

**THE LAW OF SEX  
DETERMINATION AND ITS  
PRACTICAL APPLICATION**

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The Law of Sex Determination and Its Practical Application by Laura A. Calhoun (Mrs. E. E. Calhoun)

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**LAURA A. CALHOUN (MRS. E. E. CALHOUN)**

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**THE LAW**  
**OF**  
**SEX DETERMINATION**  
**AND ITS**  
**PRACTICAL APPLICATION**

**BY**  
**LAURA A. CALHOUN**  
**(MRS. E. E. CALHOUN)**

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**New York, 1910**

THIS WORK

IS

DEDICATED

TO ALL WHO MAY BE MINDED TO LOOK INTO THE MYSTERIES  
OF THIS MUTABLE EARTH-LIFE AND INVESTIGATE  
THE VARIOUS MEANS OF ITS GREAT  
PROGRESSIONS

## PREFACE.

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THE problem of sex determination has always been of great interest. It has been the subject of investigation at all times, and has been supposed to have many solutions. These solutions have usually proved to be founded on nothing better than conjecture and coincidence, the two factors that vitiate so many investigations with regard to things human. During the last two or three generations there have been so many disappointments in this matter that there has come to be a very general impression that the problem would never be solved. The present volume is a contribution to the subject founded on observation in human beings and experiments in cattle breeding. The writer is convinced that at least very definite progress toward the solution of the problem, if not its actual solution, has been made by these studies. And they are here presented to the public entirely with the idea of securing scientific control, and it is hoped eventual confirmation of this law, by further observation and experiment conducted under such variant conditions as will test it effectively.

Publication has not been undertaken hurriedly, though this subject might be presumed to be a sensational and popular idea. Not only have the studies been pursued for years, but a number of distinguished biologists have been consulted, and all of them agreed that the subject was worthy of thorough consideration, and that the work that had been done should be published in order that further investigation of a like nature from differing

standpoints might be made. In order that the subject should be better understood, and that the scope in biological investigation in cognate subjects in recent years should be better known, a number of contributions in the recent biological literature relating to this subject and to cognate topics have been quoted. These serve not only to give information that is interesting in itself, but also indicate how much progress is being made in subjects and with regard to biological relations that were formerly, and that not so very long ago, thought to be quite outside the domain of investigation. It is evident that there are a great many questions relating to human origins that are to lose most of their mystery in the near future, and sex determination would seem to be one of these that has now yielded to patient research. This work does not pretend to explain or analyze the phenomena of the presence of the two sexes among beings nor the possibility of a neutral sex among them, but it has to do with the knowledge of manifest mechanics that determine which of the two sexes shall appear in offspring. The observation has been made that there is a definite check on any tendency that might exist in humanity toward an overproduction, or even an overpreservation, of either sex; that nature has some means even of restoring the equilibrium of the sexes when that has been disturbed by unusual conditions in humanity. After the Thirty Years' War, for instance, in Germany so many men had perished in battle, by pestilence in camp, by ineffectual medical and surgical assistance, from famine because of neglect of agriculture and the waste of planted territory, that it is said there were two women alive for every man in the region we now know as the German Empire. Because of this some of the German states relaxed their marriage laws and allowed a man to have two wives. The balance



of the sexes, it is stated, at once began to restore itself, and before the end of the century the normal equilibrium of the sexes had once more been reëstablished.

Such biological mutations with regard to the ratio of the sexes have also been noted in other animals as well as man, and these have been employed with the idea of throwing light on cases similar to the classical example of the German population after the Thirty Years' War. The question of the explanation of them has been taken up very seriously. A few years ago it was thought that some very significant and definite conclusions in the matter had been reached from experiments and observations on tadpoles. Some were led to believe that by feeding embryonic forms of the frog in various ways when they were sexless great influence might be exerted upon sex formation. Embryos fed luxuriantly developed into females in much greater proportion than usual, while those scantily fed developed more frequently into males.

Unfortunately, further experiments and observations have not confirmed this conclusion, though as yet there are many biologists who consider that there is something in it, and that this is one mode of investigating nature's methods in the determination of sex. Apply this conclusion to the case above cited of a restoration of the equilibrium of the sexes after the Thirty Years' War. At times when men are in small proportion in the population, women have to work much harder, the means of sustenance are limited, and the human embryos, therefore, may be expected to receive much less nutrition than usual, or, at least, to be much less likely to have a superabundance of nutrition, and therefore, because of these privations and vicissitudes during the Thirty Years' War, according to this theory, a great preponderance of boy babies

would have been born in the German states *during* thirty years, and therefore, at the *end* of that period, could there have been two women for every man? And according to this theory, *after* the war, in case there were two women to every man, the mothers being more luxuriantly fed, war ended, the men at home, it would seem that the equilibrium would continue to be disturbed by the preponderance of girl babies born—if luxuriant or scanty nutrition determine sex. It is easy to see why there should be the supposition of scanty or luxuriant nutrition as determining factors in the sex of cattle, although such a theory has not been susceptible of substantiation, and the so-called "hunger sex" among them is reasonably accounted for along other lines in the light of the sex-determining law as the author understands it.

These and such considerations serve to show that evidently the problem of sex determination was not solved by processes of nutrition, and yet that it is just a biological problem that will have its solution and probably in some very simple way. A great American biologist once said that Nature always accomplishes her purposes much more simply than the philosophic theorist or maker of scientific hypotheses is likely to think. And, indeed, it is a simple solution of this problem that is found. The explanation offered in this book might very well be applied to the conditions that are said to have existed after the Thirty Years' War, since in times of hardship and severe labor the positions assumed before and during sleep are likely to have definite reference to the muscles that have been employed during the day and their mode of employ. We know nothing, then, that in any way contradicts the idea here advanced, and much that seems to suggest that some such simple explanation is probably the correct solution of this interesting problem.

While the writer has carefully investigated the conditions of the problem, and has come definitely to the conclusion here announced, and is familiar with the biological literature relating to the subject, she feels that trained biologists will probably find here and there in the work traces of the amateur rather than of the professional biological worker. Dealing with a difficult subject, she would crave indulgence for such inaccuracies in the use of terms as may have occasionally crept in. The subject is placed before the scientific world with the definite idea of eliciting opinions and proving an incentive to other work along the same line. We have learned so much about human conditions by observation and experiment in late years, and the outlook for future biology is so promising because of recent studies, that this contribution is offered not for its popular interest, but for the sake of quickening at once the practical and scientific consideration of the same problem.

LAURA A. CALHOUN.

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