

MISCELLANEA.

I. The Inheritance of Psychical Characters*.

*Being further Statistical Treatment of Material Collected and Analysed by
Messrs G. Heymans and E. Wiersma.*

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(1) IN April 1905 Messrs Heymans and Wiersma sent to all Dutch doctors (about 3000 in number) and to some others, six forms, each containing in all ninety questions concerning psychical characters, and their direct or indirect expression.

The recipient was requested to select from his friends and relations one family (containing father and mother and one or more children—where possible grown up), concerning which he happened to have exact knowledge, but otherwise at random, and to answer each question for each member of the family by underlining one of the alternative characteristics mentioned in the question.

Of the six forms sent, one referred to the father, one to the mother, and the remaining four to the children.

The ninety questions were divided into six classes according to the nature of the characteristics to which they referred.

Class I. *Movements and Occupations.* (Questions 1—8.)

Mobility or restfulness; steady or temporary industry or laziness; manner of spending leisure hours; inclination to neglect work coming as a duty, for other work; postponement of any business or taking it in hand at once; giving up easily, perseverance or obstinacy in encountering difficulties; acting impulsively or after deliberation, or on fixed principles; resolute or undecided.

Class II. *Feelings.* (Questions 9—15.)

Emotionalism; vehemence or coolness in conversation; irritability, good humour, or weak acquiescence; inclination to criticize or idealize; distrustfulness or immoderate trustfulness; tolerance or intolerance; joyfulness, gloominess, inclination to alternating moods, or evenness of disposition; anxiousness or freedom from care.

Class III. *Secondary Functions.* (Questions 17—26.)

The tendency to be easily consoled, or to feel for a long time the loss of persons for whom love was felt; the tendency to be easily reconciled, to protracted ill-humour, or to irreconcilability; lasting or changing sympathies and antipathies; clinging to old memories or easily claimed

* University of London, *Publications of the Francis Galton Laboratory for National Eugenics.*

by new impressions or friends ; stiffnecked adhesion to old opinions, accessibility to fresh points of view, or liability to be easily talked over ; need of change of routine ; repeated or single change of profession ; fabrication of projects ; working for the future or for the present ; agreement or disagreement between preaching and practice.

Class IV. Intellect and kindred Qualities. (Questions 27—43.)

Much comprehension, understanding, superficiality or stupidity ; knowledge of human nature ; common sense ; wide or narrow outlook ; reliance on self or on others ; decidedness or cautiousness in expression of opinion ; special talents ; wit ; manner of conversation ; narrative faculty ; verbosity or speaking to the point ; often repeating the same stories ; public speaking ; power of observation ; ear for music ; manual dexterity ; memory.

Class V. Inclinations. (Questions 44—81.)

Eating and drinking ; use of alcohol ; sexual life ; self complacency ; vanity ; ambition ; desire for wealth ; avarice, thriftiness, freehandedness or extravagance ; lust of power ; severity, tenderness and care in bringing up of children, or allowing them much freedom ; behaviour to subordinates ; sympathy, egotism, or cruelty ; philanthropy ; political views ; political activity ; patriotism ; natural, forced or affected manner ; demonstrativeness, reservedness, or dissimulation ; openness ; diplomatic behaviour, or intriguing ; love of truth ; reliability with regard to money matters ; religiousness ; love of children ; love of animals ; consorting with social superiors or inferiors ; different in behaviour to superiors and inferiors ; courage, timidity or cowardice ; desire for amusement away from home, for the home circle or for solitariness ; subjects of conversation ; ribaldry ; reading ; casuistry ; compilation ; new doctrines ; sport ; intellectual games ; games of chance ; interest in the relationship and financial position of acquaintances.

Class VI. Miscellaneous. (Questions 82—90.)

Inclination to pay compliments, politeness or rudeness ; absent-mindedness ; cleanliness or orderliness ; punctuality ; peculiarities in manner of speech ; in tone of voice ; laughter ; behaviour in illness ; psychical disturbances.

Out of the three thousand and more sets of forms which were sent out more than four hundred were returned*.

As has been stated previously, the questions were answered by underlining one of the alternative characteristics mentioned. In some cases only two such alternatives were given, while in others three or four and in one case five were enumerated.

In reducing a sample of the material by biometric methods it was thought advisable to apply the contingency method, where this could profitably be done : i.e. in those cases where there were four or five alternative answers to the questions and consequently where parents and children could be put into four or five different classes and tables containing 16 or 25 squares constructed. The contingency method was in all cases checked by making a fourfold division of the table and calculating the correlation coefficient from it.

To the tables derived from questions in which there were only two alternative answers the fourfold correlation method only was used ; we have not considered any in which there were three alternatives.

Thus our sample tables are divided into two groups.

(2) Group I. *Fourfold correlation tables alone employed*, results summarized in Table A.

Questions on the answers to which the results are based.

Question I. Is the person concerned mobile and fidgety (gesticulating, easily rising from his chair) or sedate and quiet ?

* Heymans, G. and Wiersma, E., "Beiträge zur speziellen Psychologie auf Grund einer Massenuntersuchung. *Zeitschrift für Psychologie*, Bd. XLII. 1906, pp. 1—127, and pp. 258—301.

Question III. Is the person concerned mostly occupied in his leisure hours (playing skittles, working in the garden, mending something, doing women's work) or is he inclined to make himself comfortable?

Question IV. Is the person in question inclined to neglect tasks which come as a matter of duty (office work, study in his own subject, house keeping) in favour of others which do not (meetings of societies, propaganda, study outside his own subject, hobbies)?

Question VIII. Is the person in question resolute (quickly coming to a decision in difficult cases) or is he undecided (delaying for a long time, swaying this way and that, and only with difficulty reaching a final decision)?

Question IX. Is the person concerned emotional (taking trifles to heart more than others do, in ecstasies or tears from the slightest cause) or unemotional (less sensitive than others, cold by nature)?

Question XII. Is the person concerned critical (having much to find fault with in others, noticing and remembering more particularly their bad characteristics), or idealizing (inclined to find people good and loveable)?

Question XVI. Is the person concerned anxious and timid (very much worried about the future, afraid of any task that is undertaken or any change that is to be expected) or sanguine (inclined to think that the things will come all right)?

Question XXXII. Is the person concerned inclined to come out with a decided expression of opinion, or only to express himself conditionally (so as to leave himself a loophole for escape)?

Question XLIV. Does the person concerned care much for good eating and drinking or not?

Question LXXIV a. Is the person concerned one who reads much or not?

In order to demonstrate the method by which our correlation tables were constructed from the original tables given by Heymans and Wiersma, we take Table I. for an example. In its original form it is as follows:

TABLE I.

			Söhne			Töchter			S. u. T.		
	V	M	b	r	?	b	r	?	b	r	?
1	b	b	43	24	1	57	18	4	100	42	5
2	b	r	84	84	2	72	83	3	156	167	5
3	b	?	5	3	0	6	7	0	11	10	0
4	r	b	80	106	5	69	80	8	149	186	13
5	r	r	71	143	11	70	116	8	141	259	19
6	r	?	7	20	2	7	6	3	14	26	5
7	?	b	4	4	2	4	6	0	8	10	2
8	?	r	13	18	5	10	12	2	23	30	7
9	?	?	8	7	1	3	2	3	11	9	4

In the table given above, *b* stands for mobile and fidgety, *r* for sedate and quiet. The query denotes that the question was either not answered or not answered clearly. We first collected all the cases in which the father was described as fidgety. They are all contained in lines 1, 2, and 3, and from them by referring to the column headed "Söhne" we learn that in $43+84+5=132$ cases the son was also fidgety; but in $24+84+3=111$ cases he was quiet, whereas in $1+2=3$ he was not classed. Then all those cases in which the father was quiet were collected; these are given in lines 4, 5, and 6 and taking them together we find that in $80+71+7=158$ cases the son was fidgety, but in $106+143+20=269$ he was quiet, and in

$5+11+2=18$ the question could not be answered with certainty. The next three lines 7, 8, 9, were not considered because here the father's peculiarities are not given. Then neglecting all the indeterminate sons the following fourfold table can be constructed.

TABLE I (a).
Correlation between Father and Son.

		Father.	
		Fidgety	Quiet
Son.	Fidgety ...	132	158
	Quiet ...	111	269

The correlation table between mothers and sons can be constructed in exactly the same way, except that the fidgety mothers are found in lines 1, 4, 7, instead of 1, 2, 3, and the quiet mothers in lines 2, 5, 8, instead of 4, 5 and 6. The tables giving each parent and the daughters may be formed by consulting the column headed "Töchter" instead of that headed "Söhne".

It was thought desirable to calculate the coefficient of assortative mating, that is to say the correlation coefficient between father and mother; but as no data are given in the original tables which would enable one to do this directly, it was necessary to make a table in which the parents were weighted with the number of their children, that is to say included once for each child recorded. This it was possible to do in the following way. Line 1 gives those cases in which both father and mother were fidgety and by looking at the right hand column headed S. u. T. (Söhne und Töchter) we learn that there were $100+42+5=147$ offspring recorded from marriages of this nature. Line 2 summarizes cases in which the father was fidgety and the mother quiet; such of their progeny as are included amount to $156+167+5=328$. In line 4 the characteristics of the parents are reversed and the children number $149+186+13=348$; whereas line 5 gives those marriages in which both parents were quiet, which are apparently in the majority as they have given rise to 419 children. Lines 3, 6, 7, 8 and 9 are neglected, as in all of these the nature of one at least of the parents is doubtful, but from the remaining lines sufficient data have been derived to allow of the construction of a correlation table, which will be as follows:

TABLE I (b).

		Father.	
		Fidgety	Quiet
Mother.	Fidgety ...	147	348
	Quiet ...	328	419

There is no reason why the results obtained from a table weighted in this way should differ much from those obtained from a simple table in which each pair is included only once—unless there is any causal relation between the class in which the parents are placed and the number of their children.

All the correlation coefficients calculated from the ten original tables are summarized in Table A. In the first column are given the coefficients of correlation between father and son, which range from .19 to .59 and average .307; in the second column are entered those between father and daughter, which range between .11 and .43 and average .224; in the third between

mother and son, which range between .07 and .47 and average .188; in the fourth, between mother and daughter, which range between .16 and .63 and average .322. In the fifth column the coefficients of assortative mating are set down, these range between -.29 and .42. In the right hand division of the table are the inheritance coefficients, father and son, father and daughter, mother and son, mother and daughter, each corrected for assortative mating according to the following formula:

Where r_{FS} = correlation between father and son,

r_{MS} = " " mother and son,

r_{FM} = " " father and mother,

then the correlation between father and son corrected for assortative mating, i.e. for a constant value of the character investigated in the mother

$$= \frac{r_{FS} - r_{MS} \times r_{FM}}{\sqrt{(1 - r_{FM}^2)} \sqrt{(1 - r_{MS}^2)}}.$$

The same formula is of course applied (*mutatis mutandis*) to the correction of the coefficient of correlation between father and daughter, mother and son and mother and daughter.

It will be seen that the range of variation of the coefficients is somewhat reduced by the process of correction, and since the assortative mating coefficients are on the whole more negative than positive with regard to these ten characters the mean values of the coefficients are somewhat raised, except in the case of father and daughter. Thus for father and son the range is now between .19 and .49, with a mean value of .316; for father and daughter, between .09 and .52, with a mean value of .214; for mother and son, between .04 and .30, with a mean value of .202; for mother and daughter, between .19 and .57 with a mean value of .342.

(3) Group II. *Characters to which the Contingency Method was applicable.*

The following is the list of questions by which the information contained in the original tables, which we have selected, was elicited.

Question XV. Is the person concerned merry and bright (enjoying life) or melancholy and gloomy, or does he change from one mood to the other, or is he always of a quiet and even disposition?

(Divided for the purpose of the fourfold tables into two groups: (1) containing all those who were regarded as merry and bright or of quiet and even disposition and (2) the remaining ones.)

Question XLV. Is the person concerned a drunkard, or one who drinks alcohol regularly, or occasionally, or never?

(Divided for the purpose of the fourfold tables into (1) drinkers and (2) teetotallers.)

Question LI a. Is the person concerned avaricious, thrifty, freehanded in money matters, or wasteful?

(Divided for the purpose of the fourfold tables into (1) avaricious and thrifty, (2) freehanded and extravagant.)

Question LVII. Is the person concerned a radical (radikal reformatorisch) with regard to politics; a liberal (gemässigt reformatorisch), a conservative or indifferent?

(Divided for the purpose of the fourfold tables into (1) radicals and liberals, (2) conservatives and indifferent persons.)

Question LXIII. Is the person concerned entirely credible, or inclined to exaggerate or embellish his statements, or is he a liar?

(Divided for the purpose of the fourfold tables into (1) entirely credible, (2) the rest.)

Question LKV. Is the person concerned deeply religious (his whole life pervaded, as it were, with religion), or conventionally religious (observing the outward forms of religion without much real feeling) or inclined to scoff at religion or indifferent to it?

(Divided for the purpose of the fourfold tables into (1) deeply religious and making the conventional observances, and (2) scoffing and indifferent.)

Question LXXXVI. Is the person grave and deliberate in speech, positive, good-humoured, ironical or inclined simply to prattle?

(Divided for the purpose of the fourfold tables into (1) deliberate and positive, and (2) good-humoured, ironical or prattling.)

Question LXXXVII. Does the person concerned speak with a drawling or in a shrieking tone, or with an even flow, or shortly and abruptly?

(Divided for the purpose of the fourfold tables into (1) speaking evenly, (2) the rest.)

Our contingency tables were constructed from the original tables given by Heymans and Wiersma in exactly the same way as the fourfold correlation tables, except that a larger number of divisions of parents and children was taken. To take an example: the following is the original Table XV. *h* stands for merry, *s* for melancholy, *a* for changing from one mood to the other, and *gl* of even disposition.

TABLE XV.

		Söhne					Töchter					S. u. T.				
	<i>r</i> <i>M</i>	<i>h</i>	<i>s</i>	<i>a</i>	<i>gl</i>	?	<i>h</i>	<i>s</i>	<i>a</i>	<i>gl</i>	?	<i>h</i>	<i>s</i>	<i>a</i>	<i>gl</i>	?
1	<i>h</i> <i>h</i>	39	0	18	12	0	36	0	8	2	1	75	0	26	14	1
2	<i>h</i> <i>s</i>	5	1	3	8	0	4	0	4	1	0	9	1	7	9	0
3	<i>h</i> <i>a</i>	26	1	33	17	0	26	3	23	10	2	52	4	56	27	2
4	<i>h</i> <i>gl</i>	42	7	12	18	1	35	2	13	14	1	77	9	25	32	2
5	<i>h</i> ?	10	1	4	3	3	7	0	2	1	0	17	1	6	4	3
6	<i>s</i> <i>h</i>	6	2	5	4	0	5	0	3	6	0	11	2	8	10	0
7	<i>s</i> <i>s</i>	0	0	0	0	0	0	0	0	1	0	0	0	0	1	0
8	<i>s</i> <i>a</i>	1	0	0	2	0	0	0	1	2	0	1	0	1	4	0
9	<i>s</i> <i>gl</i>	1	0	4	0	0	1	0	1	1	0	2	0	5	1	0
10	<i>s</i> ?	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
11	<i>a</i> <i>h</i>	36	3	39	10	3	31	3	24	9	1	67	6	63	19	4
12	<i>a</i> <i>s</i>	4	1	4	1	1	2	2	6	0	0	6	3	10	1	1
13	<i>a</i> <i>a</i>	20	3	31	16	1	30	5	42	7	0	50	8	73	23	1
14	<i>a</i> <i>gl</i>	18	0	26	21	5	24	1	20	15	0	42	1	46	36	5
15	<i>a</i> ?	3	0	1	4	0	1	0	2	0	0	4	0	3	4	0
16	<i>gl</i> <i>h</i>	34	2	17	14	3	40	4	20	10	0	74	6	37	24	3
17	<i>gl</i> <i>s</i>	1	0	5	5	0	4	1	4	2	0	5	1	9	7	0
18	<i>gl</i> <i>a</i>	18	6	29	10	0	20	2	17	17	1	38	8	46	27	1
19	<i>gl</i> <i>gl</i>	9	2	15	12	2	13	3	11	5	1	22	5	26	17	3
20	<i>gl</i> ?	5	0	2	4	4	5	1	4	2	0	10	1	6	6	4
21	? <i>h</i>	4	1	2	0	0	6	0	1	0	1	10	1	3	0	1
22	? <i>s</i>	0	1	0	0	0	0	0	3	0	1	0	1	3	0	1
23	? <i>a</i>	0	0	2	0	0	1	0	0	0	0	1	0	2	0	0
24	? <i>gl</i>	1	0	0	4	1	1	2	4	3	1	2	2	4	7	2
25	? ?	0	0	0	3	0	0	0	1	0	0	0	0	1	3	0

In constructing from this the contingency table between father and son we must first collect from lines 1, 2, 3, 4, 5, all those cases in which the father was merry; then from the column headed Söhne we find that in $39+5+26+42+10=122$ cases the sons were also merry; but in $1+1+7+1$ or 10 cases they were melancholy; in $18+3+33+12+4=70$ they were of changeable moods; and in $12+8+17+18+3=58$ they were of even temperament. Thus one is able to fill in the first column of the contingency table the sons who come in the doubtful class, and who number 4, not being included.

The second column may be derived in a similar way from lines 6—10; the third from lines 11—15; the fourth from lines 16—19. Lines 20—25 which record the cases in which the father fell into the doubtful class were omitted.

TABLE XV (a).

Father.

Son.		Father.				Totals
		Merry	Melancholy	Alternating	Even	
	Merry ...	122	8	81	67	278
	Melancholy ...	10	2	7	10	29
	Alternating ...	70	9	101	68	248
	Even ...	58	6	66	45	175
	Totals ...	260	25	255	190	730

The contingency table between mother and son may be made up in a similar manner. The first column is derived by summing lines 1, 6, 11, 16 and 21; the second from lines 2, 7, 12, 17 and 22; the third from lines 3, 8, 13, 18 and 23; and the fourth from lines 4, 9, 14, 19 and 24; while lines 5, 10, 15, 20 and 25 which contain the cases in which the mother fell into the doubtful class were neglected.

The contingency tables between father and daughter and mother and daughter can be constructed in exactly the same way as those between father and son and mother and son, except that the column headed "Töchter" is used instead of that headed "Söhne"; and finally by using the last column the contingency table between mother and father may be arrived at.

The results obtained from the eight characters investigated in this way are summarized in Table B. The first four divisions of the table are devoted respectively to father and son, father and daughter, mother and son and mother and daughter, and are each divided into three columns; in the left hand column the mean square contingency coefficient is given, in the middle one the mean contingency coefficient and in the right hand one the correlation coefficient. In the lowest line of the table the mean values of each column are entered. In the fifth division of the table are given the assortative mating coefficients; and in the sixth the mean square contingency coefficients corrected for assortative mating between father and son, father and daughter, mother and son, and mother and daughter. This correction was made according to the formula given in the description of Table A, but the mean square contingency coefficients were used throughout instead of the correlation coefficients. As these constants are without a - or + sign, the sign given by the fourfold correlation method was used with them. In two cases (Tables XV. and LXIII.), where the latter method at first gave a result so small in value that its sign could not be considered to be significant, a second division of the contingency table was made and the correlation coefficient recalculated for this. As a result of this the original negative sign was retained in Table XV. and changed to positive in Table LXIII.

As in the case of Table A, the effect of correcting for assortative mating is to make the results in each column more homogeneous; but since in Table B, unlike the previous one, the assortative mating coefficients are for the most part positive, the mean value for each column is reduced. The mean corrected values are in rough agreement with the mean corrected values given in Table A, and since the correlation coefficients appear on the whole to be higher than the contingency coefficients, if the former had been taken and corrected instead of the latter, the agreement would have probably been more marked.

The mean square contingency coefficients were corrected instead of either of the other two constants because more weight is to be attached to them. The correlation coefficients in particular, which were calculated from these eight groups of tables, are on the whole not much

TABLE A.

Number of Table in Original Paper	Character	Uncorrected				Father and Mother (Assortative Mating Coefficient)	Corrected for Assortative Mating			
		Father and Son	Father and Daughter	Mother and Son	Mother and Daughter		Father and Son	Father and Daughter	Mother and Son	Mother and Daughter
I	Full of movement or sedate and quiet	.27	.21	.12	.21	-.23	.31	.26	.19	.26
III	Occupies his leisure hours or inclined to make himself comfortable	.27	.11	.23	.24	-.03	.27	.11	.23	.24
IV	Neglects duties for other occupations or not	.24	.18	.15	.41	+.20	.22	.11	.11	.39
VIII	Resolute or undecided	.27	.37	.10	.36	-.03	.27	.37	.10	.36
IX	Emotional or not emotional	.32	.15	.20	.16	-.17	.37	.18	.27	.19
XII	Critical or idealizing	.33	.09	.14	.21	-.29	.39	.16	.26	.25
XVI	Anxious or sanguine	.32	.43	.18	.22	-.28	.39	.52	.30	.39
XXXII	Decided or cautious in the expression of opinions	.19	.18	.22	.36	-.02	.19	.18	.22	.36
XLIV	Caring much for good eating and drinking or not	.59	.33	.47	.63	+.42	.49	.09	.30	.57
LXXIV ^a	Reading much or not	.27	.19	.07	.42	+.11	.26	.16	.04	.41
	Means	.307	.224	.188	.322	—	.316	.214	.202	.342

TABLE B.

Number of Table in Original Paper	Character	Uncorrected Constants. C_1 = Mean square contingency coefficient. C_2 = Mean contingency coefficient. r = Correlation coefficient, found by fourfold tables.												C_1 corrected for Assortative Mating						
		Father and Son			Father and Daughter			Mother and Son			Mother and Daughter			C_1	C_2	Father and Mother = Assortative Mating Coefficient	Father and Son	Father and Daughter	Mother and Son	Mother and Daughter
		C_1	C_2	r	C_1	C_2	r	C_1	C_2	r	C_1	C_2	r							
XV	Temperament merry or not	.16	.20	.15	.25	.26	.26	.21	.28	.19	.21	.28	.24	.19	.20	—	.21	.30	.25	.27
XLV	Tendency towards drink	.35	.41	.46	.31	.28	.43	.18	.16	.23	.48	.56	.63	.27	.24	—	.32	.21	.09	.42
LI	Nature with regard to ex- penditure of money	.30	.34	.32	.32	.34	.34	.34	.24	.21	.30	.33	.33	.34	.24	—	.26	.29	.31	.26
LVII	Political opinions	.45	.51	.58	.30	.32	.35	.21	.24	.24	.46	.55	.46	.29	.31	—	.41	.16	.08	.40
LXIII	Truthfulness	.26	.27	.33	.23	.27	.32	.27	.30	.35	.32	.28	.33	.22	.13	—	.21	.17	.23	.28
LXV	Religious feeling	± .035	.51	.57	.53	.63	.67	.46	.52	.53	.57	.72	.79	.53	.66	—	.35	.33	.26	.40
LXXXVI	Manner of speech	± .021	.40	.28	.27	.30	.14	.32	.37	.40	.28	.37	.34	.30	.26	—	.25	.20	.25	.22
LXXXVII	Tone of voice	± .030	.18	.28	.40	.31	.43	.15	.13	.23	.26	.17	.23	.22	.13	—	.22	.36	.10	.19
	Means	.325	.360	.376	.325	.340	.367	.267	.280	.297	.360	.407	.419	—	—	—	.279	.252	.194	.305

to be insisted on. The four or five alternative characters given do not, in many cases, form any sort of scale, so that it is difficult to divide them satisfactorily into two groups. This objection however does not apply to the contingency coefficients, which are equally valid whether the classes included form a scale or not.

The probable errors of four of the mean square contingency coefficients were calculated and are entered on the last half of the first division of the table. It will be seen from these that the mean and mean square contingency coefficients do not differ in any case by many times the probable error, the latter are however almost in every case higher.

Conclusions.

In conclusion we claim that we have made some of Messrs Heymans and Wiersma's numerical results more intelligible—to the initiated—by expressing them, by means of the statistical constants calculated, in a form which renders them comparable among themselves, and with similar results obtained for widely different characters in other places. It is no part of our present purpose to institute such comparisons, to examine the value of the original material, or to inquire how far the measured resemblance between parents and children is due to their having similar inborn characteristics and how far to the moral influence of the former on the latter. We will however point out, that after allowing for the effect of assortative mating the mean coefficients of resemblance between fathers and sons, and between mothers and daughters, calculated for one set of characters by the contingency method and for another set by the fourfold correlation method, come in each case to very nearly $\frac{1}{2}$, the value proposed originally for the parental inheritance coefficient by Mr Galton.

Note on Messrs Heymans and Wiersma's Material.

It appears to me that Mr Schuster's and Miss Elderton's reduction of the data published by Messrs Heymans and Wiersma undoubtedly demonstrates the fact that the psychical characters are inherited. But the extreme irregularity of the whole series, especially the results for assortative mating, make me hesitate to place much confidence in the effects of administering ninety questions to all the members of the Dutch medical profession. It is not improbable that in many cases the doctors filled in the schedule for their own family, and noticing that their wives and they themselves differed to some extent in the psychical character under consideration they did not take the standard of both relative to their experience of the bulk of mankind, but placed themselves in opposing categories and measured their offspring by the personal scale thus established. I have little doubt that this is the source of the negative assortative mating found in so many cases. Here it is that the teacher gives such a much more absolute judgment of children, than the relative judgment of the member of a family. Within the family the slightest differences are emphasised; outside the family these differences are merely intensities of the same characteristic, and no opposites at all. The true resemblances within the stock are seen much better by the outsider. If, on the other hand, the doctor who filled in the schedule chose a family, which he knew only from the outside, I cannot believe that he would be in a position to answer very completely the ninety searching questions asked about each individual member. I find from my own inquiry forms that the medical, physical and more material points get fairly satisfactorily answered, but the psychical characteristics are much more likely to be distorted when they come from any one whose life has not been to some large extent spent on training or observing individual minds. I feel therefore that above all things in these inquiries a few simple points carefully followed up in a large group will do far more to help us than such a wide field as that selected by the Dutch investigators. I am also convinced that the school is at present the best place for starting such inquiries; the age differences between parent and offspring must have been very influential at many points of Messrs Heymans and Wiersma's investigation. Above all I shall be surprised when better psychical material is available, if the marked difference in heredity between parent and offspring of the same and of the opposite sex is found to be real.

K. P.

Biometrika v