Attraction of Gravitation Is a Mystery to Science.

IT CONTROLS THE UNIVERSE.

Yet That Wonderful Force That DIrects and Regulates Moons, Planets, Suns and Stars Without Visible Means of Connection Is Inexplicable.

The mystery of enysteries in science is the attraction of gravitation-that very force of nature that is the most familiar to us all. It seems strange that the most familiar thing in the world should be at the same time the most inexplicable, but so it is.

In order to see clearly wherein the mystery consists, let us first consider what gravitation appears to be. It is gravitation that gives the property of weight to all bodies. If there were no gravitation we could float like thistledowns and infinitely better than thistledowns, for they, too, are finally brought down by gravitation.

It is gravitation that brings a can non ball eventually to the earth, no matter how swiftly it may be projected. The faster it starts the farther it will go, but during every second of its flight it drops the same distance vertically toward the earth, whether the speed imparted to it by the powder is 500 or 3,000 feet per second. Gravitation acts on a moving body exactly as well as on one at rest.

It is gravitation that curbs the motion of the moon and keeps it in an orbit of which the earth is the active focus.

So, too, it is gravitation that goverus the earth in its motion around the sun, preventing it from flying away luto boundles: space. Astronomy shows that gravitation acts between all the plants and all the stars and controls their motions with respect to one an other.

Now, this mysterious force appears to be an attraction, as if there were elastic cords connecting all the bodies in space and tending to draw them together. But space, as far as our senses can detect, is empty. There are no elastic cords and no physical connections whatever between astronomical bodies or between a flying stone or cannon ball and the earth. How, then, can there be an attraction? In order that a body may be attracted or drawn there must be something to draw it. Gravitation does the trick, but completely bides from us the mechanism through which it acts. We can discover no mechanism at all.

When an unfortunate aeroplanist drops from his machine at a height of thousand feet he begins at once to fall toward the earth as if it were pulling him. But how can it pull if it has nothing to pull with? You may think at first sight that it is the air which acts as an intermediary, but that is not so, because the earth and the moon "pull" upon one another with a force equal to the strength of a steel cable 500 miles in diameter. But there is no air and no other tangible thing in the open space, 240,000 miles across. that gaps between the moon and the

Then, gravitation exerts the same force at every instant No matter how fast the falling aeronaut may be de scending at any moment, gravitation will keep on adding speed as if he had just started. Disregarding the slight retardation produced by the resistance of the air, he will fall sixteen feet in the first second, forty-eight feet in the second second, eighty feet in the third second, gaining thirty-two feet in his velocity during every second after the

From a height of 1,000 feet he will come down in about eight seconds, and will strike the ground with a velocity of about 256 feet per second. From a height of 10,000 feet he would fall in about twenty-five seconds and would strike with a velocity of 400 feet per recond.

The same kind of calculation can be applied to the gravitation between the earth and the moon. If the moon were not in motion across the direction of the earth's "pull" it would fall to the earth in about 116 hours.

Now, to return to the mystery, how is this force exerted? Is it really a pull, as it seems to be? The answer to which science is tending is that instead of being a pull, gravitation is push; in other words, that the falling aeronaut is pushed toward the ground and the moon is pushed toward the earth.

On the face of it one might think that nothing was gained by this theory, because it seems as impossible that a push should be exerted without a taugible connection as a pull. But the clew is found in the supposed properties of that invisible, intangible, all pervading medium called the ether.

This, to be sure, is explaining one mystery by another, for we know nothing about the ether except that It conveys the waves of light and electricity; but, at any rate, it affords a enrelvable explanation of gravitation Or. Charles F. Brush's theory regards the ether is being filled with a peculmay intercept these waves in nother on account of the dimineffect of the ether waves in the bace between the bodies.-Garrett P. Serviss in New York Journal.

If you know how to spend less than you get you have the philosopher's stone. - Benjamin Franklin.

TRIALS OF AN EXPLORER. Sickness and Agony That Livingstone

Endured In Africa. Writing on David Livingstone, misslonary and African explorer, Sir Harry H. Johnston says in the British Geographical Journal: "During the winter or rainy season of 1868.9 Livingstone was very iii. He had been wet times without number and suffered from terrible pains in the chest and pneumonia. He was often semidelirious and subject to delusions, such as that the bark of the trees was corered with figures and faces of men. He thought often of his children and friends, and his thoughts seemed almost to conjure them up before him. For the first time in his life he was being carried and could not raise himself to a sitting position. The Arabs were very kind to him in his extreme weakness, but the vertical sun, blistering any part of the skin exposed to it, tried him sorely in the day marches. "In July, 1870, his feet were almost consumed with irritable, eating ulcers, pulsating with pain. * * * These sores were obviously communicated by mosquitoes from the blood of the wretched slaves who were tortured with them Livingstone could fall asleep when he wished at the shortest notice. A mat and a shady tree under which to spread it would at any time afford him a refreshing sleep. But in his

with anxiety that he might not live to complete his mission. "After 1869 he suffered much from the results of the decay and loss of his molar teeth, so that imperfect mastiention of rough African food induced severe dyspensia, and his bodily strength weakened under a condition of permanent malnutrition Stanley. by relieving him when he did, gave bim at least two more years of life. a certain measure of happiness and the sweet consolation that he was not forgotten and that the magnitude of his discoveries was appreciated."

last years of travel sleep was often

made sad by the realistic dreams of

happy English life from which he wak-

ened to find himself ill and consumed

DISEASED THOUGHT.

When You Realize That Is What Worry Is You Have It Mastered.

Concentrated thought is virtually irresistible. All the vast edifice of modern science and industry is obviously the product of thought, much of it of our own time and observation. The birth of an idea in the human mind is dearly the one and only dawn of emoires and revolutions, of engines, phiosophies, trade routes, civilization.

To class worry under the head of thinking, therefore, seems a glaring sacrilege. Yet worry is thought, for ill that-diseased, impure, adulterated thought. It means an admixture of motion, of the worst of all emotions-'ear-into one's thinking. Instead of oncentrated, clear, serene thinking on the problem in hand, worry is hinking muddled black with fear. s about as belpful as clapping the rakes upon wheels toiling uphill.

Yet all the world is laboring under that Egyptian heaviness of the wheels, ind almost every spirit is a spirit in he dark prison of fear. But once we ince ourselves that we can rid our hought of emotionalism, of fear, the lay of our deliverance is at hand. And he substitution of encouraging, healthy hought, of new channels among the vorn ruts, is a powerful aid.

There may be failures and backdidings, as is customary in all mortal fort and human endeavor. But fear s weakened like a choking thing, and nore and more clear and unimpeded becomes our thinking, for we realize it last, once for all, that where thinking cannot help us fear certainly will iot. And then we have worry by the hront-Collier's Weekly.

They Court Death.

Steeplejacks are proverbially reckess-or apparently so-in their actions when engaged on their dangerous work. A laborer who was attached to one of these experts used commonly to ake a midday nap wherever he might dappen to be situated His mates ommonly found him on the top of a steeple or chimney stretched full ength upon a single board, his arms dangling over its sides, fast asleep. A dngle lurch would have meant a fall of a couple of hundred feet, and therefore certain death, yet he treated this gossibility with the utmost indifference. -Chicago Record-Herald.

The Onion In Cooking. The greatest of French cooks, being sked to give the secret of his success. answered: "The very foundation of all good cooking is butter and onion! I ise them in all my sauces and gravies. they have the effect of making a cus tomer come back for more. Butter without onion will drive the customer away after a few days. Boll the onion dil it melts or entirely disappears; hen add the butter and call the mixture stock."-Exchange.

"How is your new maid?" "I guess she is all right; she has the baby out at present. But she has a derve."

"How was that?" "She wanted to take Fido along, and she is almost wholly unknown to us." Houston Post.

All In the Game.

"Harold, you mustn't eat all the peaauts, even if you are pretending to be a monkey. You must give sister

"Rut, mother, I'm pretending she's some kind o' animal wot doesn't pat peanuts." - Life.

TWISTING THE LANGUAGE.

English Has Received Some Severe One That Was Made a Heroine In Spite

Jolts In the Philippines. Baby talk is a highly developed language compared to the jargon American housewives talk to their Filipino bouse boys. But it usually conveys the meaning when accompanied by expressive gestures. At best, however, the performance of the command speaks well for native instuition.

Spanish construction of English words is another twist that our poor language gets in the Philippines. "No got" in the island is the most commonly used expression for "I haven't any." Similarly "no can do" means "I can't," and "no want" means "I don't want Not only between American and Filipino, but among Americans themselves, this twisted construction has largely supplanted the legitimate one.

With the soldier anything that belonged peculiarly to the Philippines was described as "bamboo." Now all colonials use the term. The "bamboo fleet" is the one assigned to Philippine waters, and the "bamboo government" is the Philippine civil government in distinction from the United States mil-

Among other "soldierisms" (if I may be permitted this contribution to the language) were certain pure Malay words. The list is continually growing, and now there are dozens of Tagalog and Moro expressions in constant use among the Americans. For example, there are the Tagalog words "bagulo," meaning "storm;" carabao," merning as animal; "palay," meaning "rice," and "tao," meaning "man Moro terms in common use are "amok," meaning "wild;" "dato." meaning "chief;" "kris," meaning a wavy edged knife, and "sarong," meaning a gagment.-Review of Reviews.

BOATS GROW ON TREES.

West Indian Boys Can Get All of Them They Want.

When a West Indian boy wants a toy boat all he has to do is to visit a cocoanut tree. These trees bear great bunches of nuts among their drooping green leaves, and when the bunch first sprouts out in the form of a big bud it is inclosed within a hard, tough, woody case or spathe two or three feet long, eight or ten inches in diameter and tapering to a point at one end and to a slender stern at the other. In fact, it looks very much like a buge wooden cigar.

As the buds and flowers develop the spathe splits open, and the flower bunch continues to grow out beyond it until the nuts begins to ripen. By this time the spathes have become dry and hard and break off and drop to the ground of their own accord.

It is the spathes or bud coverings that the West Indian boys use for toy boats, and, while the dry and fallen ones will answer, better boats are made from the more flexible and partly green spathes still clinging to the

The spathe as gathered from the tree is almost in the shape of a boat, and all that is necessary to transform it to a very seaworthy and fast sailing toy canoe is to sew the open end together first books to introduce the colon and tar embellished with gold and silver thwarts.

When this is done the boat is almost an exact model of the big dugout catoes that the bays' fathers use in fishing In fact, these dugouts were probably copied from one of the tree grown boats. - From "Harper's Book For Young Naturalists."

A Perpetual Error.

A printer's error in perpetuity! How many know that when joining in the "Te Deum" they are carrying on, in one phrase of that song of praise, an ancient blunder? "Make them to be numbered with thy saints;" so it runs. And so when manuscript copies gave place to printed books was it rendered in the medieval Latin then in use, "numerari"-"to be numbered," as we say in English. Transpose the first and third letters and you get "munerari," "to be rewarded," which is what all prayer books would be printing today and congregations singing were it not for that fifteenth century printer's error.-London Tatler.

Wrong Hunch, No Lunch. "Here, my boy," said his new employer, "take this quarter and go out and get three ham sandwiches." The boy vanished and did not return

for half an hour.

"See here. Where have you been loltering," demanded the boss, "and where are my sandwiches?" "Scissors!" gasped the boy. thought they were for me!" - New York World,

Upbringing. "Aren't you having your daughter taught to play or sing?"

"No," replied Mrs. Flimgilt. "I have decided that she shall have no accomplishments whatever. Instead of striving for approval I want her to have the superior pose that enables her to observe the efforts of others with tolerant interest."-Washington Star.

Quite Natural. "Of course," said the tourist, "you know all about the antidotes for snake bite?"

"Certainly," replied the explorer. "Well, when a snake bites you what's the thing you do?"

"Yell."--Philadelphia Press.

The New Mother, "When you kissed your weeping mother goodby and went out into the world to make your fortune I presume her last tearful injunction was for you to be good?"

"No, make good." 111.

WOMEN WARRIORS.

of Herself.

There are few countries that have not at one time or another had women soldiers in their ranks-either in disguise or openly accepted despite their sex. England, France and Germany have all had military heroines. Germany, which traditionally demands of its women only softness and domesticity, has nevertheless had its full share. Oue of them, Eleonore Prochaska, had saved her wages as a cook to buy her man's equipment. In her last battle, when storming some beights under heavy fire, she snatched a drum from a fallen Frenchman and beat the charge as she advanced.

"You can sew, cook, wash, sing and shoot better than any of us." said the comrade at her side admiringly, "and now it seems you can drum too!"

A moment later she was mortally wounded. As she fell she called to the nearest officer, with a dying flash of pride and humor:

'Lieutenant, I'm a girl!"

Another girl, Anna Lubring, only eighteen, was traced and claimed by her father after she had enlisted, but her captain refused to dismiss so fine

A young dressmaker, Sophia Kruger, who made her own uniform before en-Isting, won the Iron Cross for bravery. Maria Werder, a farmer's wife, served, undiscovered, with her husband and was promoted to be a sergeaut, although be remained a private.

An amusing contrast to these genuinely gallant women is afforded by Johanna Stegen, who quite by accident won a reputation for heroism. She and a companion, Caroline Berger, were caught by chance in the fighting lines at the battle of Luneberg. Caroline fled to what cover she could find, tore off her apron and began bluding the hurts of the wounded who had crawled there also.

Johanna, spying a beap of cartridges, tore off her apron also and began to fill it. for she mistook them for rouleaux of coin. A passing officer supposed naturally she was carrying ammunition to the front and gave her orders where to take it, orders which she dared not disobey. Apronful after apronful of cartridges she carried-and the next day found herself acclaimed a beroine!

Her apron was tied to a staff and borne proudly at the head of the regiment. Men cheered her, the king hand at a banquet. Later she married and was lionized by the fashionable ladies of Berlin.-London Tatler.

No Title Page In Early Books.

The idea of a title page did not occur to the early printers. "The books started straight off with 'Incipit' or 'Here beginneth,' without author's or publisher's name. This causes much astery near Rome in 1465.-Imprint.

London's Gunpowder Alley.

The city coroner, who commented upon the "funny" name of Gunpowder alley (off Shoe lane) and confessed that he bad never beard of it, may nevertheless have heard of the poet Lovelace, who died in the alley two years before the restoration. The lodging in which he died was a miserable one, but probably seemed to the poor poet released from prison a giorious palace, for he was philosopher enough already to have written that "stone walls do not a prison make." In this alley also lived the notorious tional guard. astrologer. Lilly, the Sidrophel of "Hudibras."-London Chronicle.

A Cure For Hiccups

Fill a glass tumbler with clear, cold water and place on a table. Then let the patient stand where he or she can look directly into the glass and fix the attention about the center of the bottom of the glass for about a minute. when the patient will find that the hiccups have entirely disappeared. This has been known to cure the most violent cases of this uncomfortable disorder.-London Family Herald.

To Make Vinegar.

Save the parings and cores of apples and put them in a jar with warm water enough to more than cover them. Set in a warm place for several days: then strain and add one pint of molasses to a gallon of the water. Put in a jar, tie a thin cloth over it, heep tu a warm place and in a few weeks this will be good vinegar.-National Maga-

Different Proposition. "What is the object of your society?" "To prevent gambling among wo

"Nonsense. It can't be acca" "Certainly gambling can be slopped." "Gambling? I thought you said gabbling."-Louisville Courier-Journal.

Grounds. "Has your husband given you group for divorce?" asked the woman who is

always eager to sympathize. "Yes," replied the one whose mind is on alimony. "Plenty of grounds, but I'd rather have some regular real Boston Transcript. estate."- Washington Star.

One of the most rare kinds of courage is the courage to wait. St. Lotts punctuality. - Hannah More.

CUZCO AND THE INCI'S.

Peru's Ancient City Was on the Plan of the Roman Camp.

The ancient city of Cuzco, when first riewed by European eyes, was, according to the best authorities, a great and wealthy municipality of perhaps 200,-000 souls. How old it was at that time we have scant means of knowing. Garcilasso would have us believe that there were only thirteen Incas in the royal family line from Manco Capacto Huayna Capac. Montesinos, on the other hand, assures us that the Incas ruled a thousand years! Which are we to believe? No written history of the race exists-only the records of the julpus, those queer knotted strings which were the Incas' sole documents and for which no archaeologist has as yet discovered the key, the Rosetta stone.

Cuzco's original plan was, singularly enough, that of the Roman camp, a quadrangle divided by two intersecting streets into quarters, with a gate on each face and towers at the angles.

The Incas, like the citizens of the United States, had no more definite name for their country than Tavantinsuya, the Empire of the Four Provinces. The four streets of the capital, prolonged by great roads, divided it into four main provinces, each under the dominion of its governor. When their people came to Cuzco they lodged in their own quarter, where they adhered to their national costumes and

the customs of their own province. The city today retains the same general plan, its two principal streets being virtually the old main thoroughfares. Its two eastern quarters lie upon steep hillsides; the two western are in the valley, where runs a little river, the Huatanay, spanned by bridges.

The northeast quarter was the Palatine hill of this South American Rome and contains the palaces of the kings, for each Inca. after the manner of the Roman emperors, built his own abode, scorning to live in that of his predecessor.-Scribner's Magazine.

HISTORIC NOTRE DAME.

Checkered Career of the Wonderful Parisian Cathedral.

Some account of the history and vicissitudes of Notre Dame appears in the London Strand Magazine. The first cathedral was erected in the year 528 by Childebert and afterward demolished, the same site being used for praised her, and she sat at his right the present building, which was begun in 1163 and finished in 1351.

Alexander III. laid the foundation stone, the first mass being celebrated by the patriarch Heraclius. The grand old building has been sorely beset by many dangers and has witnessed many strange and stirring scenes.

The reign of terror in 1793 led to such disgraceful orgies within the precincts of the cathedral that it was difficulty in attributing earlier works closed to the public as a place of di-to the proper sources." The idea of a vine worship in 1794, but was reopentitle page with names seems first to ed in 1802 by Napoleon. The interior have occurred to a Cologne printer has suffered severely at times at the named Therhoernen about 1470, but it hands of the mob and individuals was not generally adopted until fifty | The worst offender was perhaps Louis years later. The early punctuation XIV., who, carrying out his father's was very simple, consisting of an ob- vow, caused the destruction of the lique line and a full stop. One of the fourteenth century stalls, the high al- bermald boldly, "I have something to notes of interrogation and exclamation statuettes, the cloisters, tombs and was a "Lactantius" printed at a mon- unique stained glasswork. In 1845 restoration was necessary in many parts of the building, the work being successfully undertaken by Lassus.

Viollet le Duc and Boeswillwald. In 1871, also during the commune. Notre Dame was menaced with grave dangers owing to the fury of the communists, who, having effected an entrance, collected all the available chairs and other combustible material and, piling them in a bonfire, drenched with oil in the center of the choir, attempted to destroy the cathedral by fire. The evil designs of the incendiaries were, however, happily frustrated by the arrival of the na-

Misters Are Second Class.

Though one cannot decide what is a ady by rule of thumb, there are certain kindred problems that can be solved in that way, and the railway company knows how to solve them. Are you, for instance, an esquire or only a plain mister? The rallway company can tell at once. If you hold a second class season ticket any letter comes addressed to Mr. Blank, but if you rise to a first class you become at once A. Blank, Esq. That is where the railway has the pull over the motorbus, on which there are no classes.-London Globe.

One Worse.

Binks, with a yawn, said to a fisherman:

"Time ain't very valuable to you. brother; that's plain. Here I been a-watchin' you three hours, and you ain't had a bite!" "Well," drawled the fisherman, "my

time's too valuable, anyhow, to waste three hours of it watchin' a feller fish that ain't gettin' a bite."-San Francisco Call.

Habits of the Hired Man. "Weil, did them moving picture peo-

ple get pictures of everything on the "Everything but the gosh blamed

nired man," said Farmer Heck. "They couldn't ketch him in motion."-Kansas City Journal,

Mrs. Knagg-If I were to dle you'c never get another wife like me. Knagg -It's very kind of you to say that -

Method is the hinge of business, and there is no method without order and

SHAW, THE ECCENTRIC.

His Personality Compels Him to Wear Cocoa Colored Clothes. "I love order in all things," said George Bernard Shaw at a public meeting some time ago. "For this reason I am not content with ordering my life; I also order my personality I have cocoa colored hair, so I wen cocoa colored clothes and drink cocoa. Shaw today has reached the position of becoming a public institution. For more than twenty years he has succeeded in fulfilling his boast that every day some leading paper would have something to say about him.

George Bernard Shaw is the jester at the court of King Demos. When years ago he was appointed dramatic critic to a well known journal he re-fused to obey the ironclad regulation that occupants of the stalls must wear evening dress. The first night he was stopped at the door of a theater by an attendant. "What do you object to?" inquired Shaw. "My cocoa colored jacket?" The attendant assented. "Very well then," said the critic, "I will remove it." And the next moment he was striding up the aisle in his shirt sleeves.

"That won't do. sir!" shouted the attendant, running after him.

"Won't do?" exclaimed Shaw with a fine assumption of indignation. "De you think I'm going to take off any more?" The nonplussed attendant handed him his jacket and Shaw took his seat in the stalls triumphantly.

During the first nine years this brilliant man was in London his earnings from literature brought him the princely sum of £6. Now he has an incomof several thousands a year. Of that period which he spent in want he says with his characteristic candor: "My mother worked for my living instead of preaching that it was my duty to work for her; therefore, take off your hat to her and blush. I did not throw myself into the struggle for life; I threw my mother into it. I was not a staff to my father's old age; I hung on to his coat tails."-London Life.

A CURIOUS LOVE SCENE.

Rochefort Sprang a Surprise on the Troubled Couple.

Rochefort could be very democratic on occasions. I remember an amusing ncident which occurred when Rochefort was in London. His French chambermaid fell in love with his English coachman, and they were engaged to be married. John, who never spoke of Rochefort otherwise than as "the marquee," gloomily informed Charlotte that their project must be kept a profound secret, for it was a custom in aristocratic houses in London that when servants in the same household became engaged to be married they were promptly dismissed. Charlotte could bardly believe this, but John as-

sured her that it was so. At last Charlotte took her courage in two hands and, dragging the trembling John behind her, advanced into the awesome presence of "the marquee" while he was taking coffee after lunch, I was present and witnessed the scene. "Monsieur Rochefort," said the cham-

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Rochefort-Tell me, my child. Charlotte-John loves me, and I love John, and we want to be married. (John went as pale as a sheet.) Does monsieur see any objection?

Rochefort this great blue eyes dancing with fun, his arms raised in the air)-Objection, my children, objection? What earthly objection can I have? Venez donc que je vous embrasse! (Come and let me embrace you.) And, to the utter amazement of John, he heartily kissed both young lovers

on both cheeks. - Westminster Gazette.

Can't Escape Lime Salts. lay correspondent, who expresses his belief that "the lime in common water has much to do with bringing on old age." the London Lancet says that while that opinion is common, it is, of course, fatuous. To those people who believe that water is the only possible channel by which lime salts are conveyed to the organism the writer says, "Lime salts are inseparable from the common, everyday articles of food, so that if hard water were left out of the dietary there would still be secured a large intake of lime salts, which could only be avoided by a hunger strike."

Woman and Clothes,

One can't help thinking what a colorless life a man is forced to lead when one reflects that chiffon and venetian point and hand embroidery and Irish crochet are to him mere empty words, whereas a woman, whether she is interested in babies, or microbes, or husbands, or poetry, or servants, or parallelograms, or gardens, or Plato, or bridge, is fundamentally and always interested in clothes .- "Daddy Longlegs," by Jean Webster.

In a Dilemma.

"What are you crying for, Bobble?"
"Boo hoo! Willie's broke his arm, an' if I fick bim all the fellers will say I'm a coward."

"Why don't you wait till he's well?" "Boo-hoo! I can't lick him then."-St. Paul Pioneer Press.

Picking Up. "How's collections at your church,

Brudder Hambone?" "Much better since we got a one armed man to pass de plate."-Washington Herald.

Kept the Better Half.

Algy-You say she only partially re-turned your affections? Clarence-Yes. She returned all the love letters, but retained all the jewelry. - Brooklys Cit-