

TRICK RIDING.

Bicycling, like all other sports, has, besides a vast number of adepts, produced its phenomenal artists. Some we admire for their remarkable strength and endurance, which enables them to establish such records as the track and the road have seen.

Others are distinguished rather by agility. An American, Mr. Valdare, has performed in a photographic atelier before the correspondent of La Nature the tricks our illustrations (taken from that French paper) show. They are all done on an ordinary roadster. In the first cut we see Mr. Valdare stretching his body over the handlebars, and, supported by them, he turns the pedals with his hands. Then, riding on the front wheel, he grasps the handles behind his back and, throwing his weight on the fore part of the machine, he treads the pedals with his feet (No. 2).

In the third position he sits on the handlebar, and in that position propels the machine backward, achieving one of the hardest bicycling feats (No. 3). The fourth cut shows a novel way of mounting. It is executed with such graceful ease by the artist that riders of the wheel might imagine, on seeing it done, that this is the easiest way of mounting that could be (No. 4).

Then he turns his wheel over, resting it on the handle and saddle, rises upright on the pedals and treads them as if he were sitting in the saddle (No. 5). Our sixth drawing does not fully show the exercise in question, which consists of two moves.

Mr. Valdare loosens the nuts which hold the front wheel in the fork, then mounting, he gives the wheel a certain amount of momentum, gives the fork a sudden jerk, so that the wheel is set free and continues on its way, while he keeps his seat, and goes on on his unstable and uncomfortable monocycle.

The seventh exercise is executed either in motion or at rest. It is the one which strikes the public most, for it requires wonderful suppleness and equilibristic faculties. The cyclist is on his machine, and giving it a fairly rapid circular motion, passes through the frame from left to right, and is again in the saddle, all without touching the ground (No. 7).

Another exercise consists in sending the wheel along by treading the front wheel alternately with the left and right foot, holding the handles as in our eighth cut.

The exercises we have described are only those which can be rendered by photography. Some others are interesting only for the motion which they show, such as riding backward, a very difficult feat, as any one possessing a bicycle may ascertain.

Largest Camera in the World.

An enormous camera has been constructed and is now being used in San Francisco. It found its necessity in the Fair will contest, and was conceived and built by Theodore Kytka, the artist and expert in micro-photography and chirography. Mr. Kytka, who was employed by McEnerney & Goodfellow to investigate the pencil will the day on which it was filed, believed the document to be a forgery. Charles Fair's attorneys, Knight & Haggerty, decided to take every possible means to establish Kytka's theory. So they built this camera.

With it an exact reproduction of any writing can be magnified 3,600 times. This means that a letter one-twentieth of an inch in height can be accurately pictured 15 feet tall. In this way, photographing one minute section after another, the pencil will could be reproduced so that each page would be 3,000 feet wide and 5,100 feet long.

Mr. Kytka's studio was not large enough for this giant camera. In consequence, it has been built in two rooms. The telescope part, which is made up of

twelve sections or bellows, each supplied with a little side door entrance, is 25 feet long when extended to its full capacity. This is connected by a black rubber cloth with an adjoining room used as a dark room. In this way the dark room became the plate holder of the camera, and in it the expert works, directing his assistant on the outside in altering the focus and lights till a satisfactory result is attained and the photograph is taken.

When the investigation of the will began, there was a sore lack of appliances. Photographs of the document were made as large as possible with ordinary cameras and lenses. These were given to the different photographers of the city for enlargement, but the results were not as satisfactory as hoped for. In each there were evidences of marked distortion. There was a lack of sharpness and precision in the lines and a sacrifice of detail in the general effect.

A little over twelve months ago C. P. Goerz, a scien-

reinforced by powerful electric lights, Mr. Kytka showed erasures that before had only been conjectured.

In order that there might be no possible escape from his arguments, Mr. Kytka began a collection of pencils. A sample of every pencil obtainable in this country and Europe was secured, and the marks made by these pencils (of which there are now more than 2,400) were analyzed under different conditions, photographed and photographed again after erasure had been made.

The results obtained were a revelation, says the San Francisco Examiner. Never had there been constructed so elaborate a plant in this country or in Europe. The police employed this camera to assist in the Becker and Creegan case, where a check on the Nevada Bank was raised from \$12 to \$22,000. The first work to be done was to show that the check for \$22,000 was a forgery. The process employed was as simple as it was effective.

The check was placed between two sheets of glass and in focus before the camera. It was then photographed, enlarged several times with a strong reflected light from behind, emphasizing not only the fiber of the paper but the lines on it. That photograph told the whole story. The camera brought out faintly the letters "Ive" which had been erased with acid by the forgers before they changed the word "Twenty-two" to "Twenty Two Thousand." What was more, the ink in the first three letters was shown to be different from the rest. The photograph showed too that the original check had been blotted, while the letters that had been painted in were allowed to dry. The patches that had been used in filling the holes in the paper of the check made by the perforating machine were also made evident.

Kinds of Lace that Exist.

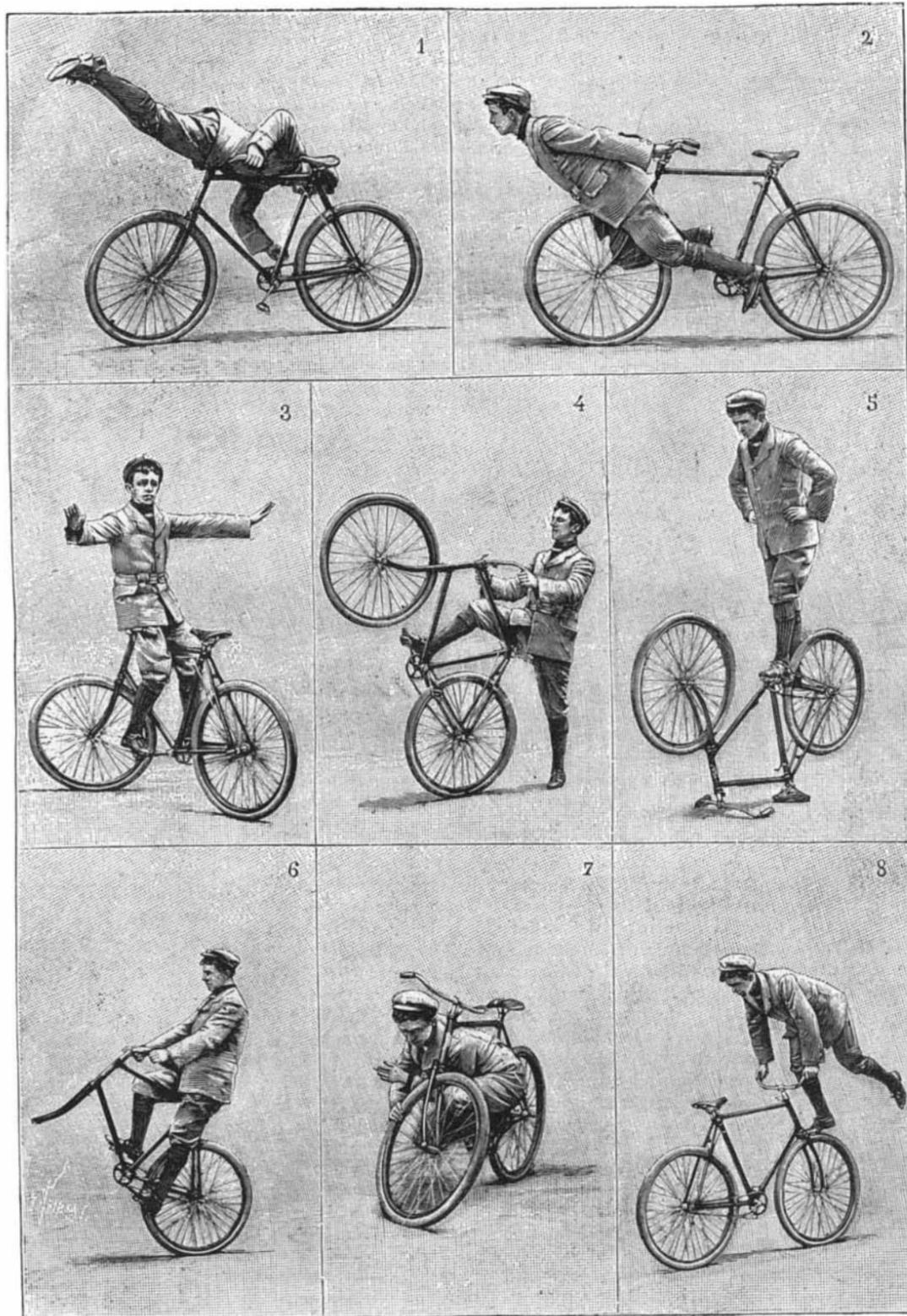
The question having been asked as to the kinds of laces known, it may be said that their names are many. A partial list of laces would begin with Albisola and conclude with Ypres, as follows:

Albisola, Alençon, Brussels, Antwerp, Appliqué, Aras, Auvergne, Ave Maria, Baby, Balloon net, Basket, Bayeux, Beaded, Beggars, Billinent, Blond, Bisette, Bobbin, Bone point, Border, Bourg Argental, Bride, Broad, Buckingham, Burano, Cadiz, Carnival, Cartisane, Caterpillar point, Chain, Chantilly, Chenille, Cluny, Cordover, Cork, Cretan, Crewel, Crochet, Crown, Dalecarlian, Damascene, Darned, Devonshire, Diamond, Dieppe, Dresden point, Duchesse, Dunkirk, Dutch, Eceru, English point, False Valenciennes, Flat point, Flemish point, Fuseau, Genoa, Grammont, Gueuse, Guipere, Henriquez, Hollie point, Honiton (made in Devonshire, England), Jesuite, Knotted, Lille, Limerick, Macrame, Meehlin, Mignon-

ette, Miercourt, Needle point, Oyah, Parchment, Pillow, Plaited point, Pot (from pattern introduced), Powdered (covered with small flowers and dots), Saxony, Spanish, Statute (lace made in accordance with sumptuary laws), Tambour, Tape, Thread, Torchon, Trolley, Valenciennes, Ypres.

The Roentgen Rays Applied to Mining.

Dr. F. E. Yoakum, of Los Angeles, Cal., has applied the X rays to the determination of gold in quartz. The physician was photographing a tumor; there was a vacant space on the plate, and he placed a piece of gold-bearing quartz on it; when the plate was developed the outlines of the rock came out on it, with specks here and there, which showed the presence of gold. Since then he has taken a number of pictures of gold in valuable ore. The fluoroscope has been used for this purpose. It is believed that the discovery will be of use to geologists and mineralogists in prospecting.



TRICK RIDING BY MR. VALDARE.

tist of Germany, invented a new lens. In this there were six lenses ground into one. They were all so adjusted that, no matter how great an object was to be magnified, it could be directly reproduced without the slightest distortion. This lens was of no value in making ordinary pictures, but in bringing out lines exactly and exposing the fiber of paper it was unequalled.

This settled the greatest of the difficulties. The possibilities of employing the camera with the Goerz lens in simplifying the points they wished to make no sooner became evident than a lens was ordered. The wonderful exactness required in its construction may be judged from the fact that though it is only about two inches in diameter, the lens required four months for its manufacture, and then cost \$185.

Upon the arrival of the lens, work was at once begun in examining the documents in question from every standpoint. Under the power of his new instruments,

Our Improved Varieties of Oranges.

BY GEORGE ETHELBERG WALSH.

The orange crop of Florida, partly recovering from the severe freeze of two winters ago, again looms up to play an important part in the prosperity of that State, and incidentally to affect the food markets of the world. The golden fruit that Florida has brought to perfection, and California has multiplied in such enormous quantities that the disposal of the crop has become the chief problem of the growers, was formerly a luxury of the sick room in this country, but to-day it is almost a necessity, and one of the staple products of the land. In seasons of plenty the orange appears on our tables as freely as apples, and, like all other fruits that are toothsome and healthful, its consumption is increasing by the invention of many curious and novel ways of serving it as dessert.

Before the freeze of two winters ago, Florida had about five million boxes of oranges on the trees, and to fill the vacuum caused by the catastrophe, California sent to our Eastern markets more than half her crop, while from Jamaica there has come enormous importations of these fruits. The California oranges do not begin to arrive before January, and, as there was no other crop ripe except that of Jamaica in time for the holiday season, the growers of that tropical island realized greater profits than any time during the past ten years, and they shipped over eighty thousand packages to us, each containing about three hundred and fifty oranges.

Considering quality alone, the Florida grafted oranges are the finest and most toothsome in the world, and their increasing supply this season will be appreciated by thousands of disinterested lovers of good things. But varieties are multiplying so rapidly that it may not be long before the old standard oranges will be replaced by something better and more succulent. Horticulturists are working diligently in the field of orange culture to produce fruits of a finer flavor, with more juice and less pulp, and without seeds or thick skins. The climate of Florida appears to be best adapted to such experiments with the citrus fruits, but California has been foremost in the field in producing new and astonishing varieties.

The Washington navel orange is partly the result of intelligent crossing and grafting, and partly due to pure accident. It now forms the chief fruit of the famous Riverside fruit region, and nearly a million trees are budded with this variety. This peculiar freak of nature in oranges, which has practically made the reputation of Riverside, sprang from a couple of trees, budded from orange trees imported from Bahia, Brazil, in 1873, by the Department of Agriculture, and sent to Mrs. L. C. Tibbets, of Riverside. The tree is a semi-dwarf and is almost thornless, while the orange is the abortive attempt of nature to produce twins. The navel orange did not come into prominence until the New Orleans Exposition, in 1885, when it received the first premium and took the palm from Florida. Since then it has stepped boldly to the front, and commands high prices in every market where it appears. Most of California's seedling groves have been cut back and grafted with the navel orange, and it will soon comprise the greater part of her shipments. Unlike most of California's oranges, the navel ripens early enough for the Christmas holidays, although it does not, by any means, reach perfection until much later. Its most perfect period of lusciousness is not until March.

While the navel is the chief glory of California's orange groves, it is not the highest priced in the market. The blood orange is considered the finest, but connoisseurs differ on this point. The comparative scarcity of this sport or freak orange makes it very expensive. It is not extensively raised because there is no certainty of obtaining pure blood oranges from trees that have produced them in the past. The reddish color of the pulp is its chief distinguishing virtue. Specimens of the blood orange are apt to be found in every box from the Mediterranean.

The Mediterranean sweet is a fancy name given to a very desirable variety of orange from the shores of the Mediterranean, but the finest fruits raised in Europe cannot equal the ordinary grafted Florida oranges, no matter by what name they go. As an instance of the peculiarity of the climate or soil of Florida in changing the character of oranges, mention should be made of the importation of one hundred boxes of Rodi oranges last summer. The seeds of these orange trees were obtained from the groves on the Indian River, and were planted at Rodi, where they have produced a small crop of fruits much superior to and sweeter than the old Rodis, which have heretofore been considered the finest oranges grown in Mediterranean countries. Scions from the new trees will be grafted upon many of the native Italian trees, and hereafter we will have regular summer importations of Florida-Rodi oranges.

The peculiarity of this experiment is more apparent when we remember that some twenty-five years ago many of the orange groves were started in Florida from seeds obtained on the shores of the Mediterranean. In fact, the old Indian groves planted around St. Augustine, hundreds of years ago, sprang from seeds brought by the priests from Spain, and now after the fruits

have been improved by their new surroundings, they have been sent back to their original home to rejuvenate the old stock. Whether the qualities of this new stock will last, or run out in a few years, is a question highly interesting to horticulturists and not to be answered easily.

California Washington navel oranges were planted in Florida several years ago, and thrifty trees are now growing from them, and in a year or two they will come into bearing. In the results of this experiment also there is great interest displayed, for the future of California's orange crop will be influenced more or less by them. Should Florida improve upon the Washington navel, and add some delicious, undefinable quality to it, California would not gain much by the experiment. There would be added luster to the fame of the navel orange, but it would be the new Florida navel, and not the California Washington navel. But it remains to be seen whether Florida soil or climate has some secret process by which all oranges can be transformed and improved as if by magic.

"Florida oranges" are better known by this distinctive name than by any variety term, but in recent years the Indian River oranges, and the Russets, have stood out conspicuously from all the rest, and as the business increases there will be more specific names applied to the leading varieties. The Indian River region can boast of the finest oranges in the world, and, either as a result of the richness of the soil, or a peculiar effect of the salt air upon the fruit, the oranges gathered from this place are invariably superior to any others grown in Florida. They are large, thin skinned, sweet, and juicy fruits—"perfectly delicious," as they have been very aptly described by a woman connoisseur. Orange land along the banks of the Indian River is consequently the highest priced in Florida. The river also protects the fruits from severe cold weather, and owing to this the orange is free from frosts in a latitude further north than elsewhere in the peninsula State.

The Florida Russets are peculiar to the "land of flowers," and they have become well known in our markets as the very opposite to the "brights." The latter differ from them only in being free from the scale which gives the singular russet color to a great deal of the fruit raised in Florida. This russet coloring is caused by a minute scale, which closes the pores of the skin and in time hermetically seals the fruit. When the scale first appeared upon the Florida orange it was considered a great injury to the fruit, but subsequent experience has shown that the russet covering is a positive benefit. It may not improve the coloring of the fruit, but it invariably helps to preserve the orange, and retains the juice for a much longer period than would ordinarily be the case. Good russet oranges that have been in the market for a long time are always juicier than "brights" that have been picked from the tree the same length of time. The reason is that the juice of the former cannot evaporate so easily through the russet scale as it can through the porous skin of the "brights."

The Jamaica orange, which has been seen so abundantly in our markets since the Florida trees were injured by the freeze, is another variety that differs from any yet mentioned. It is a lighter colored fruit than the Mediterranean, California, or Florida orange, and both the skin and pulp resemble in appearance the lemon more than the orange. The Spanish explorers undoubtedly carried the orange to the West Indies, and thence it reached the mainland of the New World. In its new island home the fruit changed its characteristics in many ways. It grew sweeter and juicier, but under neglect it never reached that stage of perfection it has attained in Florida. The Jamaica orange can never hope to rival our Florida fruits unless the seedlings are budded and grafted, and systematic cultivation be given to the trees. At present, orange growing in Jamaica is not very remunerative, as the markets have become limited by the increased supplies in this country; but there is always a chance of a sudden change for a year or two when the Florida crop is injured by the frost. In fact, the catastrophe of two winters ago has made the Jamaica growers more hopeful than ever before, and as some believe that Florida will never raise as many oranges again as in the past, because of the risk by frost, the planters of Jamaica are setting out many new orchards and improving the old, neglected ones.

Mandarins and tangarines have recently been raised successfully in Florida, and these small "glove oranges" are in popular demand, although they cannot compare in flavor and sweetness with many other varieties. They are introductions from China, but they are now grown in Malta, the Levant, the Azores, and in Florida. They thrive upon small trees, and produce abundantly, but the stock has been successfully worked upon the ordinary orange trees of Florida, making the products of one acre much larger. The culture of these varieties in this country is too limited yet to say whether they will improve in their new home, but dealers already seem to think that they can detect a decided improvement.

Every visitor to Florida or California in the winter season is familiar with the sour and bitter oranges.

Many a new comer into either State has been severely taught the lesson that there is a vast difference in oranges by plunging his teeth into a pulpy mass of sour or bitter fruit when he expected to taste a sweet, delicious morsel. Some of the largest and most flourishing trees in Florida produce oranges sour enough to make excellent lemonade, or bitter enough to pucker up the mouth of the most hardened. Originally the woods were full of these sour and bitter orange trees, and the early settlers cut them down as worthless, but to-day they are budded with sweet fruits, to the great profit of the owners. A wild "Indian grove" of sour or bitter orange trees is no longer to be picked up for a mere song. No resident of Florida is ignorant of their value.

The bitter orange was the original Seville orange brought over by the Spaniards, while the sour orange is the ordinary sweet orange allowed to run out through neglect. The latter can be improved by culture, but the bitter orange is a distinct variety that can be made marketable only by budding and grafting. By some writers the bitter orange is considered the original of all our cultivated fruits; but as there is a dispute on the point, it may be well to quote two opposite opinions, and let the reader take his choice.

"There is no instance of a bitter orange tree from seed of sweet oranges, nor of a sweet orange tree from the seed of bitter oranges," says Galesio, who observed these results for sixty years on orange trees around his town of Finale. Directly opposite to this is the following statement of Mr. Macfayden, author of the "Flora of Jamaica": "It is a well established fact, familiar to every one who has been any length of time on the island, that the seed of the sweet orange very frequently grows up into a tree bearing the bitter fruit, numerous well-attested instances of which have come to my own knowledge. I am not aware, however, that the seed of the bitter orange has ever grown up into the sweet fruited variety."

Roentgen and His Rays.

Prof. Roentgen has again made a communication to the Royal Academy of Sciences on his great discovery, says the *Lancet*. He states that while the X rays are passing through the air they traverse it in every direction. When a plate, impervious to the rays, is placed between a fluorescent screen and a source of the rays, so that the screen is overshadowed by the plate, the platinocyanide of barium nevertheless becomes luminous, and this luminosity is visible even when the screen lies directly upon the plate, so that one might imagine that some rays had traversed the plate; but if the screen placed on the plate is covered by a thick piece of glass, the fluorescence becomes weaker and disappears completely when the glass is replaced by a cylinder of lead 0.1 centimeter (equals $\frac{1}{8}$ of an inch) in thickness surrounding the fluorescent screen.

Prof. Roentgen's explanation of this phenomenon is that X rays emanate from the irradiated air. He considers that, if our eyes were as sensible to the X rays as to ordinary light, the appearance would be as if a candle were burning in a room filled with tobacco smoke. Prof. Roentgen has, moreover, invented a new apparatus for measuring the intensity of the X rays. He has succeeded in ascertaining by means of this apparatus that the intensity of the rays is influenced: (1) by the course of the primary current; (2) by the interposition of a Tesla transformer; (3) by the rarefaction of the air in the tube; and (4) by some other agencies not yet known. He concludes: (1) that the rays issuing from a discharging apparatus consist of a mixture of rays of different absorptibility and intensity; (2) that the combination principally depends on the course of the discharging current; (3) that the absorption of the rays varies according to the absorbing medium; and (4) that as the X rays are produced by the cathode rays, and have similar fluorescent, photographic and electrical qualities, it is very probable that they are both phenomena of the same nature.

Gophers Destroy a Canal.

An Oklahoma City enterprise has been ruined by the gopher pest. It was thought that the rapidly flowing North Canadian River could be used to operate all the mills that could be placed on its banks at Oklahoma City. The fall was nearly thirty feet and it was expected that 2,000 horse power would be developed. A canal five miles long was constructed, at an expense of \$40,000. It was diked part of the way and the river was crossed twice. The canal is twenty-five feet wide and four feet deep, and when four inches of water was let in at the head gate an electric light plant and a large flouring mill were run with ease, but an unsuspected enemy soon caused disaster to the enterprise. The banks of the canal were of porous, sandy soil and gophers attacked the dike, the holes which the animals burrowed quickly widened into crevasses and the sandy dikes were easily swept away, causing constant and expensive repairs. Finally the entire canal became wrecked, and farmers are now plowing up the right of way and the canal is gone.