extends three-fourths of an inch caudad from the end of the sternum. In outward aspect this tract is identical with the others. On raising the skin the glandular structure is very evident; it is the same in appearance, under the lens, as that of the lateral tracts, but thicker as well as more extensive.

All three tracts are strictly subcutaneous, and come away from the subjacent parts when the skin is raised. They are supplied by large cutaneous vessels, the ramifications of which are conspicuous beneath the integument. This vascularity reddens the minutely granular texture of the glands, which a low magnifying power discloses. The three areas appear alike in both sexes.

ELLIOTT COUES.

WASHINGTON, D. C., May 7, 1896.

INSTINCT.

EDITOR SCIENCE: It seems to me that it would be well to keep the issue with which this discussion started in view, and then the direction in which the truth lies will be clearer. Nothing could be more explicit that the statement by 'The Writer of the Note' in SCIENCE of February 14th, which was this: "A chick will peck instinctively, but must be taught to drink. Chicks have learned to drink for countless generations, but the acquired action has not become instinctive."

In other words, the view that eating is instinctive and drinking is not, was that taught by Prof. Morgan and endorsed by 'The Writer of the Note' in a subsequent communication. Feeling that an important truth was being imperilled, I advanced facts to show that such a view was untenable. This was followed by the recital of additional facts by others, so that it was plain to myself—more so than ever—that such a theory as that first advanced was not sound. I was aware that all three of the writers supporting this view were in accord, constituting a sort of trinity in unity; there was, nevertheless, a great lack of harmony which seemed to be owing to the somewhat important defect that their views were not endorsed by Nature.

Now, to my surprise, Prof. Baldwin claims that I have missed the real point which he takes to be that an instinct may be only 'half congenital,' and cites this drinking of chicks; but according to the above quotation drinking is not instinctive at all, so that it looks as if the shoe was on the other foot.

In 1894, in a paper read before the Roy. Soc. Can. on 'The Psychic Development of Young Animals,' published in the Proceedings of the Society for 1895 and a copy of which was forwarded to Prof. Baldwin, I emphasized the conception that instinctive acts are *never perfect* at first, or, as Prof. Baldwin would prefer to say, are only partially congenital, though whether such an expression as 'half congenital' is a valuable addition to the English language, I doubt. Now it would be strange that I should alter my own views without noting the change, and miss the point in a matter which I was, I think, the first to emphasize; in fact, I have in this very correspondence in SCIENCE urged this view—the imperfection of instincts. If Prof. Baldwin and those he professes to interpret will grant that eating and drinking in chicks are instinctive; that both alike are imperfect at birth; that congenitally the chick is in the same condition to all intents and purposes as regards eating and drinking, he will, I believe, be in accord with the facts, and we shall all agree that the much overlooked imperfection of instincts is well illustrated by the subjects under discussion, but I should like to add, universal in its application, though in varying degree, the imperfection being in some cases not very obvious to our inadequate observation.

But in discussing evolution I feel that we are on a different plane. Here the appeal to facts is of a much less decisive character.

I have been trying since reading Prof. Baldwin's letter in SCIENCE of May 1st, in reply to my own, to ascertain his real views in regard to evolution, and have some hesitation in deciding whether I really grasp his meaning or not. However a few concrete cases may make matters plainer. A and B are, let us suppose, two individuals that survive because they can and do adapt to the environment; X and Y die because they cannot; or in Prof. Baldwin's terminology, A and B adapt to their 'Social Heredity' constituting 'organic selection' which is ontogenetic or affects the individual. But the survival of individuals specially adapted affects the race or phylum. But surely an indi-

vidual adapts to an environment ('social heredity') because of what he is congenitally. In the language of evolutionists this is survival of the fittest or natural selection, though Prof. Baldwin seems to think he has introduced a new factor in his 'social heredity.' The name is new and to my mind objectionable, as there is no real heredity; the idea is not.

Ordinary people express themselves by saying that we become what we are because of 'education,' 'circumstances,' etc. We say, "The man is the product of his age."

People tend to believe too much in the power of education, circumstances, etc., and too little in heredity; hence all sorts of cures for deep-rooted evils are ever welcome. But we find that the changes wrought by 'social heredity' are very much on the surface, and in consequence there may be but little outcome from these effects, possibly none in some cases, in heredity, as ordinarily understood, which does not, however, contravene the Lamarckian or any other well recognized principle of heredity or evolution. To return to the concrete: A and B have offspring, differing slightly from themselves. The 'social heredity' has had little effect, therefore, on the race; in the case of the lower animals, much less than in the case of man, possibly, and if the offspring C and D be placed in widely different environments the slight extent to which they have varied (congenitally) will be all the more evident.

A Lamarckian explains these variations, such as they may be, by the influence of the use and disuse of parts, and evolutionists of other schools in other ways. Prof. Baldwin misapprehends, I take it, the sense in which I employed the term 'use' in the phrase which he quotes from my last letter. The Lamarckian sense was that intended.

I must repeat that, after reading a good deal of what Prof. Baldwin has written on this aspect of evolution, it still seems to me that while he has with new terminology set forth old views in a new dress that there is really no new principle or factor involved. I do not, of course, consider such writing without special value, though it may sometimes be provokingly difficult to understand from the new technicalities employed, for the relative parts played by heredity and environment in the make-up of each individual is an interesting and practically very important problem.

If I have failed to understand Prof. Baldwin fully and so to appreciate his views at their full value on the score of originality, I regret it. However, it is likely that others are in the same case, and I venture to suggest that the remedy for our denseness, if such it be, is to be found in a specific and concrete treatment of the subject.

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NOTES ON PERCEPTION OF DISTANCE.

IT appears to me that the best *data* for determining the psychological elements in the perception of distance, as I suggested some time since in SCIENCE *apropos* of mountain climbers, is to be derived from those men of mature and reflective mind who, finding themselves in very strange surroundings, are compelled to learn a new language of distance. From them we can obtain direct evidence of what passed in their consciousness, an evidence thus far superior in value to the indirect judging from the action of infants or young animals, or even the meager and few reports of the blind who have suddenly received sight. Even supposing a blind genius for psychological analysis to be suddenly given sight, the fact that an absolutely novel and complex experience was produced which included much else than mere perception of distance, as light, color, form, would tend to make his evidence to some extent unsatisfactory. For the best results in the study of perception of distance we must then find it in course of formation with individuals sufficiently educated and reflective to give some account of their experience. Even then the forming perception may be so instinctive a process that the elements may not be clearly discernible. For instance, Mr. Casper Whitney in the strange surroundings of the Barren Grounds had to learn a new form of distance which he thus describes in *Harper's Magazine* for April, 1896, (p. 724): "I began my first lessons in Barren Ground distance-gauging by guessing the yards to a stone and then pacing them off. I was not only astonished at the discrepancy between