

SIGNS OF INTELLIGENCE

Large Head Is Not a Reliable Evidence of Superior Mentality—Conscientiousness More Closely Associated with Intelligence Than Any Other Trait so Far Measured

DANIEL Webster's head was so large that he had to have his hats made to order; and he was a man of great intellectual ability.

On "evidence" of this sort it has been generally supposed that a large head means superior mentality. But this is by no means the only supposed relation between external physical characters and mental qualities. Phrenology tried to build a science on these relations; and after phrenology was transferred by unanimous consent from the realm of science to the realm of superstition, the task of interpreting character by external appearances was taken over by a school, very active during the last few years in the United States, of "character experts." Their work, which has some scientific backing, has been connected rather conspicuously with the movement for vocational guidance and industrial efficiency. They profess to be able, to some extent, to tell by a man's appearance, and especially by an examination of his face and head, what his mental talents are.

There can be no doubt that, in a limited way, character is really revealed by the face. The habitual use of certain sets of muscles leaves lines which register the most frequent emotions of their bearer. But these traits are so subtle and complex that they can hardly be pointed out, much less measured; so far, therefore, they have remained outside the field of exact science.

It is easily possible, however, to decide by exact methods whether there is any connection between a large head and intelligence, because the head can be measured with calipers and the intelligence measured by school stand-

ing or estimated by teachers and friends. Similarly a wide range of other characters can be used with precision. In this way large numbers of persons can be studied and the average results found. To cite the case of Daniel Webster as having had a notably large head and great intelligence does not prove that the two are ordinarily found together in men, yet much of the supposed "evidence" cited by those who diagnose character is not worth much more than that.

KARL PEARSON'S STUDY

The problem can never be solved by citing individual instances, no matter how many thousands of them might be collected. But it lends itself admirably to treatment statistically by the correlation method, and Karl Pearson, the master of this method, has done some work on it which seems to deserve being brought to notice, since it was published in technical form¹ and has attracted little attention.

Professor Pearson's subjects were about 1,000 Cambridge University undergraduates (males) and nearly 5,000 English school children, half boys and half girls. The intelligence of each subject was determined by careful methods, based on school standing and teachers' reports, and was correlated with a number of other characters of which either measurements or trustworthy estimates could be made.

Taking first size of head, three measurements were employed: the length, the breadth, and the auricular height, measured from the line of the ear-openings to the top of the skull. In each case there was found to be a slight connection between size and intelligence. But this is so small that

¹ On the relationship of intelligence to size and shape of head, and to other mental and physical characters. By Karl Pearson. *Biometrika*, v, pp. 105-146. London, October, 1906.

there is no possibility of using it to make even rough individual predictions. On the other hand, if a population were divided into those with large and those with small heads, there would probably be a very slight balance of average intelligence in the former group. The length of head is more closely associated with intelligence than is the breadth, and the breadth than the auricular height, but none of these measurements is of any value for individual character determination.

A long series of other tests was then made: "Judging the series as a whole," Professor Pearson says, "it seems impossible to use any of the physical measurements to estimate intelligence from. Hair color is practically as good as head length or breadth, and eye color as good as auricular height, and even all these are more important than the age influence. Health and temper have more relation to the intelligence than any of the physical measurements we have made, while the intelligent child is popular, athletic, and markedly conscientious. Handwriting is doubly as good a test of intelligence as any head measurement."

"Looked at broadly our table seems to justify fully current common-sense methods of estimating intelligence. Give weight to health, temper, physique, popularity, handwriting, and above all conscientiousness, in seeking friend, assistant, or servant, and in doing this you will most probably obtain intelligence also. If you wish to take anthropometric characters into account—and they are not worth much—hair and eye color will be as valuable as head measurements, and you need not produce the calipers in order to observe them!"

After reviewing his studies of school children in detail, Professor Pearson concludes:

THE INTELLIGENT BOY

"To sum up, then: While no characters in school children so far dealt with show very high correlation with intelligence, we may yet say that the intelligent boy is markedly conscientious, is

moderately robust, athletic and popular; he tends rather to quick than to sullen temper. He is more self-conscious and quieter than the dull boy; he has a *slightly* bigger head, and possibly lighter pigmentation than those of more mediocre intelligence. His hair has a larger percentage of curliness.

"The intelligent girl is also markedly conscientious, moderately robust, athletic and popular. She, too, tends to quick rather than sullen temper. She is less self-conscious than the dull girl, and noisier than the girl of mediocre intelligence. It is the slow girl who is quiet and shy. The intelligent girl has a slightly bigger head than the dull girl, and her hair is more likely to be wavy and much less likely to be curly.

"It may possibly be hinted that these results are of little significance, and had they not been so, they could still have been deduced—without elaborate statistics—from the impressions of a careful and observant teacher. It may be so, but much of science is the verification or refutation of opinions and impressions, and the mainly negative conclusions of this paper place at any rate on a sounder quantitative basis the view that even for the mass, and therefore much more for the individual, little can be judged as to intelligence from the more obvious anthropometric measurements and the more easily noted psychical characters of children.

"The onus of proof that other measurements and more subtle psychical observations would lead to more definite results may now, I think, be left to those who *a priori* regard such association as probable. Personally, the result of the present inquiry has convinced me that there is little relationship between the external physical, and the psychical characters in man."

OTHER STUDIES

More recent studies have not required any important modification of Professor Pearson's conclusions. Measurements of the brain itself have failed to reveal any constant relation between size and intelligence.² Ameri-

² Biometrical Studies of Man. I, Variation and Correlation in Brain Weight. By Raymond Pearl, Ph.D. *Biometrika*, iv, pp. 13-105. London, 1905.

can psychologists who are interested in the question of character analysis have made a few fragmentary studies, and have shown, for instance, that beauty and intelligence tend to go together—as indeed one would expect—but their methods have been much less trustworthy than those of the memoir above quoted, and the results they have secured have not added much to the knowledge of the problem.³

It is not meant here to deny that a skillful man can judge character with some degree of success. Very possibly he can, although such accurate tests as have been made have not always been favorable to the claim, according to Hollingworth's account.

Such success as is attained, it would seem, is due to the way in which a man's face frequently reveals his inner nature. His face may be read in an intuitional way; but any claims for the diagnosis of intelligence by means of measurable features of the head have never been substantiated. Much progress in char-

acter analysis is to be hoped for from the use of the exact methods of a modern psychologist's laboratory, but it is doubtful whether accurate results can ever be expected from estimates based on external appearances.

PEARSON'S COEFFICIENTS OF THE CORRELATION OF ABILITY WITH VARIOUS MENTAL AND PHYSICAL CHARACTERS

Character	Mean (both sexes)		
	Boys	Girls	
Conscientiousness.....	.45	.46	.43
Handwriting.....	.29	.28	.30
Popularity.....	.26	.22	.30
Athletic power.....	.22	.20	.24
Temper.....	.21	.19	.22
Health.....	.18	.17	.19
Head length.....	.11	.14	.08
Head breadth.....	.11	.11	.11
Hair color.....	.10	.10	.09
Shyness.....	.10	.03	.18
Selfconsciousness.....	.07	.10	.03
Eye color.....	.07	.08	.06
Head height.....	.06	.07	.05
Age.....	.06	.05	.08
Quiet habits.....	.06	.04	.09
Hair set.....	.06	.04	.09
Cephalic index.....	—	.04	.07

Field Workers' Conference on Eugenics

The annual Field Workers' Conference for 1917 will be held at Cold Spring Harbor on Friday, June 22, continuing on Saturday, June 23, at the Brooklyn Institute of Arts and Science. All members of the several training classes in eugenics, as well as other persons who have been engaged in or are especially interested in modern eugenical field studies, are invited to be present.

The plan will be much the same as that of former conferences. There will be no formal program, but each person present will be invited to tell of his or her work during the past year, and to present for discussion some of the problems which have especially presented themselves. Further announcement concerning the conference will be made next month.—*Eugenical News*.

New Tests for Species and Hybrids

External characters have always given naturalists the means of telling one species from another, but the work of E. T. Reichert and others in recent years shows that internal, physical and chemical characters may be used with much precision. Dr. Reichert describes the continuation of his work in the year-book of the Carnegie Institution.

Many different tests have been made of starches, and it is found that those from one species react differently, in many ways, from those of even a closely related species. Genus and variety also yield distinctive results while hybrids may, by the new methods, be referred to their true parentage. Similar studies are being made of proteins.

³ Prof. H. L. Hollingworth's book, "Vocational Psychology" (New York, 1916), gives a good summary of the work that has been done.