Then $S^2 - p_2 = b$, and $S+p = a$: $\therefore$ $S-p = \dfrac{b}{a}$, and $S = \dfrac{a^2+b}{2a}$, and $p = \dfrac{a^2-b}{2a}$; hence x and y are easily found.

4. $72 \times \lfloor 15 \times 2 = 2160$,   Surface of sides
   $72 \times 24 \quad\quad = 1728$,   "   bottom
   $24 \times 15 \times 2 = 720$,   "   ends

                  $\overline{4608}$,   area of the whole vessel.
$4608 \times \cdot 281 = 1294 \cdot 848$ lbs. weight of the vessel.
$72 \times 24 \times 3 \cdot 03617 = 187 \cdot 505$ lbs. of water to displace.
Then $187 \cdot 505 \div 1294 \cdot 848 = \cdot 144 +$ thickness of theiron.

5. Method of Computation. Let A B C be the given triangle; B at the vertex ; D the given point in AC ; and let DF represent the required line ; then the area of DFC and base DC are known, $\therefore \perp$ FG is known. BC$\times$AC : FC$\times$CD : : 3 : 2 ; hence FC is known ; $\therefore$ GC and DG are known. Then $(FG^2+DG^2)\tfrac{1}{2} = DF$.

6. Construction. Let AB = the given line ; and from B draw the $\perp$ BC, such that $BC^2 = (n-1)$ AB^2. Join AC, and make CD=CB ; and erect the $\perp$ DE meeting AB in E ; complete the parallelogram ADEF ; join EC, and it is evident that EB and ED are equal. then $\triangle$S ABC and ADE are similar ; $\therefore$ CB : BA : : ED : DA ; but $CB^2 = (n-1)$ AB^2; $\therefore$ ED^2 or $EB^2 = (n-1)$ AD^2 ; $\therefore$ I·47, $AC^2 = \lfloor n AD^2$.

7. Let t = the whole time of descent ; $\therefore$ the altitude $= \tfrac{1}{2}gt_2$, and the space descended in the time $(t-1) = \tfrac{1}{2}g(t-1)^2$; $\therefore$ the space descended in the last second $= \tfrac{1}{2}g(2t-1)$, and $\tfrac{1}{2}gt^2 = n.\tfrac{1}{2}g(2t-1)$; $\therefore$ $t^2 = 2nt-n$; $\therefore$ $t = n + \sqrt{n^2-n}$, and the altitude of the tower $= \tfrac{1}{2}gn(2n - 1 + 2\sqrt{n^2+n})$.

8. $\Phi = \dfrac{a}{F\sqrt{2gh}} = \dfrac{10}{60 \times \cdot 02182 \times 8 \cdot 03\sqrt{2}} = \cdot 673$; the coefficient of resistance $= \left(\dfrac{1}{\cdot 673}\right)^2 - 1 = 1 \cdot 23$.

CORRECT SOLUTIONS RECEIVED.

John Anderson, Clarendon, P.Q., solved 2, 3, 4, and 8 ; Daniel Drimmie, Solina, 2, 3, and 8 ; William Waddell, Burns, 4, and a particular case of 5 ; Robert J. Walsh, Albion, 2, 3, 5, and 6. For the June No. of the *Journal*, Robert Patterson, Grafton, solved 2 ; and Michael Wallace, Sep. S., Osgoode, 1, 2, 4, 5, 6, and 7.

Correspondents to this department can receive answers to their communications by defraying the expense of postage.

Solutions of the following problems to be addressed to A. Doyle, Ottawa.

1. At what rate of compound interest will money treble itself in ten years ?

2. $x^2+x^{\frac{4}{3}}y^{\frac{2}{3}} = a$, and $y^2+x^{\frac{2}{3}}y^{\frac{4}{3}} = b$,

3. $x^4 - 2ax^3 + (a^2 - 2)x^2 + 2ax = a^2$

4. In fig. I· 47, the sum of BA and AC, and the difference of the squares of AD and AE, are given, to find BA and AC.

5. Find straight lines which exactly represent the square roots of 5, 6, 7, 8, 10, 11, &c.

6. There is a tube 1 inch in diameter and 6 feet high, inserted in a cubical vessel whose sides are each 4 square feet ; the vessel and tube are filled with water : required the whole weight of water therein contained, and the whole pressure exerted in tending to burst the vessel.

VIII. Short Critical Notices of Books.

W. A. MANSELL & CO., LONDON, ENG. :—

Studies, by Frank Miles :—A series of seven photographs of original drawings—studies of heads—by Mr. Frank Miles. They are admirably adapted for copying, and in themselves form very pretty pictures.

From BEMROSE & SONS, London.

The Teacher's English Grammar Assistant. With Hints on Letter Writing, &c. By the Author of the " Schoolmaster's Drill Assistant."
Bemrose's 1875 Code Copy Books. A series of twelve books.

From W. & R. CHAMBERS, Edinburgh and London.

Chambers's Elementary Science Manuals—viz.
1. Astronomy. 2. Chemistry. 3. Geology. 4. Magnetism and Electricity. 5. Language. The object of the publication of these Manuals is the diffusion of some knowledge of the leading principles of Science among all classes of society. They are also designed to aid in " self-instruction." They are neatly got up, with illustrations, and are sold at 6d. and 1s. sterling each.

National Reader, Chambers's.
Those received are numbers IV. and V. The preface says, " Without discarding old and established favourites, the Publishers have sought to introduce freshness into the Readings by giving a large number of pieces from authors of the day."

What Will the World Say? by Charles Gibbon :— Toronto, Hunter, Rose & Co.

Breakfast, Luncheon and Tea, by Marion Harland :—TORONTO, HART & RAWLINSON ; NEW YORK, SCRIBNER, ARMSTRONG & CO. :—A bundle of receipts for various mystic delicacies, prepared from almost nothing, entrees, cakes, creams, &c. The work is artistically constructed, each batch of receipts being introduced by a "familiar talk" on various subjects, all tending in one direction—meals, and how to make them enjoyable.

Schiller's Die Piccolomini, Edited by Prof. J. Morgan Hart :—G. P. Putnam's, Sons, New York ; James Campbell & Son, Toronto.

No one could be better fitted to edit the series of German classics, of which this is one, than Prof. Hart. His knowledge of the language is extensive, and his experience of German life and customs was gained during his four years' sojourn on the continent. This will render his commenatry on the text, as well as his index of persons and places, of more value. We hope the series so well edited and " got up " will meet the success it deserves. There is one sentiment expressed by the author in the preface in which we cordially agree. It is as follows : " I venture to express an earnest wish that the time may speedily arrive when the study of German, and also French, shall be raised to a higher place * * * and especially that the study of Continental history— this Pariah of our College curriculum—may be regarded as at least equal in dignity and value to the study of the Institutions of Greece and Rome, and (the author might have added) of the more than doubtful morality of their mythology.

MESSRS. D. & J. SADLIER & CO., NEW YORK AND MONTREAL :—

The Young Ladies' Reader.—Arranged by Mrs. James Sadlier, is a work designed especially for teachers in Roman Catholic female schools. The book contains 146 selections, which appear to have been made with great care and discrimination from both Protestant and Roman Catholic authors. The first part of the book is devoted to several excellent " Lessons in Elocution " from various authors. Each lesson is preceded by a short biographical sketch of the writer and closed with a brief dictionary of the prominent words which occur in it. The book is admirably printed with clear type on good paper.

Metropolitan English Grammar, by Wm. Lennie: —A new edition of a well known and excellent grammar revised.

Victims of the Mamertine, by the Rev. Father O'REILLY, D. D., author of " Martyrs of the Coliseum." D. & J. Sadlier & Co., Montreal.

After the success which the Rev. Father's last work seems to have achieved, it will not be hard to predict a like happy result for this. Though hardly as extensive a subject, it will not be found to be the less interesting on that account, since it leaves more space to be devoted to historical and descriptive writing. The Publishers will send the volume free by mail on receipt of price, $1.75.

From J. W. SCHERMERHON & CO., New York.

Masterpieces in English Literature, and Lessons in the English Language, with a Brief Statement of the Genealogy of the English Language, Biographical Sketches, Explanatory Notes, Suggestions for Expressive Reading, Methods of Analysis, &c. Designed for Colleges and Schools. By Homer D. Sprague. In Four Books. Vol. I.
The object of this important work is to present in as narrow a compass as possible a complete collection of " acknowledged English Masterpieces," and " productions that are complete in themselves." The present volume contains examples from Chaucer, Spencer, Bacon, Shakespeare, Milton, and Bunyan. Each author is illustrated with a portrait. The text has copious and most valuable notes.

Elements of English Grammar. By S. W. Whitney, A.M.
To meet the many objections to text books on Grammar, the author says this one " has been prepared and rigidly confined to the subjects of Grammatical Etymology, or Accidence, and Syntax."

THE INDUSTRIAL PUBLICATION CO., NEW YORK :—

Practical hints on Selection and use of the Microscope, by John Phin, very illustrated :—The work before us gives, in the plainest language, complete directions for the management of the microscope and for collecting objects, preparing them for examination, and preserving and mounting them. That such a work is greatly needed, every one owns a microscope of moderate power knows but too well. In the present volume all mathematical and theoretical disquisitions have been avoided ; simple rules are given in plain language, and the whole is illustrated with such engravings as are necessary. We notice in it many new and valuable devices calculated to aid the microscopist in his work, and predict for it a large circulation, feeling that it cannot fail to do much towards enabling those who possess ordinary microscopes to obtain from them the greatest amount of instruction and pleasure which they are capable of affording.

From Professor HENRY.
Annual Report of the Smithsonian Institute for the year 1874. Government Printing Office, Washington, 1875.—A most valuable document, containing scientific papers on Warming and Ventilation, Ethnology, Electricity, Language, Tides, Temperature, Earthquakes, &c., &c.