The field of work of American anthropologists is also in part determined by the character of the institutions that maintain anthropological work. The Bureau of American Ethnology which forms part of the Smithsonian Institution is by law restricted to work on the natives of America and the Hawaiian Islands. Most positions held by working anthropologists are museum positions, and consequently the scientific work is largely restricted to those aspects of anthropology that yield tangible specimens. University positions are on the whole of such a character that the funds necessary for the conduct of field work are not supplied by the universities, but if available at all, come from museums.

Anthropologists have felt for a long time that their work needs expansion, and many attempts have been made to free anthropological research from the restrictions dependent upon the association of anthropological work with museums on the one hand, and from those conditions that tend to give undue preponderance to work on American Indians on the other hand. Attempts have been made particularly to direct attention to African problems, which are of importance to us on account of our large negro population, and also to investigations on racial anthropology among the white and negro populations of the United States. Work of this kind needs financial support, but all attempts have failed to interest the government institutions which command considerable funds, or private individuals, to support work of this type. There is a peculiar hesitancy in regard to undertakings of this kind, which will not be overcome until more work on a smaller scale has been done. Investigations of this description have been undertaken by American anthropologists and by educators, sociologists and medical men with anthropological leanings.

Recently, biologists have also directed their attention to this subject, but methods applied and results obtained up to this time are quite unsatisfactory. Work on human paleontology is also not vigorously pursued.

The difficulty of giving anthropological research an adequate position in the scheme of the National Research Council is largely based on the fact that the humanities find no place in the general scheme of work of the Research Council. While anthropology must necessarily be based on the one hand on biological science, on the other hand it is intimately associated with the humanities. It is impossible to treat even the biological problems of anthropology without a due regard to the cultural aspect of anthropology, because the forces which determine the development of human types are to a very large extent cultural forces.

The peculiar position of anthropology brings about close contact with a great many different sciences—biology, geology, paleontology, geography, psychology, history, linguistics and the whole range of humanities. Cooperation will be necessary according to the particular type of problems taken up, and anthropology will be best served by an entirely free association with different subjects, according to the need of each case.

It is the opinion of the undersigned committee that the appointment of a director of anthropological work, who would have a dominating influence over organized work, would not be helpful on account of the great diversity of subject matter included in anthropology, and might prove decidedly prejudicial on account of the necessity of developing this subject in different directions. Much better results would undoubtedly be obtained by regular meetings of representative scientists, and by the appointment of a secretary who would carry out the necessary clerical work.

FRANZ BOAS, *Chairman*,
ALEŠ HRDLIČKA,
ALFRED M. TOZZER

NEW YORK CITY,
March 6, 1919

## SPECIAL ARTICLES

### EGG-WEIGHT AS A CRITERION OF NUMERICAL PRODUCTION IN THE DOMESTIC FOWL[1]

IN connection with a study of the manner of inheritance of egg-weight in the domestic

[1] Contribution 251 from the Agricultural Experiment Station of the Rhode Island State College, Kingston, R. I.

fowl, conducted for several years at the Rhode Island Agricultural Experiment Station, there has been evolved a new method for the detection of those birds in a flock that are characterized by higher producing ability. The method is not based upon data involving observed numerical production in any way, but upon the tendency on the part of normal hens to manifest, at certain periods of the year, a gradual increase or a gradual decline in the size and weight of the eggs which they lay.

It has been found that when the numerical production curve of a flock of hens of the same approximate age and condition, and characterized by mediocre producing ability, is plotted on monthly ordinates (aside from the mode of December production of the pullet year which is sometimes manifested if the hens were hatched very early in the season or are high producers) two modes appear, one in April and one in September. These modes, or maxima, represent the peaks of production for the first laying year.

It has also been found that when the curve of mean egg-weight is plotted on similar monthly ordinates, two modal points appear, one in April and the other in September. These weight modes, or weight maxima, are approximately coincident with the production maxima.

When, however, one analyzes the performance of individual birds at the period of these maxima, one finds that, while the majority show an egg-weight which has markedly increased over the mean weight of the first ten eggs laid at the beginning of the laying year, some have not shown such an increase, and some have shown an actual decrease. When the increase or decrease in mean egg-weight is measured as a percentage-increase or as a percentage-decrease, some birds may show an increase of 10 per cent. or more while others show a decrease of equal amount.

The question naturally arose whether the hens which showed the greater increase in mean egg-weight for April or for September also manifested the higher productions for the first laying year. Such correlations were computed and it was learned that in the majority of cases the hens which gave the higher-percentage increase in egg-weight during these months also showed the higher productions for the year. The flock could easily be separated into production-groups based upon the percentage of increase (or decrease) in mean egg weight. As a rule the correlation was more perfect in September than in April.

Correlations between the percentage of increase in mean egg-weight and numerical production were also attempted when the former were based upon the mean weight of *only ten eggs* laid as nearly as possible to the absolute weight-mode for April and for September respectively. It was learned from these computations that the correlation was even more perfect when the smaller number of eggs was employed in the computations. The following table gives the results for the autumnal weight maximum, based on the "10-egg test."

TABLE I

*Showing the Mean Annual Production, for the First Laying Year, of Groups of Hens Selected for Varying Percentages of Increase or Decrease in Mean Egg-weight of Ten Eggs or Less Laid at the Period of the Autumnal Weight Maximum*

| Percentage-Class: Birds Selected for Increase in Egg-Weight Indicated Below. Per Cent. | Number of Individuals Making the Record | Mean Production for the First Laying Year |
|---|---|---|
| > 13 | 3 | 147 |
| > 11 | 6 | 145 |
| > 10 | 7 | 143 |
| > 9 | 8 | 144 |
| > 8 | 10 | 144 |
| > 7 | 12 | 139 |
| > 6 | 12 | 139 |
| > 5 | 14 | 135 |
| > 4 | 16 | 134 |
| > 3 | 19 | 131 |
| > 2 | 21 | 125 |
| > 1 | 23 | 125 |
| > 0 | 26 | 124 |
| < 0 | 5 | 108 |
| < 6 | 19 | 112 |
| Total flock | 31 | 120 |

From the data presented in the table it appears that higher production is correlated very definitely with higher percentages of increase in egg-weight. The maximum group-production (147) occurred in those hens whose mean increase in egg-weight was above 13 per cent. in the "10-egg test." Selecting above 10 per cent. gave seven birds whose mean production was 143 eggs. Selecting above 6 per cent. gave 12 hens whose mean production was 139 eggs. On the other hand selecting the hens which gave a decrease in egg-weight ("$< 0$ per cent.," in the table), gave five hens with a mean production of only 108.

The superiority of the "10-egg test" in establishing the correlation with numerical production in this instance clearly brings the testing of egg-production of hens into the same class with testing milk-production of dairy cows, in which case Gavin and also Wilson have pointed out that under suitable conditions the one day test may be of greater value than the seven-day, the 30-day or the year test.

With these points openly in mind, and only with the purpose of stimulating further investigation and discussion, the author presents the following brief summary of his results with a single flock as expressing a biological fact which, if later proved to be of general application, may take its place as a fundamental law of production in the domestic fowl:

The innate egg-producing ability of a hen is manifested, not only by the number of eggs laid within a year, or within some longer or shorter period of time, but also by the degree of increase or of decrease in the mean weight of her eggs, when this increase or decrease (calculated as a percentage-increase or percentage-decrease) is measured at those periods of laying (the vernal and autumnal maxima) characterized by the markedly increased laying of the flock; and on this basis, groups of hens characterized by higher producing ability can be differentiated as accurately as, and more easily than by other known means.

The validity of this proposed law of production is supported by detailed evidence in an article to appear in *The American Naturalist.*

PHILIP HADLEY

R. I. AGRICULTURAL EXPERIMENT STATION

## SOCIETIES AND ACADEMIES

### THE NATIONAL ACADEMY OF SCIENCES

THE program of scientific sessions of the meeting held in Washington on April 28, 29 and 30, was as follows:

MONDAY, APRIL 28

*Morning Session*

ALFRED G. MAYOR: The age of the fringing reef of Tutuila, American Samoa.

CHARLES D. WALCOTT: Seaweeds and sponges of the Middle Cambrian.

ROBERT G. AITKEN: The spectra of the visual binary stars.

GEORGE E. HALE, F. ELLERMAN, S. B. NICHOLSON and A. H. JOY: The magnetic polarity of sun spots.

WALTER S. ADAMS and A. H. JOY: The motions in space of some stars of high radial velocity.

WALTER S. ADAMS and G. STRÖMBERG: The use of spectroscopic method for determining the parallaxes of the brighter stars.

ADRIAAN VAN MAANEN (introduced by George E. Hale): Evidence of stream-motion afforded by the faint stars in the Orion nebula.

GRAHAM LUSK and H. V. ATKINSON: The production of fat from protein after giving meat in large quantity to a dog.

WILLIAM S. HALSTED: End-to-end anastomosis of the intestine—experimental study.

ROBERT M. YERKES (introduced by George E. Hale): Psychological examining in the United States Army.

*Afternoon Session*

FREDERICK H. SEARES (introduced by George E. Hale): Relation between color and luminosity for stars of the same spectral type.

FREDERICK H. SEARES, A. VAN MAANEN and F. ELLERMAN (introduced by George E. Hale): Deviations of the sun's general magnetic field from that of a uniformly magnetized sphere.

W. W. CAMPBELL: The solar corona.

HERBERT E. GREGORY (introduced by W. M. Davis): Plans for exploration of the Pacific.

FRANCIS G. BENEDICT, W. R. MILES and ALICE JOHNSON: The temperature of the human skin.