THE WINTON MOTOR CARRIAGE.

A ride in a motor carriage is a comparatively new and delightful sensation. With its easy springs, which supplement the pneumatic tires, the vehicle rides along without effort and without anxiety for an overworked horse. The ownership of an automobile carriage is the realization of a dream which has haunted us ever since the introduction of the steam engine, and the experiments which have been tried in the last fifty years furnish an interesting chapter in the history of invention. Within the last few years this dream has been realized, and we can now glide lazily along, propelled by one of the products of petroleum or by electricity. The idea of having gained such mastery over nature that we can, by the touch of a lever, be propelled with ease, comfort and safety at a speed outrivaling the horse or bicycle, is at once so captivating as to be irresistible. Though the final emancipation of the horse may be long deferred, still the motor carriage of today is perfectly practical for the pleasure vehicles of those who can afford them. Strange to say, Europe in this industry has set us an example. For several years the motor wagon has been in common use in France and Germany, and now the horseless vehicle has been perfected in America. Among the notable carriages which are built and used in the United States are those made by the Winton Motor Carriage Company, of Cleveland, O. This carriage has been tested very successfully by a series of hard trips, as from Cleveland to New York, and their carriages have been in constant use during the past two winters in all kinds of weather and over every condition of roads. This is far more practical than running carriages over race-courses to demonstrate their speed. But the Winton carriage made a mile in 1:48 on a circular track, on Decoration Day, 1897. This is, we believe, the world's record for a horseless carriage for one mile. This seems to indicate that their carriages are not only serviceable, but are capable of developing great speed. The success of these vehicles fully demonstrates the practicability of the self-contained hydrocarbon motor. With gasoline safe to handle, cheap and everywhere available, we have a primary power suited to the wants of locomotion. The pneumatic tire, which made the bicycle a commercial possibility, finds its usefulness on the motor carriage, adding immeasurably to its comfort and durability. The suspension wire wheel and ball bearings also add greatly to the ease of the motor carriage. The Winton motor carriage shown in our engraving is a light single-seated vehicle of phaeton type and shows that a motor carriage can be built so that it is not a mechanical monstrosity. The design of the carriage is very pleasing. It is finished in Brewster green, with leather cushions and nickel trimmings.

THE WINTON MOTOR CARRIAGE.

The driving mechanism is snugly concealed in the vehicle. The motor is the single hydrocarbon type of special construction. It is simple, powerful and compact, and is practically free from noise and vibration; and by an ingenious and simple arrangement the motor is absolutely under the control of the driver, who can run it at any speed from three to twenty miles an hour, without affecting its driving power. The motor can be speeded from 200 revolutions to 900 or 1,000 per minute in about three seconds and almost as quickly slowed down to a governed speed of 200. The speed of the carriage is at all times under variable control and can be regulated and held at will anywhere from zero to the maximum power of the motor. The carriage is operated by levers conveniently placed, which engage, release or reverse the driving mechanism, applying the brake, placing the vehicle under perfect control. The motor, being placed in a horizontal position, neutralizes the vibration, making a light-running, easy carriage. The carriage will seat three people, although intended for two. It uses common stove gasoline, which may be purchased at any village, so there is little danger of being left in some country town without means of proceeding. Each carriage carries a sufficient quantity for a day's run of seventy-five miles over ordinary level roads. The cost on the average is less than half a cent per mile. There is no danger from fire or explosions. All the working parts are perfectly protected from dust. The company has just built and delivered four new carriages.

A Life Line for Niagara Falls.

Frequent disasters on the Niagara River above the falls, whereby people have lost their lives by being swept over the cataract, have led to the agitation of the advisability of stringing a life line or cable across the river from the New York State mainland to the Canadian shore, at a point above the breakers and below the line of navigation. The object of such a cable or life line would be to catch unfortunates who are caught in the strong current through being unacquainted with the river, or have their boats upset during a storm. In the last disaster of this kind three men lost their lives by drifting on the current so far down stream that they were unable to regain the shore. They were members of a camping party. Letters have been written to Gov. Black on the subject, and it has been suggested that the commissioners of the two great free parks at Niagara take active parts in the construction, as the line would extend between points under their domain.

The danger line above the falls is a short distance above Goat Island, where the waters divide, part going down the Canadian channel and over the Horseshoe Fall and part between Goat Island and the New York State mainland over the American Fall. The suggestions for this life-saving construction have taken various forms, but none has received official approval as yet. One of the substantial ideas advanced for the line is that piers be erected at points between the two shores on which a heavy rope, chain or wire cable might be stretched, and that a well insulated wire be also strung through which a supply of electricity could be sent to be used in lights on the piers at night, to determine the location of the line in the darkness. Thus any person being carried down the river at night would be made aware of its presence before reaching it. There is no doubt that had such a life-saving device been in place in the past, several lives would have been saved. As yet, however, no definite steps have been taken for its construction.

Petroleum Briquettes.

In a process for making petroleum briquettes, described in Kuhlow's, petroleum refuse is worked up in such a manner as to assume the form of a solid substance, easily handled and constituting a cheap and convenient fuel. About ten per cent of soda lye, with about ten per cent of any fatty matter—tallow, for instance—is heated in a boiler, either by superheated steam or with exclusion of air; and so much petroleum refuse is then added to the heated mass as to make up 100 parts. The whole is heated with constant stirring for about an hour, the time varying with the mode and intensity of heating; but the temperature must never be allowed to reach the boiling point of petroleum, because in that case a large quantity of froth would form. In this incipient state of saponification the mass acquires the property of taking up large quantities of very fluid rockoil, and, if this incorporation of the mass should proceed too slowly or remain incomplete, it may be hastened by the addition of a little soda lye. In a short time the saponification of the grease with the fixing of the petroleum will be effected, and the mass thus produced may be run into moulds and allowed to cool; when it may be cut into pieces of any desired form. According to the use for which the briquettes are destined, they can during manufacture receive the addition of coal-dust, sawdust or other refuse, and, if it be desired to obtain a product of less firm consistency, the grease may be entirely or partially replaced by resin or resin acid, the product in either case having a content of more than 80 per cent of petroleum, more than 90 per cent of combustible substances and less than 5 per cent of incombustible residue.

Expansion and Contraction of the Eiffel Tower.

The daily movement of the Eiffel Tower, due to expansion and contraction, has been studied by Col. Bassot, who recently explained to the Academy of Sciences that the expansion of the metallic components of the structure produces a torsion movement from sunrise to sunset which traverses a curve of ten centimeters, says Industries and Iron. This movement is repeated in an inverse direction during the night, as the column becomes cooled, so that the lightning rod on the summit of the tower is in constant motion. Col. Laussedat, director of the Conservatoire des Arts et Métiers, being appealed to for confirmation of Col. Bassot's statements, stated that he had carefully followed Col. Bassot's investigations, which extended over ten years, and that the results given were perfectly exact. The laws of the expansion and contraction of iron by heat and cold are well known, and the tower simply obeys the physical law of temperature influence. In summer the expansion is superior to that in winter, and the movement reverses at night, owing to contraction due to the cooling down of the mass. Yet this twisting, this torsion, in no case compromises the solidity of the structure, which is absolute.

The New York Zoological Society.

The New York Zoological Society is making great progress, and soon work will be begun on the grounds and buildings. An agreement has been made with the city whereby 261 acres of land in South Bronx Park was set aside as the site of the New York Zoological Park, subject to some conditions, such as that the collections and animal buildings are to cost not less than $250,000. The city is to prepare the ground for occupancy, and maintain the zoological park when established. The estimate of cost of improvements to Bronx Park is $125,000. Immediately after the bill became a law, work was begun on the elaboration of the general plan of the Zoological Park. The preliminary plan had been submitted to two zoological experts, Dr. C. Hart Merriam and Mr. George Bird Grinnell. Their opinions were valuable and suggestive, and are published in the report of the society which has just appeared.

The preliminary plan was approved by the executive committee and a close topographical survey was made of the ground and where the most important buildings are to be located, and a complete geographical survey of the entire park was also made. At every step expert advice was called whenever matters of architecture, engineering or landscape gardening were in question.

Messrs. Heins and LaFarge were appointed architects, and were commissioned to develop especially the architectural and landscape features of the main court and its main approaches. Mr. C. N. Lowrie was regularly employed for the landscape treatment of the portions outlying the main court. The director, Prof. W. T. Hornaday, co operated in and partly supervised this work, so that the scientific and practical requirements should be met at every point. The superintendent of the Zoological Garden at Philadelphia, Pa., Mr. A. E. Brown, Carl Hagenbeck, of Hamburg, and Prof. D. G. Elliot, of the Field Columbian Museum, were consulted, and after several months of labor the final plan was drawn up, and approved by the Board of Parks.

It is intended to raise a park fund of $250,000 for buildings and collections, and of this amount $103,500 has been subscribed during the year. It is hoped that some rich men may feel like erecting buildings, which would make a highly attractive individual memorial, the cost varying from $1,000 to $75,000.

A Rapid Developer.

The distinguishing feature of the metol developer is that it brings out the details on the surface of the dry plate very quickly, but requires a little time to gain density. In the new developer recently introduced, named ortol, and of the same general character as metol, we have a developing agent of remarkable rapidity, yet possessing the good qualities, as regards freedom from producing chemical fogginess, of other developers, and a rapid building of density that is astonishing. The density-producing quality appears to keep pace with the rapidity of detail production on the surface. The consequence is, the possibility of developing a dry plate as quickly as a wet plate of olden times is fully realized. The speed of development may be regulated by the addition of bromide of potassium or by dilution with water. Experiments we have made with the developer show that a fairly good result can be obtained with almost any kind of exposure. If a plate is considerably over-exposed, the developer will cause the image to flash out in two seconds, yet in that short time it will gain enough density to be a soft negative after fixation.

Ordinary exposures can be finished in from twenty to thirty seconds. We developed, with four ounces of developer, a dozen four by five plates, two at a time, in less than half an hour, a larger part of the time being occupied in removing the plates from the holders, washing and immersing in the fixing bath.

The developer is prepared in two solutions, as follows:

A.

Water	32 ounces.
Meta-bisulphite potassium (crystals)	113 grains.
Ortol	225 "

A chemically pure quality of the potassium salt, in crystals, should be used, and may be obtained from the dealers supplying ortol.

B.

Water	32 ounces.
Sodium sulphite (chemically pure crystals)	5½ "
Potassium carbonate (chemically pure)	1¾ "

To the above eight grains bromide of potassium can be added or used separately, as desired. We prefer the latter method, dropping a few drops of a 10 per cent solution in the developer according to circumstances. In other cases it is recommended that a few drops of a very weak hyposulphite of soda solution (1 ounce of hyposulphite in 20 ounces of water) be added.

To prepare the developer for ordinary exposures, mix with 1 ounce of the A solution, 1 ounce of the B solution, and add 1 ounce of water. If this produces too much density in the negative, the solution can be diluted considerably more with water. Greater contrast is produced by increasing the quantity of A and decreasing B. The color of the developed film is a deep chocolate brown—a color desirable for transparencies. The ortol solution keeps well and may be used repeatedly until exhausted. We think it is a very promising developer and certainly one which has the merit of producing easily, clear, crisp, quick-printing negatives.

A Year's Passengers to New York.

The customary statistics relating to the passenger traffic across the Atlantic have been published, says The Shipping World. They will furnish interesting study for the curious. The number of passengers carried to New York continues to diminish. The total for 1897 is given as 282,936, as against 351,573 in 1895, and 595,313 in 1891. On the other hand, the total number of trips made was greater last year than in any previous one. It would at first be inferred that the year was a bad one for the passenger lines, but the effect of the rate-maintaining conference must be remembered in any such consideration. The decreases mentioned above are shown in respect of both cabin and steerage passengers. The Cunard Line heads the list for cabin passengers carried with 15,196, but it is singular that the two services of the North German Lloyd, together, the Bremen (12,589) and the Mediterranean (2,607), carried precisely the same number—15,196. The figures for both classes appear as follows:

Line.	Cabin.	Steerage.
Cunard	15,196	17,303
*N. G. Lloyd	15,196	40,415
American	14,443	11,322
*Hamburg-American	10,866	17,323
White Star	10,104	19,271
Cie. Trans	6,044	14,264
Anchor	6,478	*19,372
*Holland-American	2,871	10,503
Red Star	4,493	10,557
At. Transport	1,890	7,280
Allan-State	1,823	1,050
Thingvalla	850	3,201
Fabre	22	11,374
Union	..	2,332
Baltic	..	2,227
Pacific	..	1,010

* Two services.

In every case save in that of cabin passengers carried by the North German Lloyd, a decrease is shown in both classes. The North German Lloyd heads the list of sailings with 121; the Hamburg-American follows with 100; then the Cunard, 61; the White Star and American, 53 each. The highest average number of passengers per ship belongs to the White Star, viz., 553, the Cunard being 534.

Animals' Stores.

A writer on "Animals in Famine" observes, in the London Spectator, that if we examine the stores made by most of the vegetable-eating animals that lay by a "famine fund," we shall find "a rather curious similarity in the food commonly used by them. They nearly all live on vegetable substances in a concentrated form—natural food lozenges, which are very easily stored away. There is a great difference, for example, between the bulk of nutriment eaten in the form of grass by a rabbit and the same amount of substance in the 'special preparation' in the kernel of a nut, or the stone of a peach, or the bulb of a crocus, off which a squirrel makes a meal. Nearly all the storing animals eat 'concentrated food,' whether it be beans or grain, hoarded by the hamster, or nuts and hard fruits by the squirrel, nuthatch and possibly some of the jays. But there is one vegetable-eating animal whose food is neither concentrated nor easy to move. On the contrary, it is obtained with great labor in the first instance, and stored with no less toil after it is procured. The beaver lives during the winter on the bark of trees. As it is not safe, and is often impossible, for the animal to leave the water when the ice has formed, it stores these branches under water, cutting them into lengths, dragging them below the surface, and fixing them down to the bottom with stones and mud. This is more difficult work than gathering hay."

The Current Supplement.

The current SUPPLEMENT, No. 1167, contains many articles of timely interest dealing with the topics of the day. "The Maxim Gun for Naval Use" describes one of the most deadly weapons of modern warfare. "The Deterrent Influence of Modern Arms," by Gen. O. O. Howard, U. S. A. (retired), deals with the subject of warfare and is treated from the professional point of view. "Test of Fighting at Sea by Machinery" is an interesting article by Mr. A. K. Fiske, dealing with modern naval battles. "Malay Life in the Philippines," by W. G. Palgrave, is an article of extraordinary interest and value at the present time. Among the articles dealing with more peaceful subjects are: "The Engineering Research Laboratory in its Relation to the Public," by Prof. W. F. M. Goss. "A Method of Measuring the Pressure at Any Point on a Structure Due to Wind Blowing Against that Structure," by F. E. Nipher. "Learning to Drive a Motor Carriage," by Hiram Percy Maxim. "The English Regalia," "The Working of Long Submarine Cables" and "The Psychology of Invention."

Miscellaneous Notes and Receipts.

Blue Color for Copper.—A steel-blue color on copper is produced by a solution of 20 grammes of potassium sulphide and 20 grammes of kitchen salt in 10 liters of water. Old copper plates of engravings or etchings can be colored with this in an extremely fine tone, since by diluting the solution all the shadings of the design on the plate can be obtained.—Technische Mittheilungen f. M.

Treatment of Oak Parquet Floors.—In order to preserve the original color of oak wood it should not be primed with linseed oil, but the varnish should be applied directly on the new floor. It should not be too fat, i. e., not contain much oil. A fatter varnish is used for the last coat. Linseed oil enters the wood too deeply and darkens it, and as it becomes darker with age the floor will get darker too. Varnish remains more on the surface and can therefore not affect the color so much.—Maler Zeitung.

Protecting the Silkworm.—The world's silk production now amounts to over 28,000,000 kilos, according to a lecture by Dr. Erlenbach before the Society of German Chemists. Europe participates with one-fifth, China furnishes 12,500,000, Japan 6,000,000, Italy 4,000,000, France 900,000, Austria-Hungary 250,000, European Turkey 200,000, Spain 80,000, Greece 35,000, European Russia 1,000, Germany 500 and England 200 kilos. Acting on Pasteur's advice, steps are now taken against the sicknesses of the silkworm by having each butterfly deposit its eggs in a separate pasteboard box. It is then affixed to this box and microscopically examined. If fungi are found on it, it is destroyed with its brood.

Cleaning Varnished and Antique Furniture.—To restore to their original appearance antique pieces of furniture which have become unsightly on account of too frequent varnishing or besmearing by unskilled hands, the following method is employed: Take equal parts of strong alcohol and good oil of turpentine and heat this mixture in a bottle by placing it in hot water. With this warm liquid paint the article, whereupon the old varnish will dissolve at once. The varnish is removed by scraping and wiping, and the spreading, scraping and cleaning is repeated as often as necessary until the surface has become entirely clean again, so that the object may be rendered glossy or dull as desired. This process is especially recommended, since it does not change or attack the color of the wood, as is often the case if lye is used.

The Combination and Cause of the Chimney Deposits in Glass Factories.—Dr. A. Grosse publishes, in the Chemische Industrie, the results of the examinations of three glass factory products, which had formed by depositing in the chimneys of three glass factories. The researches have caused the author to come to the conclusion that the deposits in the chimney canals of glass factories are caused by chlorides. According to his opinion, the deposits have to pass the following five stages in their development: 1. Formation of the chlorides in the pot. 2. Sublimation of the chlorides from the pot into the canal. 3. Action of the sulphurous acid on the chlorides; formation of the sulphates. 4. Increase of the temperature; partial decomposition of the sulphates. 5. Action of the arsenious acid; formation of the arsenites. In conclusion, the author admonishes the manufacturers to use pure materials for the manufacture of glass. Especially great importance must be attached to the freedom of the products from chlorine.

To Produce Photographic Pictures upon Cotton Fabrics by Printing.—E. Kopp publishes an interesting paper on indigo salt in the Bull. d. l. Soc. Ind. de Mulhouse. For a number of years a prize has been offered in the said bulletin for a process to produce photographic pictures upon cotton fabrics by printing—a problem which has not yet been solved. Kopp has made a contribution toward the solution of the question founded on the following facts: Indigo salt was formerly sold in commerce as bisulphite compound. The same decomposed strongly, however, in diffused daylight; even if stored in dark rooms, decomposition set in after a few months. Therefore, Kalle now offers the free "keton" of the indigo salt to the print works, and the consumer has to add the bisulphite himself directly before use. Kopp had made the observation that cotton goods prepared with indigo salt, if they had been exposed to the light for some time before treatment with soda lye, did not show a nice blue effect. On this he based his photographic process. He prepared the cotton fabric with:

Indigo salt	7·5 grammes.
Sodium bisulphite, 40° Bé	0·01 liter.
Soda	1·0 gramme.
Water	4·0 c. cm.
Wax	¼ liter.
Gum water	0·3 liter.

Dry with exclusion of light and the fabric is prepared for the photographic printing. Expose the texture, according to the description of the cliché and the concentration of the color, one hour to one day to the sun. The design forms in yellow, passing more or less into dark brown. Develop with caustic soda lye of 15° Bé at 62° Cent. on the foulard, wash and dry.