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HOUSING PROBLEMS AS MET WITH IN SEMI ARID CLIMATES SUCH AS CALIFORNIA.

It is somewhat difficult to talk about the climate of California because of the fact that it possesses so many climates. One would have to be exceptionally hard to suit to be unable to find a particular local climate fitted to one's tastes in this great State of such varied topography, with its long stretch of seacoast, its foothills and mountains, its valleys, great and small, and its desert stretches.

However, in the great valley regions which comprize the larger part of the State, and which are separated from the coast line by the Coast Range Mountains, the days of Summer become intensely hot, vegetation dries up unless irrigated, the sun pours down its blighting rays day after day, and stock of all kinds, as well as man, feel the heat intensely. Add to this the hot winds, like a blast from an oven, which come at frequent intervals during midsummer and blow for days at a stretch, and one can gather some idea of how intensely hot it gets, and the great need of shade and cool, well ventilated houses for our fowls.

In the winter, on the other hand, there are the rains. On account of the mildness of the climate, cheapness, small amount of thought devoted to poultry housing, it has been the custom for generations to house fowls in roosting coops or sheds; no provision being made for a dry scratching pen. During wet and rainy weather the fowls in such quarters have either to sit on the roosts all day, if they wish to keep dry, or else paddle around in the mud and rain. As a result of such housing and the gen-

eral methods it typifies, egg production slumps with every rain and the health and vigor of the fowls suffer.

Further, a good deal of the soil is a heavy clay or adobe. Such heavy soils become extremely sticky when wet, and if fowls paddle around over such soil in wet weather, their feet become gummed up with masses of it, their plumage is soiled, and they quickly take on a very dirty, bedraggled, unhappy appearance. "Balling up" of the toes is very common on heavy soils, especially with young stock. The birds run out on the wet, sticky ground, mud adheres to their toes; they go into the houses and it dries fast.

Abundant ventilation can and should be provided at all times of year because the climate is so mild that cold weather does not have to be considered, whereas the intensely hot days of Summer represent the California poultryman's most unfavorable season just as the cold Winter period is the worst season in other States. Where the temperature reaches the vicinity of 100 degrees F., a house that is closed on three sides, even though the front is entirely open becomes a veritable oven. Add to this the fact that a large number of our poultry farms are, under present conditions, supplied with very scant outdoor shade, and the fowls remain largely indoors out of the sun during the hot part of the day, one can realize how they can be made to suffer from the heat in poorly built houses. The hot summer sun dries up all the vegetation not artificially watered, the ground becomes hot and drv. and the fowls prefer to stay in and close to the houses where it is shady. They will not get out on the sunbaked ground, but live largely in the houses during hot weather. As a result, a

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good many fowls are lost every year from heat prostration. In fact such mortality represents quite a serious loss, and its prevention is a subject worthy of most careful consideration.

In order to obviate the hot box condition, provision must be made to throw open the rear of the house on hot days in addition to the open front, so that every breath of air may be caught and the air in the house kept moving as much as possible. There is invariably at least a little breeze blowing from one direction or another, and by having at least two sides of the house open during the day these breezes circulate through the house and keep it quite cool.

Trees in the runs and about the houses are of great value in adding cool shade. Deciduous trees of heavy foliage are best because they furnish dense shade and shed their leaves in Winter. Since evergreen trees do not shed their leaves they ought not to be located close to the houses as they will cut off the sun in Winter from getting into the houses. Fig trees are especially fine for shade in the runs. The use of two story houses also makes for coolness, for the upper story keeps the lower floor cooler than it would otherwise be, and by hanging windows on all sides of the lower floor the additional coolness of free ventilation on all sides is secured.

Dry quarters well protected from the heavy rains and winds of Winter are fully as essential as cool quarters in Summer. At the University Farm the rains drive with tremendous force from the southeast. Coming as they do in torrents with a heavy gale driving them, these rains whip across houses of the very low front, no curtain type, drenching the floor to the very rear, drive through casements and around muslin curtains, rip the curtains loose from their frames and make it necessary to use extra care and thought in designing and building.

In pursuing our investigations in house design, we utilized, first, a 16' x 24' brooder house originally built for a large brooder stove. We had observed that this house always remained dry in driving storms which saturated the floors of the common type of muslin curtained houses. With this house it was also possible to open both front and rear sides on hot summer days. We, therefore, went ahead and fitted it up as a laying house for 100 hens, and while we are still in the midst of our investigations we feel that a brief description of this house may be of interest for the good ideas it embodies. It has been used as a laying house for two years and has proven very satisfactory to date.

The house is 16 x 24 feet in size, with a gable roof, and sides 6 feet high from floor to plate. The sills are laid on a 1:3:6 concrete foundation four inches wide, eight inches in the ground and four inches above. The sills are bolted fast to foundation with

10" x 1/2 inch carriage bolts which had been set in the concrete, heads down, when the foundation was laid. The sides are enclosed with one inch tongued and grooved material.

The windows are located 1 foot above the floor on two sides of the house. They were placed low that the fowls could use the windows when open as exits, doing away with special chick doors. The low hung windows in the south wall open into one big yard, and the ones in the north wall may open into another big yard. All of the windows are fitted frames to keep the fowls from flying through them. There are three windows in the south wall and three on the north side. Nearly all of these windows are kept open all of the time during the day, the rule governing this matter being that any window should only be closed when rain is entering, or a cold draft can be felt when standing in front of it. If the windows are handled according to the above rule, and all windows, but those on the side away from the wind, are closed at night, there will be no trouble whatever in keeping the house both comfortable for the fowls and always well ventilated.

The roosting platform, instead of being built against the north wall of the house, is located down the middle and thirty inches off the floor. This droppings board is portable and on legs, and only reaches to within three feet of each end wall so that the poultryman can walk all around it. Another point in favor of this location for a roosting platform is that both sides are clear so that nests can be put underneath. There is a row of trapnests under each side of the platform, but if desired, two rows of ordinary nests could be used instead. Facing them inward, with an aisle down the center between these two rows, the hens could enter from each end and the nests would be dark and secluded.

The many windows placed on both sides of this house gives entrance to cooling breezes from all sides during the hot summer days, and even in winter some of the windows can always be left open. As a result we have an open front house without the muslin curtains. Again the light coming from all sides prevents the hens scratching all the litter away from the light toward the rear of the house, as they do in houses where all the light enters in front. A hen always faces the light in scratching, and since the light comes from all sides, the litter is always kept evenly distributed over the floor.

Summing the question up very briefly, the type of house best suited to California conditions, is one that can be made airy and cool during the hot days of summer, will keep out the strong winds and heavy rains of winter, will provide dry, comfortable well protected scratching space where fowls

may scratch and exercise in stormy weather, is comfortable for the fowls, is simple in construction and low in cost.

J. C. DOUGHERTY.

THE MANAGEMENT OF A COLLEGE POULTRY PLANT.

The purposes of a college plant are, First, a laboratory for students; Second, a model or adaptable model for farmers and poultrymen; Third, a laboratory for research work; and, Fourth, to refresh the memory and create new experiences for the teacher. In order for the plant to serve these purposes and be free from public criticism, it must be kept in show shape at all times. The cost, therefore, will be nearly twice that of keeping a commercial plant in good condition.

It is to the interest of the department that the plant be under close supervision of not only a competent man but one intensely interested in its success. Naturally, the man most interested is its Head, and he is the man whom the President and Trustees hold responsible for its success. He must, therefore, give detailed supervision to his plant or shift the responsibility to someone else. If he must shift this responsibility, upon whom should it fall, and how he can keep in close touch with the work, to be the guiding or directing force, is the real problem before us.

My ideal organization for a poultry department is that

1. There shall be a Head.
2. A College Assistant.
3. An Extension Assistant.
4. A Research Biologist.
5. A Pathologist.

A department that does not include all these is, in my judgment, incomplete.

What seems to me to be an ideal plan for the management of the plant is to have a good reliable, practical man called "a working foreman" to carry out instructions and see that the work is properly done, and make the College assistant superintendent or manager. This will keep him—the assistant—in close touch with the plant, which is his laboratory, and, therefore, make him a better teacher. I can assure you this point cannot be emphasized too much.

If biological work is being carried on, it should be under the direct supervision of the biologist, either through the Superintendent or under a separate foreman if the operations are large enough to warrant it. The same thing is true of pathological work. The exact plan and arrangement of some of these details will depend largely upon the type of men concerned and the amount of human nature they have.

The next question, how can the Head of the Department keep in touch with the details of the plant, is the vital one. There

are three methods by which this can be done:

1. By personal visits to the plant daily.
2. By frequent conferences with the plant superintendent.
3. By detailed reports.

But I believe the best results will follow when all three methods are brought into use. Nocturnal visits accompanied by a lantern, the foreman and superintendent will accomplish wonders, but the number of these must be determined by one's time and endurance. During my first year and a half at Amherst I not only visited the plant daily, but spent considerable time there and used the telephone nights. Gradually these visits have been cut down. Conferences were tried, but finally cut out on account of the lack of time, and recently I have been obliged to rely, to a considerable extent, upon reports. I have a number of blanks with me, and I will pass them around for your inspection. They cover the subjects of incubation, brooding, egg production, disease, and we hope to have one soon on growing.

These reports are valuable for two reasons:

1. They contain desired information.
2. They keep the men alert.

The fact that they have to hand in these reports makes them anxious that they be good ones. Most men caring for poultry like to avoid definiteness. If we demand it of them, we can place our hands on the causes and results of many things that we are obliged now to put in the guess column.

J. C. GRAHAM.

Editor's Note.—On account of lack of space it is impossible to publish the record forms referred to. Any one especially interested in securing these can get copies by addressing Prof. J. C. Graham, Amherst, Mass.

EARLY RESULTS OF A CO-OPERATIVE ORGANIZATION OF POULTRY AND EGG PRODUCERS IN NEW YORK STATE.

The Poultry Producers' Association of Ithaca, N. Y., is an organization of the farmers for the purpose of increasing their profits from the production of their poultry products. The operations of this Association were started about March 15, 1913, although the plan has been under careful discussion for a considerable time.

The average farmer in New York State has only 35 to 50 hens, and this number is inadequate to pay him to take much trouble in selling his eggs when no more is paid in the local markets for good eggs than is paid for poor ones.

The question was, how could we get several farmers, a whole community, if you please, to combine so that enough eggs could be supplied during the period of