ful a fane in the midst of moral surroundings so ignoble and unlovely,—a spiritual remembrance perhaps older and truer than paganism, ennobling the pagan mind with the idea of an architectural Sabbath, so to speak, such as a heathen may purely enjoy and a Christian may not wisely despise."

Pure Buddhism knows no idolatry, and Mrs. Leonowens herself in summing up the doctrines of Buddhism, mentions on page 203 that all idol-worship is condemned in Buddhist doctrine. She nevertheless speaks again and again of the idolatrous religion and her condemnation is to a certain extent justified. Her judgment of the situation is about the same as that of a Puritan of the old type would be should he visit Rome and speak of the Roman Catholic Christians as "idol-worshippers" pure and simple. For Buddhism and Romanism are very similar in their ceremonies. Here also it is noticeable that her harsh judgments of the religion of Buddha are found in the beginning of the book, while later on her views appear to be modified; and it will be interesting to read her description of "Buddhist doctrine, priests, and worship."

While attending to her lessons, Mrs. Leonowens incidentally gave her pupils some information about God, and she relates in this connexion the following incident:

"On translating the line, 'Whom He loveth he chasteneth,' she looked up in my face, and asked anxiously: 'Does thy God do that? Ah! lady, are *all* the gods angry and cruel? Has he no pity, even for those who love him? He must be like my father; *he* loves us, so he has to be *rye* (cruel), that we may fear evil and avoid it.'"

It is a fact that we, the white nations, meet all nations with a haughtiness calculated to impress them that we are a superior race. Haughtiness seems to us proper, although I should think the superior race need make no show of its superiority if it is genuine. However, when we observe haughtiness in others we are impressed with the barbarity of showing haughtiness. Mrs. Leonowens says:

"The characteristic traits of the Siamese Court are *hauteur*, insolent indifference, and ostentation, the natural features and expression of tyranny; and every artifice that power and opulence can devise is employed to inspire the minds of the common people with trembling awe and devout veneration for their sovereign master. Though the late Supreme King wisely reformed certain of the stunning customs of the court with more modest innovations, nevertheless he rarely went abroad without extravagant display, especially in his annual visitations to the temples. These were performed in a style studiously contrived to strike the beholder with astonishment and admiration."

As to the future of Siam, our authoress abstains from uttering an opinion; She says:

"What may be the ultimate fate of Siam under this accursed system, whether she will ever emancipate herself while the world lasts, there is no guessing. The happy examples free intercourse affords, the influence of European ideas, and the compulsion of public opinion, may yet work wonders."

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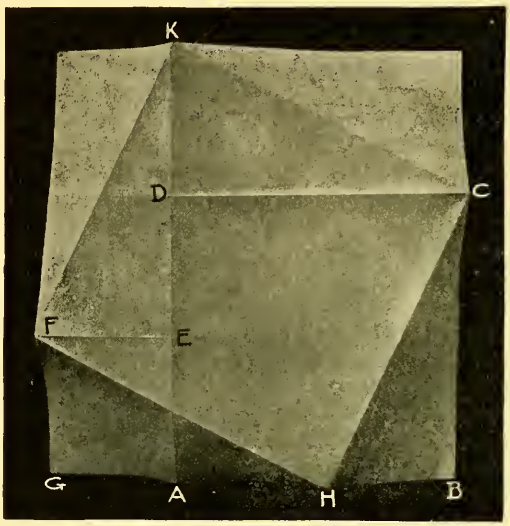
## INSTRUCTION IN GEOMETRY BY PAPER-FOLDING.

The devices in common use in the text-books for visualising instruction in elementary geometry are limited almost entirely to combinations of black lines on plane white paper. Other visual, palpable, and especially *motor* aids are resorted

to only in the rarest cases, and even where they are recommended, or explained the opportunity is lacking for their employment.

To a great extent this neglect to train the sensory and motor functions, to establish a physiological memory in support of our abstract thought, is attributable to an imperfect correlation of studies. One branch is pursued in absolute independence of other branches in intimate psychological relationship with it, and the consequent loss of time due to successional instead of collateral work, is great. Even in schools where genuine correlation is most boasted of, the work is frequently very desultory. Arithmetic, elementary geometry, algebra, and physics, should be made to run hand in hand; and while a logically perfect system of correlation is difficult, much of the needed material is ready.

Three hundred years ago, about, Galileo attempted an *approximate* quadrature of the cycloid by weighing thin cycloidal sheets of metal in the pan of a balance, and by good luck hit upon the *theoretical* quadrature exactly. The value of $\pi$ can be experimentally calculated to three decimal places, on this method, by weighing only six circular sheets of zinc with common school instruments. In fact, the laboratory methods of physics may be applied to nearly all the problems of mensuration; and geometry, arithmetic, and experimental science, in its metrical phase, taught and illustrated in this manner, collaterally.



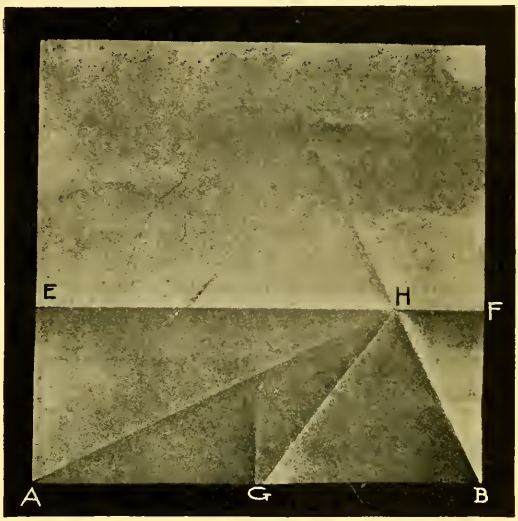

PROOF OF THE PYTHAGOREAN THEOREM BY PAPER-FOLDING.
(Sundara Row.)

This idea, even then not a new one, was carried out in some detail thirty-one years ago, by Professor Hinrichs, of Iowa, now of St. Louis, in his *Elements of Physics*.

Numerous other methods might be incorporated with the suggestions involved in the foregoing procedure; for example, paper-folding, paper-cutting, and paper-modelling; the manufacture and use of movable models; the experimental and arithmetical verification by tables and a millimetre rule of such propositions as the generalised Pythagorean theorem, etc.

All of these methods save the first require instruments that are without the reach of some individuals and schools. *Paper-folding* and *paper-cutting*, however, are within the reach of all, though seemingly the least developed. It will be of interest, therefore, to know that we now have a systematic book on the subject, and it is to be hoped that every one concerned for sound education will do his part towards disseminating the simple methods developed in it.

This book is the *Geometric Exercises in Paper-Folding* of T. Sundara Row, a Hindu mathematician. It is highly recommended by Professor Klein, the foremost mathematician of Germany, and being but little known in its original edition, now exhausted, it has just been republished in elegant form, with half-tone reproductions of the actual exercises and a package of colored papers for folding.[1] It was, in fact, the colored papers of the Kindergarten gifts that first led the Hindu mathematician to apply paper-folding to geometry. "The use of the Kindergarten gifts," he says, "not only affords interesting occupations to boys and girls, but also prepares their minds for the appreciation of science and art. The teaching of plane geometry in schools is made very interesting by the free use of the kindergarten gifts. It is perfectly legitimate to require pupils to fold the diagrams with paper. This gives them neat and accurate figures, and impresses the truth of the propositions forcibly on their minds. It is not necessary to take any statement on trust. But what is now realised by the imagination and idealisation of clumsy figures can here be seen in the concrete. Many of the current fallacies would on this method be impossible."



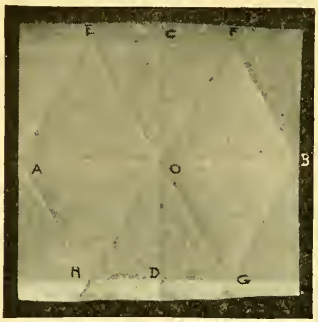

A Problem in Construction.
To describe a right-angled triangle, having given the hypothenuse and the altitude.

Another advantage of the method is the ease with which many geometric processes can be effected by paper-folding as compared with the use of compasses and ruler; for example, "to divide straight lines and angles into two or more equal parts, to draw perpendiculars and parallels to straight lines." It is not, however, "possible in paper-folding to describe a circle, but a number of points on a circle, as well as other curves, may be obtained by other methods. These exercises do not consist merely of drawing geometric figures involving straight lines in the ordinary way, and folding upon them, but they require an intelligent application of the simple processes peculiarly adapted to paper-folding."

The author's purpose in writing the book will also be of interest to the reader. "I have sought not only to aid the teaching of geometry in schools and colleges, but also to afford mathematical recreation to young and old, in an attractive and cheap form. 'Old boys' like myself may find the book useful to revive their old

[1] Chicago: The Open Court Publishing Co.; London: Kegan Paul, Trench, Trübner & Co., Ltd. 1901. Edited and revised by W. W. Beman and D. E. Smith. Pages, xiv, 148. Price, cloth, $1.00 net (4s. 6d. net).

lessons, and to have a peep into modern developments which, although very interesting and instructive, have been ignored by university teachers. . . . I have attempted not to write a complete treatise or text-book on geometry, but to show how regular polygons, circles, and other curves can be folded or pricked on paper. I have taken the opportunity to introduce to the reader some well known problems of ancient and modern geometry, and to show how algebra and trigonometry may be advantageously applied to geometry, so as to elucidate each of the subjects which are usually kept in separate pigeon-holes."



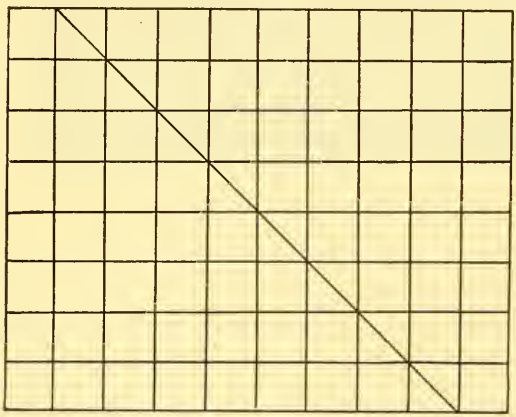

CUTTING OFF A REGULAR HEXAGON FROM A SQUARE.

We have reproduced here some figures illustrating the methods of the work.

The first figure represents a well-known proof of the Pythagorean proposition. *KDC* is the triangle; the square on the hypothenuse is *KFHC*, which is shown to be equal to the sum of the squares on the two sides, viz., the squares *DABC* and *FEGA*.

The second figure shows how to describe a right-angled triangle, given the hypothenuse *AB*, and the altitude. Fold *EF* parallel to *AB* at the distance of the given altitude. Take *G* the middle point of *AB*. Find *H* by folding *GB* through *G* so that *B* may fall on *EF*. Fold through *H* and *A*, *G*, and *B*. *AHB* is the triangle required.

The third figure is a miniature of the diagram representing the method of cutting off a regular hexagon from a given square. "Fold through the middle points of the opposite sides, and obtain the lines *AOB* and *COD*. On both sides of *AO* and *OB* fold equilateral triangles (by previous proposition), *AOE*, *AHO*; *BFO* and *BOG*. Draw *EF* and *HG*. *AHGBFE* is a regular hexagon."



SUMMATION OF AN ARITHMETIC SERIES BY PAPER-FOLDING.

The fourth figure illustrates an arithmetic series. "The horizontal lines to the left of the diagonal, including the upper and lower edges, form an arithmetic series. The initial line being $a$, and $d$ the common difference, the series is $a$, $a+d$, $a+2d$, $a+3d$, etc. The portions of the horizontal lines to the right of the diagonal also form an arithmetic series, but they are in reverse order and decrease with a common difference. In general, if $l$ be the last term, and $s$ the sum of the series, the above diagram graphically proves the formula $s=\frac{n}{2}(a+l)$."

The summation of other series is also admirably illustrated by the graphic method. The construction and theory of polygons, congruence, the theory of triangles, symmetry, similarity, collinearity, the theories of inversion and of coaxial circles, and many other topics, including conics, are treated in a novel manner. The publishers and editors have done their utmost to render the book an indispensable and attractive adjunct of mathematical instruction,—one which will be useful in the earlier as well as the later steps, and which therefore cannot fail to be welcomed by the public.

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## THE TAI-PING CANON.

[The politicians of Europe exhibit great eagerness to prove that the Christianity of the Tai-Ping rebels was spurious, and so it was if we assume that the Western forms of Christianity, Roman Catholicism and the Protestant sects, are the only standard of Christianity. There can be no doubt, however, that the religion of the Tai-Ping is based upon the Bible, that God the Father is recognised as the creator and ruler of the universe, that Jesus is called his son and our elder brother, the latter being a title of respect to superiors, for the elder brother represents the absent parents to his younger brothers and sisters. No mysterious origin was claimed by Hung Siu Tsuen, the leader of the Tai-Ping, but he claimed to have had a vision in which God the Father and Jesus, our elder brother, charged him to pacify the country and assume authority over the world. He called himself the younger brother of Jesus, and his whole appearance in history, the sternness of his moral discipline, the faith in himself and his mission, his piety combined with military success, vividly remind one of Cromwell. The interesting history of the Tai-Ping rebellion is told in full in *The Open Court* for November and December, 1901.

The Tai-Ping Canon (or Classic) is a sample of the Tai-Ping religion, being the literal translation of a poem used as an educational text-book and written in the style of the Trimetrical Classic, the common school book of the Chinese, a translation of which appeared in *The Open Court*, Vol. IX., No. 29.

The Tai-Ping Canon was translated by the Rev. Dr. Medhurst and published by Sir George Bonham. Mr. John Oxenford in quoting the 'Trimetrical Classic' adds:

"The above document gives no reason to suppose that the insurgents are otherwise than orthodox Confucians, with a superstructure of spurious Christianity. While Buddhism is stigmatised, not a word is uttered against the ancient Chinese philosopher; and the Emperor Tsin, from whom the reign of diabolical delusions is dated, is the same Emperor who is infamous in Chinese tradition for his attempted destruction of the works of Confucius."—*Editor.*]

"The great God
Made heaven and earth;
Both land and sea
And all things therein.
In six days,
He made the whole;
Man, the lord of all,
Was endowed with glory and honor.
Every seventh day worship,
In acknowledgment of Heaven's favor:
Let all under heaven
Keep their hearts in reverence.
It is said that in former times,
A foreign nation was commanded,
To honor God;
The nation's name was Israel.
Their twelve tribes
Removed into Egypt;
Where God favored them,
And their posterity increased.