cause of the absence of a dense a tmosphere such
as the earth has, but not less real for that rea-
son. 2. Is space limitless? It canmot be conson. 2. Is space limitless? It cammot be con-
ceived it has limits, as the mind would inguire ceived it has limits, as the mind would inquire
what is beyond. Yet every object occupies a fraction of space, and as a fraction is only con that there is a limit; what is the philosophical explanation? A. As to space we know little, and speculation can teach nothing. To a scien
tific mind it seems fruitless to discuss what can never be settled by discussion, Astrono-
mers now believe there is an end to the worlds mers now believe there is an end to the worlds
in space; but belief is not knowledge. We may in space; but belief is not knowledge. We may
know some time, but not till we go beyond the flesh and sens
(9781) M. O. C. asks: Please give me the difference between a whip-poor-will and the
bull-bat; the zoological and common name of bull-bat; the zoological and common name of
each bird, and to what genus each belongs? And if the bull-bat is the same bird as the nighthawk? Also give the distinction betw̌een a catamount and a wild-cat. Which, if either, has the long tail? A. The bull-bat and the nighthawk are different common names for the Chordeiles Virginimnee. The scientific name o the whip-poor-will is Antrostomus vociferus.
The genus of anything is indicated by the first word of its scientific name; the species, by the
second word of its name. A catamount is ansecond wor of its name. A catamment is an
other name for the cougar or mountain lion A wild-cat is a lynx. It has a short tail, and most of the s.
(9782) M. F. S. says: 1. Would you kindly explain the real meaning of the word lamp takes 56 watts, say 60 watts for con-
venience, per hour. If it takes 60 watts per venience, per hour. 1 it takes 60 watts per
hour, it should take 1 watt to light it for 1 minute. Yet we all know that it takes the full
60 watts to light it even for one second. A 60 watts to light it even for one second.
300 -watt dynamo does not give 300 watts pe 300 -watt dynamo does not give 300 watts pe
hour, it gives them all the time; if such dynamo were connected with a watt-meter
would the watt-meter register 300 watts after an hour? A. A watt has no reference to time. It is the unit of electric power. And just as hour, or any other time and is the same horse
power, so the watt is the same for any time. If a lamp requires 60 watts to light it, it will require the 60 watts for a second just as really
as for a whole day. What is paid for on the watt-meter is the watt-hours. If 1,000 watts
are used for one hour, that is a kilowatt-hour are used for one hour, that is a kilowatt-hour; same as the horse doing work. If one hires herse which might do a horse-power of work entire time which he does work. The idea seems simple. 2. Does the sun have any direct
influence upon the weight of ebjects on the influence upon the weight of ebjects on the
earth? Example: Will an object be theoret cally heavier at midnight than at midday? to midnight because of the position with refer ence to the sun. The change of distance from the sun in that time is so small as compared with the immense distance of the sun as to be of no value at al
(9783) J. S. asks: 1. How does the last part of our names originate? A. The surname added to and above (sur) the individual name. These often denoted the occupation of the man at the time the name was taken. An example is John Smith, or John the "smith." When the peasantry had but a single name, it was well nigh impossible for the officers of the law, or the crown, to locate the man wanted, as one can easily see by considering the case lar John Smith even than a particular John. There are many more Johns than there are authorities compelled the adoption of a second name, which was often arbitrarily given, and
so we have names of birds, places, colors, and so we have names of birds, places, colors, and
many others as family names. 2. Is it air many others as family names. 2 . Is it a buoyance that causes the stocks of wheat to be
stronger against the wind than if the stocks stronger against the wind than if the stocks
were solid? A. There is a very common mispprehension regarding a hollow sher tube a stalb, of wheat or a bone is strong as if it were of the same size and solid. It is stronger than if it were of the same weight and solid. In other words, a given amount of material can be made into a stronger shaft by
giving it the form of a hollow cylinder than to giving it the form of a hollow cylinder than to make it a solid rod of any shape. It is the enable it to stand up against the wind. 3. Can a body be charged purely positively or negatively? Must there not be a little negative electricity in a body that is supposed to be charged positively, and vice versa? A. A body is charged positively by giving it an excess lectricity is removed as there is positive elec tricity communicated to the body. If more positive electricity should be given to the body, 4. Why is the negative pole of a medical bat ery stronger than the positive? That is, stronger to the feelings. A. We were not ware that the negative
the positive pole, to the feelings even, and can give no reason for it. 5. I notice water is a better conductor when hot than it is when cold. Can you give a reason: A. We have never measured the resistance of water at various
temperatures, and cannot give any reason why
hot water should have less resistance than cold
water. 6. Can you give a scientitic explana-
tion of the famous painting e elifled "In the
Shadow of the Cross," painted by Henry IIam-
mond Ahl, which was exhibited at the world's
fair, St. Louis? This religious painting is of
the Master, and when the room is darkened,
the painting appears luminous, which makes
the appearance of a pale moonlight. A cross
can be seen lying over his shoulders, which is
not observable when the room is lighted. A.
The painting to which you refer was painted
with a phosphorescent paint which glowed in
the dark, but did not appear in the light. 7 .
In going up in an elevator do we not weigh
heavier and in coming down weigh lighter? A.
A person is no heavier while going up in an
elevator than while coming down. If the ele-
vator starts up sudenly, the inertia of the
man would cause him to exert a greater pres-
sure on the floor than his weight; and if it was
jerked down quick enough it might even leave
the man in the air, not pressing at all on the
floor of the car. You can hold an apple on
your hand, and drop your hand away from it
so quickly as to leave the apple in the air above
the hand.

## NEW BOOKS, ETC

Ordinary Foundations, Including the
Coffer mam Process Cofferdam Process for Piers. By
Charles Evan Fowler, C.E. New York: John Wiley \& Sons, 1905 York: John Wiley \& Son
8vo.; pp. 214. Price, $\$ 3.50$.
This book, which has reached its second dition, has received numerous valuable addi
ions. The subject of ordinary foundations is more comprehensively covered than heretofore
and several new chapters have been added, ne of the most important of which discusses cylinders; with timber caissons by open dredging; and the construction of ordinary caissons. Another ne $\dot{w}$ chapter is that on cement and concrete, which contains many valuable tables giving the amount of material equired for concrete of different proportions. Other chapters which were not in the flrst dition are one on the subject of foundations, which the bearing capacity of soil is discussed, and another on building stone, masonry, piers of timber and pile bents, together with the subject of timber preservation, has s a general knowledge requires. The book is illustrate with some 150 cuts, many of which are fine half-tone plates.
The Compound Engine. By W. J. Tenval Marshall \& Co., 1905. 8vo.; pp. 200. Price, $\$ 1$.

This is a popular treatise intended as an introductory manual to the study of the com-
pound engine. The first seven chapters give a great deal of information such as is desired by the ordinary person who has very little ter deals with the graphic method of indicator diagrams for a two- or three-stage compound f the ordinary, or receiver, type. In suceding chapters the indicator diagram cylinder ratios and the action of the receiver are
dealt with more minutely than in the opening chapters, and the subjects of jacketing, the condenser, and the air-pump are touched upon. The book has three appendices, consisting Theoretical Indicator Diagrams for Compound Engines," part of a paper on "Expansion Curves," by the author, and tables giving the dimensions of typical compound engines, of Mechanical Drawing: Technique and
Working Methops for Technical STubents. By Charles L. Adams.
Boston: George H. Ellis \& Co., 1905. 4to.; pp. 204.
of the senses so as to giv drawing, and the acquirement of technica methods of execution, are necessary prepara tory requirements for a course in engineering
or architecture. These are what the author of the present work had in mind when pre paring it. The book has a collection of ma judicious selection, to lay out the work the course, and it is further specialized to meet the needs of individual students. The author believes that when a course includes descriptive geometry, it is unnecessary to
give a portion of this subject under a different give a portion of this subject under a different
name. The book not only goes thoroughly into the technique of drawing and the instru pictorial representation, wash drawing, and mechanical copying, such as the blue-print drawing. It is abundantly illustrated with over 160 drawings and plates.
Proceedings of the Society for the ProMotion of Englyerrixg Edeation
New York: Engineering News Publishing Company, 1905. 8vo.; pp.

This book is the twelfth volume of the "Proceedings of the Society for the Promo tion of Engineering Education." It contains
some fifteen addresses on engineering education some fifteen addresses on engineering education
by well-known engineers in its various phases, by well-known engineers in its various phases,
and also memoirs of the following deceased
and also memoirs of the following decease
members of the fraternity: Benjamin Franklin
LaRue, Thomas Messinger Drown, Robert
ITanry Thurston, and Burton S. Lanphear. A
suitable index is added to the book, which
also contains the names and addresses of all
of the members
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