ADAPTATION OF HOUSE TYPE TO CHANGING FUNCTION: A SEQUENCE OF CHICKEN HOUSE STYLES IN PETALUMA

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Settlement features are a distinct part of the cultural landscape. Studies have been made in recognition of these features in recent articles in agricultural geography dealing with farm structures which may act as an index to the classification of regions.¹

This paper is a study of certain agricultural settlement features with a basis in historical geography and implications of environmental adaptability. It deals with some preliminary facts of architectural design in selected agricultural outbuildings and the role of their morphological evolution in the one-time center of commercial egg production in California. The location is Petaluma, in Sonoma County, 30 miles north of San Francisco, which has in its landscape relict poultry structures giving evidence of a sequential development and adaptation of style to climate and production.

Once known as the “Egg Basket of the world,” Petaluma produced nearly 100 per cent of the commercial eggs in California and partially supplied the urban populations of the eastern United States as well. However, since the peak production era of the late 1940's, the region has been in a steady decline and now produces only seven per cent of California's eggs, the center of production having shifted to Southern California.²

The landscape in which the commercial egg industry of California had its origin was one of low, rolling, grass-covered hills. Colony houses were the first structures introduced on the hillsides in 1880 by dairymen who were already in the region (Figure 1A). The houses were about six feet wide and eight feet long for the smallest, others were 8 by 12 or 14 feet, with an open doorway in front, with no floors or windows and topped with a gabled roof. The smaller houses were connected six to eight in a row. The connection enhanced their portability so a team of horses could move them every month or so. The movement was away from the deposits of accumulated manure and mud to ground which made for cleaner eggs and provision for closer location to more green feed. The middle house was furnished with nesting material (litter) for laying and the others functioned as roosting houses with a capacity for 25 to 50 birds each. The larger houses usually remained where they were originally placed.

A. Colony House  
B. Lyding House  
C. Semi-Monitor House  
D. Closed, Gable-Roof House  
E. Modified Open House  
F. Open Shed Cage House  

Figure I. Chicken house styles of Petaluma.
The chickens were fed outside in long narrow troughs placed in front of the houses, and they ranged for grit and grubs on the unfenced hill land. A few farmers kept this type of housing for small operations and because changing meant more capital outlay than they could afford. The majority changed because of disease problems, small roosting capacity of the houses and the muddiness of the open fields through which the farmer had to walk. Also through decrease in the size of farms and with growth of the industry a permanent type of house developed.

In Hutchison's book, *California Agriculture*, George Hart and others mention an evolutionary sequence of chicken house styles in the Petaluma region. Although they seem to cover the entire sequence of house types there is no developed nomenclature for these structures. The names set forth in this article are indigenous to the Petaluma-Santa Rosa area. They serve as a style guide for the various types of houses, creating a separation between distinctive style changes and increased house size without a style change.

Walter Hogan's book, *The Call of the Hen*, has a short discussion, with photos, of the colony type of house. Structures in which the chickens are housed, however, are of minor importance since the book deals with the selection and breeding of poultry. There is some mention of the poultry factory (long building with a 500-bird capacity) but he does not mention if these are in the Petaluma or Southern California region.

The permanent house type which followed the portable colony house was the Lyding house, appearing on the landscape around 1913 (Figure 1B). (A rectangular, closed gable-roofed house appeared about three years before but didn't achieve prominence until 1930.) The Lyding house was 12 to 14 feet wide and 30 to 50 feet long, of shed-type construction with windows in the front for sunlight and aeration. This house had a capacity for approximately 100 birds, one for every 2 square feet, and was provided with litter on the floor for nesting material. The chickens didn't have the freedom to roam about as they did with the colony type, for there was a fenced-in yard in back of the house in which the chickens were fed a mixture of kale and horsemeat and also foraged for grit; the other half of their feed consisted of grain which was fed to them inside the house. The kale was more important than it seemed, for it furnished an excellent source of vitamin A, known to be a preventative against a deficiency disease common among flocks that lacked greens in their diet.

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5 An example of the Lyding house may still be found on the ranch of D.B. Walls of Petaluma, who along with Max Herrera and Virgil Stratton, Sonoma County Poultry Farm Advisor, produced the dates and names of the house type considered in the time span between 1880 and 1950.

6 In 1904 M.E. Jaffa, working at the University of California Agricultural Experiment Station at Petaluma, tested for a low cost feed that would increase egg production. In 1905 he published *Poultry Feeding and Proprietary Feeds* as a culmination to his research. This bulletin advised the ranchers on most of the nutritional problems they would encounter in the care and feeding of their hens.
The loss of freedom on the outside was compensated for by providing more room for roosting and laying on the inside of the house; this meant greater efficiency in handling a large flock. The added space alleviated the disease problem somewhat; however, the need for even more sunlight and aeration with expansion of the flock, provided the reasons for a change.

The introduction of the semi-monitor house in 1917 caused a definite increase in the size of the flock as well as production (Figure 1-C). It consisted essentially of two Lyding houses, one shorter than the other, placed face to face; a split level half gable roof with an opening at the top and screened half way down on one side. The method of constructive outside covering was usually board and batten occurring in all the different styles. A variation to this was the tongue and groove method.

This structure occupied approximately 720 square feet and had a capacity for 400 to 500 chickens. The chickens were fed a mixture of wheat and corn. Grit had to be furnished, due to their inside environment, which they would have otherwise gotten naturally outside.

In the mid-1920's there was a migration of poultry farmers from the Midwest to the Petaluma region. These farmers brought with them their customary methods and styles of housing. Their chicken house type was one of a closed, gabled-roof construction with very little opening and was designed to keep the chickens inside and protected from the "elements" (Figure 1D).

At this point the evolution of the chicken house took a backward step as far as combating disease was concerned. Nevertheless, the new house reduced cannibalism among the chickens. It seems that poor lighting proved to be an asset, providing an atmosphere where chickens weren't as apt to establish a pecking order.

These houses went through three successive stages of development. The first houses had a 16-foot width; the next model was 18 to 20 feet wide, and, finally, the third had a 30-foot width, all being about 100 feet long. Large operations, at that time, consisted of 500 to 1,000 birds in these structures. During this period the mortality rate started to climb, due primarily to lack of sunlight, crowding and to poor ventilation. In the 1930's the University of California's Agriculture Extension Service again started to make overtures to the ranchers to change their style of housing and eventually the era of the modified partially-open house was introduced.

This old house type modification appeared upon the Petaluma landscape about 1950 (Figure 1E). The change actually consisted of adding

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Footnotes:
5 This semi-monitor structure along with the colony house may be found on the Max Herreras chicken ranch today. The opening extending the entire length of the building between the split roof levels has been boarded up. This, Mr. Herreras explained, was because placing burlap over the opening during foul weather and then removing it consumed too much time and effort. Instead the screening area on the side has been enlarged thus permitting more aeration.

8 In 1921 the California shed-roof poultry house design was published by the University of California Agriculture Extension Service. This design caught on in the rest of the state but Petaluma didn't pick it up until much later.

9 Cannibalism, often a disputed word among non-poultrymen, pertains to the dictionary definition. Chickens when pecking one another actually eat the pieces of meat they may tear off. Unless preventative measures are taken the weakest hens will eventually die. Two methods now being employed are debeaking or the inserting of contact lenses onto the chicken's eyes.

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fenced-in yards to some of the smaller structures, or simply by making an opening in the side of the house and placing a screen over it. Another method suggested by the Agricultural Extension Service at Davis was the addition of a screened-in porch. The closed, gable-roofed houses were the first type destined for modification because of the high mortality rate due to disease fostered by lack of sunlight and limited circulation of air.

The ranchers, however, stood firm in their belief that their type of housing was correct and some refused to change styles, partly because of tradition and partly because of lack of available funds either from savings or through bank financing. Provincialism took hold of the area and forced a stagnant period in the evolutionary sequence. (Southern California, 10 years earlier, had been receiving large-scale bank financing and was constructing modern efficient house styles, the effects of which were soon felt by Petaluma producers.)

At the same time of the final opening up of old structures, the Agricultural Extension Service also introduced new and open structures in 1950. The first new structures were called Stratton houses (after Sonoma County’s poultry farm advisor). These new types became the cage house that has persisted to the present day (Figure 1F). This house type is the most popular style in California today. It is essentially a long shed ranging from 10 to 16 feet wide and 100 to 230 feet long. The roof is often slanted (made of corrugated aluminum or some galvanized metal) and the sides are covered with removable (in some cases) slatted windbreaks. The operations studied in the Petaluma-Santa Rosa area had the south-facing side usually covered and the north-facing side left open.

There is no longer a problem of inadequate aeration and insufficient sunlight, for these open styles houses have provided an excellent solution to the problem. Inside the house the chickens are kept in stretch wire cages consisting of the individual or colony type. An individual cage is ¾ of a foot square and was introduced first. Colony cages, coming in several years later, were three feet wide by four feet long and held 16 to 20 birds.

Advantages of the chickens being kept on wire are: birds are protected from groundborne diseases, work is at a convenient height, eggs are cleaner and fewer are cracked, droppings are easily removed, and no litter has to be provided. Feed is stored in large cylindrical units at the end of every other house.\(^\text{10}\) A gradual change in the type of feed also became evident. Up until 1947 wheat was still used; in 1950 a high percentage of the feed was barley; and from 1954 to the present, milo is the dominant grain with a small percentage of corn.

However, even in this latest style of chicken housing serious problems need to be solved. First, the housing investment is high; second, the cost of the hot-weather care that must be provided, such as fogging and sprinkling devices, is an extra expense; third, even though the productivity has

\(^{10}\) From this storage tank the feed is put in a hand feeding device to distribute to the birds. This was the feeding operation used on the Crystal Poultry Farm in the Petaluma-Santa Rosa area which had a housing capacity for 300,000 chickens. It is one of the largest operations in the area at present. There are actually only three or four ranches with 50,000 birds or more; this is out of a 1962 total of 300 operators. In 1950 the total number of operators was 1084.
increased, eggs are often apt to be wire-marked; a. Fourth, the fly problem is aggravated by the mounds of wet manure produced.\textsuperscript{11}

Disease is still a threat in the Petaluma area. Once infested with chicken pox and fowl cholera, whole flocks died within a short period of time. Rats were extremely prevalent in the early days and were the main carriers of cholera. There are now certain control measures for disease, such as vaccination for chicken pox and poison and traps for rats.

In conclusion, the three factors underlying the change of chicken house styles in Petaluma have been: first, the experience of economic loss due to diseases; second, a desire to reduce overhead cost through increasing the size of flocks; and third, a trend toward higher productivity and the reduction of handling costs. The causes for the industry's decline, in the last 10 to 15 years, have been provincialism, competition from Southern California, and late financing for expansion of antiquated facilities. Along with this decline has come a shift in the center of commercial egg production, leaving a landscape of relict poultry structures behind.

\textsuperscript{11}The main problem is that the manure remains wet (70-80\% moisture content) for a longer period of time than it did in the litter floor house. The best handling moisture content is 35\% (the manure being dried and then spread on crops and landscaped areas, such as parks). There is specially built machinery to remove the manure but the problems of smell and flies still have to be solved. Urban encroachment in rural areas is the main reason why the problems are receiving so much attention.