"2. Mating an adult cock with not more than three pullets will be uncertain in its results, one sex as likely as the other to predominate."

"3. Mating an adult cock with five or more pullets will give an excess of pullets, but, as in the first instance, there will be most female birds from the earlier eggs."

"4. Young birds, or adult birds, mated together, will give uncertain results, but the fewer the hens, and the more vigorous the cock, the greater will be the proportion of males, and they will be most numerous from the early eggs."

One of the best uses to which the hens may be applied, is that of scratching in the manure pile, they not only find worms, grubs and grain as well as other desirable matters, but they render the manure fine and keep themselves in exercise. If the fine manure be removed occasionally, so as to expose the under layers of coarse material, the hens will make it much more serviceable for garden purposes, especially where fine, small seeds are to be sown.

It must not be forgotten, if we expect our fowls in early spring to have full vigor and be productive, that the necessary articles must be provided.

Nothing but thoroughbred males should ever be used with common hens. A mongrel cock will do you more harm in one season than can be repaired in three.

Above all things be kind to your fowls, do not get them so they are afraid of you; cultivate their acquaintance.

Variety is the spice of life. Bread is good, so is water; but not as a steady diet. So do not confine the fowls to bread and water. It is good for every family to take a "boiled dish" sometimes. Why not for fowls?

Be sure that the ground floor in the poultry house is much higher than the surrounding ground, to keep it perfectly dry. Damp floors are very productive of diseases.

POULTRY BREEDING.

BY H. S. BABCOCK, PROVIDENCE, R.I.

No. 3.

HEREDITY.

IF variation is the unstable, heredity is the stable principle in breeding. It is the principle which makes true the maxim "Like próduces like." That maxim is true only in so far as it is not affected by variation and when the first "like" is made to include not only the immediate parents but an indefinite number of their ancestors. Heredity is that principle which accounts for the resemblance of the young to one or both parents or to some more distant ancestor or ancestors.

One of the most difficult problems connected with the science of life is to account for the manifestations of heredity. One would naturally suppose that the offspring would partake of the characters of sire and dam and would indeed be intermediate between them. This is sometimes the case, but often one parent is more strongly represented than the other, and at other times there is little resemblance to either parent, but a strong resemblance to some distant ancestor. If we should reckon that each cell which unites to form the new being consisted of a hundred different elements and if the new being could have only one hundred elements contained in the male and female cells it is obvious that only half of them can be contained in the offspring. The one hundred elements contained in the offspring might contain fifty each of the male and the female, or twenty-five of the male and seventy-five of the female, or 10 of the male and 90 of the female, or in a vast number of proportions. This we might represent by a figure thus:

MALE ELEMENTS.	FEMALE ELEMENTS.
50	50
25	75
10	90
1	99
99	1
2	98
98	2
3	97
97	3
4	96
96	4
5	95
95	5
6	94
94	6

and so on indefinitely. Now, it is known that in the process of the segmentation of the cell which forms the young—the cell formed by the union of the ovum of the female with the sperm cell of the male—certain bodies, called polar bodies are formed and that a portion of the contents of the cell are expelled. A half of the cell at least is withdrawn. It is possible that the meaning of the polar bodies is thus to be explained; that the two hundred or two thousand elements which are united and reduced by one-half; and that in the expulsion unequal parts of the male and female elements are removed. If this is a correct explanation we are prepared to understand why the offspring resembles one parent more than it does the other.

But heredity is not to be entirely ex-