

POULTRY TRIBUNE SERIES

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*Editor of Poultry Tribune*

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BREEDING AND CULLING  
BY HEAD POINTS

To Prof. G. E. Rice  
With best wishes  
H. H. Steep.

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POULTRY TRIBUNE SERIES

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# Breeding *and* Culling *by* Head Points

*By*

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# Breeding and Culling by Head Points

## PREFACE

PRESENT day poultry production is built upon a number of sound economic practices. Feeding, housing, breeding, sanitation, brooding, incubation and culling are all closely woven together to form the cloth of a vast poultry industry. Each of these may be compared as links in the present poultry production chain. If they are so considered, and if a chain is no stronger than its weakest link, which of these is then the weakest link?

Recent developments have added the knowledge of vitamins to the poultry feeding schedule and have given the poultryman plans for more comfortable hen houses. Knowledge of disease control is increasing daily and the commercial hatcheries are turning out better chicks each day. Brooding troubles are being met and conquered and the few breeding farms are slowly increasing the output of their high laying stock. Yet with all this advancement in the other branches of the poultry industry, the average poultryman of today is still forced to practice the same culling methods that were in vogue years ago. From this it might appear that culling is the weakest link in the present poultry production chain.

As poultrymen invest more capital in better houses, equipment, and feed, it is very essential that more efficient birds be kept in order that their investments be profitable. Poultrymen can improve the efficiency of their birds only by culling, and culling can be done either by the use of trapnests or by physical character selection. Neither of these systems is as efficient today as it might be; so it is the purpose of the following discourse to help each system to a higher degree of efficiency by pointing out certain head type characters that will add more or less to each of them. Head characters should be considered as an addition to present day culling knowledge and not as an absolute substitute.

The old saying that there is nothing new under the sun, will

probably hold good in this case. As the writer gradually worked out the observations reported herein, he would pass them on to all interested parties with whom he came in contact. The reactions were many and interesting.

Frequently he was left with the impression that he had called into prominence but some hazy, preconceived, similar idea of head types. In other cases it appeared as though his classification of head characters was entirely new. In one instance he found a Canadian breeder that could accurately describe practically the same head type characters for which he looked.

Those who read and study the head characters listed herein may experience any of these impressions, but if they are like the others to whom this system has been explained, they will find much that is helpful both in trapnesting and culling.

—H. H. S. (May 1928)

## CHAPTER I

### NEED FOR MORE CULLING INFORMATION

FOR YEARS poultrymen have been searching for those definite physical characters that will enable them accurately to tell the good laying hen from the poor laying hen. In order to make a profit it is necessary to locate and discard all unprofitable birds.

Of course, there are always the trapnests which do a mighty close piece of separation, but even this method needs to be supplemented by physical examinations. Trapnesting is further laborious and above the reach of the vast number of average poultry raisers. If these average poultrymen are to practice the selection and culling that is so essential to profitable poultry management, they needs must resort to a physical examination.

#### TOO MUCH WASTED EFFORT

Ever since culling practice was stimulated by the expounding of the Hogan and Potter systems, there has been a steady advancement in the number of physical characters whereby the good hen can be told from the poor layer. *With all this increase in knowledge, there still remains one very pertinent criticism of present day culling methods. The slacker hen still has to be boarded before she can be recognized, and the impotent male bird has to be mated and his daughters become mature and have poor egg records before he is condemned.*

It is for the benefit of this large army of poultrymen—the hundreds of thousands of Poultry Tribune readers—that I have been induced to set forth this method of reading head type as a means toward telling good hens from poor hens.

#### ADVANTAGES CLAIMED FOR NEW SYSTEM

The advantages claimed are:

1. Pick certain percentage of boarder pullets before they lay.
2. Tell in advance what birds are worth trapping.
3. Cull at any time of year—even after birds have finished year's lay.
4. Facilitate the selection of prepotent males.
5. Pick breeding cockerels when half mature.

CHAPTER II  
WHAT ONE BREEDER THINKS OF HEAD TYPE

SUNNY SLOPE POULTRY FARM  
*Single Comb White Leghorns*  
RALPH E. UPHAM

April 12th, 1928.

Mr. H. H. Steup,  
Manhattan, Kansas.

Dear Sir:

In reply to your question on what I think of head points will say, I firmly believe that head points in conjunction with other body points will eventually take the guess out of culling for egg production.

Head points were first strongly impressed upon me by a talk I heard you give three years ago. Since that time, I have been studying it carefully in all my culling and trapnesting. As Superintendent of the Geary County Poultry Breeders Trapnest, I have had an opportunity to study head type in a number of different breeds under trapnest. In the two years I have run the contest I have found that head points show almost without exception what may be expected in production. In my own flock of 2000 White Leghorns, I find that head points compare very well with trapnest records.

In my culling work, in which I handled 75,000 birds this year, I found head points to be prominent in the high production birds of all breeds. In my progeny testing, I find that head points are a very good criterion as to what may be expected from the daughters of a male bird. In the spring of 1926 I mated a male showing exceptionally strong head characters and from this mating I obtained five daughters which passed 300 eggs under trapnests and Kansas weather conditions.

Not only do I find head type carrying true in mature birds, but

I can detect it in the young chick. In transferring the seal bands from the leg to the wing of the week old chicks, I have noticed particularly a number of outstanding heads and in checking the pedigree of these chicks, I found without exception they were from parentage of 300 eggs or better.

From my observation, I believe that culling by head points will become one of the greatest assets the poultry industry has developed for some time. I am convinced that we can cull far more accurately by the use of the head points than by any method in use at the present time.

Very truly yours,

RALPH UPHAM.

### CHAPTER III

#### HEAD CHARACTERS IN THEIR RELATION TO TRAPNESTING AND CULLING

THERE ARE two systems of improving the laying ability of the modern hen. One employs the use of the trapnest and the other uses certain physical characters.

The more accurate of these is the trapnest system, but even this method has room for improvement. There are occasional mechanical mistakes made in trapnesting and there will always be hens that lay on the floor. Both of these tend to keep trapnest records slightly under 100 per cent of accuracy, but it is not these few minor discrepancies that seem to be holding this trapnest method back. The main problems are to lessen the present high cost and to obtain an accurate means of predetermining the value of male birds.

#### MORE TO BREEDING THAN PEDIGREE

Present day breeders use males from high producing hens having good pedigree backing, but only a certain per cent of these prove out. To tell the good breeding male from the poor is at present a task requiring both patience and expense, for the male must be mated and his daughters must mature and be put under trapnest before any decision can be reached. When the results are known, it is not uncommon to find that some of the proven sires have "gone by" and are incapable of producing offspring. Besides this, there is the expense of testing many males which requires much equipment and labor for the small number that prove themselves.

The same is true for hens. The reports of egg laying contests usually stress the few exceptional birds, but along with these are also the poor hens that were not worthy of the time and trouble placed upon them. What is thus true at contests in a small way is true on an enormous scale when all trapnested hens are considered.

## CHECK INDIVIDUAL WITH PEDIGREE

This inefficiency exists primarily because the poultryman has never had any reliable means of telling performance in advance, and has had to resort to this trial and error method. There is not reason why a large percentage of the poor individuals should not be eliminated before testing. After one becomes familiar with certain head characters, it may be possible to tell by physical examination the great majority of both males and females worthy of testing.

Since the trapnest is not practical for the large number of average poultrymen, head type characters will probably be of most value to the poultry industry when included in the physical character type of culling. Present day culling methods include observations on pigment bleaching, quality or freedom from fat, molting, body conformation, temperament and a little on head characters. As these are used today, they apply in the main to past production. Thus the poor hen has to be boarded and given a chance before present culling practice weeds her from the flock. This unproductive test period consumes some of the profits of the good hen, and the efficiency of the flock is lowered. How much better it would be to recognize the poor individuals and discard them before they accumulate a board bill!

The same is true for male birds. The writer once visited a large poultry farm that specialized on commercial egg production, and was keeping White Leghorns. The owner had not been using trapnests, but always had followed a rigid culling program with large body capacity, broad backs and vigor as its main essential. Six-pound Leghorn pullets were not uncommon in the flock, and every bird showed wonderful body type. The owner attributed his good average flock production to his constant selection for vigor and size, especially on male birds.

Then he put in trapnests. When the writer visited him he was much perplexed because his largest, best body-typed, and supposedly best pullets were being badly out-laid by the smaller birds he did not value so highly. This sudden revelation had so shaken

his faith in body type and size that he was in a quandry as to which cockerels to select for the coming breeding season.

#### HEAD TYPE THE DISTINGUISHING FACTOR

The cockerels he was to choose from had been obtained from the best matings of a well known west-coast breeder. Each one had an imposing pedigree behind him, yet not all would be prepotent breeders. How was he to select the good from the poor, after proving to himself that body type and vigor in themselves were not a sufficient guide? What other points are left by which to judge a male bird? There seems to be but one answer—head type. It seems only logical to conclude that if good hens conform to a certain definite head type that the good male also should express this same type of head.

#### CULL BY CAUSE RATHER THAN EFFECT

If one should analyze the group of physical characters now used in culling practice, he would find that they apply to the result and not the cause. Hens do not lay because they bleach. The pigment fades because of the laying. Hens do not quit laying because they are fat. They become fat because of non-production.

There is a lot of evidence that body type may be influenced by production rather than being its cause. The spread of the pubic bones depends upon laying or non-laying as well as does the depth from pubic bones to keel. The lateral processes swell outward with laying and point inward in periods of non-production.

Even some of the early head type characters first included in culling programs are not constant. Temperament, which was so closely linked with Foreman's first classification of head types, is especially fluctuating. This fluctuation was recently very well demonstrated by Lady Mary, the Barred Rock hen with such a wonderful egg record. When she was displayed at the Third World's Poultry Congress at Ottawa she was just recuperating from the injurious effects of an egg being broken in the oviduct. Gone was the snap and fire from her eye and her usual active and alert expression had dimmed.

If temperament alone were considered it would have been im-

possible to recognize her as the same Lady Mary that appeared at the Chicago Coliseum show immediately following her record year.

What was true of Lady Mary in this exceptional case is true of most hens after they have finished a year of heavy production and are resting for the start of another. Therefore the present culling system is not only weak in that it locks the door after the feed has been eaten, but also in that it is incapable of efficient use at all times.

#### HANDLING TEST OFTEN DECEPTIVE

The writer has been closely associated with poultry judging contests for some years, and here, more than any other place, the inefficiency of modern culling methods was impressed upon him.

Whenever a class of birds is selected for these contests it must be hand picked. If four birds, all starting to lay the same month, were chosen from the egg record book alone so as to have at least 20 eggs difference between each one, there would probably be what is known as a "ringer" amongst them. This "ringer" would not handle as she had laid. In other words it is quite common to find hens that do not conform to present culling practices.

This was well illustrated in the 1926 Mid-west Intercollegiate Judging Contest which was held at the Coliseum poultry show. The Kansas Experiment Station was asked to furnish a class of White Leghorns. These birds were conscientiously selected according to the rules of the contest. After selection they were placed by a few non-interested men who decided that the class was all right to send. The top bird had laid 240 eggs, but was out of production at this time, the first of December. It happened that the student judges did very poorly on these birds, 12 out of the 30 contestants placing this 240-egg hen at the bottom of the class.

Much criticism was heaped upon the man that selected the class, but it was not his fault. The hen had proved herself. If the contestants were unable to recognize such an individual it was the fault of present day culling methods and not of the bird. The three boys on the Kansas team all placed this hen at the top. This

was not because they were familiar with this individual or had any unfair information. They had been coached on the head characters contained herein and it was this that enabled them to place correctly a bird that was considered by many to be a "ringer."

#### NO DEFINITE CORRELATIONS

Realizing that both trapnesting and culling practices could be benefited by additional knowledge of physical characters, the writer started a search some years ago to locate this additional information. He knew that the logical way to attack the problem was at the cause and not backwards from effect. Head types soon interested him, as other workers were beginning to believe the head region to be the cause of production. Correlation studies were made upon various recognized head characters only to prove that no apparent relation existed. These failures to obtain significant correlations on these then accepted head characters soon convinced the writer that such things as temperament, brightness of eye, quality of head appendages, etc., were helpful in certain individual cases, but were too fluctuating with the seasons of year and period of egg production to be a year around criterion.

#### STUDY UNCHANGING CHARACTERS

When almost ready to call the task a hopeless one the first clue came. After spending nearly an hour in a house of Leghorn hens where the low record was 225 eggs, the writer went immediately to a house of Rhode Island Red pullets where the best individual had laid not much over 150 eggs. The first difference in a permanent head character was thus stumbled upon—namely position of eye. Since then more permanent characters have been observed and studied until the characters listed herein have finally been evolved.

The main thing to remember is that these characters deal with the skull conformation which is the same irrespective of season or period of production. If predictions of breeding and laying ability are to be worked out, they will come from such unchanging characters that act as a cause, rather than from the characters that are changed periodically and are affected by production itself.

## CHAPTER IV

### HISTORY OF HEAD TYPE CHARACTERS

A COMPLETE STUDY of any subject must necessarily include its history or evolution. This chapter is included here because it is well for students of head characters to become familiar with the many phases through which these characters have evolved. Each step listed herein has advanced the knowledge of culling and is worthy of consideration. Some are more important than others, but they all belong together as a background for present day head classifications.

#### HEAD TYPE FIRST STUDIED IN 1922

In checking over past culling practices it appears that the year 1922 was the beginning of attention to head type. Previous to this date, with the exception of the little accepted Hogan theory of male head prepotency, one can find only the descriptions of combs and wattles as they varied in production from non-producing periods.

Almost every one is familiar with the bright, red, full comb and wattles of the hen that is laying, and the liquid, pale, shriveled condition of these same appendages when the bird is out of production. These signs are valuable to the poultryman, and have probably caused many a non-layer to be killed for eating whereas without their notice a laying hen might have ended in the pot. In fact, most poultrymen have associated red combs and wattles with egg production for so long that this knowledge often works against them when they first start to study head types.

The writer has seen many students of head type go sadly awry because they were blinded to more important points by a red comb. Comb and wattles should be used only in determining present production—that is, whether or not the bird is laying at the time of handling. To use them for more than this purpose is to court much trouble in reading head characters.



FIGURE 1—Head of Barred Rock hen 3301 that appeared in Kansas Circular 93, published in May, 1922, which was used to illustrate the head type of a good producer. This hen laid 187 eggs during the season of 1920 and 1921. Even though this photograph was taken before present-day head characters were worked out, it is well to note how these characters were in operation at this time. This head shows a fairly flat top line from side to side and fairly good balance. The carry forward of skull width is only medium and there is a slight tendency toward sloping from front to rear. Present head characters would classify this bird as a medium producer. - (Courtesy of Kansas Experiment Station.)

#### PAYNE UNKNOWINGLY ILLUSTRATES FUNDAMENTALS

In 1922 there appeared in print additional information on head characters. Loyal F. Payne, in Kansas Circular 93, published in May of this year, gives the description of the head of a high producer and of a low producing hen as follows: "The head of a high producer has prominent, bright, full eyes, a large comb, a lean, clean-cut face, well developed wattles and ear lobes, and a short, well curved beak." (See Figure 1.) "The head of a low producer has dull, sunken eyes, a small comb, a prominent eye-ring, a full face and a beefy head." (See Figure 2.) He further described the head of a broody hen as "showing prominent eyebrows, wrinkled face, and masculine features," as illustrated in Figure 3.

#### FOREMAN BECOMES MORE SPECIFIC

These descriptions were the typical conception of head characters for that period until E. C. Foreman, then Head of the Poultry Department at the Michigan Agricultural College, published, in the same year, his classification of head types. Although some of his descriptions were meager and hard to understand, yet to him undoubtedly belongs the credit for first emphasizing head type.

## SIX CLASSES

Foreman divided head types into six classes. The first of these, *crowhead*, was more or less known at the time of his first publication. He associated, however, the long skull, shallow face and sunken eye of the crow head with slow maturity and slow feathering. He further intimated that crowheaded individuals might possess enough laying temperament to lay as many as 140 eggs a year. To make his classification more complete he said that laying temperament combines such factors as "character, refinement, intelligence and enterprise supported by a powerful digestive apparatus."

His second type was known as "*overly refined*." Such a head lacked the determined expression and more substantial conformation that is found on the refined group. The head was supposed to be trim, bright and intelligent, but to lack stamina, and ruggedness. Nowhere, however, did he clearly define what one might look for in the way of this rugged stamina.

His third group included the extremely good hens, and it was known as the "*refined*" type. The eye was alert and intelligent. The skull was moderately narrow, but entirely free from heaviness directly over the eye. The jaw was narrow and the skin showed

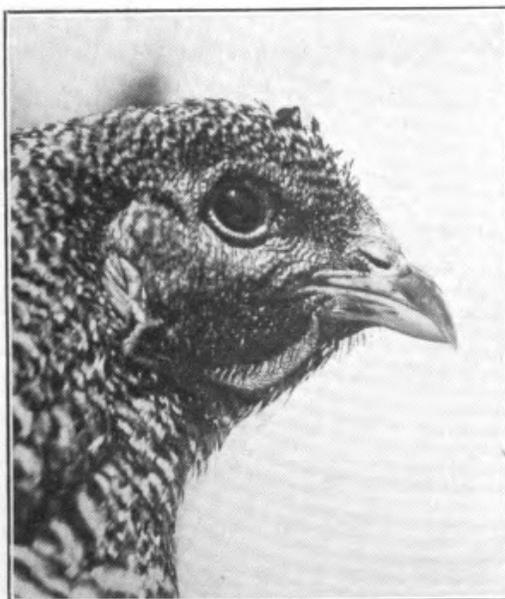


FIGURE 2—Head of Barred Rock hen 3425 that also appeared in Kansas Circular 93. This hen laid 97 eggs during the season of 1920 and 1921 and was used to illustrate the head type of a poor producer. Again present head characters were in operation. This individual shows a decided sideways roll of the top skull line and extremely poor balance. The carry forward of skull width is extremely poor, as shown by the eye being set far back in the head and there is a decided slope of skull line from front to rear. Present head characters would classify this bird as a poor producer. (Courtesy of the Kansas Experiment Station.)

FIGURE 3—Head of Rhode Island Red hen 4154 that appeared in Kansas Circular 93 to illustrate the head type of a broody hen. This bird laid 151 eggs during the season of 1920 and 1921. Analyzed for present-day head characters, this individual shows a fairly flat side to side skull top but decided weakness in the carry-forward of skull width. The balance of head is fair, but there is a little evidence of sloping from front to rear. This lack of carry-forward of the skull width would indicate a bird taking rest periods either as winter pause, broody spells or molting period at the close of the laying year. In this case, it was broody spells. Present head characters would classify this hen as a medium producer. (Courtesy of the Kansas Experiment Station.)



no tendencies toward fat. The neck was included with this head type and was supposed to fit on neatly, without any tendency toward heaviness.

His fourth type was the “*beefy head*” with heavy prominent skull, protruding eyebrows, sunken eyes, thick jaws and a heavy neck attachment. It further included a wrinkled face and a sluggish temperament.

His fifth type included the masculine heads so common when certain injury results to the ovary. Large comb and wattles, spur development, masculine voice, and general male characters predominated his descriptions. He called this type the “*incomplete hermaphrodite*.”

His sixth type was known as “*lacking in character*.” This head was coarse and expressionless and usually abnormal in shape. A dull, listless temperament was usually associated with it.

#### FOREMAN FAILS TO PUBLISH MORE

Thus Foreman first listed head types. No doubt such a classification can be made by those who understand all the descriptive terms, and during those certain periods of the year when temperament indications are favorable. Had Mr. Foreman carried his

work on farther he would have no doubt given the world a more satisfactory description. He resigned from college work, however, shortly after his first publication on head characters. If he has published further, since his resignation, the writer is not familiar with it.

RICE BEGINS TO WRITE ABOUT IT

When Mr. Foreman discontinued his work on head types it was carried on by Professor J. E. Rice, Professor and Head of the Department of Poultry Husbandry at Cornell University and his staff colleagues.

In 1925 Professor Rice describes the good head type as follows: "The head should be well proportioned and distinctly feminine, and the eyes well set and prominent. The feathers of the head should lie close, rather than stand outward or upward.

The head should be wider at the top of the skull than at the bottom, but not so wide as to overhang the eyes. When the head is viewed from the front or rear, the eyes should be seen standing out from the face. The head, from top to bottom, on a line drawn at right angles from this line to the beak should not show the head so long proportionately as to give the bird a crowheaded appearance. The face should be clean and free from feathers; the eyelids should be large and slightly oval. The eye should have a fearless, determined expression. As an indication of temperament, the eye is important." (Practical Poultry Management, page 13, Rice and Botsford, 1925 edition.)

CORNELL LISTS SEVEN TYPES

In 1927 head types were classified on Cornell stencil 5842 as follows:

1. Rugged Refined
2. Refined
3. Overly Refined
4. Crowhead
5. Unrefined
6. Phlegmatic
7. Masculine

They evidently found that one class for good producers was not sufficient and so distinguished between the extremely good as "rugged refined" and the good as "refined." The beefy type of Foreman was changed to a more descriptive type called "unrefined," the "lacking character" group was changed to "phlegmatic" and the "incomplete hermaphrodite" was designated as "masculine."

#### TWO SYSTEMS MUCH ALIKE

Since talking personally to Professor Rice, the writer is convinced that this Cornell system and the one described herein have much in common. These newer classifications and better descriptive terms have added enough to the Foreman system that the writer now can see many common points that were not visible at first and the absence of which forced him to make his own classifications.

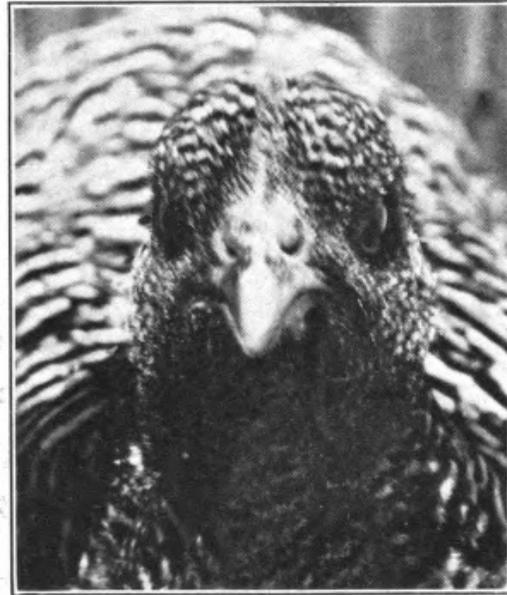
In addition to the above classes, the Cornell system uses the expressed mentality of the bird. This is divided into three sections, namely expression, disposition and intelligence. These are undoubtedly their method of determining temperament, the point so stressed in the Foreman system.

In further describing the head of a good individual the Cornell



FIGURE 4—Front view of the head of hen 3301 illustrated in Figure 1. In examining for head characters, it is well to view the head from such a forward position. Note how well the degree of side to side flatness can be told from this position. This individual has a slight slope from the top of the skull where the comb fastens on down to where the top of the eye begins. This position is also good for noticing the carry forward of the skull width. Note how the width of this hen's skull stops immediately in front of the eye. This is the usual stopping place for skull width except on the better laying hens that carry this down well toward the nostril. (Courtesy of the Kansas Experiment Station.)

FIGURE 5—Front view of the head of hen 3425 illustrated in Figure 2. Much can be learned by contrasting this head with the one in Figure 4. Note how much greater is the sidewise roll of this skull line than on hen 3301. Also note how the width of this skull stops directly in front of the eye. This head is wider throughout than the one in Figure 4. In the early stages of the development of head characters, the writer once thought that broad skull width was connected with heavy production. After taking measurements on many hens, he was unable to verify this wrong belief by correlation tables so finally noticed the relation between carry forward of skull width and high production. (Courtesy of the Kansas Experiment Station.)



system states as follows: "The head should be clean cut. It should be of medium length and depth, wide and flat, the width increasing uniformly from attachment of beak to a point directly behind the eye. The eyes should be large, bright, and prominent. A smooth and lean condition of the skin covering the face is desirable. The head should be neatly attached to the neck, avoiding all tendency toward throatiness. Common defects to be avoided are thick, prominent jaws, narrow skulls, heavily wrinkled or shallow faces, small or sunken eyes, over-hanging eyebrows, or combs with extremely narrow serrations."

#### RICE CALLS HEAD HEN'S DYNAMO

In the report of the proceedings of the Third World's Poultry Congress, Professor Rice is quoted as follows: "The first and most important single character in judging is the head. It is the bird's periscope—the light-house. It is the central power house. It is the dynamo that drives all the machinery of the body. It reflects the condition and value of all other sections of the body. It is the center of the nervous system. It is the bird's radio station. It is both a sending and a receiving set. We see it first because it shows most in hens as in humans."

## BASIC PRINCIPLE IS FUNDAMENTAL

Thus, in the space of a few short years, head type has risen from insignificance to the consideration as most important of all characters. The various descriptions listed in this short historical sketch are all important. Regardless of how many ways and by how many persons good head type is described, the heavy producing hen will always have the same head. Any differences in descriptions are due either to faulty observations, study of exceptional individuals instead of the large majority, or else just the same characters described differently from various viewpoints.

## CHAPTER V

### THE FOUR HEAD TYPE CHARACTERS

THE WRITER has classified head characters into four definite groups. This classification depends entirely upon form and shape and thus is constant. Form and shape can be altered and changed in the young chick by malnutrition and mismanagement, but once they are established in the bony framework of the skull, they are fixed forever. This permanency is not affected by seasonal factors, and seems to work as well on hens out of production as those in full lay.

When once these characters are recognized it is possible to distinguish these differences even in baby chick heads, which gives promise of enabling their application much earlier than present culling methods are now applied.

#### KEY CHART ILLUSTRATES DIFFERENCES

These four characters are diagrammatically illustrated in Figure 6. For study purposes it is suggested that this diagram be used in connection with the series of head photographs accompanying it.

#### NO. 1—FLATNESS OF TOP OF SKULL FROM SIDE TO SIDE

The first character is the flatness of the top of the skull from side to side. The good laying hen has a flat head which makes the eye set well up towards the comb. The top line of a good hen's head is like the flat roof found on many buildings, and immediately beneath this level top line is found the eye. In some cases, the flatness is carried out wide enough over the eyes so as to give the skull an overhanging effect. The writer has yet to find an individual that had a flat overhang but what was a good producer.

This side to side flatness can be told by noticing the distance from the top of the eye to the bottom of the comb. The shorter this distance the flatter the top of the skull and the better the in-

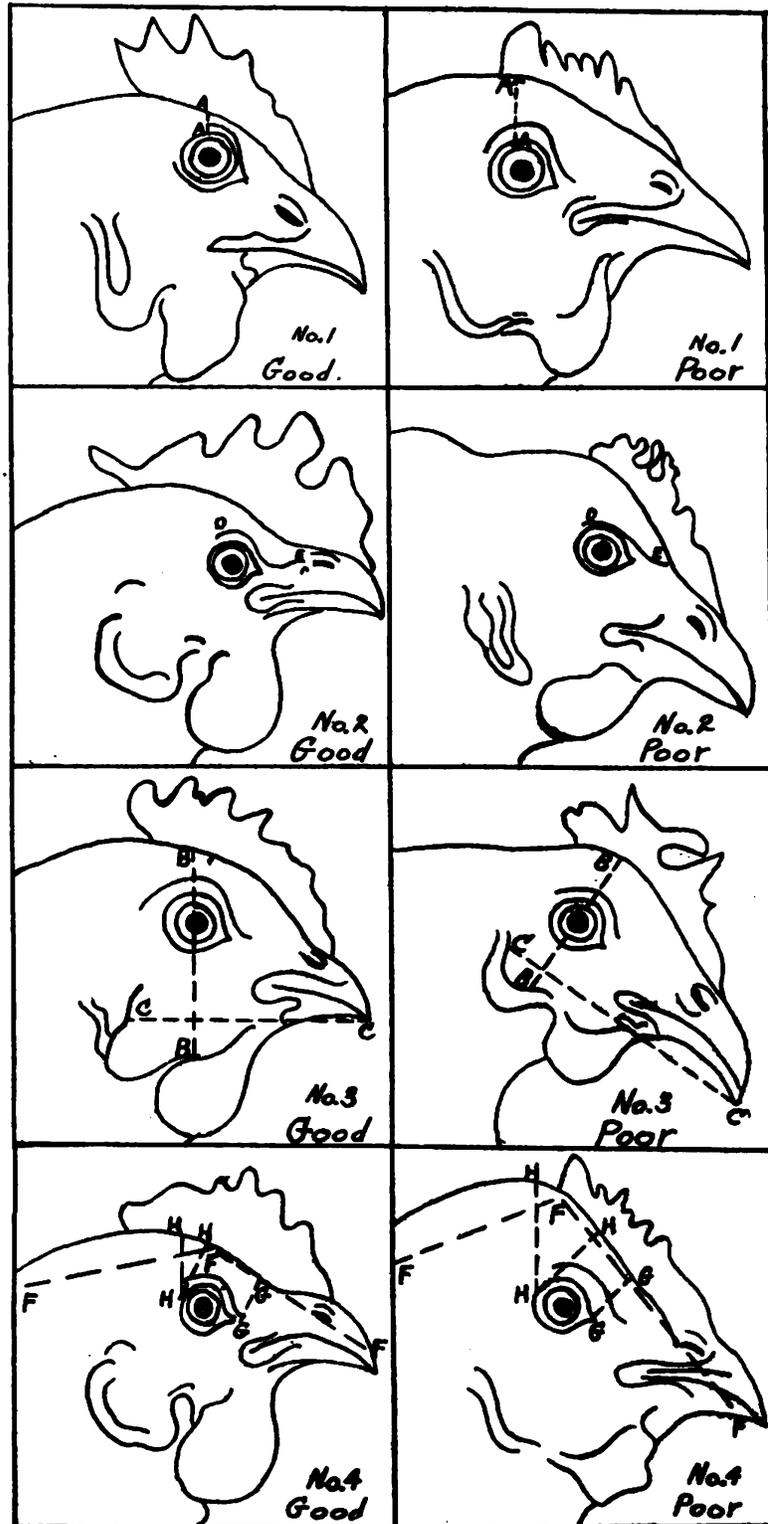


FIGURE 6—Key to Head Points

FIGURE 6.—  
Key chart to  
head characters.  
The four divi-  
sions are ex-  
plained as fol-  
lows:

1. *The first character is the flatness of the top of the skull.* This is best noticed by observing the length of the line AA. On good producers with flat heads the eye sets well up toward the base of the comb, making the distance AA very short. On poor producers, the top of the skull slopes or rounds downward side-wise to an eye set low in the head, giving the line AA much more length.

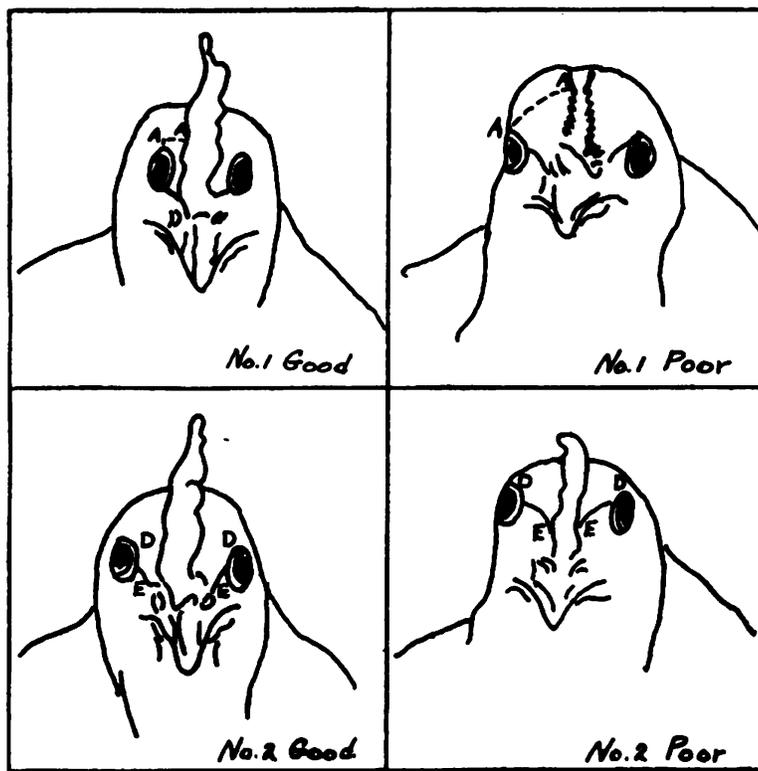


FIGURE 6A—Front View Points 1 and 2

2. *The second character is the carry forward of the skull width.* Good producers have the eye set well forward in the head under the front half of the comb, while poor producers have the eye sitting farther back under the rear half of the comb or else behind the comb entirely. This is illustrated by D on the key sketch. Most skull widths taper and narrow right in front of the eye. The extremely good hens carry this width farther forward than do the poor layers. The front point of skull width is illustrated on this sketch as point E.

3. *The third character is head balance.* On good hens the distance BB from bottom of comb to top of wattle is nearly equal in length to the line CC from front of earlobe to end of beak. On poor layers the line CC is usually much longer than the line BB, giving a narrow, snakey appearance to the head.

4. *The fourth character is the levelness of the top of the skull both in front of and behind the eye.* This is told by noticing the degree of slant to the lines FFF. Good hens have these lines approaching levelness whereas the poor producer has enough slope so as to produce a gable roof effect. On good hens, the center of the front of the eye is nearly the same distance from the bottom of the comb (line GG) as is the same point on the rear of the eye (line HH). On poor producers, the vertical line HH is much longer than the line GG.

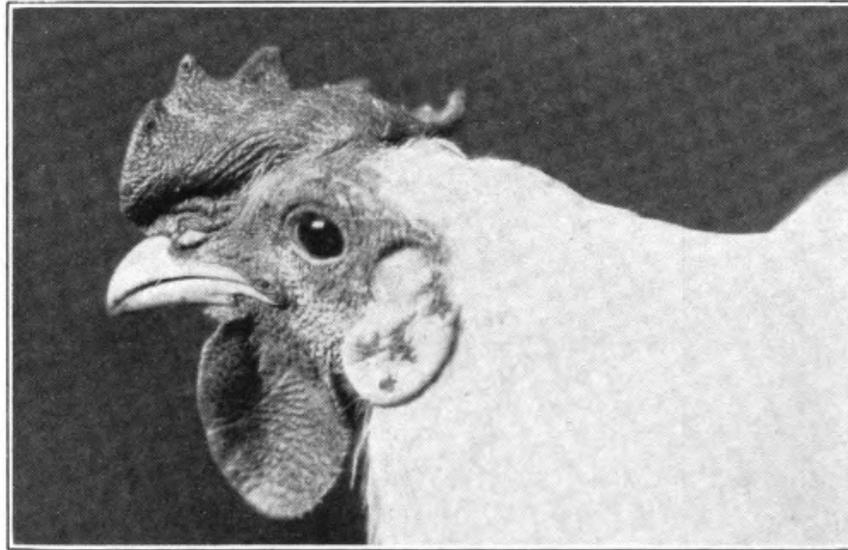


FIGURE 7—Head of S. C. White Leghorn hen 409A.

This bird laid 274 eggs during her first laying year of 1926 and 1927. In applying the head characters found illustrated in Figure 6 it will be noted that this hen has a very level top line from side to side. Her eye is set fairly well forward in the head and her skull width carries forward somewhat in front of the eye. The head balance is nearly perfect and there is no trace of any sloping from front to rear. The only way this head could be improved would be by a more pronounced carry forward of the skull width and perhaps by the eye being set a wee bit higher in the head.

Figure 8 gives the individual egg record of this bird. In studying this record it will be noted that this hen was a bit slow in starting but once under way laid at a good rate. Towards the end of her laying year, her rate slowed up somewhat but not badly. This is the type of laying record her head characters would indicate. The flat head would indicate good rate and the forward position of the eye and slight carry forward of skull width would indicate a fairly strong persistence without quite equalling that length of steady production found in 300-eggers. Hens with such strong heads lay well and keep up their body weight at all times. (Courtesy of Kansas Experiment Station.)



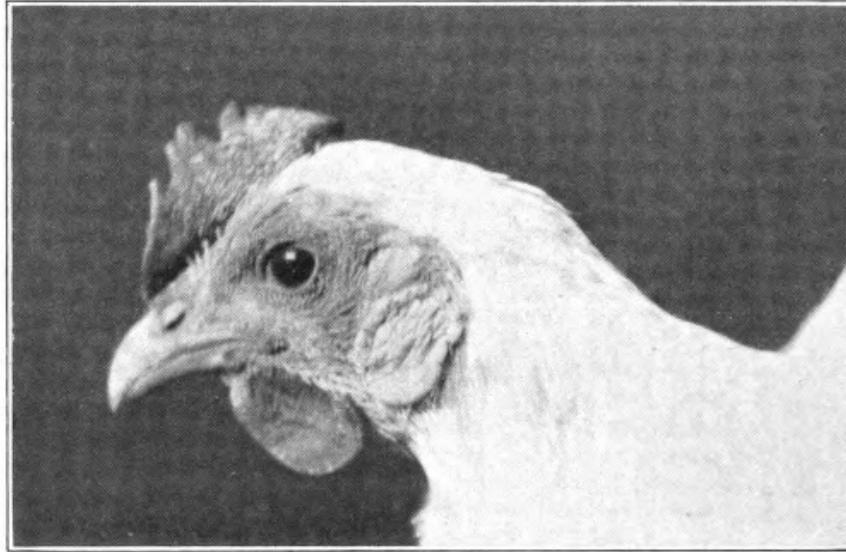


FIGURE 9.—Head of S. C. White Leghorn hen 38A.

This bird laid 207 eggs during her first laying year of 1926 and 1927. In studying this bird for head characters the most noticeable thing is an apparent lack of head balance. The lengthwise distance of the head is greater than its depth, giving it a crowheaded tendency. This head is a good example of why it is essential to consider all four characters and not to be prejudiced by any one. The flatness of skull is fairly good and the long narrow head is offset by a skull width carried well forward. There is a slight tendency for lengthwise slope but this fault is not great. This is further a good example of why the writer considers balance of head the least important of the four characters. This bird would have had a better egg record had not early hatching forced her into a late summer start of laying and fall molting.

Figure 10 gives the individual egg record of this hen. It will be noticed that her rate is not as good as hen 409A. With an eye setting lower down in the head this would be expected if this character is associated with rate of production. The forward width of the skull would indicate fairly good persistency but not as good as hen 409A. Her egg record shows that she quit laying about a month before her year was completed. The break in October, November and December is due largely to the environmental factor of early hatching, which brought on this fall molt. Some of it might have been expected as a winter pause but not for such long duration as the actual break was. Hens with this type of head lay fairly well but lose a little in body weight which brings about the rest period at the end of the laying year. (Courtesy of Kansas Experiment Station.)

INDIVIDUAL EGG RECORD

BREED *S. C. W. Leghorn* YEARS 19 *26* TO 19 *27*  
 HATCHING DATE *Mar 3* 19 *26* AGE *161 days* LEG BAND NO. *38A*  
 WING BAND NO. *75* MATING NO. *900M7511*

DATE	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	TOTALS		
	MONTH																															MONTH	TO DATE	
Aug										X	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	15	15	
Sep	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	22	37	
Oct	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	13	50	
Nov																																0	50	
Dec												/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	10	60	
Jan	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	20	80	
Feb	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	21	101	
Mar	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	1	24	125
Apr	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	26	151	
May	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	1	22	173
Jun	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	22	195	
Jul	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	12	207	
Aug											X																							

PREVIOUS RECORDS 1ST 2ND 3RD 4TH 5TH 6TH 7TH 8TH

MATED TO *999M* REMARKS YEAR'S RECORD *207*

KANSAS AGRICULTURAL EXPERIMENT STATION  
POULTRY DEPARTMENT

FIGURE 10.—Egg Record Sheet of Hen 38A.

will do a fairly accurate job of culling by itself and again there are individual hens that will not conform exactly to this character. *No definite correlation can be obtained on this character nor on the other three of this system. Therefore it is unwise to use any one by itself as the influence of the other three may greatly alter the general effect. However, of the four characters here considered this first one is probably the most important.*

The writer believes that side to side flatness is closely related to rate of production, but this never has been proved by correlation tables.

NO. 2—CARRY FORWARD OF SKULL WIDTH

The second character is the carry forward of the skull width. The width of the head itself is not as important as is the way the width is carried forward toward the nostril. The writer has taken many skull width measurements without finding any definite correlation existing, except a positive relation between size of bird

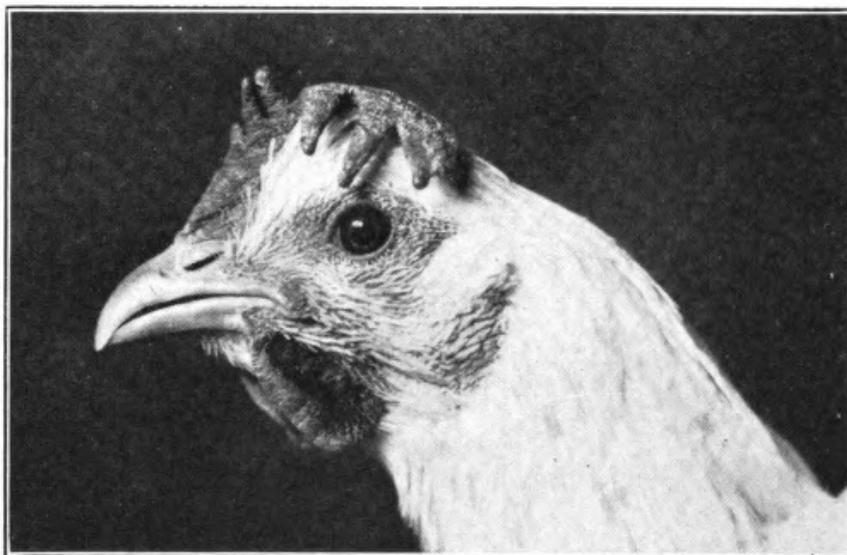


FIGURE 11.—Head of S. C. White Leghorn hen 381A.

This bird laid 187 eggs during her first laying year of 1926 and 1927. Unfortunately, this bird is one whose head feathers do not lie down closely to the head. This makes her photograph somewhat confusing. This head type is typical of many medium producing hens. The head is not flat and yet it is not extremely bad for this character. The skull width is carried forward only moderately and the head balance tends to be strong. The lengthwise skull line shows a little rounding or sloping both in front and behind the eye. This bird is just medium in all four of the head characters, with the possible exception of balance, which tends toward being strong.

Figure 12 gives the individual egg record of this hen. As would be expected from a medium plus head, she has been only a strong medium producer. Her rate of production is very good but she lacks persistency. It is such individuals as this hen that make it difficult to state positively that sidewise flatness and rate of production are correlated. If monthly egg records alone are considered, this hen is no exception as the average of her monthly rate is only medium. This low average, however, is due mainly to rest spells for she has a good cycle when laying.

In checking these egg records it might be well to notice the age at first egg. Hen 409A was seven months old before starting to lay, while this hen was only five months old. The writer has been unable to notice any positive connection between head characters and sexual maturity. (Courtesy of Kansas Experiment Station.)

BRED BY *S.C.W. Seghom* **INDIVIDUAL EGG RECORD**  YEARS 19 *26* TO 19 *27*  
 HATCHING DATE *May 12* 19 *26* *Age 156 days.* *4413* WING BAND NO. *381 A*  
 MATING NO. *901M6195*

DATE	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	TOTALS		
	MONTH																															TO DATE		
<i>Oct</i>													X	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	<i>13</i>	<i>13</i>
<i>Nov</i>	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	<i>24</i>	<i>37</i>
<i>Dec</i>	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	<i>8</i>	<i>45</i>
<i>Jan</i>																																	<i>0</i>	<i>45</i>
<i>Feb</i>																																	<i>4</i>	<i>49</i>
<i>Mar</i>	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	<i>27</i>	<i>76</i>
<i>Apr</i>	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	<i>17</i>	<i>93</i>
<i>May</i>	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	<i>21</i>	<i>114</i>
<i>Jun</i>	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	<i>19</i>	<i>133</i>
<i>Jul</i>	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	<i>16</i>	<i>149</i>
<i>Aug</i>	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	<i>13</i>	<i>162</i>
<i>Sep</i>	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	<i>23</i>	<i>185</i>
<i>Oct</i>	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	<i>2</i>	<i>187</i>

PREVIOUS RECORDS: 1ST 2ND 3RD 4TH 5TH 6TH 7TH 8TH  
 MATED TO \_\_\_\_\_  
 REMARKS *Adams*  
 YEAR'S RECORD *187*

FIGURE 12.—Egg Record Sheet of Hen 381A.

and skull width. However, there is a general tendency for a good hen to carry her skull width well up to the nostril, and for the poor hen to lose this width much farther back.

On most hens, the skull width is lost immediately in front of the eye. Therefore, this carry forward of skull width is usually associated with a forward position of the eye. Good layers have the eye sitting well towards the nostril under the front half of the comb. Poor layers have the eye more in the back of the head under the rear half of the comb and sometimes entirely behind it. On some good layers, the eye is not as far forward in the head as might be expected but then it will be observed that the skull width does not stop at the front of the eye but carries well forward beyond this usual stopping point. The strength of this character also can be observed by looking down on the head from in front of the hen. (See Figures 4 and 5.) The more width toward the beak, the better.

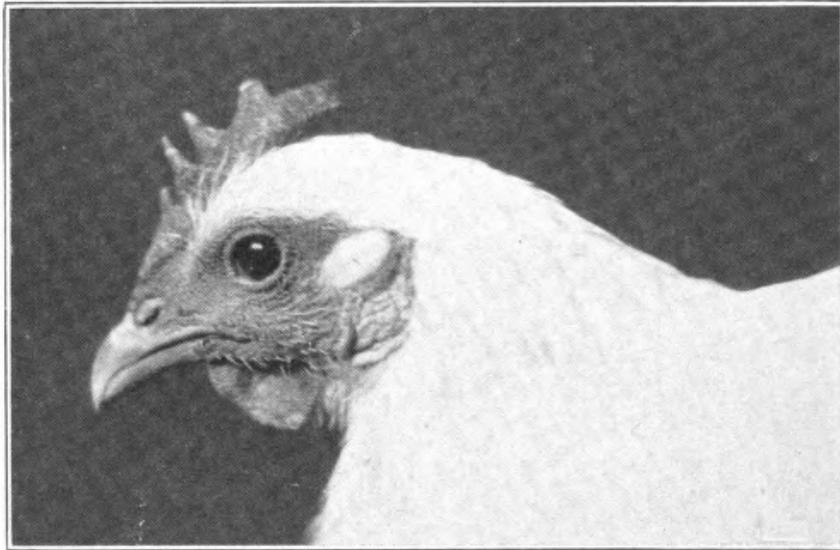


FIGURE 13.—Head of S. C. White Leghorn hen 579A.

This bird laid 128 eggs during her first laying year of 1926 and 1927. This head shows at once an extreme lack of carry forward of skull width. It is fairly good for sidewise flatness, has fair balance but shows marked tendency for lengthwise sloping both in front of and behind the eye. This head illustrates very well the type so often met up with in flocks that have been bred for refinement of head parts. The marked lack of skull width in the region of the nostril would indicate lack of persistence in laying. No matter how many eggs are bred into hens with such head type, they will not have the ability to lay them because of this weakness.

Figure 14 shows the individual egg record of this bird. Her rate is not quite as high as the upward position of her eye would indicate but her persistence is in direct line with expectations. This hen quit laying with four months of her first laying year still remaining.

The writer believes that the production of a flock of hens could be greatly improved by selecting males to mate with them that showed considerable strength in the head sections where the hens are weak. Such hens as these would need a male bird showing a much better carry forward of the skull width. (Courtesy of Kansas Experiment Station.)

INDIVIDUAL EGG RECORD  YEARS 19 26 TO 19 27

BREED S.C.W. Seghorn LEG BAND NO. 579A

HATCHING DATE May 12 1926 AGE 244 days 4352 WING BAND NO. 941M8081

MATING NO. 941M8081

DATE	TOTALS																																
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	MONTH	TO DATE
JAN									X	/	/																					6	6
Feb	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	18	24	
Mar	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	15	39	
Apr	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	18	57	
May	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	17	74	
Jun												/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	12	86	
Jul	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	20	106	
Aug	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	17	123	
Sep	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	5	128	
Oct																															0	128	
Nov																															0	128	
Dec																															0	128	
Jan											X	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	0	128	

PREVIOUS RECORDS: 1ST 5TH, 2ND 6TH, 3RD 7TH, 4TH 8TH

REMARKS: tinted shell

YEAR'S RECORD: 128

MATED TO: \_\_\_\_\_

FIGURE 14.—Egg Record Sheet of Hen 579A.

SEEMS RELATED TO PERSISTENCY

This forward carriage of skull width seems to be closely linked with persistence of production. Hens that are very strong in this character lay continuously. Those that are weak on forward width are not able to lay without rest periods. These rest periods appear as winter pauses, broody spells, or vacation periods of molting toward the end of the laying year.

This second character is as important as the first where one is dealing with production of over 200 eggs or more. The first character will be used more on average flocks where extremely good hens are the exception and carry forward of skull width is hard to find. Those who apply these head characters on extremely good birds will find much use for the second character. It is extremely pronounced on the 300-egg individuals, and is usually the deciding factor when dealing with birds from such high record breeding.

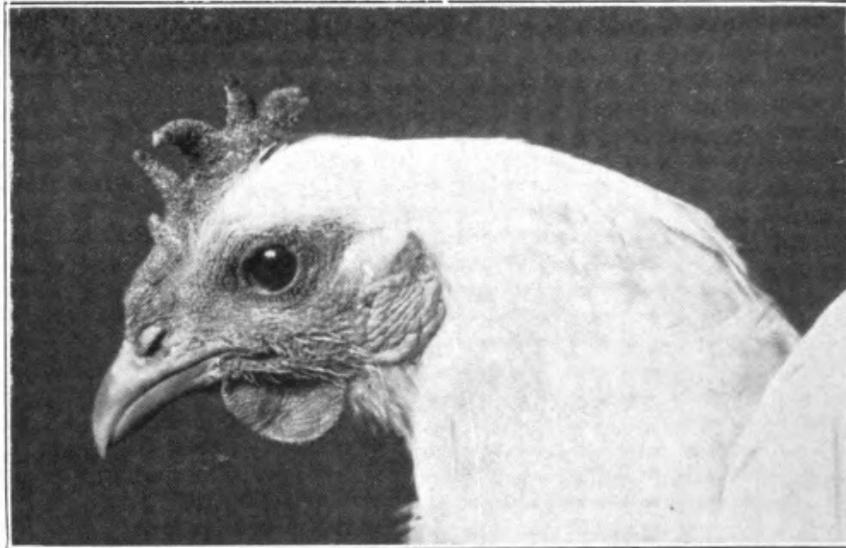


FIGURE 15.—Head of S. C. White Leghorn hen 577A.

This bird laid 94 eggs during her first laying year of 1926 and 1927. This head shows all four characters to be poor. The eye is low set from the comb and the head rounds greatly sidewise. The head balance is poor, giving a crowheaded appearance and there is a decided lack of skull width being carried forward. The lengthwise run of the skull rounds both in front of and behind the eye. On Leghorns it is hard to tell just how the poor record will result but such head types are always associated with low production. Usually this is brought about by a low rate and poor persistence. Head types such as this may be caused by sickness or mistreatment during the early chick period.

Figure 16 shows the individual egg record of this bird. Her rate was fairly good but she laid for only five months. This bird was nearly ten months old before laying her first egg, which might indicate that her poor vigor and crowhead was picked up through some set-back in the early brooding period.

Such individuals as this one can be readily recognized at an early age and need not be boarded before being culled from the flock. (Courtesy of Kansas Experiment Station.)

KANSAS AGRICULTURAL EXPERIMENT STATION  
POULTRY DEPARTMENT

BREED *S.C.W. Leghorn* INDIVIDUAL EGG RECORD  YEARS 19 *26* TO 19 *27*  
 HATCHING DATE *May 12* 19*26* *Age 295 days.* 4353 LEG BAND NO. *577A*  
 WING BAND NO. MATING NO. *941M 8081*

DATE	DAYS																															TOTALS		
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	MONTH	TO DATE	
<i>Mar.</i>	X						/	/		/		/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	<i>14</i>	<i>14</i>	
<i>Apr.</i>	/			/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	<i>20</i>	<i>34</i>	
<i>May</i>	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	<i>22</i>	<i>56</i>	
<i>Jun</i>	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	<i>21</i>	<i>77</i>	
<i>Jul</i>		/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	<i>17</i>	<i>94</i>	
<i>Aug</i>																																<i>0</i>	<i>94</i>	
<i>Sep</i>																																	<i>0</i>	<i>94</i>
<i>Oct</i>																																	<i>0</i>	<i>94</i>
<i>Nov</i>																																	<i>0</i>	<i>94</i>
<i>Dec</i>																																	<i>0</i>	<i>94</i>
<i>Jan</i>																																	<i>0</i>	<i>94</i>
<i>Feb</i>																																	<i>0</i>	<i>94</i>
<i>Mar</i>	X																															<i>0</i>	<i>94</i>	

PREVIOUS RECORDS 1ST 2ND 3RD 4TH 5TH 6TH 7TH 8TH REMARKS *Sold 1-4-28* YEAR'S RECORD *94*  
 MATED TO

FIGURE 16.—Egg Record Sheet of Hen 577A.

NO. 3—BALANCE OF THE HEAD

The third character is the balance of the head. This balance refers to the relation of the depth of the head to its length. Good layers usually have nearly as much distance from the bottom of the comb to the top of the wattle as they do from the front of the ear-lobe to the tip of the beak. Poor layers sometimes have a long, narrow head which means that the comb to wattle distance is considerably less than the ear-lobe to tip of beak distance. Long, narrow heads usually have a long beak attachment, whereas the good balanced head usually carries a short, strong beak.

This character is associated with physical weakness for it is nothing more than the crow-headed condition that poultrymen have avoided for years. Long, narrow heads can be easily obtained by certain malnutrition practices. All birds in the later stages of rickets show decided crow heads.



FIGURE 17.—Head of R. I. Red hen 853A.

This bird laid 281 eggs during her first laying year of 1926 and 1927. This head is similar to the one in Figure 7. They are so nearly alike that it would be impossible to choose between them from head character selection. Again, all four characters are present in a marked degree of strength. The only room for improvement on this head type would be a better carry forward of the skull width. This head would indicate good rate with some slow up toward the end of the laying year, the same as was found on hen 409A.

Figure 18 gives the individual egg record of this bird. Her rate and intensity follow expectations perfectly, which demonstrates that these head characters are universal. They will apply the same whether the birds under consideration be Leghorns, Rocks, Reds, or any other breed.

Since this same good head type follows good production so consistently, is it too much to expect good results from deliberately making matings to produce good head types? (Courtesy of Kansas Experiment Station.)

INDIVIDUAL EGG RECORD  YEARS 1926 TO 1927

BREED *S.C.R.P. Red* LEG BAND NO. *853A*

HATCHING DATE *Mar 3 1926* *Age 289 days* 13 WING BAND NO. \_\_\_\_\_

MATING NO. *959M5578*

DATE	TOTALS																																
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	MONTH	TO DATE
<i>Dec</i>																X	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	<i>11</i>	<i>11</i>
<i>Jan</i>	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	<i>24</i>	<i>35</i>
<i>Feb</i>	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	<i>25</i>	<i>60</i>
<i>Mar</i>	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	<i>27</i>	<i>87</i>
<i>Apr</i>	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	<i>24</i>	<i>111</i>
<i>May</i>	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	<i>26</i>	<i>137</i>
<i>Jun</i>	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	<i>24</i>	<i>161</i>
<i>Jul</i>	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	<i>21</i>	<i>182</i>
<i>Aug</i>	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	<i>24</i>	<i>206</i>
<i>Sep</i>	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	<i>24</i>	<i>230</i>
<i>Oct</i>	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	<i>23</i>	<i>253</i>
<i>Nov</i>	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	<i>19</i>	<i>272</i>
<i>Dec</i>	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	X															<i>9</i>	<i>281</i>
PREVIOUS RECORDS	1ST					2ND					3RD					4TH					REMARKS					YEAR RECORD	<i>281</i>						
MATED TO	5TH					6TH					TH					5TH																	

FIGURE 18.—Egg Record Sheet of Hen 853A.

EVEN PACKER RECOGNIZES IT

One poultry packer called the writer's attention to the "eagle-beaks" of the fattening station. It had been his observation for years that these "eagle-beaks" would never fatten properly and always ended in the second or third grade of dressed poultry. These are birds with extremely unbalanced heads. This evidence naturally points to the assumption that parasitic infestations and mismanagement are no doubt further contributors toward crow-headedness, especially if they affect the chick early enough so that this weakened vitality can be fashioned into the forming skull.

Important as this character is in head type classification, it is well always to use it with caution. There are many good laying hens whose head type is at first not so impressive because of an unbalanced condition. These heads are not long and narrow enough to be called crow-heads, but still lack quite a bit from the perfect balance herein described. Such individuals, however, are so ex-



FIGURE 19.—Head of R. I. Red hen 902A.

This hen laid 242 eggs during her first laying year of 1926 and 1927. This head is somewhat similar to the Leghorn head in Figure 9. Both show fairly good sidewise flatness of skull and about the same degree of carry forward of head width. This head shows a better balance, however, and the same slight tendency toward lengthwise slope. Of the two heads, this one is the better. Because of the fall molt of hen 38A a comparison of egg records will be unfavorable to the Leghorn hen, but the better balance of this R. I. Red hen's head would give her a slight edge over the Leghorn even had the latter not molted, due to an environmental factor. The lack of forward skull width in this hen would indicate some rest periods but this lack is not great enough to expect too long a vacation.

Figure 20 shows the individual egg record of this hen. As was to be expected, her rate was good but the looked for rest periods came as broody spells. This hen lost a month and a half in four broody periods. Had not she taken her rest this way, she would probably have had about the same length of time off at the end of her laying year. (Courtesy of Kansas Experiment Station.)

INDIVIDUAL EGG RECORD  YEARS 19 26 TO 19 27

BREED *S.C.R.S. Red* LEG BAND No. *902A*

HATCHING DATE *Mar 17 1926* Age *264 days* WING BAND No. \_\_\_\_\_

MATING No. *965M 8416*

DATE	TOTALS																															
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	Month
Dec				X	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	20	20
Jan	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	20	40	
Feb	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	22	62	
Mar	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	26	88	
Apr	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	20	108	
May	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	22	130	
Jun																														15	145	
Jul																														19	164	
Aug	Broody																													20	184	
Sep							Broody																							12	196	
Oct	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	23	219	
Nov	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	19	238	
Dec	/	/	/	X	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	4	242		

PREVIOUS RECORDS: 1ST 2ND 3RD 4TH 5TH 6TH 7TH 8TH

MATED TO *975M*

REMARKS

YEAR'S RECORD *242*

FIGURE 20.—Egg Record Sheet of Hen 902A.

tremely good for the other three head characters that it is not hard to recognize them for the good hens that they are. Of the four head characters, the balance of head, or character three, is probably the least important.

NO. 4—LEVELNESS OF TOP OF SKULL FROM FRONT TO REAR

The fourth character is the levelness of the top of the skull from front to rear. The good layer has a top head line that is nearly level from the nostril to the back of the comb attachment. The poor layer has a top head line that rounds or slopes both in front of and behind the eye. The extremely poor hen has this two-way slope to such a marked degree that her head takes on a gable roof effect.

This slope can be observed by actual visualization, or by noticing the distances between the bottom of the comb and both the front and rear of the eye. Good hens with heads nearly level in this respect have very little difference between these distances. The eye

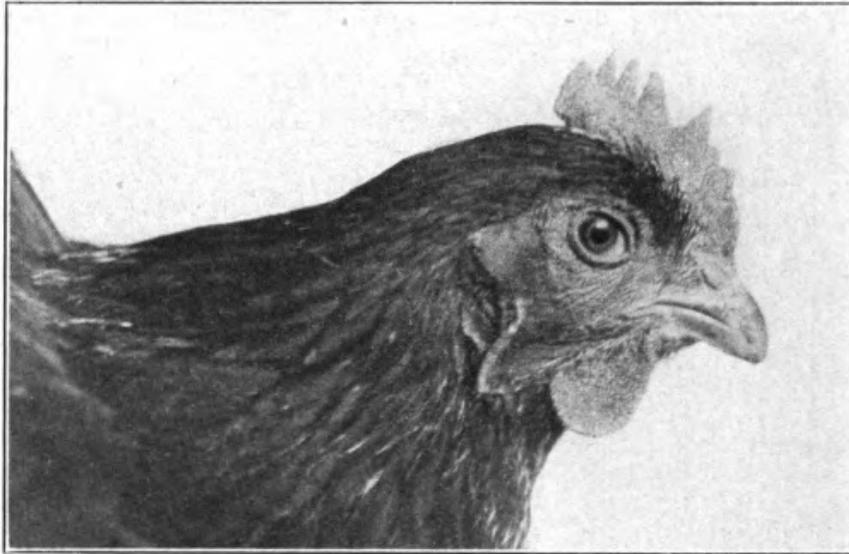


FIGURE 21—Head of R. I. Red hen 837A.

This bird laid 188 eggs during her first laying year of 1926 and 1927. Again head types parallel, for this bird has practically the same head characters as were found on Leghorn hen 381A. This bird is neither extremely good nor extremely poor for all four head characters. There is some sidewise slant, some lack of forward skull width and some sloping both in front of and behind the eye. The good balance is the best feature of this head. Being similar to hen 381A this bird's production should be nearly the same.

Figure 22 gives the individual egg record of this hen. As was the case of the similar head typed hen 381A, her rate of production is fairly good but her persistency is not so good. The Leghorn had better cycles of production but a few more rest periods. This hen laid along with fewer days of rest grouped together but squeezed vacation days in between low cycles. The end result was practically the same total of eggs as was produced by 381A. (Courtesy of Kansas Experiment Station.)

KANSAS AGRICULTURAL EXPERIMENT STATION  
POULTRY DEPARTMENT

BREED <i>S.C.R.G. Red</i>		INDIVIDUAL EGG RECORD <input checked="" type="checkbox"/>		YEARS 19 <i>26</i> TO 19 <i>27</i>																															
HATCHING DATE <i>May 5 1926</i>		<i>Age 195 days</i>		LEG BAND NO. <i>837A</i>																															
		<i>4242</i>		WING BAND NO.																															
				MATING NO. <i>964M8506</i>																															
DATE	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	TOTALS			
	MONTH																															TO DATE			
<i>Nov</i>															X	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	10	10	
<i>Dec</i>	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	20	30		
<i>Jan</i>	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	22	52		
<i>Feb</i>	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	21	73		
<i>Mar</i>	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	24	97		
<i>Apr</i>	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	25	122		
<i>May</i>	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	16	138			
<i>Jun</i>	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	17	155			
<i>Jul</i>	<i>Broody</i>																																	6	161
<i>Aug</i>	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	12	173			
<i>Sep</i>																															0	173			
<i>Oct</i>																								/	/	/	/	/	/	/	1	7	180		
<i>Nov</i>	/	/	/	/	/	/	/	/	/	/	/	/	/	/	X																8	188			
PREVIOUS RECORDS	1ST		2ND		3RD		4TH		REMARKS <i>Sold 11-21-27</i>																		YEAR'S RECORD		188						
MATED TO	5TH		6TH		7TH		8TH																												

FIGURE 22.—Egg Record Sheet of Hen 837A.

appears to be set in the head parallel to the skull top line. On poor producers, the front of the eye is much nearer to the bottom of the comb than is the back of the eye. The sloping of the skull line makes the eye appear to be set in the head at an angle to the top skull line.

This character is associated with beefy and sluggish individuals and is the most important in observing the extremely poor layer. It is of further use in that it often helps in distinguishing close differences on birds of medium production.

IN JUDGING, USE ALL FOUR CHARACTERS

A careful study of the key chart (Figure 6) and of these descriptions along with the various illustrations and their explanations should give a thorough understanding of head type characters as the writer sees them. It should be remembered always that all four of these characters should be considered together and not too much dependence placed upon any one.



FIGURE 23.—Head of R. I. Red hen 875A.

This bird laid 161 eggs during her first laying year of 1926 and 1927. In examining this bird for head characters, it should be noted that the sidewise skull line is level. The eye sits towards the back of the comb and there is no carry forward of the skull width. The head is slightly out of balance and there is some indication of lengthwise sloping both in front of and behind the eye. Such a head would suggest good rate with poor intensity.

Figure 24 shows the individual egg record of this bird. Her rate is fairly good and there appears to be rest periods both during brooding spells and a molting period. The peculiar part of this hen's performance is her early comeback after the molt. She started to lay again on October 18th and managed to squeeze in 32 eggs before her laying year was up. This is unusual for hens with such head type. The 129 eggs laid previous to this date is a more typical production for hens with such a combination of head characters.

It is such peculiarities as these that prevent any accurate predictions or estimations on exact number of eggs produced. However, it will be noted how consistently these head characters are able to group hens within certain classes such as good, medium and poor. (Courtesy of Kansas Experiment Station.)

KANSAS AGRICULTURAL EXPERIMENT STATION  
POULTRY DEPARTMENT

BREED <i>S.C. R. J. Red</i>		INDIVIDUAL EGG RECORD		YEARS 19 <i>26</i> TO 19 <i>27</i>																														
HATCHING DATE <i>Mar 3 1926</i>		<i>Age 291 days</i>		LEG BAND NO. <i>875A</i>																														
				WING BAND NO. <i>32</i>																														
				MATING NO. <i>855M4666</i>																														
DATE	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	TOTALS		
																															MONTH	TO DATE		
<i>Dec</i>																																	<i>5</i>	<i>5</i>
<i>Jan</i>	<i>/</i>	<i>/</i>	<i>/</i>	<i>/</i>	<i>/</i>	<i>/</i>	<i>/</i>	<i>/</i>	<i>/</i>	<i>/</i>	<i>/</i>	<i>/</i>	<i>/</i>	<i>/</i>	<i>/</i>	<i>/</i>	<i>/</i>	<i>/</i>	<i>/</i>	<i>/</i>	<i>/</i>	<i>/</i>	<i>/</i>	<i>/</i>	<i>/</i>	<i>/</i>	<i>/</i>	<i>/</i>	<i>/</i>	<i>/</i>	<i>/</i>	<i>23</i>	<i>28</i>	
<i>Feb</i>	<i>/</i>	<i>/</i>	<i>/</i>	<i>/</i>	<i>/</i>	<i>/</i>	<i>/</i>	<i>/</i>	<i>/</i>	<i>/</i>	<i>/</i>	<i>/</i>	<i>/</i>	<i>/</i>	<i>/</i>	<i>/</i>	<i>/</i>	<i>/</i>	<i>/</i>	<i>/</i>	<i>/</i>	<i>/</i>	<i>/</i>	<i>/</i>	<i>/</i>	<i>/</i>	<i>/</i>	<i>/</i>	<i>/</i>	<i>/</i>	<i>/</i>	<i>23</i>	<i>51</i>	
<i>Mar</i>	<i>/</i>	<i>/</i>	<i>/</i>	<i>/</i>	<i>/</i>	<i>/</i>	<i>/</i>	<i>/</i>	<i>/</i>	<i>/</i>	<i>/</i>	<i>/</i>	<i>/</i>	<i>/</i>	<i>/</i>	<i>/</i>	<i>/</i>	<i>/</i>	<i>/</i>	<i>/</i>	<i>/</i>	<i>/</i>	<i>/</i>	<i>/</i>	<i>/</i>	<i>/</i>	<i>/</i>	<i>/</i>	<i>/</i>	<i>/</i>	<i>/</i>	<i>23</i>	<i>74</i>	
<i>Apr</i>	<i>/</i>	<i>/</i>	<i>/</i>	<i>/</i>	<i>/</i>	<i>/</i>	<i>/</i>	<i>/</i>	<i>/</i>	<i>/</i>	<i>/</i>	<i>/</i>	<i>/</i>	<i>/</i>	<i>/</i>	<i>/</i>	<i>/</i>	<i>/</i>	<i>/</i>	<i>/</i>	<i>/</i>	<i>/</i>	<i>/</i>	<i>/</i>	<i>/</i>	<i>/</i>	<i>/</i>	<i>/</i>	<i>/</i>	<i>/</i>	<i>/</i>	<i>22</i>	<i>96</i>	
<i>May</i>	<i>/</i>	<i>/</i>	<i>/</i>	<i>/</i>	<i>/</i>	<i>/</i>	<i>/</i>	<i>/</i>	<i>/</i>	<i>/</i>	<i>/</i>	<i>/</i>	<i>/</i>	<i>/</i>	<i>/</i>	<i>/</i>	<i>/</i>	<i>/</i>	<i>/</i>	<i>/</i>	<i>/</i>	<i>/</i>	<i>/</i>	<i>/</i>	<i>/</i>	<i>/</i>	<i>/</i>	<i>/</i>	<i>/</i>	<i>/</i>	<i>/</i>	<i>12</i>	<i>108</i>	
<i>Jun</i>	<i>/</i>	<i>/</i>	<i>/</i>	<i>/</i>	<i>/</i>	<i>/</i>	<i>/</i>	<i>/</i>	<i>/</i>	<i>/</i>	<i>/</i>	<i>/</i>	<i>/</i>	<i>/</i>	<i>/</i>	<i>/</i>	<i>/</i>	<i>/</i>	<i>/</i>	<i>/</i>	<i>/</i>	<i>/</i>	<i>/</i>	<i>/</i>	<i>/</i>	<i>/</i>	<i>/</i>	<i>/</i>	<i>/</i>	<i>/</i>	<i>/</i>	<i>9</i>	<i>117</i>	
<i>Jul</i>				<i>/</i>	<i>/</i>	<i>/</i>	<i>/</i>	<i>/</i>	<i>/</i>	<i>/</i>	<i>/</i>	<i>/</i>	<i>/</i>	<i>/</i>	<i>/</i>	<i>/</i>	<i>/</i>	<i>/</i>	<i>/</i>	<i>/</i>	<i>/</i>	<i>/</i>	<i>/</i>	<i>/</i>	<i>/</i>	<i>/</i>	<i>/</i>	<i>/</i>	<i>/</i>	<i>/</i>	<i>/</i>	<i>12</i>	<i>129</i>	
<i>Aug</i>																																	<i>0</i>	<i>129</i>
<i>Sep</i>																																	<i>0</i>	<i>129</i>
<i>Oct</i>																			<i>/</i>	<i>8</i>	<i>137</i>													
<i>Nov</i>	<i>/</i>	<i>/</i>	<i>/</i>	<i>/</i>	<i>/</i>	<i>/</i>	<i>/</i>	<i>/</i>	<i>/</i>	<i>/</i>	<i>/</i>	<i>/</i>	<i>/</i>	<i>/</i>	<i>/</i>	<i>/</i>	<i>/</i>	<i>/</i>	<i>/</i>	<i>/</i>	<i>/</i>	<i>/</i>	<i>/</i>	<i>/</i>	<i>/</i>	<i>/</i>	<i>/</i>	<i>/</i>	<i>/</i>	<i>/</i>	<i>/</i>	<i>20</i>	<i>159</i>	
<i>Dec</i>	<i>/</i>	<i>/</i>	<i>/</i>	<i>/</i>	<i>/</i>	<i>/</i>	<i>/</i>	<i>/</i>	<i>/</i>	<i>/</i>	<i>/</i>	<i>/</i>	<i>/</i>	<i>/</i>	<i>/</i>	<i>/</i>	<i>/</i>	<i>/</i>	<i>/</i>	<i>/</i>	<i>/</i>	<i>/</i>	<i>/</i>	<i>/</i>	<i>/</i>	<i>/</i>	<i>/</i>	<i>/</i>	<i>/</i>	<i>/</i>	<i>/</i>	<i>4</i>	<i>161</i>	
PREVIOUS RECORDS	1ST		2ND		3RD		4TH		REMARKS		YEAR'S RECORD																							
MATED TO	5TH		6TH		TH		8TH		<i>Sold 12-21-27</i>		<i>161</i>																							

FIGURE 24.—Egg Record Sheet of Hen 875A.

Extremely good hens will usually express all four of these characters in their head types, although they sometimes may have only three present in perfection while the fourth may be more or less weak.

Extremely poor layers will have a decided absence of these four good characters. The two extremes are usually easy to note. Difficulty is sometimes encountered in being able to separate small differences among medium producing hens. Here two good and two poor characters may be combined while at other times all four characters may be neither good nor bad.

EXCEPTIONS TO RULES FAVOR SYSTEM

There are exceptions to this classification. Usually these appear as hens laying better than their head characters would indicate. It is extremely rare to find a good headed hen with a poor egg record, unless some outside factor such as sickness, injury, improper feeding, or floor laying has disturbed normal results.



FIGURE 25.—Head of R. I. Red hen 1008A.

This bird produced 106 eggs during her first laying year of 1926 and 1927. In looking at the head of this individual one can see poor examples of all four of the head characters. The eye is extremely low set and the sidewise roll of the head exceedingly great. The carry forward of the skull width is relatively poor on such a big head. The head lacks balance and the lengthwise slopes before and behind the eye might easily be used for an example of the poorest type possible for this character. Such a head shows neither any possibilities for good rate nor persistence.

Figure 26 gives the individual egg record of this bird. The 106 eggs laid were strung out over a period of seven months, which does not speak well of rate. The five months of vacation does not approach good persistence.

From the illustrations and descriptions just given it will be seen that the extremely good and extremely poor heads are easy to notice and read. Greatest difficulty arises in distinguishing close differences in the medium group of hens. (Courtesy of Kansas Experiment Station.)

KANSAS AGRICULTURAL EXPERIMENT STATION  
POULTRY DEPARTMENT

BREED *S.C.R. Red* INDIVIDUAL EGG RECORD  YEARS 19 *26* TO 19 *27*  
 HATCHING DATE *Apr 14 1926* *Age 308 day* LEG BAND NO. *1008 A*  
 2473 WING BAND NO. *2516751*  
 MATING NO. *2516751*

DATE																																TOTALS		
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	MONTH	TO DATE	
Feb														X	/																		4	4
Mar	/			/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	15	19	
Apr	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	17	36	
May	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	17	53	
Jun	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	21	74	
Jul	<i>Broody</i>											/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	5	79		
Aug																																7	86	
Sep	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	18	104	
Oct																																0	104	
Nov																																0	104	
Dec																																0	104	
Jan																																0	104	
Feb														/	/	X																2	106	

PREVIOUS RECORDS 1ST 2ND 3RD 4TH 5TH 6TH 7TH 8TH REMARKS *Sold 2-17* YEAR'S RECORD *106*

FIGURE 26.—Egg Record Sheet of Hen 1008A.

There are other head characters than these four that are sometimes helpful in head type culling. These have been mentioned in the history of head characters, but they are seldom used by the writer because of their variability and the confusion resulting from dealing with too many factors. When one is able to read correctly the four characters herein listed there is little need to look further for additional help unless an absolutely perfect, exception free system is desired. In other words, the correct application of these four simple head characters will be sufficiently efficient for all practical purposes.

## CHAPTER VI

### PREDICTING PRODUCTION

THERE IS NO question but that the head characters herein described will become useful in the general practices of culling for past production. The writer has made sufficient observations on enough different strains, varieties, and breeds of hens to be assured that these head characters are a useful addition to present culling knowledge. The debatable part of head culling is whether or not it will prove out as a practical means of predicting future production.

Reliable evidence for or against this is quite hard to obtain, as it necessitates many predictions on a large number of pullets of different breeds, varieties and strains. Although the writer has no definite evidence to present, he feels quite optimistic that this predicting can be applied in a practical way. This optimism is based on the fact that all preliminary work along this line seems to work out favorably.

#### CAN SPOT PULLETS NOT DESERVING OF TRAPPING

Mr. Upham, whose letter appears at the beginning of this discourse, has probably done as much in the studying of these head characters as anyone with whom the writer is familiar. Mr. Upham is quite satisfied that he can so divide his pullets by head examinations that those unworthy of trapping are eliminated in advance.

Another student of the writer decided to test out the predicting ability of head characters. In the fall of 1926 he entered a house of 225 S. C. White Leghorn pullets and selected 10 that he thought would have good records. At the end of their laying year, nine of the ten pullets he selected were over the 200-egg mark and the other one would probably have done likewise had not sickness overtaken her. This of course, is not really impressive, but it does point at least in a favorable direction.

TABLE I  
PREDICTING PRODUCTION BY THREE METHODS

Method of Prediction	Poor Layers 120 eggs or less	Medium Layers 121-199 eggs	Good Layers 200 eggs or more
Classification, by Professional Culler		1318A 1427A *1326A *1431A 1343A *1435A 1346A *1437A 1426A *2563A	*1352A 2564A **1354A 2566A **1423A 2569A *1434A 2570A *1531A 2571A 2562A 2572A
Classification Without Examination	*1318A **1424A 1326A *1426A *1343A *1434A 1421A 1437A *1531A	*1324A 1429A 1346A *1435A 1352A *2562A 1363A *2564A *1423A *2571A	**1354A *2565A **1396A 2566A *1427A 2567A 1431A 2568A 2563A 2569A 2570A 2572A
Classification, by Head Characters	1324A 1421A 1326A 1435A 1396A 1437A	1346A 1429A 1352A *1431A *1354A 1434A 1363A 1531A *1418A 2565A *1423A *2566A *1424A *2569A 1426A 1427A	*1318A 2567A *1343A 2568A 2562A 2570A 2563A 2571A 2564A 2572A
Classification as Indicated by Egg Records to May 1, 1928	1324A 1421A 1326A 1423A 1354A 1435A 1396A 1437A 1418A	1318A 1426A 1343A 1427A 1346A 1429A 1352A 1434A 1363A 1531A 2565A	1424A 2567A 1431A 2568A 2562A 2569A 2563A 2570A 2564A 2571A 2566A 2572A

\*Indicates that pullet was classified in wrong group.  
\*\*Indicate that pullet was classified two groups away from the correct one.

In this table the production is classified into three groups: poor, medium and good. Production of 120 eggs or less is considered poor; from 121 to 199 eggs is considered medium; production of 200 or more eggs is considered good.

In the first column across will be found the classified predictions of the professional culler. None of his estimations were below 120 eggs. Perhaps he figured that by discarding those pullets on which he refused to pass he had eliminated all poor producers. At any rate, his predictions did not contain a single poor record.

The second column across contains the predictions made without examination of the birds and the third column contains the classification according to head characters. The last column shows the correct classification of the pullets in so far as it was possible to obtain it by their trapnest records up until May 1st, 1928. There was a wide range of dates on which these pullets started to lay which made a classification somewhat difficult. There may be one or two changes to make in these after the yearly records are completed, but the classification given will not be altered enough by final results to make any appreciable difference.

All pullets marked by an asterisk are those whose production was predicted so incorrectly as to classify them in the wrong group.

## INTERESTING PREDICTION TEST TRIED

In the fall of 1927 a small test was started at the Kansas Experiment Station upon a few pullets to determine the value of predicting methods. Three methods of predicting were employed.

The first one was being used by a professional culler who was commercializing this ability of foretelling egg production. His exact method is unknown as he was very secretive about it and explained everything by claiming to have a "God-given touch."

The second prediction was in reality more of a guess. The man in charge of the breeding work, who was more or less familiar with the history of the pullets under observation, sat down and wrote in his estimated production after each pullet's leg band number without ever seeing the individual birds.

The third estimation was made by the writer who used the head characters herein described.

The original intention was to have this test run on a mixed group of 60 Rhode Island Red and White Leghorn pullets that had not started to lay. The professional culler refused to pass on quite a few, however, because of immaturity and what he called "out of condition." Since this predicting was done at different times some confusion resulted and a few pullets were not presented to the writer for classification. To make things more complicated a few pullets developed winter sickness and some died. However, 32 pullets came through without any apparent environmental handicap and the result of the predictions are listed in Table I.

In studying Table I it will be noticed that the professional culler mis-classified 10 out of 22 pullets whose production he predicted. His efficiency was 55 per cent. The classification without examination of the birds missed 16 out of the 31 pullets considered for an efficiency per cent of 48. The head character classification missed 9 pullets out of the 32 examined for an efficiency per cent of 72.

The number of pullets included in this test is not sufficient to make these results significant. It is quite encouraging, however, to note that the head character prediction in this case equalled the expected efficiency of the present day culling practices that are applied after the hens have laid. Another favorable indication of

this test is that in all cases where the prediction by head points was wrong, the birds were classified but one group away from where they belonged.

If a substantial test with a large number of pullets of different breeds works out as well as this preliminary test, then the writer will not hesitate to make a positive statement that future production can be predicted by head characters in a practical way. Until such evidence is forthcoming it is safest to state that head characters give great promise as a reliable and practical means of predicting future production.

## CHAPTER VII

### HEAD CHARACTERS IN RELATION TO MALE SELECTION AND INHERITANCE

ONE OF THE most beneficial results of this head type examination will be male bird selection, if these four characters prove a reliable basis for such selection. It is only logical to conclude that if certain definite head characters are associated with good production in females, then these same characters are desirable in male birds.

Like begets like to some degree. A male bird with a poor head type can hardly be expected to produce daughters with good head characters, whereas a male with a good production head ought to transmit these good qualities to his daughters. The theory is plausible enough. To prove it is quite a task since tested or proven males are comparatively scarce.

The writer is as optimistic of the reliability of head type selection in males as he is on predicting future production. In studying males with good and poor breeding ability he has usually been able to recognize distinguishable head type differences. These ob-

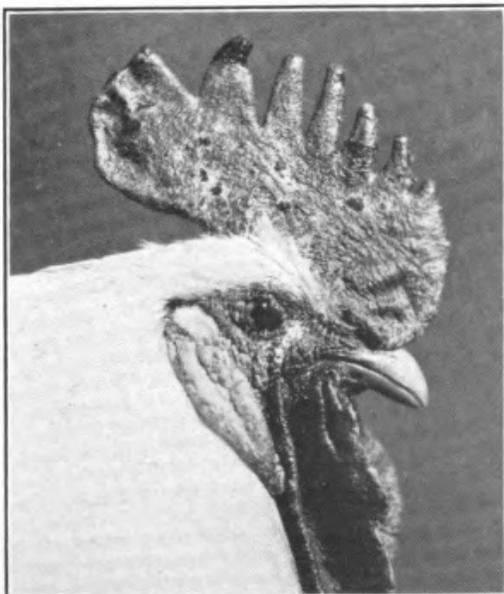


FIGURE 27—Head of male 945M.

This male bird was three years old when this photograph was taken. Age has coarsened the features somewhat but has in no way interfered with the application of the four head characters. The feathers standing upright do not hide the sidewise flatness of his head nor the way the skull width is carried forward. This head shows a tendency towards lengthwise slopings but has good balance. At the time his photograph was taken, he was considered the most prepotent tested male on the K. S. A. C. poultry farm. Daughters of this male averaged a rate of 20 eggs per month during the winter of 1926. (Courtesy of Kansas Experiment Station.)

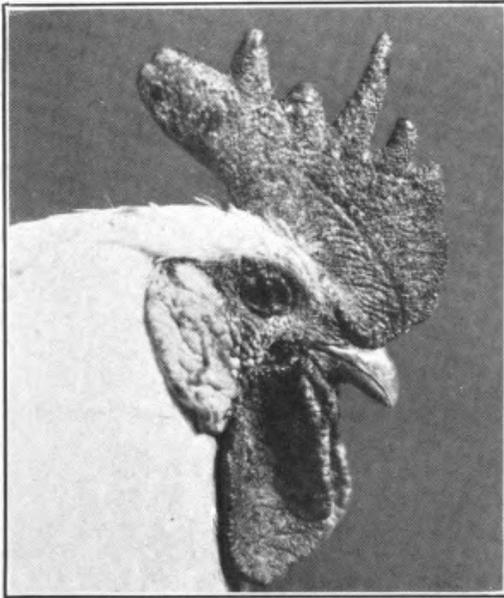


FIGURE 28—Head of male 994M.

This head is similar to that of 945M with the exception of more sidewise roll. Daughters of this male averaged a rate of 18 eggs a month during the winter of 1926. The writer was able to distinguish this difference before breeding records were known by applying the four head characters. (Courtesy of Kansas Experiment Station.)

servations have necessarily been confined to a comparatively few tested individuals, but were made on several different breeds. If these head characters work at all on male selection they will hold true for all breeds.

#### POSSIBLE TO SPOT PREPOTENT MALES

The first thing approaching a test of male selection was done a few years ago by the writer. It happened at this time that the poultry department of the Kansas Experiment Station was doing considerable work on progeny testing. Among their tested males were four pairs of full brothers. In each pair one male had shown superior prepotency over his brother. These males were lined up for examination and even though at that time the writer was not so familiar with head type, he was able to pick the good male from the poor in every pair.

At the World's Poultry Congress the writer had further opportunity of testing the potency of this head type selection. One R. O. P. breeder of Barred Rocks had three male birds on display. The writer was asked by this breeder to select the best male of the three. The one he chose was an exceptional breeder—the father of many 300-egg hens—and considered by his owner to be the best male bird he ever owned.

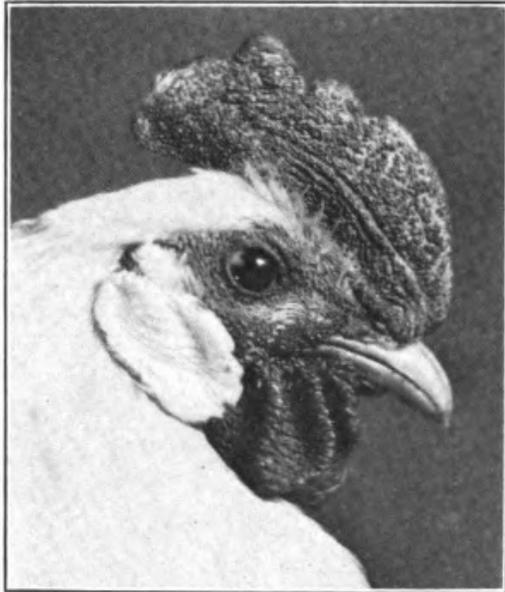


FIGURE 29—Head of male 1016M.

This male is the result of inbreeding and low vigor. His poor head characters are easily recognized. Such males should not be used as breeders. (Courtesy of Kansas Experiment Station.)

Further observations on the many R. O. P. birds displayed at this congress, aided by the explanations of a man familiar with the breeding and history of many of them, yielded additional proof that head characters are as related to male performance as to female production.

In choosing the male birds whose heads are shown in Figures 27, 28, 29, 30 and 31 the writer was able to recognize and classify



FIGURE 30—Head of male 559M.

The writer was unable to locate a tested R. I. Red male with good prepotency. This individual produced medium laying daughters. If their head characters resembled their father's, they would be like hen 875A. (See Figure 23.) The absence of forward skull width is the chief criticism of this head. (Courtesy of Kansas Experiment Station.)



FIGURE 31—Head of male 114.

Another example of a male who produced only medium daughters. This head shows better balance than that of 559M but the sidewise roll is greater. Both are equally weak on forward width of skull. Of the two males, the writer would rather have 559M as he believes sidewise flatness to be a more important character than balance. Neither male represents a type that will improve the egg production of a flock of medium hens. (Courtesy of Kansas Experiment Station.)

correctly the breeding powers of each one before any knowledge or record of their performance was produced. These individuals were selected from the few males on which breeding records could be obtained.

#### INDICATIONS SHOW PREDICTION POSSIBILITIES

To draw definite conclusions from such smattering evidence is not sound, but again, all indications point in a favorable direction.

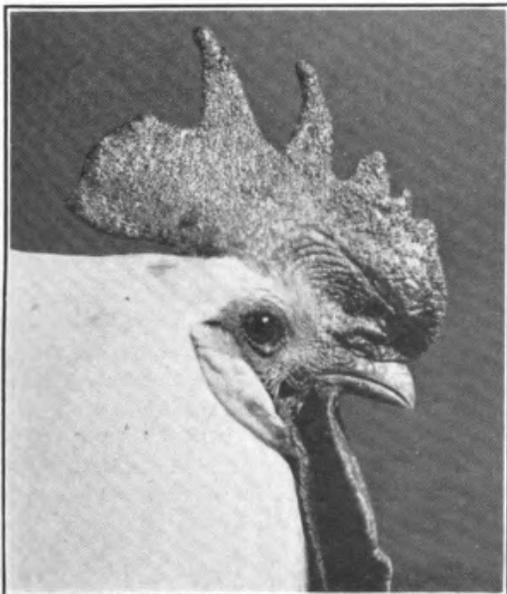


FIGURE 32—Head of male 1010M.

This bird is the direct breeding of a well known west-coast breeder. Although as yet untested, the head characters of this bird speak well of his prepotency. This individual illustrates that these four head characters are not confined to any certain strain of birds but are universal in their appearance. (Courtesy of Kansas Experiment Station.)

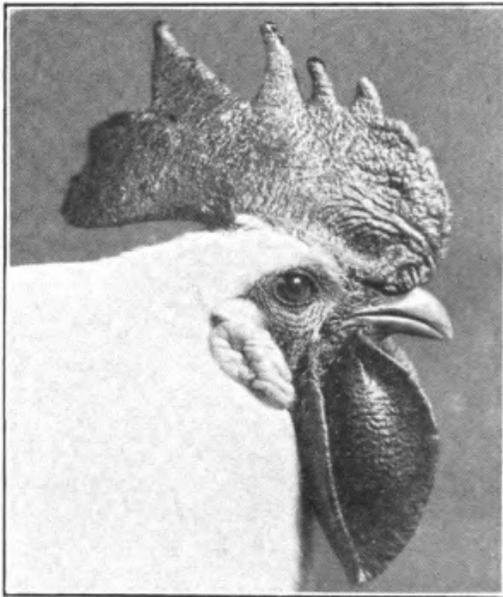


FIGURE 33—Head of male 1011M.

This bird is from the same breeding as 1010M. His head is included to show that differences exist in the head characters of closely related birds. Which one of the two males would you choose as the best breeder? (Courtesy of Kansas Experiment Station.)

It will be a difficult task to accumulate mass evidence on this point as tested male birds are not nearly as numerous as trap-nested hens. In addition to this the male has no way of expressing his egg production abilities except with the help of females in the breeding pens. In bringing in this female side the breeder has added additional factors that may either help or hinder the possibilities of the male.



FIGURE 34—Head of male 928M.

This bird was a decided failure as a breeder. His daughters' production averaged 105 eggs. He was from a 230 egg hen but was incapable of transmitting this production. Would not his head type have indicated his poor breeding abilities? Note the sidewise slope, the lack of balance, the absence of forward skull width and the strong tendency toward lengthwise slopes. (Courtesy of Kansas Experiment Station.)

FIGURE 35—Head of hen 84.

Note the splendid example of good head type, especially the carry forward of the skull width in front of the eye. The first year record of this hen was 303 eggs. Since then she has been the mother of several other 300-egg hens. Although somewhat hidden by the ruffled head feathers, the top of this skull is absolutely flat. (Courtesy Ralph Upham.)



To show that head characters are not limited to certain strains, Figures 32 and 33 are here presented. These cockerels are the direct breeding of a well known west-coast Leghorn farm. In analyzing these heads one need not be told that 300-egg breeding is behind them. Although these cockerels are as yet untested for breeding ability, their head characters are strong enough that much can be expected of them.

FIGURE 36—Head of male 436.

This bird is a son of hen 84 and male 92. Male 92 died before being photographed so this picture of his son is inserted as the owner feels the two heads are almost identical. This bird is as yet untested but male 92 sired several 300-egg daughters. (Courtesy of Ralph Upham.)



FIGURE 37—Head of hen 124.

This bird is a daughter of hen 84 and male 92. Note how good head characters have been inherited. First year record of this bird was 303 eggs. (Courtesy Ralph Upham.)



#### CAN PREVENT WORTHILESS MATINGS

Figure 34 is presented to show that at least in this one case much loss could have been prevented by the employment of head characters as a check to male selection. This Rhode Island Red male was out of a 230-egg hen yet he proved to be an utter failure as a breeder. His daughters not only showed extremely poor vigor and livability, but the average of their production was only 105 eggs. He was mated to poor producing hens, but had his head characters been observed in advance they would have shown no evidence of improving poor egg production and he probably would not have been used.

The writer believes that judicious selection of both male and female breeders according to their head types will bring good results. This assumption is based upon the work and results of Mr. Upham's breeding work.

#### FIVE 300-EGG DAUGHTERS FROM HEAD POINT MATING

In the spring of 1926 this breeder had one hen, No. 84, and one male bird, No. 92, with exceptional head characters. He arranged his pens so as to mate these two individuals. From this pair he obtained five 300-egg daughters and quite a few more whose pro-

FIGURE 38—Head of hen 327.

Another daughter of hen 84 and male 92. First year record 298 eggs. Again note transmission of head characters. (Courtesy Ralph Upham.)

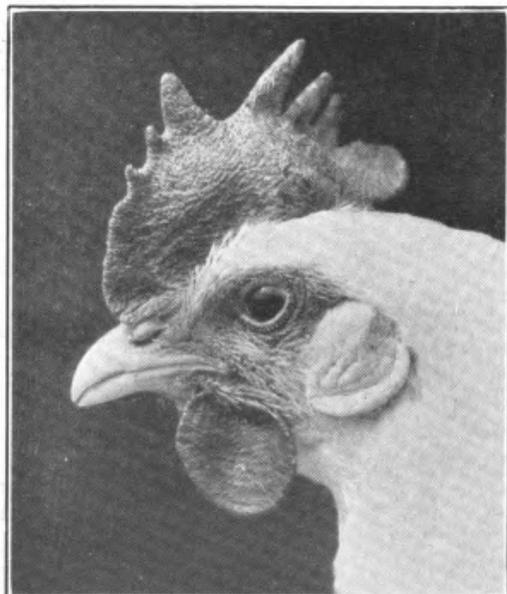


duction was between 290 and 300 eggs. Since other daughters of this male bird did not lay quite so well, it is only a fair conclusion to state that perhaps the balance of the hens hindered or lessened his potentialities. Since these other hens did not possess the extremely good head characters of this one good hen this hindrance could have been noticed by head examinations before breeding.

Figures 35, 36, 37, 38 and 39 are included to illustrate this in-

FIGURE 39—Head of hen 318.

Another daughter of hen 84 and male 92. Can you tell this bird from her mother (Figure 35)? First year record of this bird was 296 eggs. (Courtesy Ralph Upham.)



teresting bit of head type inheritance. Unfortunately this good male bird, No. 92, died before a photograph of his head could be taken. In its place is substituted the head of one of his sons whose mother is the good hen, No. 84. Mr. Upham believes this son to have so nearly the same head characters as his father that for illustration purposes it can be considered identical.

#### FULL BROTHER REVEALS HEAD POINT INFLUENCE

Another interesting piece of evidence of head character inheritance is to be found in another case at the Upham farm. Male 1851, a full brother of the good hen 84, produced one 300-egg daughter. Since this was from an untrapped mating the mother of this daughter is unknown. This is the only 300-egg daughter that this male bird produced. The head of this male and his 300-egg daughter is illustrated in Figures 40 and 41. An examination of these photographs will show that the daughter possesses a stronger head than the father. The unknown mother has added to head characters as well as improving egg production.

#### EVIDENCE INDICATES HOPEFUL POSSIBILITIES

Again, the evidence here presented is fragmentary. It is such cases as these, however, that lead the writer to expect much from

FIGURE 40—Head of male 82.

This male produced but one 300-egg daughter. The mother is unknown. This further illustrates that head types are not confined to strains. The blood of these Upham birds was originally obtained from a west-coast breeder other than the one who bred males 1010 and 1011. Note the lack of forward skull width on this bird as compared to Figure 36. (Courtesy Ralph Upham.)



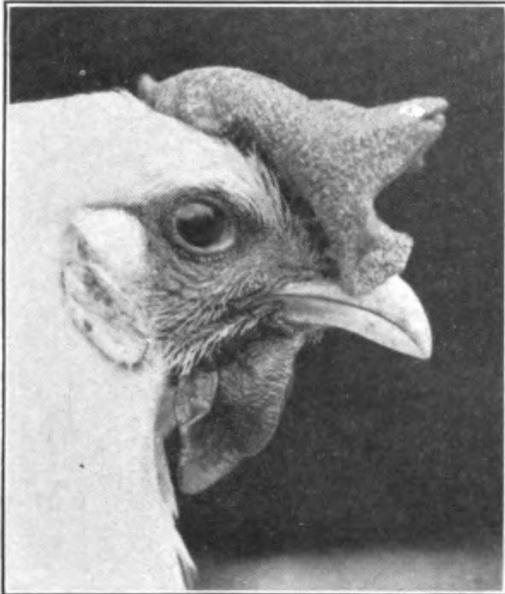


FIGURE 41—Head of hen 1358.

This is the 308-egg daughter of male 82 (Figure 40)). Can you notice how the unknown mother added to the forward width of this hen's head? A good example of how, when defects in head type are overcome, production increases. (Courtesy Ralph Upham.)

head type characters when they are purposely mated, so as to have the strong points of one sex bolstering up weak characters of the opposite.

It should be remembered that little or no effort has been expended so far along such lines. The evidence given throughout this discourse has accumulated as a by-product to other methods of breeding. Perhaps breeding can be speeded up by paying attention to head characters and by mating birds with good head type as a goal. If these characters can be definitely associated with the breeding performance of birds on which no definite selection has been practiced, it is not too long a jump to expect that they will still associate in the same manner when purposely looked for. If such is the case they afford the poultryman an open index to breeding ability.

## CHAPTER VIII

### HEAD CHARACTERS IN YOUNG STOCK

THE POULTRY INDUSTRY is rapidly progressing toward greater efficiency. In this march of progress all new systems that will effect a saving are eagerly absorbed into the management routine.

The sooner the poultryman can recognize unprofitable birds the sooner he can dispose of them and thus eliminate considerable waste. If male birds are kept until they become staggy before they are recognized as poor individuals and sold, their market price is so lowered that they are worth little, if any more, than they would have brought as broilers. The poultryman thus loses most of the expense of care and feed after the broiler age.

#### SELL UNDESIRABLE PULLETS AT BROILER AGE

Usually pullets culled in the fall have to be sold on a market glutted with fryers and they also seldom bring more than they would have as broilers. Therefore if these poor individuals could be recognized at the broiler age a great saving would result.

FIGURE 42—Head of male 1087.

This young cockerel is highly inbred with the blood of hen 84 illustrated in Figure 35. The owner of this seven weeks cockerel was able to locate him amidst a group of over 500 brooder mates. There was no distinguishing mark on this bird except his pronounced good head type. Would you recognize him as having the possibilities of a good breeder? (Courtesy Ralph Upham.)

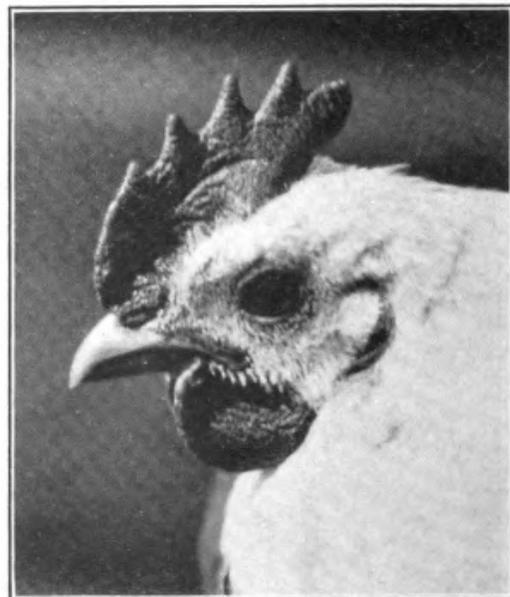




FIGURE 43—Head of young R. I. Red pullet 264.

At the broiler age, this pullet shows a flat head from side to side but has her eye set under the rear of her comb. If this head type does not change during the intervening growth period, she will develop into a medium producer with a head like hen 875A. (See Figure 23.) (Courtesy Kansas Experiment Station.)

In the face of this economic situation, the question naturally arises whether or not head type characters can be used at broiler age. This question is hard to answer. The writer has observed differences in head characters on baby chicks, but has never had the opportunity to follow these differences through to maturity. He does not know whether head type will change on normal growing chicks or not. It does change on chicks given mistreatment. As the chick grows the skull grows and before this bony structure is fixed there are always chances of changing.

#### HEAD TYPE LOCATES COCKEREL AMONG 500 CHICKS

At broiler age it is still easier to recognize differences in head type. Figure 42 is presented here to illustrate how clearly certain head types stand out at broiler age. The young male in this illustration is highly inbred with the blood of hen 84 (Figure 35). Her strong head points are easily recognizable in this young male. The owner of this bird picked this young male out of a brood of over 500 and declared his breeding before ever checking the wing band number. Outside of head characters he was no different from his many other brood brothers, and the owner admitted that it was head type that enabled him not only to recognize this bird, but also all others of similar good breeding.



FIGURE 44—Head of young R. I. Red pullet 147.

This young pullet is beginning to show signs of crowheadedness. Although she is the same age as pullet 264 she was not as well grown at the time of photographing. Perhaps both this stunted growth and the crow-head can be traced to a set-back in early brooder days. At any rate, this bird gives no promise of being a good layer. (Courtesy Kansas Experiment Station.)

#### CAN SEE DIFFERENCE AT BROILER AGE

Figures 43 and 44 are presented to illustrate further the difference that can be noted in heads at broiler age. There is no question but that differences in head characters can be discerned at this time. The questionable part is whether or not these characters are fixed. If the young birds are not mismanaged there is some evidence showing that the head type will remain constant, but the writer has not checked this sufficiently to have any definite opinions. Should this prove out, however, it would offer a means for culling at the brooder age which is probably the most economical time to cull.

## CHAPTER IX

### HOW TO BECOME FAMILIAR WITH HEAD TYPES

IN THE PRECEDING chapters, the writer has tried to set forth his observations on head characters in a fair and unbiased way. He has tried to present the facts as he has observed them without allowing any undue enthusiasm to make him over-state the evidence. These head characters will aid the poultryman in many ways after he becomes familiar with them. The real task comes in learning these characters so they can be applied in a practical way.

The photographic evidence herein presented should offer a substantial background for familiarity with head types. All photographs, however, are more or less unsatisfactory as they present but one view and permit of no handling for closer inspection. It is for this reason that the writer urges caution in the use of these characters until the user is absolutely familiar with what to look for.

#### CHECK WITH TRAPNEST RECORDS

Those who operate trapnests will be the first to become familiar with these head characters. Actual laying records will act as a balance wheel during the study period and will guide the student past all dangers of misconception and mistakes. All false impressions will be ironed out where actual egg records can be used as a check.

To those who will have the advantage of such trapnest records it is suggested that at first they compare the head types of extremely good and poor hens. Such contrast is best for a speedy familiarization of head characters. When the good and poor are easily recognized it is then time to study the harder field comprising the medium layers. As elsewhere stated, it is sometimes quite difficult to note close differences between medium producers, but the good and poor heads are comparatively easy to recognize.

## HARDER TO LEARN WITHOUT TRAPNEST

The poultrymen that do not have trapnests will have a more difficult task in gaining the true conception of these head characters. It is not that these head characters will not be as effective on untrapped birds, but that such poultrymen do not have such an accurate way of checking themselves to see whether or not they have obtained the true conception. For such as these it is suggested that first of all they thoroughly study the descriptions, drawings and photographs herein contained. After such study there are two ways in which they can check themselves.

The first way is to wait until early summer when other culling methods work best and then cull their birds both ways. In this manner they will be able to see how closely head type checks with present culling methods. Of course this will not be absolute and should be considered only at that period of the year when old culling methods are best employed, but it will at least tend to stabilize judgment.

## TEST YOUR OWN FLOCK

The second way to check head types without the use of trapnests is to divide the flock into three separate units. This is best done in the fall as a predicting program. The birds can be grouped as poor, medium and good according to the head characters. If these three flocks are then kept separate it will be an easy matter to keep a record of flock production and thus obtain a check.

The writer offers these suggestions so that everyone can check the potency of culling by head characters before blindly jumping in and using them more or less in the dark. The amount of help each will receive from this system will depend upon his proficiency in recognizing these characters together with the number of exceptions he might chance to run across. These exceptions will not be numerous but they should be expected occasionally. They do not influence the general results to any marked degree; therefore it is hoped that these head characters will be judged and accepted for their great general benefit rather than condemned for these few exceptions.



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