

INHERITANCE OF ARTISTIC AND MUSICAL ABILITY.

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THE investigation of the mode of inheritance of human traits has been confined, for the most part, to cases of disease and physical abnormalities. Mental traits are much more difficult to study, because they are more difficult to recognize with certainty, and not infrequently two observers would differ in their opinion as to whether a certain trait was or was not present. I have been able to construct two large pedigrees, one showing the inheritance of artistic, and the other of musical ability. Both pedigrees are so remarkable that they appeared to me to be well worthy of publication. They are large, fairly complete, and throw some light on the mode of inheritance. In both cases my informants have been the judges as to whether the various members of the families are to be classed as artistic or musical, but I shall give all the particulars of each individual as far as they have been gathered, in order that readers may form their own opinion as to the way they should be classified. I think the known facts accord with the classification shown in the charts, where the black circles indicate those members who are artistic in the one case, and musical in the other, and the white circles those who do not possess these traits.

Artistic ability.

In this chart the black circles indicate the artistic members of the family: the white circles the non-artistic. All the artistic members are stated to be *skilful* in drawing: most of them also show marked

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ability in painting, and several excel in design. In addition to ability in drawing, they show the following particulars:—

Generation I.

No. 2 is "very artistic."

Generation II.

No. 1. Paints original pictures and designs.

No. 2. Teacher of drawing: art critic.

No. 5. Draws well.

(No. 6. Does not draw: clever actress.)

No. 12. Architect, and builder of most beautiful houses.

No. 13. Paints pictures.

No. 14. Paints: designs art embroidery. (Husband: a school master.)

Generation III.

No. 1. Designer and actress: highly artistic.

No. 2. Surgeon.

No. 3. Surgeon.

No. 4. Surgeon: artistic photographer: has invented some improvements in photography.

No. 5. Artistic and belongs to an artistic family: her father is a theological author.

No. 9. Clever actress: lady doctor.

Nos. 11, 12 and 13 are accomplished musicians.

No. 16. Paints: accomplished musician.

No. 18. Paints: accomplished musician: has several certificates for drawing.

No. 20. Paints: accomplished musician.

No. 21. Designs art needlework and embroidery.

No. 23. Designs and makes stained glass windows.

No. 24. Draws in black and white: teacher of drawing.

No. 25. Skilful table decorator: horticulturist.

No. 26. Paints pictures.

No. 27. Designer by profession.

No. 30. Artist by profession. Has pictures in the House of Lords and the Royal Exchange.

No. 31. Designer by profession.

No. 32. Artist by profession: formerly designer at Waring's.

No. 34. Designs and makes art needlework.

No. 36. Designs and makes art needlework.

Generation IV.

Nos. 1 and 2. Paint.

No. 10. Draws portraits.

The following members of the family are "exceptionally gifted" as artists :

II. Nos. 1 and 13.

III. Nos. 23, 30, and 32.

IV. No. 10.

Most of those in Generation IV are still young, and their talent is not fully developed.

No. 12 in Generation II seems to have been a strange individual. He always declined to speak about his relatives, or to say who they were. He would give no particulars of his early life. He predicted that he would die on a certain day: a week before its arrival he took to his bed, and died on the specified day.

Is the inheritance in this family such as one expects from a Mendelian point of view?

Marked general ability has been stated to be inherited as a Mendelian recessive.

If artistic ability is recessive, what are the expectations from various matings?

They are as follows:—

(1) Two non-artistic parents, if pure dominants, should have non-artistic children only.

In Generation II, no. 4 and his wife have no artistic ability, and have five children, all of whom resemble the parents.

The same result is seen in the children of the twin sister of no. 8.

In Generation III the only child of no. 15 is not artistic.

These results are perfectly in accord with the theory that artistic ability is a recessive.

(2) Where an artistic individual marries one who is not artistic but has artistic relatives (and if heterozygous in this respect), the expectation is for the children to be of both types in approximately equal numbers.

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The actual results are :

I.	1 + 2	= $\frac{3}{2}$	artistic	}	= 14 artistic 13 not artistic
			non-artistic		
II.	5 + 6	= $\frac{2}{3}$			
	7 + 8	= $\frac{3}{5}$			
	9 + 10	= $\frac{3}{5}$			
III.	17 + 17a	= $\frac{3}{2}$			

Here again the result is strictly Mendelian.

(3) If both parents are artistic *all* the children will be artistic. Two recessives breed true to the recessive character, and do not re-produce the dominant type.

The chart shows that in six cases both parents are artistic. The number of children in each family is respectively as follows: 4, 11, 2, 2, 2 and 3. The last four families are in the youngest generation, and are still children. The numbers will probably be increased considerably. In these six families there are twenty-four children, twenty-three of whom are artistic, and one (III, 28) is of uncertain type. The result here is strictly Mendelian.

The chart contains sixty-four artistic members, by far the largest artistic family of which I have been able to collect particulars. In nineteen instances both parents are shown.

Twins have appeared four times, in each instance being of the same sex. Two pairs are artistic and two are not.

The above particulars have been collected for me, with great care, by the lady $\frac{11}{a}$ in Generation III. She is personally acquainted with most of her relatives, and those she does not know she has received information of, by correspondence, and verbal inquiries extending over a period of about nine months. She is a highly educated lady, and an accomplished musician, but has no knowledge of Mendel's Laws, or of theories of inheritance which might bias her in forming an opinion. She does not know what is to be expected from any particular type of parentage. I wish to express to her my most sincere thanks for all the trouble she has taken, but am not at liberty to mention her by name.

As already stated the black circles indicate those members of the family who are "skilful in drawing," but skill in drawing does not comprise the whole of artistic ability. In its full development artistic ability seems to me to comprise at least five distinct talents: namely

1. Perception of form.
2. Perception of colour.
3. Memory of form.
4. Memory of colour.
5. Inventiveness. (Design.)

Those who possess nos. 1 and 2 may be able to make excellent copies: but could not draw things from memory—they may have no *clear* remembrance of form or colour.

Those who possess nos. 3 and 4 must of necessity have 1 and 2 also.

A person may have all the first four, and be totally lacking in inventive faculty.

Anyone who possesses no. 5 must of necessity possess all the others; so that this must be regarded as the highest form of artistic ability. This family is interesting from this point of view. Several members are stated to be skilful as designers, which means that they possess the inventive faculty.

Nothing can now be stated as to whether there were any designers in Generation I. There are two in Generation II (nos. 1 and 12).

In Generation III there are twelve designers, and they are all children of the two mentioned in Generation II: two of them are the children of II, 1, and ten are the children of II, 12.

If design is inherited like drawing ability, then II, 11 was probably a designer, but if so the fact has not been mentioned. It will be interesting to notice whether "design" develops in the children in the fourth generation. It is noteworthy that no other artistic member of the third generation is talented in this way beyond those mentioned: in other words, only those who design have children who show the same talent.

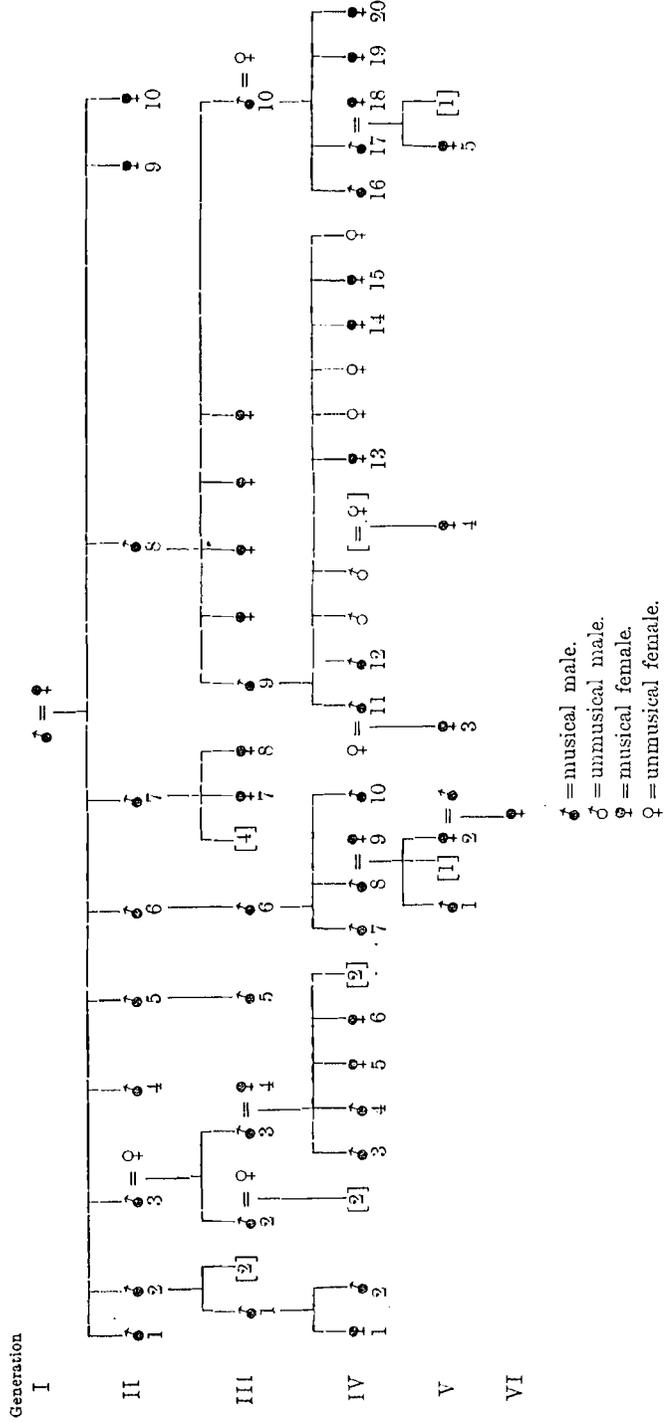
Musical ability.

This chart shows the pedigree of a family of organists. The musical members are indicated by black circles, the non-musical by white ones.

By musical ability is here meant something more than mere ability to play certain musical instruments. It implies the possession of the musical Sense, whatever that is. I am informed by a professional

PEDIGREE OF FAMILY OF ORGANISTS.

The figures in brackets [] give the number of children who either died young or whose musical tastes are unknown.



musician, who has had large experience as a conductor, that there are many performers on brass instruments who cannot be considered really musical: and it is certainly true that the pianoforte is often played in a mechanical sort of way by people quite devoid of musical tastes.

I have asked several eminent professional teachers for a definition of the term "musical," and so far have not received a satisfactory answer.

It appears to me, however, that a man must be considered "musical" if he is capable of acting as professional organist and choir master, and especially if he holds his post for forty years or more, as several members of this family have done. It would appear indeed that such a post must demand the possession of musical talent of a high order.

Moreover, several members of this family are mentioned in the *British Musical Biography* (1897).

The chart at first sight looks fairly complete, but the expert in Mendelian records will observe omissions that are to be regretted. There is an absence of *one* of the parents in six instances, so that one cannot tell precisely how many children should show musical talent on theoretical grounds. On the other hand both parents are shown in ten instances, but even here, unfortunately, it is not known whether the non-musical parent (♀ or ♂) has a musical ancestry or not.

Despite these defects the chart is of great interest as showing that musical ability is, in some way, markedly hereditary; and the chart is complete in so far as the children of each parental pair is concerned, and the type of each is known with the exception of the few shown in brackets [].

Hurst¹ asserts that the musical sense is inherited as a Mendelian 'recessive.'

If that is correct, we should expect the same results of the various matings that are indicated under (1), (2) and (3) in the case of artistic ability, so that only the actual results in this musical family need be mentioned.

(1) Two non-musical parents.

There is only one instance in this family: viz. the parents of no. 4 in Generation V.

One of the parents, the father, belongs to this musical family, but nothing is known of the ancestry of the mother. If she also belonged to a musical family, both she and her husband may be heterozygous

¹ "Mendel's Law of Heredity and its application to Man," *Leicester Lit. and Phil. Soc. Trans.* xii. 1908, p. 35.

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(*DR*) as to musical capacity, and might therefore have musical children, but only one in every four according to theory. If three more children are born they should not be musical.

So that the appearance of V, 4 is unexpected, but is not certainly contrary to the theory that musical ability is recessive.

(2) Where one parent is musical and the other not, but with musical ancestry.

In this case 50 per cent. of the children may be musical, but a larger percentage is not expected.

In III, 9 we get five musical, and five not musical : this is exactly in accord with the above statement.

In II, 3 and III, 10 all the children are musical, and some of them are said to be especially talented. These cases do not accord with the theory that musical ability is inherited as a simple Mendelian recessive, for there are far too many musical members.

(3) If both parents are musical all the children should be so.

Generation II is a striking corroboration of the theory in this respect: it is seen that all the ten children of the couple shown in Generation I were musical. The same is true of the children of III, 3 and 4, IV, 8 and 9, 17 and 18, V, 2, so far as they can be traced. Of twenty-two children, the type of eighteen is known, and they are without exception musical. Nothing is known of the other four children, not even the sex.

The results here are therefore perfectly in accord with Mendelian theory.

With regard to those mentioned in the last paragraph under (2), where the musical members are present in apparent excess, it will be observed that the un-musical parent is in every case the mother. The father was a professional musician holding an important appointment. His musical status would altogether overshadow and eclipse that of his wife, even if she were musical, and one can imagine that any musical talent she possessed might thus be overlooked. The wife moreover is so much engaged with household duties that she has little time for "accomplishments."

If one were able to state that these mothers were "musical" with the talent undeveloped, then one would expect all the children to be musical. Moreover my informant only considers those individuals "musical" who were "performers." Yet there is little doubt that the musical sense may be present without the person learning to play on a musical instrument.

I do not suggest that these considerations will explain the actual results observed in this family, but I do maintain that they are points which should be taken into account.

The following are the particulars I have been able to gather respecting the individual members. Except in one instance V, 2, the inheritance has occurred through the male members of the family, the females having in the great majority of instances remained single.

Generation I.

No. 1. This was John Simms, the earliest member of the family now traceable. He was an organist. He had a musical wife. They had ten children, every one of whom had musical ability of a high order.

Generation II.

No. 1. Bishop Simms, organist at the Church of St Philip, Birmingham (now the Cathedral Church), for about forty years.

No. 2. James, organist at Bromsgrove Church for forty-four years, and also at Chaddeley, Worcester.

No. 3. Samuel, organist at St Thomas's Church, Stourbridge, for fifty years. He was one of the finest players of the time. He died sometime before 1860. His wife "belonged to a musical family."

No. 4. Henry, organist at a church near Stourbridge.

No. 5. Jesse, organist at the parish church of Handsworth.

No. 6. Edward, organist at Ashbourne, Derbyshire.

No. 7. George Frederick, "held musical appointments."

No. 8. Francis or Frank, musical, but not a professional organist.

Nos. 9 and 10 were musical.

Generation III.

No. 1. John Simms, succeeded his father as organist. He had two brothers, one of whom died young: the other was "chef" to the Duke of Fife and "was probably not musical." Nothing is known about the mother.

No. 2. Arthur, organist. He married Miss Shore of Wrexham, who was not musical.

He was born in 1839 at Birmingham. In 1874 obtained the degree of Mus. Bac., Oxford: 1875-80, organist St Mary's Cathedral, Glasgow: then for seven years organist and choir master at Forest School, Walthamstow: afterwards at Chard and Hythe. The obituary notice in the *Church Times* describes him as "a Saint."

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No. 3. Samuel, succeeded his father as organist. Later he was organist at Ladywood (St John's), Birmingham, and afterwards at St Cyprian's, Haymills, Birmingham. He married Miss Davies, a cousin, who was musical. Of their six children four are known to be musical, the other two are untraceable.

No. 5. Henry, born 1804, organist: succeeded his uncle Bishop at St Philip's. Between them they occupied the organ stool for about eighty years. He was famous as an extempore player and as a teacher of pianoforte and singing. He died May 1st, 1872.

No. 6. Edward, born at Oldswinford, Worcestershire, February 10th, 1800, organist successively at Holy Trinity and St John Baptist Churches, Coventry, then for fifty-eight years (1828-86) at St Michael's. He resigned at the age of 86. He established the Coventry Choral Society, and had many distinguished pupils, including George Eliot. It is to him that reference is made in *Middlemarch*. He died in 1893.

Nos. 7 and 8 are "moderately accomplished musicians."

No. 9. Henry, organist at Oldswinford Church, Stourbridge, for forty-two years. Died aged 70.

No. 10. Frank, has played church services since 14 years of age, and is now 83. Has held three church appointments as organist. He has supplied me with most of the information about his family, and his estimate as to musical ability of the various members is here recorded. His wife "belonged to a musical family."

He had four sisters, Elizabeth, Emma, Frances and Mira, all musical.

Generation IV.

Nos. 1 and 2 "are both musical."

No. 3. Samuel, succeeded his father as organist at St Cyprian's, Haymills, Birmingham, where he remained for over thirty years.

No. 4. Arthur, is a Bachelor of Music.

Nos. 5 and 6 "are very musical."

No. 7. Robert Henry, born at Birmingham in 1829, was organist for a short time (1853-56) at Wrexham Parish Church, but died young, suddenly, "as the bells were ringing for morning service."

No. 8. Edward Bishop, organist at Wrexham Parish Church for about forty years (1856-94). He married Miss Shore who was very musical. He died at Wrexham in 1913.

No. 10. George Handel, "was full of music." Became curate of Stoke Prior Church, near Bromsgrove, and later vicar of Haymills, Birmingham.

Nos. 11 and 12. Frank and James Herbert; one studied under Dr Arnold of Winchester Cathedral, and the other at Wells Cathedral. Both obtained first-class musical appointments (Professorships) in the United States. "Frank's wife was not of a musical family, but she was a clever literary writer."

No. 13. Anne, musical.

Nos. 14 and 15. Mary and Emily, were both musical.

No. 16. Henry, was for some time organist at Gresford. Later he entered the medical profession. He and

No. 17. Alfred are "full of the blood of the old ones." Alfred later took to law.

No. 18. Wife of Alfred, is clever musically.

No. 19. Kate }
 No. 20. Clara } are both musical performers.

Generation V.

No. 1. Musical.

No. 2. "Among the best."

No. 3. Music teacher by profession, "is exceedingly clever." She is "a public performer."

Nos. 4 and 5 are very gifted.

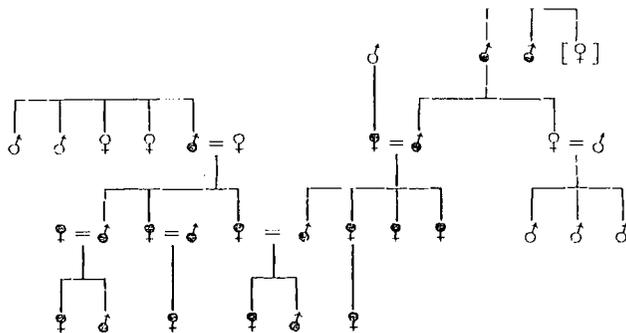
Generation VI.

No. 1 is very gifted.

I am able to give the pedigrees of four other musical families. In the E. D. and to a less extent in the R. family the ability is of a very

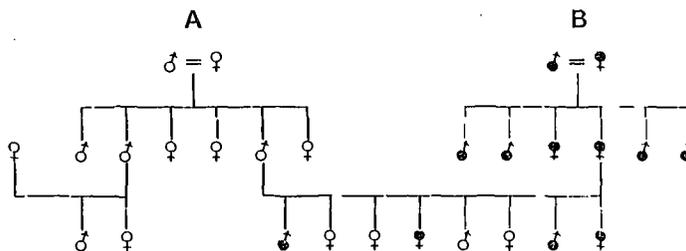
INHERITANCE OF MUSICAL ABILITY. R. FAMILY.

It agrees with the theory that where both parents are musical all the children should be musical.



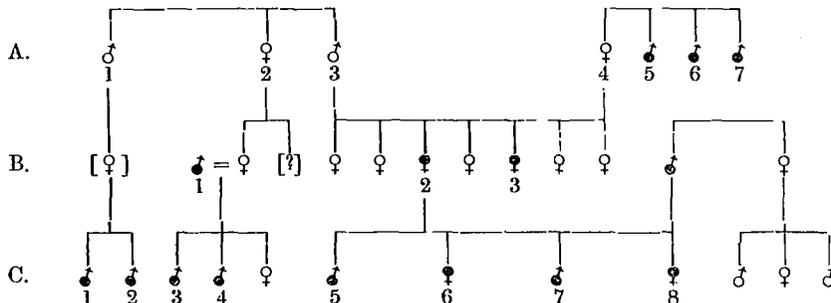
INHERITANCE OF MUSICAL ABILITY. S. D. FAMILY.

- A. Both parents non-musical have only non-musical children.
- B. Both parents musical: all the children are musical.

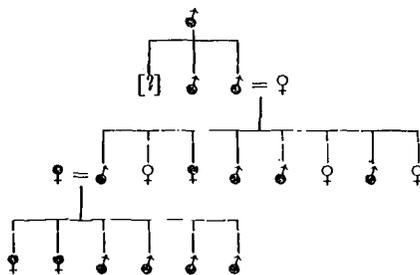


INHERITANCE OF MUSICAL ABILITY IN VERY HIGH DEGREE. E. D. FAMILY.

A 6, C 1, 2, 3 and 4 are professional musicians with university degrees.



INHERITANCE OF MUSICAL ABILITY. J. FAMILY.



high order ; many of the members are professionals, and have university degrees in music. In every case they show that where both parents are musical all the children show musical ability. The E. D. and the J. families agree with the theory that musical talent is inherited as an ordinary recessive, like dwarfness in *Pisum sativum*. In the R. pedigree the three children of ♂ = ♀ are all musical and this is exceptional.

The chart of the S. D. family shows two branches (or roots). One A contains non-musical members exclusively: the B branch is entirely musical. When both parents are musical all the children are musical (B). Where musical ability is lacking in both parents, all the children lack musical ability (A). The two families became united by marriage. According to Mendelian theory—i.e. supposing musical ability to be transmitted as an ordinary recessive—the children should all lack musical ability, but as a matter of fact exactly 50 per cent. are musical, and two of them are professionals of great ability. The inheritance is exactly what would be looked for if the father (♂) were heterozygous, but from the pedigree he is more probably homozygous.

The conclusions that one must come to from a study of these pedigrees are

- (1) The inheritance is strictly Mendelian where both parents show the 'recessive' trait.
- (2) There are too many musical children born, when only one parent (apparently) is musical.
- (3) No satisfactory explanation can be offered for the latter feature.
- (4) Musical sense is probably recessive.