

The following paper was read by the President :—

*On HEAD GROWTH in STUDENTS at the UNIVERSITY of
CAMBRIDGE.*¹

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[WITH PLATE VIII.]

IN the memoir just read by Dr. Venn upon the measurements made, during the last three years, of the students of Cambridge, one column is assigned to what he terms "Head Products," and which may fairly be interpreted as "Relative Brain Volumes." The entries in it are obtained by multiplying together the maximum length and breadth of the head and its height above a specified plane. The product of the three determines the contents of a rectangular box that would just include the portion of the head referred to. The capacity of this box would be only rudely proportionate to that of the skull in individual cases, but ought to be closely proportionate in the average of many cases. The relation they bear to one another affords, as it seems to me, a trustworthy basis for the following discussion, especially as all the measurements were made not only on a uniform plan, but by the same operator.

It will be convenient to reproduce Dr. Venn's figures in a separate table, neglecting the second decimal :—

Head Products.

| Ages. | Class A. "High honour" men. | Number of measures. | Class B. The remaining "honour" men. | Number of measures. | Class C. "Poll" men. | Number of measures. |
|----------------------|-----------------------------------|---------------------------|--|---------------------------|-------------------------|---------------------------|
| 19 | 241·9 | 17 | 237·1 | 70 | 229·1 | 52 |
| 20 | 244·2 | 54 | 237·9 | 149 | 235·1 | 102 |
| 21 | 241·0 | 52 | 236·4 | 117 | 240·2 | 79 |
| 22 | 248·1 | 50 | 241·7 | 73 | 240·0 | 66 |
| 23 | 244·6 | 27 | 239·0 | 33 | 235·0 | 23 |
| 24 | 245·8 | 25 | 251·2 | 14 | 244·4 | 13 |
| 25 and upwards | 248·9 | 33 | 239·1 | 20 | 243·5 | 26 |
| | | 258 | | 476 | | 361 |

The figures in the table are thrown into diagrams I, II, and III (Pl. VIII), in which curves are also drawn to interpret what seems to be their significance. The great irregu-

¹ This paper appeared in "Nature," of May 3, and the editor of that Journal has obligingly supplied the diagrams in Pl. VIII.

larity in fig. II, corresponding to the age of twenty-four, may be fairly ascribed to the smallness of observations, only thirteen in number, on which it is founded. The three resultant curves are shown by themselves in fig. IV, where they can be easily compared. It will then be seen that the A and C curves are markedly different, and that the B curve is intermediate. Accepting these curves as a true statement of the case—and they are beyond doubt an approximately true statement—we find that a “high honour” man possesses at the age of nineteen a distinctly larger brain than a “poll” man in the proportion of 241 to 230·5, or one that is almost 5 per cent. larger. By the end of his College career, the brain of the “high honour” man has increased from 241 to 249; that is by 3 per cent. of its size, while the brain of the “poll” man has increased from 230·5 to 244·5, or 6 per cent.

Four conclusions follow from all this :—

(1.) Although it is pretty well ascertained that in the masses of the population the brain ceases to grow after the age of nineteen, or even earlier, it is by no means so with University students.

(2.) That men who obtain high honours have had considerably larger brains than others at the age of nineteen.

(3.) That they have larger brains than others, but not to the same extent, at the age of twenty-five; in fact their predominance is by that time diminished to one-half of what it was.

(4.) Consequently “high honour” men are presumably, as a class, both more precocious and more gifted throughout than others. We must therefore look upon eminent University success as a fortunate combination of these two helpful conditions.

Description of Plate VIII.

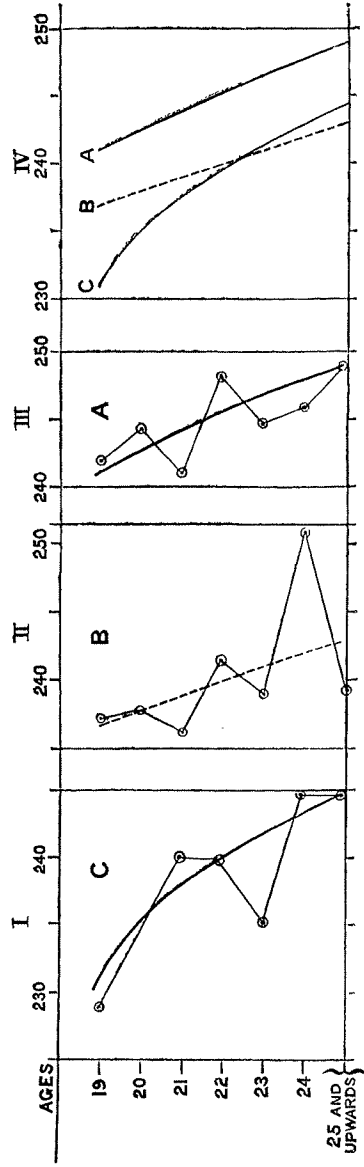
Diagrams illustrating the relative brain capacity of Cambridge University men, according to their proficiency and age.

DISCUSSION.

Mr. E. W. BRABROOK observed that the statistics of the B class at the age of twenty-four, showed a remarkable aberration, being in fact in excess of any other class at any age, no doubt due to the smallness of the number under observation. This led to the inquiry whether any individual cases of exceptionally large size were included in this particular group; and whether a curve struck upon the line of greatest frequency might not be more symmetrical. In any case, it was very satisfactory to observe that these investigations proved the physical advantage of high culture, and proved also that it was most valuable to those who entered upon it from the lowest plane. The thanks of the Institute were due to Dr. Venn and Mr. Galton for this important contribution to knowledge.

RELATIVE BRAIN CAPACITY OF CAMBRIDGE UNIVERSITY MEN ACCORDING TO THEIR PROFICIENCY AND AGE
(FROM DR. VENN'S TABLES).

*The Numerals along the top of the diagrams signify the product of the three Head measures, viz. :—
Length x Breadth x Height (in inches).*



A, High honour Men; B, The remaining honour Men; C, Poll Men.