CURIOUS NEW DISCOVERIES ABOUT WALKING AND RUNNING.

From Instantaneous Photographs Made by the Academy of Science in Paris.

THIS IS THE WAY MOST PEOPLE WALK, BUT IT IS WRONG.

THIS IS A SCIENTIFIC AND INTELLIGENT WAY TO WALK.

THIS IS THE USUAL BUT INCORRECT WAY WE RUN.

THIS IS THE SCIENTIFIC AND IMPROVED WAY TO RUN.

WALK LIKE THIS HERE-AFTER.

Lean Forward and Don't Hold Your Body Stiff.

MAKE A SERVANT OF GRAVITATION.

French Scientists Tell How People May Cover Many Miles without Fatigue.

There is a new way to walk. That is, it is new to people who live in cities and large towns. It is much easier, a greater distance can be covered with less fatigue, and it is the way nature intended we should walk.

It has always been the popular belief that there is but one way of walking—that which every one learns in childhood—but M. Marey, the famous French scientist-photographer, together with Drs. Comte and Regnault, have just made a report to the Academy of Sciences, of Paris, which seems to prove that the ordinary manner of walking and running is far from being the best and least fatiguing.

These savants explain minutely, by words and pictures, the difference between the right and wrong methods of locomotion, and tell how a man may quickly acquire the best method which will enable him to traverse long distances on foot without the least fatigue.

The idea originated in 1872, with a French army officer, Commandant de Raoul, but he was unable to get the war or navy department to recognize its utility. Now that it has been so clearly demonstrated by means of instantaneous photography, the French Government will doubtless put it into immediate use in the army, for a body of troops who have acquired the new step will be vastly superior to any others who march in the old way.

Commandant de Raoul discovered this method of walking after many years of patient study and observation. He called it the "pas de flexion," or "flexion," or "bending step," to distinguish it from the "parade step" taught the soldiers. Its characteristics are that the body is inclined forward and the knees kept bent. The feet are raised only enough to avoid any unevenness in the surface of the ground, and the trained walker or runner glides along with the suppleness and agility of a cat. According to M. de Raoul, a pedestrian can cover five and a half miles in an hour's walking, or eight miles in the same time by running, with less fatigue than he could accomplish these distances in the ordinary way.

WHERE THE SAVAGES WERE WISE.

Though this method may be regarded as a new discovery, as it is quite unknown and unused among European nations as a distinct style of locomotion, yet among savage and half-civilized races it has ben long in vogue. The Singalese and Japanese runners who cover sixty to seventy-five miles daily, month after month, the couriers and footmen of India and some of the peasants of Asia, all swing their limbs in exactly the same way. In Belgium alone this method of walking has received the characteristic name of the "messenger's step," for it is like that of the rural postman. When a man is fatigued he drops into it unconsciously, calling into use, in fact, those muscles which he has been employing the least in the ordinary way of walking, and so letting rest those which have become fatigued. It is following out the same principle that the tired couriers of the Orient walk backwards in order to rest themselves without losing time on their way.

The use of scientific photography has confirmed all these facts and has at last brought out the difference between the two methods very clearly. The human eye is not sufficiently quick to note each separate movement that a man makes in walking. The images strike the retina in such rapid succession that the mind is powerless to distinguish between them. But by means of chronophotography M. Marey has been able to do this and to show clearly on the photographic plate, by means of pictures, scarcely one-fiftieth of a second apart, every minute motion and pose that a man makes or assumes in walking or running.

The experiments were undertaken by direction of the municipal government of the city of Paris, and were conducted in this wise. At a certain point in a carefully measured course a dial was placed, whose needle, moved by clockwork, made one complete circuit in the space of one second. The moment the man "en experience" came beside the dial, he entered the field swept by the camera. The movement of the step he made in passing the dial was therefore recorded in all its movements, the dial meanwhile noting in fractions of a second the exact time of the taking off of each of these instantaneous photographs, the aggregate time consumed in making the single step being from one-fourth to one-third of a second. The accompanying illustrations should be read from right to left and from the top downwards, as they show the successive poses of the subject. In this way a graphic idea can be obtained of the difference between the ordinary method of locomotion and what may be called the "new."

TWO WAYS OF WALKING.

In the ordinary way of walking the body rises and falls successively. This, M. Marey states, is one of the principal directions in which force is wasted and lost. In one of the series of experiments a shining bit of metal was attached to the head of the subject in order to calculate exactly how much the body rose and fell with each step, and it was shown by the resulting series of pictures that range in ordinary walking was nearly two inches, while with the "flexion step" it was less than one. The difference seems of slight moment, but it has been computed that in running a mile in the usual way, a man loses enough force through these oscillations to enable him to climb vertically 250 feet. This loss by the new method is greatly reduced, the waste being only sufficient for an ascent of about 100 feet.

The reason for this is that by the new method the feet are only raised enough from the ground to clear any unevenness in its surface, and when the foot touches the ground, therefore, it does so more gently and gives the body less of a jar than in the ordinary way. The limb from the toes to the hip is bent—the foot at the ankle, the leg at the knee, and the thigh stands out at a sharper angle from the axis of the hip, which is the reason for the unusual suppleness of those who move after this fashion. As in jumping, it is best that the body strike the ground with the legs bent so as to lessen the shock, so it is that their being bent and flexible in walking causes the body to come down gently with each step.

Summarized in brief and simple fashion, the points of difference between the two methods of walking are these: In the ordinary way we hold our body upright and rigid and the legs stiff. We lift our feet higher in the air than is necessary and bring them down harder. The Raoul method teaches that the body from the hips upward shall be inclined forward somewhat, so that the centre of gravity shall be continually on the point of being lost, and the only way to keep from falling is to keep in motion. Now, as the centre of gravity keeps moving continually forward, it drags the weight of the body after it. In order to keep pace with this movement with the least effort the feet should be lifted and slid along just above the surface of the ground and just high enough to escape any irregularities in the path, and should touch the ground glancingly rather than coming down flat.

RULES TO THINK ABOUT.

Certain simple rules have to be observed in learning or teaching people how to walk in this way. The runner, for instance, begins by making very short, quick steps, 190 to the minute. The length of the step is gradually lengthened until—if he is even only an average man—he will find himself able, almost at the start, to do his first mile in eight minutes, his second in seven, the third in six and the sixth in about fifteen seconds less. These records have recently been made over and over again in France. When a man is well trained he can cover his third mile in five and a half minutes, or loaded down with the regulation arms and baggage he can accomplish easily eight miles an hour.

It is said that in this way a man's endurance depends entirely on the strength of his legs, for his legs give out first. Ordinarily one's "wind" is exhausted in running long before the muscles in the limbs have lost their springiness, but with the new method the reverse is true.

It is recommended that the runner hold his head up and take long, slow, deep breaths, and that when he reaches the end of his journey he gradually slacken his pace until he comes to a halt.

The question naturally arises why our present defective method of getting over the ground should have supplanted this much easier one that was universal, it is supposed, with primitive mankind. The answer is, that the use of various kinds of conveyances, from horses and wagons up to railway trains, has caused it to be unnecessary for people to travel far or fast afoot, and that thus their methods of walking have gradually changed. Among mountaineers, for instance, where horses and wagons are, and always have been, impossible, this same primitive method of locomotion is still a characteristic.

AIMED AT THE ARMY.

As may be supposed, the French scientists of the city of Paris are not engaging in these costly researches simply to pass away the time. Like almost everything else in France, the vast standing army occupies always the first place in the thoughts of the Government. Now it is often the case that the soldiers of one army may be able to march further and more hours than those of another, and in this way many battles have been gained. It naturally follows that if this Raoul method of walking is adopted in the French army, as it undoubtedly will be, the old parade step will soon be a thing of the past, and the soldiers will go loping speedily over the ground, covering three miles or more to their untrained enemy's two, and be fresh and breathing easily when the time comes for close fighting.

Another point of view is the hygienic one. Walking is said by every physician to be of great benefit, and among the best of all forms of physical exercise. If the pedestrian follows this new method he can cover miles without fatigue or loss of breath. French physicians have already begun to take the matter up, and many people are acquiring proficiency with great rapidity in this new way of walking, which is the old.

EXPLOSIVE BULLETS.

The New Implement of Destruction for Penetrating the Skin of Big Animal Game.

Ordinary rifle balls have long ago been found unsatisfactory not only in hunting the elephant and rhinoceros, but also in attacks on the lion and the tiger. Such a ball seldom penetrates the thick skin of an elephant or hippopotamus, or the skull of the large felines, and, if it does, it usually only irritates the punctured animal. Hence explosive balls are now generally used.

The body of the explosive balls is of lead, enclosing a brass shell closed at both ends and filled with powder. Into the bottom of this shell is fitted a percussion cap, to be exploded by a pin whose head projects beyond the shell, but which the still further projecting leaden envelope prevents from premature action.

When the shot is fired the powder gases drive the brass shell forward, the broad foot of the shell becoming firmly wedged in the lead. The head of the pin then projects so that, on contact with the object fired at, it strikes the percussion cap, exploding the ball. These projectiles are called Podevila's balls.

In the balls usually employed in hunting elephants in particular there is no brass shell. The steel pin is inserted in through the point of the hollow ball; the cavity is then filled with powder and closed with a screw carrying the percussion cap.

A still more original and more expensive ball for the same kind of sport is that invented by Baron Waterskirchen, consisting of a steel tube having an outer covering of lead. The front end of the tube is finely tempered and sharpened. This wicked, hollow projectile cuts like a punch through flesh and bone, through thick and thin, and so far remains unsurpassed in the elephant-killing business.

AIR, LIGHT AND SUN TO RENT.

In New York They Bring in Fat Revenues.

PERQUISITES OF A SKYSCRAPER.

Even the Law Holds That the Air Is Subject to Property Rights.

Air, light and sunshine are rented to hundreds of people in New York each month and at fairly good prices.

This seeming impossible transformation of the immaterial into cash is accomplished through the renting of offices. Offices well up in the sky-scrapers bring much higher prices in many cases than those lower down, this fact being due to the greater abundance in the former of light, air and sunshine. The difference is paid for the three immaterial things mentioned. Therefore, they are rented as much as the offices.

The question of rent in the air has been brought out conclusively in a claim the Astor estate has recently made, which was described fully in last Sunday's Journal. The Astors have made this claim upon an old legal point that has long been sustained by the courts that a man on buying real estate buys the rights of it not only on the ground, but all the way up to heaven if he chooses to go so far. Acting upon this old opinion of law, the Astors now propose to make the American Surety Company pay a good fat rental because the cornice of that corporation's great new building hangs twenty-six inches over in the air above their property.

Something like this came up a couple of years ago downtown, a claim that was even more interesting. One of the new tall buildings in that region, it was contended by the owners of some adjoining property, had settled a little on one side, so that the upper part of the wall leaned a few inches into the air above the adjoining property. It was at once proposed that the owners of the building that had fallen a little out of plumb should pay rent to the people on whose air they were encroaching, and the matter very nearly came to a legal battle. Had the claim been pushed, there would have been a very fair chance of its having been allowed by the courts, for there seemed to be little doubt that part of the tall building was beyond its proper line, poaching, in fact, upon its neighbor's preserves.

Hardly less immaterial, though commercially enormously important, are the numerous "rights of way" which are rented by the score in every section of the country. A great portion of the business of America would, indeed, go without being transacted, were it not that these permissions of moving across certain territory were annually rented to corporations and individuals. No less interesting are the easements, or concessions, that go with the sale of certain pieces of real estate, and are afterward rented out with these parcels of property, giving them a vastly increased value because of the convenience they add.

A case in point relates to a certain country home at Long Branch, situated on the land side of Ocean avenue, and surrounded by broad grounds. It brings a good fat rental yearly, because, with house, lawn and outbuildings, go the rights to a bathhouse on the beach, and the privilege of passing through the property immediately opposite, and on the other side of Ocean avenue, at any time.

Water rights is a topic of very little concern here in the East, but in the great plains beyond the Mississippi it is a matter of exceedingly great moment. There, ter of exceedingly great moment. There when a person rents a piece of property certain rights in the streams of the region; that is, he is fully protected against these streams being turned from their courses for any reason whatsoever. The question of irrigation is such a prominent one in this country, and it so closely affects all farming and grazing interests that the value of water rights there is readily to be seen.

There is another sort of water rights which pertains especially to the seaboard section of the United States—the rights over oyster and clam beds along the coast, which, when rented, are a source of great revenue. A question with reference to this very thing is now pending in the Legislature at Albany, in regard to some oyster beds along the Sound in Queens County. Some recent buyers of land along this shore are endeavoring to get the territory under water out for a distance of about half a mile, and are claiming that because of their purchases, they are entitled to it. This land under water, however, is so immensely valuable, on account of the high rental it will command, that a spirited fight is now going on for its possession; a fight that is represented by great quantities of money on both sides.

A very common rental, and one that is so familiar that the peculiarity of it does not strike the average man, is the letting of windows on important avenues temporarily, perhaps, for some commercial purpose, but usually as a point of vantage for sight-seeing at the time of a great parade or some big civic formality. Windows that are ordinarily of no importance at all become of great value on these occasions, and the prices for them mount skyward with rapidity.

When it comes to severely material things, articles that are of value in themselves, and, at certain seasons, of increased value because of circumstances, the number of queer rentals is almost unlimited. Telephones and phonographs are never sold, for example. They are simply rented for so much a month or week, and keeping them in repair is guaranteed while the rent is paid. Jewelry of the most costly sort can be hired upon good security, and any one wishing to give a dinner or an evening party can rent complete sets of silver, china and napery at prices that are very moderate. He can also rent camp chairs by the dozen, while the renting of steamer chairs for ocean tourists has steadily increased as a business until now it is a much more common thing for the traveller on board an ocean greyhound to have merely paid for his chair going over instead of having gone to the trouble of buying one.

Perhaps one of the strangest things it is possible to do in the way of giving a banquet is to be able to secure for a few dollars a magnificent centrepiece of heaped up fruits, which looks as if meant for consumption, but which, as a mater of fact, is never offered the guests. Certain fruiterers do quite a trade in renting out these centrepieces, and by care in the selection of the pieces and great delicacy in handling them, they can make the same fruit do service many times.

"Dress suits" are getting more and more in vogue at East Side balls, and the consequence is that they are rented out for an average sum of $2 a night, in increasing numbers. Some of the concerns that do this sort of business keep two or three hundred dress suits in stock and reap a huge profit on the original cost of them. If the customer meets with an accident while wearing the clothes he has to pay for them, while if the suit goes safely through the season, it is good for another Winter easily, and coat, vest and trousers that originally cost $20 to make up will turn an even $100 on the average.

Plays are another thing that can readily be hired, and very frequently are. Actors and actresses whose names appear on the programme with "By kind permission of Mr. George Blank" under them, are generally rented out by the seemingly obliging manager for financial consideration. The renting of baseball players to one club by another is a matter upon which every enthusiast of the great national game is fully posted.

Even names are getting to have a distinct rental value. Any enterprising young man, for example, who could persuade Dr. Chauncey M. Depew to rent him his distinguished patronymic and Christian name for the purpose of trade, keeping this fact close secret, could realize a handsome profit on the investment. There is one widow in New York who is getting $20,000 a year by renting out her late husband's name to the firm who bought out his business. And this simple commercial arrangement is duplicated in fully a hundred similar instances.

UNSOLVED MYSTERY.

What Becomes of People Who Disappear in New York.

ONLY HALF HEARD FROM.

Poverty, Destitution and Woe the Lot of Those Left Behind

What becomes of the hundreds of people who disappear in New York City each year? Who cares for them and how are they existing, if they exist at all? These are questions which the police can only partially solve, and the roll of mystery grows with each year.

It is true, as the police maintain, that only a comparatively small portion of the number of disappearances are reported to them; this fact crops out occasionally, when some one reappears who has been mourned as dead. So it is safe to say that not more than 50 per cent of the people who disappear are ever heard from afterward.

Perhaps the saddest of all the features of this sorrowful phase of life is the woe of the relatives and friends of the missing. Poverty and want often presage a sudden vanishing of husband and father. They are almost sure to follow such an event. That is a chapter in tragedy of which the public knows little. In the majority of cases any sympathy to be bestowed should be upon the persons left behind, and not given to those who are—no one knows where. Who cares for the persons left destitute by mysterious disappearances no one seems to know. Eventually they, too, disappear.

The Police Information Bureau of this city sent out 254 general alarms last year for missing men and women. This number does not represent one-tenth part of the applications to the police in regard to missing persons, but only the more serious cases, of which it is feared that foul play had something to do with the disappearance. Of ordinary cases where the missing persons are likely to turn up in a few days no record is kept.

Out of the 254 persons sought, only two-thirds were accounted for up to the close of the year. No less than seventy-two of the serious cases for which general alarms were sent out still present unfathomable mysteries. It is curious to note that a considerable number of these were husbands who were sought by their wives, or wives who had vanished from the sight of their husbands. The following are a few of the more interesting cases:

John Signart, twenty-seven years old, left his work in New York City, on Saturday, January 5, and his wife who lives at Jersey City Heights, has been searching for him ever since.

Fred E. Conkling, of Bayside, L. I., has been sought by his wife, Nona, since February 3.

Celia Bram has been looking for Henry Bram since February 24.

Mary Berry was going to work February 23, and her husband has not seen her since.

Sarah Orton is believed to have run away from her husband on May 5.

Margarita Pischkalla disappeared on May 3. A week later Paul, her husband, shot himself from grief. Nothing has since been seen or heard of his wife.

Kate Hollinger vanished June 16, and William, her husband, had heard nothing from her when the police inquired in December.

T. F. Ryan was out of work in July. His wife, Mary, has not seen him for six months.

Jacob Goedten, a Brooklyn saloon keeper, crossed the Bridge on July 30, and his wife and family still mourn his absence.

B. Krieger left home not feeling well October 25. His whereabouts are still a mystery to his wife, Kate.

Teresa Schler, of Webster avenue and Kingsbridge road, deserted her husband on October 29. The fate of herself and her four children has not been decided by her husband Joseph.

Jacob Singer was slightly demented. His wife has seen nothing of him since he left his home, November 1.

John Renoff, seventy-six years old, has been sought by his wife, Rosa Ann, since November 19.

Nellie M. Nagle came from Boston with her husband on November 27. He lost her on the corner of West Third and Thompson streets the same day, and is still looking for her.

Adolph Lind left his Brooklyn home one rainy afternoon in November. His wife, Maud, still inquires for him.

Anne Egbertson purchased furniture in New York on December 12, and her husband in Orange, N. J., is still wondering what has become of her.

Louisa Boull left Hoboken on a visit to New York, December 20, and Harry Boull is asking for her yet.

J. R. Kettner was last seen by his wife on an Avenue B car on December 21. The police have not been able to help her in her search.

George L. Applegate crossed the East River on the last day of last year, and the police of New York add his name to the list of husbands who are sought by their despondent wives.

Such are a few of the inquiries which were set on foot last year in New York City by anxious relatives and friends. Many applications are also made from abroad, for New York is the Mecca of adventurous youths and a gravitating point for criminals of every country.

The inquiries came not alone from the city itself and from every part of the United States, but from every city in the Old World. The city applicants are, however, the most numerous. Their stories, also, run on well-known lines. Many of them are pitiful in the extreme.

A story repeated day after day runs on these lines: A woman, whose every garment shows a struggle against poverty, tells of a husband out of work for the Winter; has lately been curious in his habits; morose and despondent; now he has disappeared. Will the police find him? Do they think he has committed suicide? Ten to one her story ends in a fit of weeping, as she thinks of the river and its alluring invitation to the city unfortunates. Even more sorrowful is the story of the mother whose pretty daughter has disappeared. She is generally from a village or small town in one of the nearby States; has been a belle of the place; her head has been turned by the attention of Summer visitors and their stories of New York gayety. Will the police find her? Can it be possible that she has been entrapped in some den of infamy? Again the sympathies of the most callous are aroused by the mother's grief.

What becomes of all these applications? For the most part they are noted by a clerk. It would be useless to keep a formal record of each. It is customary to give each applicant at the Bureau of Information a stamped and addressed envelope and request them to notify the police upon the return of the missing. In a great number of cases this is not done, though friends and relatives at the time of inquiry are ready to make affidavit that they will notify the police.

The general alarm book, in which all alarms sent out for missing persons are carefully recorded, is overhauled frequently by Sergeant Burns for the purpose of checking off those still missing. Whenever the fate of the person is still undecided a form containing name and address is sent out to the captain of the precinct in which he resided and inquiry is made again. If it is found that the missing man has returned his name is checked off in the general alarm book. General alarms were sent out for between 70 and 80 persons last year who have not since been found.