do not see that the case of boys of average ability can be separated off, and dealt with singly by itself. If Greek continues to be taught universally in all schools of eminence, the ordinary educated Englishman will know something of Greek, and all will be able to go on, if they choose. If Greek is not continued, only a few will learn, the door will be closed to the majority, and the question whether they are boys of average ability will not come forward at all. No line can be drawn where the mere drudgery of training ends and literary power begins. Till that is possible, no answer can be given of the educational value of Greek to the average boy, beyond the answer, which however evades the whole exercise of mental gymnastics, and as a matter of vocabulary, it is the best subject known. I do not see how any modern subject can be a substitute for the whole interest of the ancient thought power of mankind ; or how any modern language, with the fatal facility of mistaking a parrot-like fluency for knowledge, can give the mental training that is involved in learning Greek. I should not alter the educational system or arrangements of this school in the least in consequence of the legislation of the Universities on the subject of Greek ; remembering always how many years Cambridge had no Classical Tripos, but the schools nevertheless remained classical schools. The modern subjects are either worthy of a degree, or they are not. If they are worthy of a degree, as I think they are, then a degree given for them is an intelligible honor, and a thoroughly satisfactory conclusion. If they are not worthy of a degree of their own (as some of their promoters appear to think), they ought not to make the B.A. degree less of a reality, in order that they may seem to share a culture which they do not share.

The Rev. E. C. Wickham, Head Master of Wellington College : Theoretically, and supposing the arrangements for teaching to be put on a level, I feel it very difficult to weigh subjects against one another in respect of educational value. Practically I am convinced that the education on the modern side, although successful for its chief immediate purpose, viz., that of preparing boys for the Army Examinations, is not nearly so cultivating to the intelligence, even to average boys, as that on the Classical side. As to the effect of such a change as that suggested upon school education, I must say that I do not desire to encourage our 'Modern' departments by making them generally avenues to the Universities. They seem to me very valuable for their own purposes. They find boys who are going to the army, business, country life, studies more within their tastes and more directly and practically useful than the Classics. But so far as I have seen their working here (and our Modern School is successful for its own purpose, but perhaps dominated more than some by the necessities of Army Examinations), I do not feel that the new education is as educating as the old. A boy of the same age and capacity in the Classical School will understand an English author better, will write a better letter, speak better in the Debating Society, start more intelligently at a new subject, than his equal at the Modern School. Opening the University generally to boys in the Modern School would, no doubt, in the present temper of English parents, draw boys from the Classical to the Modern School. I doubt whether, in the face of the practical aims which limit the Modern School education, it would raise the tone of culture in it to a degree which would compensate.

The Rev. Prebendary Scott, Head Master of Westminster School, reports that the *unanimous* opinion of the masters there is in favor of retaining Greek as a *compulsory* subject for ordinary degrees at Cambridge. He adds :—I do not think any language could be substituted for it without serious educational loss, as things now stand. The precision of the Classical tongues and the accuracy with which the syntax has been analysed, as well as the fact that the rules are fixed and not liable to change from varying usage, make them of peculiar value for education. It is doubtful whether Latin would long survive the separation from Greek ; and the Greek literature is infinitely richer and more full of interest for boys, as well as for grown men.

"BUT."

I have been much amused by the article on the word "But" in the CANADA SCHOOL JOURNAL for May, by H. P. B. For puzzle-headedness it beats anything I ever met with. He tells us that "All but him had fled " must be bad grammar, because "*all*" is not the subject, for *all* had not fled ; consequently "*him*" is a

part of the subject, and as the subject must be in the nominative, "*him*" must be "*he*." Does he not see that if "*he*" is a *part of the subject*, since the verb states something about that which the subject denotes, "had fled " must be stated of "he" as well as of "all," that is to say *he had fled*, which flatly contradicts the sense of the passage ?

It is quite true that expressions like "All but he had fled " are so common that usage tolerates them, but it remains true that in such phrases "but" was originally and properly a preposition. The dative case follows it in Anglo-Saxon. For example, in Beowulf (*l* 705) we read : "Sceotend swaeton ealle buton anum," = "the men-at-arms slept, all but one." About that point there can be no dispute. The word *buton* (=but) is a preposition and not a conjunction in such constructions.

H. P. B. must try and master the fact that if *x* stands for a certain "all," then *x* − 1 may be described in words as "all minus one," "all save one," "all except one" (*i.e.*, "all, one being left out "), or "all leaving out one" indifferently.

<div align="right">C. P. MASON.</div>

London, May, 1880.

Mathematical Department.

SOLUTIONS OF PROBLEMS IN EXAMINATION PAPERS.

Not having room for solutions of all the questions in last issue, we give those of the problems in the Honor Algebra-Trigonometry and Problem Papers, as likely to be of greatest interest or present the greatest difficulty.

ALGEBRA AND TRIGONOMETRY—HONORS.

2. Rider. Let
$$1.1^2 + \ldots + n(n^2 + \ldots + 1^2) = A + Bn + Cn^2 + Dn^3 + En^4 + Fn^5 \ldots (1)$$
Then... $+ (n+1)\{(n+1)^2 + \ldots + 1^2\} = A + B(n+1) + \ldots\ldots$

Subtracting,
$$(n+1)\{(n+1)^2 + \ldots + 1^2\} = B + C(2n+1) + D(3n^2 + 3n + 1) +$$
$$E(4n^3 + 6n^2 + 4n + 1) + F(5n^4 + 10n^3 + 10n^2 + 5n + 1) + \ldots\ldots$$

$$\therefore (n+1)\frac{(n+1)(n+2)(2n+3)}{6} = \ldots\ldots$$

In this identity equating the coefficients of the different powers of *n*, we find *B, C, D, E, F*, the coefficients beyond *F* vanishing. *A* may be found by inserting in (1) the values of *B......F*, and putting *n* = 1.

3. Rider. $\sqrt{n^2+1} - n =$

$$\frac{1}{\sqrt{n^2+1}+n} > \frac{1}{\sqrt{n^2+2n+1}+n} > \frac{1}{2n+1}$$

$\therefore$ the series is greater than $\frac{1}{1} + \frac{1}{3} + \frac{1}{5} + \ldots\ldots$, which is divergent (See Todhunter or Gross), and $\therefore$ the series is divergent.

4. Rider. $_nf_p = \frac{n.(n+1)\ldots\ldots(n+p-2)}{\underline{|p-1}}$ (Todhunter, § 669)

$$= \frac{\underline{|n+p-2}}{\underline{|p-1}\ \underline{|n-1}} = \frac{p.(p+1)\ldots\ldots(p+n-2)}{\underline{|n-1}} =$$

coeff. of x^{n-1} in $(1-x)^{-p}$ (1)

$\therefore (1-x)^{-r} = {_1f_r} + {_2f_r}x + \ldots\ldots + {_mf_r}x^{m-1} + \ldots\ldots$

$(1-x)^{-s} = {_1f_s} + {_2f_s}x + \ldots\ldots + {_mf_s}x^{m-1} + \ldots\ldots$

$\therefore$ series is coeff. of x^{m-1} in $(1-x)^{-(r+s)} = {_mf_{r+s}}$, by (1).

5. Rider. Assume that it holds for the (*n*−1)th and *n*th convergents. Now, Todhunter, Ex. XLIV., 18,