II.

The following are the solutions of two problems which were in the Senior Leaving Chemistry paper, published in the Science Column of THE MONTHLY in the January number of this year:

The cubic contents of the cylinder is $^{25}/_{2} \times ^{25}/_{2} \times ^{22}/_{7} \times 50$ cc's, and this is equal to

$$\frac{^{25}/_{2} \times ^{25}/_{2} \times ^{22}/_{7} \times 50}{1{,}000} \text{ litres.}$$

$$= \frac{625 \times 22 \times 50}{4 \times 7 \times 1000} \text{ litres.}$$

And this is measured at 25° C and 600^{mm} pressure.

∴ At standard temperature and pressure it will measure

$$\frac{625 \times 22 \times 50}{4 \times 7 \times 1{,}000} \times ^{273}/_{298} \times ^{600}/_{760} \text{ litres,}$$

but 11.2 litres of carbon monoxide at standard temperature and pressure weigh 14 grams. ∴ the gas in the cylinder will weigh

$$\frac{625 \times 22 \times 50 \times 273 \times 600 \times 140}{4 \times 7 \times 1000 \times 298 \times 760 \times 112} \text{ grams} = 22.19 \text{ grams.}$$ *Ans.*

The number of calories absorbed by the ice as it is raised from − 40° C to 0°C will be 200 × 40 × .5 = 4,000.

The number of calories absorbed by the ice while melting will be 200 × 79 = 15,800, since 79 is the latent heat of water.

The water formed from the ice will absorb 200 × 32.5 = 6,500, as its temperature is raised to 32.5° C.

The whole number of calories absorbed by the ice as its temperature is raised from − 40° C to 32.5° C is 4,000 + 15,800 + 6,500 = 26,300 cal.

These are absorbed from the 400 grams of water at 95° C, and the 200 grams of zinc at 100° C as their temperatures are being reduced to 32.5° C, and are equal to 400 × 62.5 + 200 × 67.5 × S.H., where S.H. is the specific heat of zinc.

We have then the following equation: 400 × 62.5 + 200 × 67.5 × S.H. = 26,300 ∴ S.H. = .096 the specific heat of zinc.

CLASSICAL DEPARTMENT.

PRINCIPAL STRANG, GODERICH.

QUESTIONS BASED ON CÆSAR, BOOK III., CHAPTERS 1-6.

I.

1. Translate chapter 3, *Quo consilio —defendere* into good idiomatic English.

2. What difference of idiom between Latin and English is illustrated by the use of *quo* in this sentence?

3. Classify the subjunctives in the passage.

4. Construction of *peri uli, subsidio, quibus, parti.*

5. *salute.* What nouns in *us* of the 3d declension are feminine?

II.

1. Translate idiomatically chapter 6, *Quod jussi—recipiunt.*

2. *Sui colligendi.* Point out and, if possible, account for the peculiarity.

3. Distinguish in meaning and use *constare, consistere* and *constituere.*

4. Account for the mood of *fieret,* and the case of *numerum.*

5. *ne—quidem.* What peculiarity in the use of these words?

III.

Translate idiomatically:

(1.) Accedebat quod suos ab se liberos abstractas obsidum nomine dolebant, et Romanos non solum itinerum causa, sed etiam perpetuae possessionis culmina Alpium occupare conari, et ea loca finitima provinciæ adjungere sibi persuasum habibant.

(2.) Nostri hoc superari quod diuturnitate pugnæ. Hostes defessi proelic excedebant, alii integris viribus succedebant; quarum rerum a nostris propter paucitatem fieri nihil poterat, ac non modo defesso ex pugna exce-