

A DEFINITION OF HEREDITY—“NATURE VS. NURTURE” NOT A GOOD EXPRESSION

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THE expression “Nature versus Nurture,” introduced originally by Galton, has been very widely adopted, but this prettily balanced phrase is not altogether satisfactory from the standpoint of scientific definiteness. From the artistic point of view we cannot but admire a dainty little bit of word carpentry. We have the two N’s furnishing alliteration, and the words nearly balance in weight. The last four letters are identical, and in addition to this the words seem to express well, the same idea as heredity vs. environment for the antithetical forces of nature. But here is already the first objection. The word nature can never be made to mean anything less than all the forces of the cosmos. Surely everything is nature.

Sometimes, again, the word nature is employed in another limited, yet entirely different sense, as meaning the wild-woods, the fields, the clouds, and the birds. The zealot advocates a “back to nature” movement, as though human nature were not a part of nature. In the same way our forefathers invented for us the phrase “natural history,” thus suggesting that human history was unnatural or at least non-natural, and that man was apart from the world of organic life.

Of course this sort of criticism is almost inevitable, if we start to dissect the English language. The same objections can be raised against the words heredity and inheritance. We all use these words in different senses

with different associative ideas, according to our age, habits of thought, and professional training, even if we are trying to use them in a narrowly defined and technical sense. The word heredity to a biologist, trained in microscopical anatomy and embryology, suggests a single cell—a germ-cell immediately after fertilization. Is it likely that this word suggests the same picture to a man trained in theology or law?

But we shall all have to see the same picture some time—that is, if we are to make the science of heredity part of the curriculum of education, and the best definition of heredity will have to be closely associated with the mechanism of chromosomes and germ-cells, and the clearest pictures will be mentally held only by those who have some ideas of the structures and functionings of these primordial elements.

The use of the word “nature” as synonymous with heredity is associated with an objection beyond the academic one that everything is nature anyway; and that is, because we have the common phrase “human nature,” so that when we say the *nature* of that man is bad, we do not know whether we mean to suggest that his bad nature is inherent or the result of bad associates.

Again, we have the familiar phrase applied to kindly souls that he or she has a “good nature.” This last idea can only be conveyed if the words are spoken (or read as spoken) quickly. How different is the picture portrayed of one who has a good nature (spoken

NOTE: In connection with this discussion it may interest some readers to refer to a former article in the JOURNAL OF HEREDITY for February, 1918 (vol. ix, No. 2) on the “Meanings of Genetic Terms.” About sixty of the terms commonly used in the subject of genetics are there discussed.—Ed.

quickly) from one who has (accent on the good) a *good nature*. So we may have good-natured people who may be lazy, dirty, and incompetent. It is only by stressing the last word that we can convey in *good nature* anything of the Galtonian usage of the word.

The word heredity is also far from ideal as an expression of scientific exactitude. In the first place, we have our "social heredity" or even our "heredity from God," though these usages are usually pretty clearly differentiated, and it is evident from the text that we are talking about something other than the functioning of reproductive germ-cells. The chief difficulty in using the word heredity is that to many people heredity either means all that one is at birth, or means all that one has for an ancestry. Neither of these conceptions is in accordance with modern views on the method of reproductive generation and therefore it is undesirable to use the word heredity in either of these senses.

All that one is at birth is already a compound resultant of germ-plasm and environment. All that one has for an ancestry may amount to little. It is solely a question of how the ancestral germ-plasms are sorted and arranged in any particular case.

The word "heredity" should be understood to signify all that is contained in the original fertilized cell (zygote) from which all the subsequent cells are, by cell-division, produced. If the chromosomes are found to be the sole intracellular agencies controlling the normal development of the body, then the word "heredity" may be considered as synonymous with chromosomes, and to say a man has a good heredity is to say he has good chromosomes. If, as is more probable, other portions of the cell enter somewhat into the matter, though to a limited extent, then the word "heredity" is almost, though not quite, an equivalent of the word chromosomes.



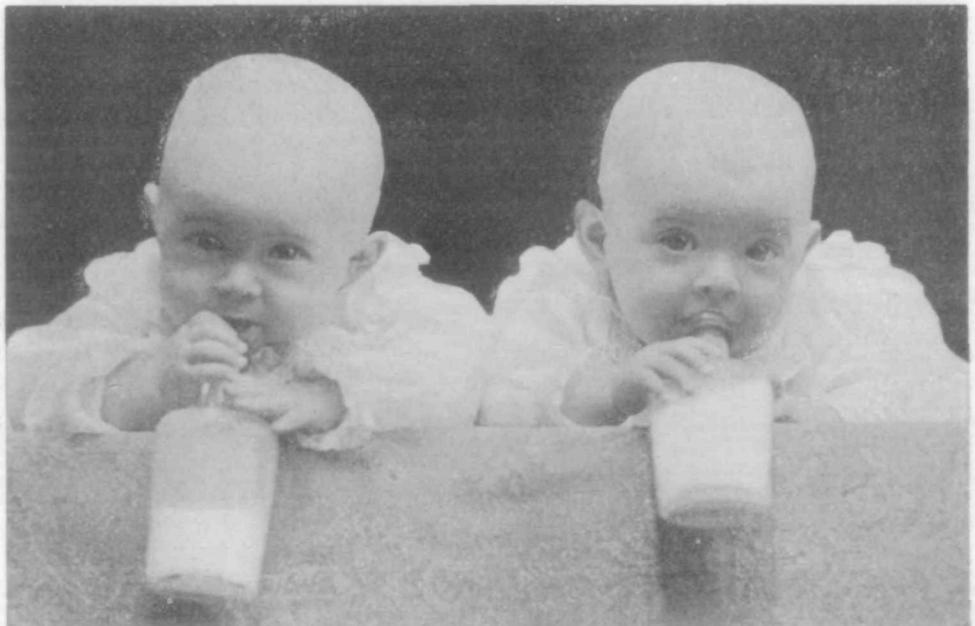
OF THE SAME HEREDITY

George and John Seiffert, of York, Pa., eighteen years old. (Fig. 24.)



IDENTICAL TWINS FROM JAPAN, YEIICHI AND YUJI OGATA, OF TOKIO

(Fig. 25)



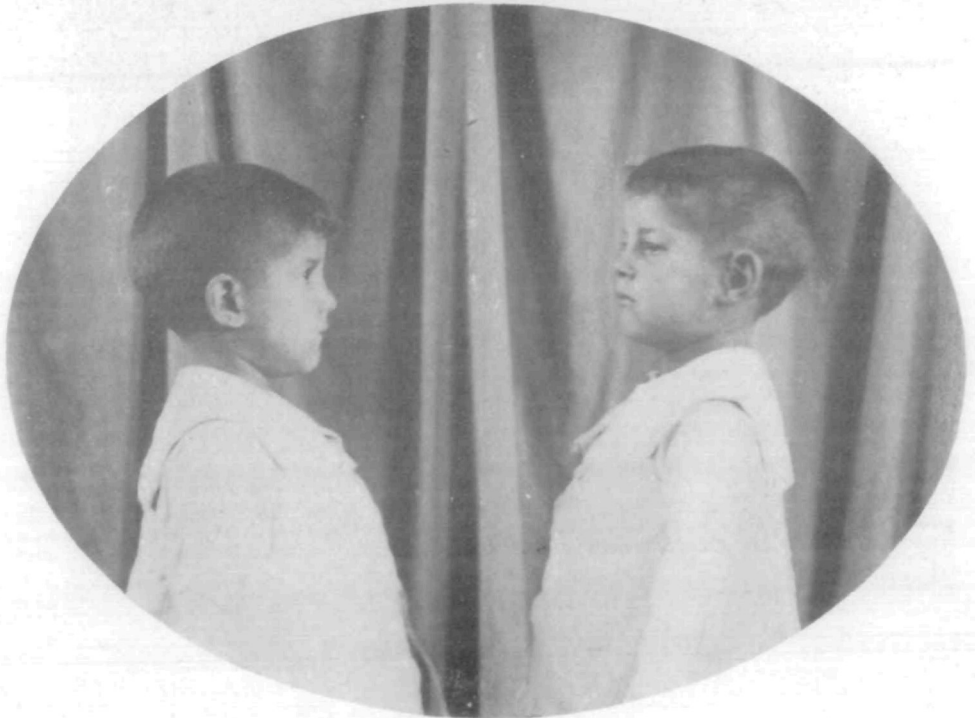
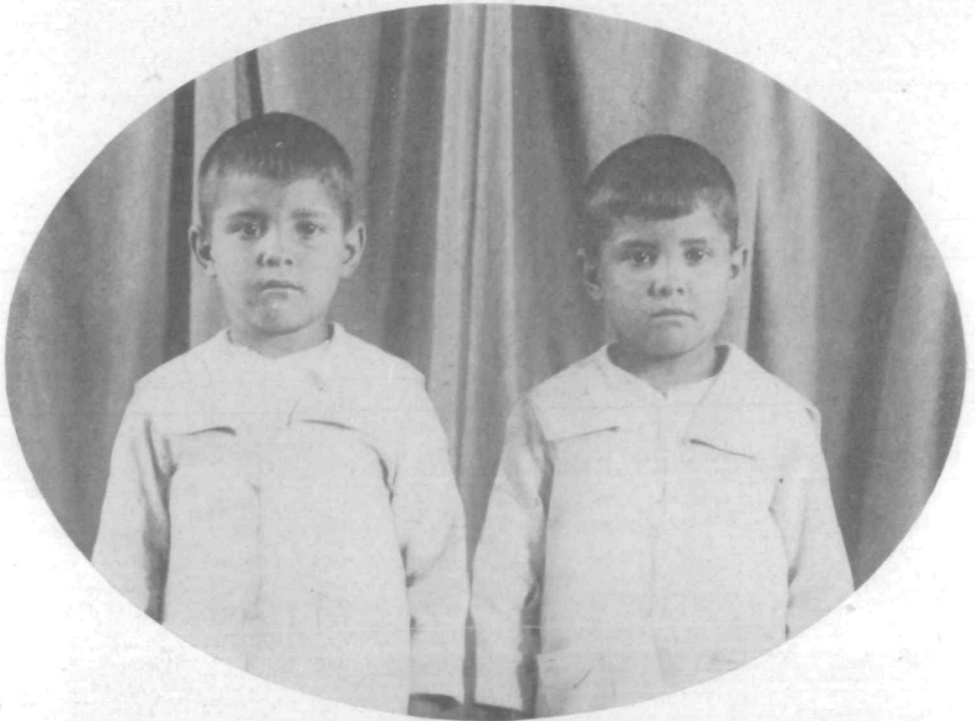
THEY LOOK THE SAME, THOUGH ONE DRINKS FASTER THAN THE OTHER

(Fig. 26.)



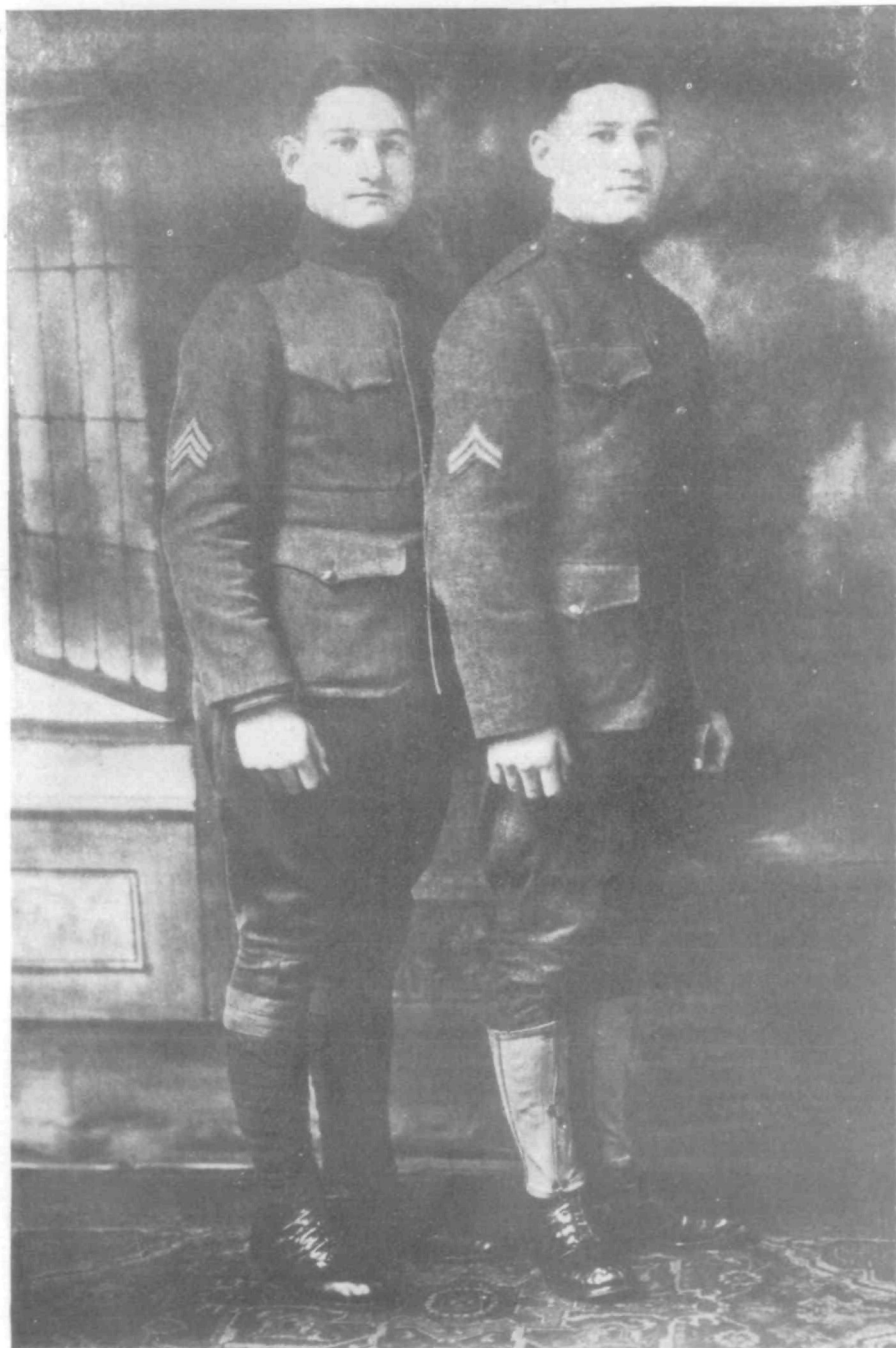
ARE THESE BOYS IDENTICAL?

Appearing at slightly different angles, it is hard to tell if these boys are identical twins and the Association has no data about them at present. They are sons of B. E. Burdick, of Racine, Wis. (Fig. 27.)



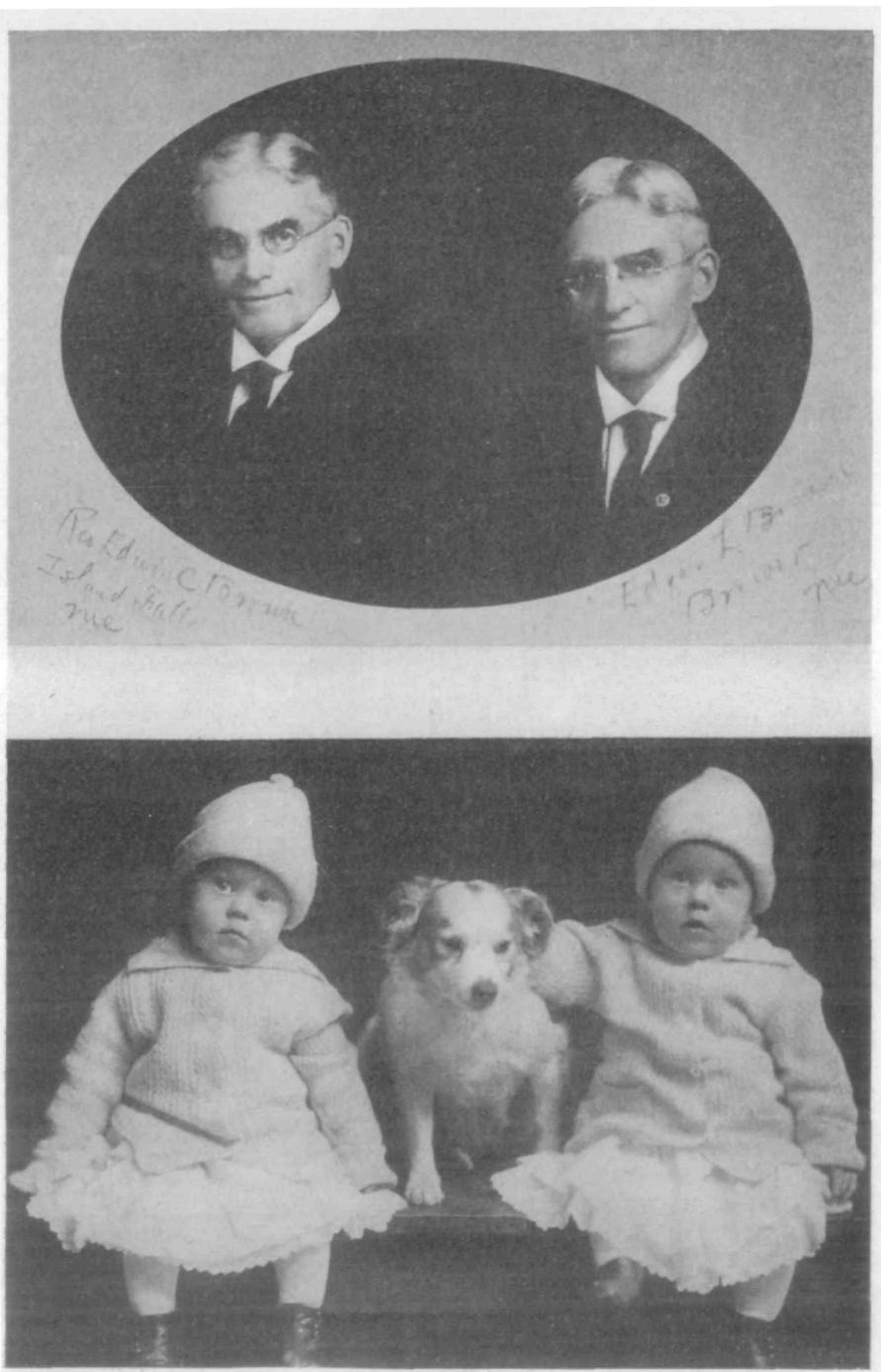
TWO SPANISH BOYS FROM CUBA

From Cuba have come the pictures of Enrique and Armando Brana. These twins were born in June, 1912. (Fig. 28.)



STRIKINGLY SIMILAR IN CHARACTER

The Zermansky twins have a similar love of poetry and music, enjoy the same sports, but differ in their taste for mathematics. Philip dislikes all mathematics except trigonometry, while Mark has been good in all mathematics. They both have slight eye trouble, and their gait is different. Mark was left-handed as a child but was taught to use his right hand. Their writing is strikingly alike; both have a "double-jointed" thumb on the left hand. Mark works hard at anything and does well on examinations, while Philip is inclined to work only at what interests him, and he does not do his best on examinations as he is apt to be nervous. (Fig. 29.)



THE BROWN TWINS AT FIFTY-NINE YEARS AND THE HARLOW TWINS AT TEN MONTHS

For fifty-nine years the brothers (top), whose hair is now snow white, have been taken for one another. Edwin is a Congregational minister and has lived in various places, and Edgar a bookkeeper who has stayed in Maine. Both were born with defective eyesight, one in the right, and the other in the left eye. Both are right-handed; for years with similar gait, with tastes remarkably similar, with similar bodily weaknesses, one requiring surgical aid, both with idiosyncrasy against strawberries and acid foods, both with a good sense of locality and direction, and both peculiarly congenial towards each other. Their handwriting is not strikingly similar. Edgar L., 3 Holyoke St., Brewer, Me. (right); Edwin C., Island Falls, Me. (left).

The chances are very great that, like the Brown twins, the Harlows (bottom picture) will remain alike through life. (Fig. 30.)