowing the salmon's head to enter the mesh but not the body, catching the gills as the fish attempts to back out or break free.

Nets were also a cultural form. Finns and Scandinavian fisherman families usually made and repaired their own during the off seasons.

“The nets are all hand made by the fishermen themselves or their families; the fishermen's union prohibits the use by any of its members of factory or Chinese made nets.”

“The nets are made between seasons...they are hung in the ordinary manner...and it is said they are tanned twice a month during the fishing season. Nets ordinarily last two years but the fishermen generally expect to put in half new twine each season.”²¹

By 1940, the Gillnetter Union no longer made Chinese nets an issue, but most nets were still hand-made by fishermen and their families. Often the work became a social activity. Canneries encouraged the fishermen to use their own nets, since “a man rarely catches a steamboat in his own net.”²²

Drift Gillnetting Method (2 man operation)

To set the net, the “boat puller” rows across the drift, while the second fisherman pays out the net, slipping it into the water in a line. A buoy is attached at the far end. When about two-thirds of the net is laid out, the boat is turned to a right angle, so the net forms the letter “L.”²³ The net can also be drifted at right angles to the current, or lengthwise to it.

²¹ Spurlock, *History*, 75; Fifth and Sixth Annual Reports of the Fish and Game Protector, State of Oregon 1897-1898, (Salem, Oregon, 1898), pp. 93.

²² For an excellent discussion of gillnets as a cultural form, refer to Martin's Legacy and Testament.

²³ *ibid*, 478

Usually the net was put out about an hour before “high-water slack,” and taken in about an hour before the turn of the tide.

Haul Seines

Haul seines used horse teams and large (cannery-employed) crews of fishermen to catch schools of salmon, mostly on the sand bars near Astoria when they were uncovered at low tide. When the tide slacked, the net was placed on a large seine boat, with the shore end attached to a dory. The seine boat headed offshore, and the dory headed toward the bar, laying the net in a semi-circle between them. Then the outer shore line is brought around to the bar, and horses are hooked to the ends to bring the net together and haul it in.²⁴ Buildings were put up on piles, or floated on scows, to keep the fishermen and horses above the water at high tide.

Purse Seines

Similar idea as the haul seine, but performed in water. Two boats worked together to ring a net around schools of salmon. Purse seines were rarely used on the Columbia, but were a staple of Puget Sound. Rumored to have been introduced on the Puget Sound by Chinese fishermen in 1886.²⁵

²⁴ Cobb, *Pacific Salmon Fisheries*, 479.

²⁵ *ibid*, 481.

BIBLIOGRAPHY

Books

- Alanen, Arnold R. "Considering the Ordinary: Vernacular Landscapes in Small Towns and Rural Areas," in *Preserving Cultural Landscapes in America*, edited by Arnold Alanen and Robert Melnick. Baltimore and London: The Johns Hopkins University Press, 2000.
- Alfrey, Judith and Catherine Clark. *The Landscape of Industry*. London: Routledge, 1993.
- Andrews, Ralph W. and A.K. Larssen. *Fish and Ships*. Superior Publishing Company. Seattle, WA, 1959.
- Bauer, Karl Jack. *A Maritime History of the United States: The Role of America's Seas and Waterways*. Columbia: University of South Carolina Press, 1988
- Bjork, Kenneth O. *West of the Great Divide: Norwegian Migration to the Pacific Coast, 1847-1893*. Northfield: Norwegian-American Historical Association, 1958.
- Borja-Mamaril, Concordia R. and Tyrone Lim. *Filipino Americans: Pioneers to Present*. Portland: Filipino American National Historical Society, 2000
- Browning, Robert J. *Fisheries of the North Pacific : History, Species, Gear & Processes*. Edmonds: Alaska Northwest Pub. Co., 1980
- Campbell, K. Mack. *Cannery Village, Company Town: A History of British Columbia's Salmon Canneries*. Victoria: Trafford Publishing, 2004.
- Carlsson, Sten. *Swedes in North America, 1638-1988: Technical, Cultural, and Political Achievements*. Stockholm: Streiffert & Company, 1988.
- Chapelle, Howard. *American Small Sailing Craft: Their Design, Development, and Construction*. New York: Norton, 1951.

- Chiarappa, Michael J. "Great Lakes Commercial Fishing Architecture: The Endurance and Transformation of a Region's Landscape/Waterscape," in *Building Environments: Perspectives in Vernacular Architecture, Volume 10*, edited by Kenneth A. Breisch and Alison K. Hoagland. Knoxville: University of Tennessee Press, 2005
- Damron, John E., "The Emergence of Salmon Trolling on the American Northwest Coast: A Maritime Historical Geography." PhD diss., University of Oregon, 1975.
- Dell, Sidney. *Astoria and Flavel: The Chief Seaport of the Columbia River Watershed*. Astoria: City Booster Pamphlet, 1893
- DeLoach, Daniel. *The Salmon Canning Industry*. Oregon State College, 1939
- Donan, Peter. *Astoria, The Peerless Maritime Metropolis of the Golden Northwest*. Buffalo: Matthews-Northrup Co., 189?
- Fagan, John L. "The Chinese Cannery Workers of Warrendale, Oregon, 1876-1930." in *Hidden Heritage: Historical Archaeology of the Overseas Chinese*. edited by Priscilla Wegars. Amityville: Baywood Publishing Company, [1993]: 215-228
- Friday, Chris. *Organizing Asian American Labor: The Pacific Coast Canned-Salmon Industry, 1870-1942*. Philadelphia: Temple University Press, 1994.
- Gilmore, Janet C. *The World of the Oregon Fishboat: A Study in Maritime Folklife*. Ann Arbor: UMI Research Press, 1986.
- Glassie, Henry. *Pattern in the Material Folk Culture of the Eastern United States*. Philadelphia: University of Pennsylvania Press, 1968
- Material Culture*, Bloomington: Indiana University Press, 1999
- Groth, Paul "Frameworks for Cultural Landscape Study." *Understanding Ordinary Landscapes*. edited by Paul Groth and Todd Bressi, Yale University, 1997.
- Hardesty, Donald L. "Ethnographic Landscapes: Transforming Nature into Culture." in *Preserving Cultural Landscapes in America*, edited by Arnold Alanen and Robert Melnick. Baltimore and London: The Johns Hopkins University Press, 2000.
- "Power and the Industrial Mining Community in the American West," in *Social Approaches to an Industrial Past: The Anthropology and Archaeology of Mining*, A. Bernard Knapp, Vincent C. Pigott, and Eugenia W. Herbert. London: Routledge Press, [1998]: 81-96

- Hardwick, Susan. "Inscribing Ethnicity on the Land" (chapter revision), in *The Making of an American Landscape*, edited by Michael Conzon. Boston: Unwin Hyman, 2008
- Hasselmo, Nils. *Swedish America: An Introduction*. Minnesota: Brings Press, 1976.
- Haugen, Einar, *The Norwegians in America: A Student's Guide to Localized History*. New York: Teacher's College Press, 1967.
- Hummasti, Paul George. [videorecording] *Remembering Uniontown: Finnish-Americans in Astoria, 1918-1942*. Lawrence Johnson Productions. Astoria: Clatsop County Historical Society, 1988
- *Finnish Radicals in Astoria, Oregon, 1904-1940: A Study in Immigrant Socialism*. New York: Arno Press, 1979.
- Jordan, Terry. "Cultural Pre-adaptation and the American Forest Frontier: The Role of New Sweden." in *Re-Reading Cultural Geography*, edited by Kenneth E. Foote, Kent Mathewson, and Jonathan M. Smith. Austin: University of Texas Press, 1994.
- Kaups, Matti Enn. "Finns in the Lake Superior Region," in *To Build in a New Land : Ethnic Landscapes in North America*, edited by Allan Noble. Baltimore: Johns Hopkins University Press, 1992.
- King, Anthony D., ed., *Buildings and Society: Essays on the Social Development of the Built Environment*. London: Routledge & Kegan Paul, 1980.
- Lefebvre, Henri. *The Production of Space*. trans. by Donald Nicholson-Smith. Editions Anthropos/Blackwell Publishing, 1974.
- Lewis, Susan. "Finnish American Women as Socializers." PhD diss., University of Oregon, 1993.
- Lingo, Shawn, "Survey of Historic Structures in Astoria". Unpublished Inventory, 2007.
- Lowenthal, David, "Age and Artifact: Dilemmas of Appreciation" in *The Interpretation of Ordinary Landscapes: Geographical Essays*, edited by Donald Meinig, New York: Oxford University Press, 1979.
- Martin, Irene. *Legacy and Testament: The Story of the Columbia River Gillnetters*. Pullman: Washington State University Press, 1994.

- Mason, Randall. "Management for Cultural Landscape Preservation" in *Cultural Landscapes: Balancing Nature and Heritage in Preservation Practice*, edited by Richard Longstreth. Minneapolis: University of Minnesota Press, 2008.
- McEvoy, Arthur F. *The Fisherman's Problem: Ecology and Law in the California Fisheries, 1850-1980*. Cambridge: Cambridge University Press, 1986.
- Melnick, Robert Z. "Considering Nature and Culture in Historic Landscape Preservation," in *Preserving Cultural Landscapes in America*, edited by Arnold Alanen and Robert Melnick. Baltimore and London: Johns Hopkins University Press, 2000.
- Miller, Emma Gene. *Clatsop County, Oregon: Its History, Legends, and Industries*. Portland: Metropolitan Press, 1958.
- Newell, Dianne. *The Development of the Pacific Salmon-Canning Industry: A Grown Man's Game*. McGill-Queen's University Press, Montreal. 1989.
- Nielsen, Rebecca. "A Cultural Resource Survey of Finnish Immigrant Architecture in the Lower Columbia Region". Master's thesis, University of Oregon, 2004.
- Passi, Michael. "Fishermen on Strike: Finnish Workers and Community Power in Astoria, Oregon 1880-1900." in *The Finnish Experience in the Western Great Lakes Region: New Perspectives*, edited by Karni, Michael Karni, Matti Kaups, Douglas Ollila. Turku: Institute for Migration, 1975.
- O'Bannon, Patrick William. "Technological Change in the Pacific Coast Salmon Industry." PhD diss., University of California, 1983.
- Rasmussen, Janet, *New Land, New Lives: Scandinavian Immigrants to the Pacific Northwest*. Seattle: University of Washington Press, 1993.
- Riesenweber, Julie. "Landscape Preservation and Cultural Geography" in *Cultural Landscapes: Balancing Nature and Heritage in Preservation Practice*, edited by Richard Longstreth. Minneapolis: University of Minnesota Press, 2008.
- Rottle, Nancy D. "A Continuum and Process Framework for Rural Historic Landscape Preservation" in *Cultural Landscapes: Balancing Nature and Heritage in Preservation Practice*, edited by Richard Longstreth. Minneapolis: University of Minnesota Press, 2008.
- Sauer, Carl. *The Morphology of Landscape*. Berkeley: University of California Press, 1938.

- Schein, Richard. "Normative Dimensions of Landscape" *Everyday America: Cultural landscape Studies after J.B. Jackson* edited by Chris Wilson and Paul Groth, Berkeley : University of California Press, [2003]: 199-218.
- Smith, Courtland L. *Salmon Fishers of the Columbia*. Corvallis: Oregon State University Press, 1979.
- "Fisheries as Subsistence Resources: Growth and Decline of the Columbia River Salmon Fishery," in *Those Who Live From the Sea: A Study in Maritime Anthropology*, edited by M. Estellie Smith. West Publishing Company, 1980.
- Spurlock, Clark Patrick, "A History of the Salmon Industry in the Pacific Northwest." Master's thesis, University of Oregon, 1940.
- Taylor, Joseph E. III. *Making Salmon: An Environmental History of the Northwest Fisheries Crisis*. University Washington Press, Seattle, WA. 1999.
- Trinder, Barrie. *The Making of the Industrial Landscape*. London: Weidenfeld & Nicolson, 1997.
- Wilson, Chris and Paul Groth, ed. *Everyday America: Cultural landscape Studies after J.B. Jackson*. Berkeley: University of California Press, 2003.
- Tuan, Yi-Fu. "Thought and Landscape: The Eye and the Mind's Eye." in *The Interpretation of Ordinary Landscapes: Geographical Essays*, edited by Donald Meinig, New York : Oxford University Press, 1979.
- Zelinsky, Wilbur. *The Cultural Geography of the United States*. Englewood Cliffs: Prentice-Hall, 1973.

Articles

- Acheson, James. "Anthropology of Fishing." *Annual Review of Anthropology* 10 [1981]: 275-316.
- Barker, W. H. "Reminiscences of the Salmon Industry." *Pacific Fisherman Yearbook*, Seattle [January, 1920]: 67-69.
- Allan, Cain. *Women Can Fillers, Elmore Cannery*, Oregon Historical Society, Oregon History Project Website, 2006.
- Cleveland, Alfred. "Social and Economic History of Astoria." *Oregon Historical Quarterly* 4:130-149.

- Cobb, John. "Pacific Coast Fishing Methods." *Pacific Fisherman Yearbook*, Seattle [1916]: 20-27.
- Collins, J.W. "Salmon Fishing on the Columbia." *Popular Monthly*, 1897.
- Cox, Thomas R. "Lower Columbia Lumber History, 1880-1893" *Oregon Historical Quarterly* 67: 175-182.
- Hume, R. D. "The First Salmon Cannery." *Pacific Fisherman Yearbook*, Seattle. [1916]
- "Salmon of the Pacific Coast." Schmidt Label and Lithographic Company, San Francisco, 1893.
- Lawrence, Denise and Setha Low. "The Built Environment and Spatial Form." *Annual Review of Anthropology* 19 [1990]: 453-505.
- Minor, Rick. "The Bay View Cannery: Skamokawa Village Site." *Northwest Anthropological Research Notes* 9 [1975]: 121-138.
- Niska, Ed. "Astoria's Union Fish," *CUMTUX* 8 [Spring 1988]
- Reese, Jo. "Microarchaeological Analysis of the Chinese Worker's Area at the Warrendale Cannery Site, Oregon." in *Contributions to the Archaeology of Oregon: 1987-1988.*, edited by Rick Minor. Association of Oregon Archaeologists, Occasional Papers no. 4 [1989]: 197-221.
- Schein, Richard H. "The Place of Landscape: A Conceptual Framework for Interpreting an American Scene." *Annals of the Association of American Geographers* 87, no. 4 [December 1997]: 660-680.
- Unknown author, "Motor Craft in the Pacific Fisheries." *Pacific Fisherman Yearbook*, Seattle [1919]: 56-64.
- Upton, Dell. "Outside the Academy: A Century of Vernacular Architecture Studies, 1890-1990". *Studies in the History of Art* 35 [1990]: 199-213.
- "Architecture in Everyday Life." *New Literary History* 33 [2002]: 707-723.
- "The Tradition of Change" *Traditional Dwellings and Settlements Review* 5 (1993): 9-15.
- Yasui, Barbara. "The Nikkei in Oregon, 1834-1940." *Oregon Historical Quarterly* 76: 238-239.

Government Publications

- U.S. Bureau of Commercial Fisheries. *Pacific Salmon Fisheries. Appendix XIII to the Report of the Commissioner of Fisheries for 1930.* by John Cobb. Washington: U.S. Government Printing Office, 1930.
- U.S. Bureau of Commercial Fisheries. Bulletin of the Bureau of Fisheries, Vol. XLIX, No. 32. *The History and Development of the Fisheries of the Columbia River.* by Joseph A. Craig and Robert L. Hacker. United States Government Printing Office, Washington D.C. 1940.
- U.S. Bureau of the Census. Population of Clatsop County, 1880 - 1930 [microfiche]
- U.S. Bureau of Fisheries. *Bulletin of the Bureau of Fisheries.* Vol. 24 (1904)-v. 49 (1938-40) Washington, D.C.: Government Printing Office, 1905-1950.
- U.S. Department of Interior, National Park Service. *National Register Bulletin #30: Guidelines for Evaluating and Documenting Rural Historic Landscapes,* by Linda McClland and Robert Melnick. Washington D.C.: [1989] Revised, 1999.
- U.S. Department of Interior. *Double-Ended Columbia River Gillnet Boat, National Historic Register Nomination,* by Jacob E. Thomas, Kent & Irene Martin. Altoona, Washington, 1977.
- U.S. Department of Interior. *Samuel Elmore Cannery National Historic Register Nomination,* by Roger Tetlow, 1996.
- U.S. Department of Interior. *Union Fisherman's Cooperative Packing Company's Alderbrook Station, National Register Nomination,* by Roger Tetlow, 1989.
- U.S. Department of Interior. *Uniontown-Alameda National Historic District Nomination,* 1988.
- Library of Congress. *Historic American Engineering Record (HAER), Elmore Cannery,* by Roger Tetlow, 1991.
- U.S. Bureau of Commercial Fisheries. Bulletin of the U.S. Fish Commission vol. 10, 1890. *Fishing Vessels and Boats of the Pacific Coast,* by J. W. Collins. Washington Government Printing Office, 1892.
- U.S. Commission of Fish and Fisheries. *Report on the Fisheries of the Pacific Coast of the United States.* by J. W. Collins. Washington D.C., 1892 [microfiche]

U.S. Bureau of Fisheries. *The Fisheries and Fishing Industry of the United States*, by G. Brown Goode. Washington, Government Printing Office, 1884-87.

U.S. Department of Agriculture, Forest Service. *Characteristics of remnant old-growth forests in the northern Coast Range of Oregon and comparison to surrounding landscapes* by Andrew N. Gray, Vincente Monleon, Thomas A. Spies, Gen. Tech. Rep. PNW-GTR-790. [Portland: Pacific Northwest Research Station. 2009]

Archival Records

The Astoria Guide, Shipping schedule, Ed. W. Wright, Publisher. Sept 7, 1889

Structural inventories, Dooly & Co. Insurance Records, Portland, Oregon, Columbia River Packers Association Records, Columbia River Maritime Museum.

Structural inventories, General Appraisal Company Records, Columbia River Packers Association Records, Columbia River Maritime Museum.

Penner, Liisa. *Plowing the Raging Columbia: The Salmon Industry in the 1870s*. Astoria: Unpublished, Clatsop County Historical Society, 1991

Penner, Liisa. *The Chinese in Astoria, Oregon, 1870-1880*. Compilation of newspaper clippings and census records. Unpublished, Clatsop County Historical Society, 1990

Chappel, Jill A. *Historic Context Statement: Adair-Uppertown Historic Inventory, Astoria Oregon*. Heritage Research Associates, Inc. Report no. 159. 1994.

Additional Sources

Oregon Historical Society Website, Oregon History Project. <http://www.ohs.org/education/oregonhistory>

Hip Fish Monthly Newsletter. "Mondo Condo," <http://www.hipfishmonthly.com/issue103/103mondocondo.html>

Sanborn-Perris Map Co. Fire Insurance Maps of Astoria, Oregon. New York: Sanborn-Perris Co., 1888, 1892, 1896, 1908, 1931, 1948