

Automobile News.

Now that automobiles have shown their capabilities on the road for transporting suburban sight-seeing parties, as shown by the Paris-Versailles touring buses and the New York-Tarrytown Mobile wagonettes that were run daily last summer, automobile cars are soon to be introduced on French and English railway lines for fast speeding over long distances and for taking care of suburban traffic respectively. In France, the Serpollet steam motor and flash boiler is to be used to propel single cars rapidly over long distances, while in England the Napier gasoline motor, of a type similar to that on the car that won the Gordon-Bennett race last year, is to be used on individual cars over a 30-mile stretch of track. The service required in this section is not frequent enough to warrant the installation of an electric equipment, so gasoline motor cars are to be used, and these will reduce the running time over steam trains by about 20 per cent, owing to their being more easily and quickly accelerated. From present indications, it looks as if the automobile is destined to revolutionize not only road traffic, but traffic on rails as well.

One great improvement that the French manufacturers have made on their machines this year is the method of lubricating the motor. Instead of depending on splash lubrication alone for oiling every part of the engine, positive oil feeds are led to each of the crankshaft bearings, and the crankshaft is pierced with suitable passages to conduct oil to the cranks themselves, so that the connecting rod boxes also receive plenty of oil. In the Renault motor, the oil that is splashed up by the cranks is caught in small cups at the top of the crankcase, which feed the major bearings by gravity. Centrifugal force is depended upon to send this oil afterward through small holes to the cranks themselves. The new de Dion-Bouton double-cylinder motor has a small pump driven by a worm gear, that raises the oil to the top of the crankcase, whence it flows to the bearings by gravity. A sufficient bath of oil is kept in the crankcase all the time, to splash up and lubricate the pistons. The better oiling arrangements of the motor conduce to longer life and more efficient service, and they should be introduced as far as possible on American gasoline cars.

The legislatures of many of the different States are at present considering bills regulating the speed and operation of automobiles. Connecticut, which has had the most sensible law imposing a speed limit of fifteen miles an hour in the country and twelve miles in cities and towns, is threatened through the efforts to distinguish themselves of some of her would-be farmer legislators; Massachusetts is considering a bill requiring that all operators of autos shall be registered, and prohibiting the licensing of any car capable of traveling faster than twenty miles an hour; while it remains for Maine to try to bring anti-autoists back to their senses by considering a bill providing a speed limit of eight and twenty miles an hour in towns and country, respectively. In every instance, the automobile clubs are fighting the adverse legislation and attempting to forestall it with bills giving equal rights to autoists and the drivers of horses.

Four hundred dollars damages were awarded an automobilist of New Haven, Conn., recently because of injuries received by being thrown from his machine, which ran into a hole in the pavement between the trolley tracks 48x7x4 inches deep. The judge held that the city was primarily responsible for the condition of the pavement, but that it can exact settlement from the trolley company, as the latter, under the law, is responsible for the pavement between its tracks. This is one of the few cases where the autoist has come out victorious.

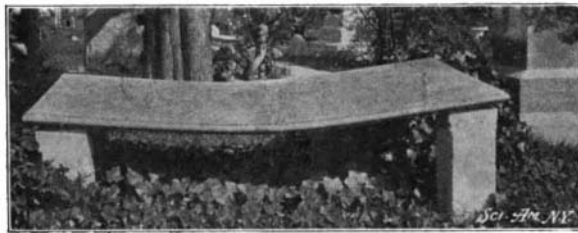
Another interesting decision has just been made by a judge in Bridgeport, Conn., which, while not affecting automobiles directly, throws some light on the right of way of trolley cars on country roads. A hack was being driven with two wheels in the track at 12:40 A. M. one dark, stormy night last winter. A car came along behind it and ran into it, throwing it down a small bank and turning it upside down. Neither the occupants nor the driver were seriously injured, but the driver was awarded \$500 damages on the ground that the company was to blame in not providing a sufficiently powerful headlight for the motorman to see an object on the track in time to stop the car. The motorman testified that the gong was rung just before he saw the hack. In handing down his decision, Judge Wheeler said: "The company has no exclusive or paramount right to the use of the roadway between the tracks. It must operate its cars in the knowledge that the public has a right to use its tracks as a part of the highway. The traveler must recognize that the car cannot proceed save upon the track, and hence he must turn off from the track, when he knows the car is approaching, within reasonable time to allow it to pass. When a traveler enters upon a car track in advance of an approaching car,

he must, in the exercise of reasonable care, do what he can to avoid accident, and ordinarily, if he turn upon the tracks so closely in advance of a car that an accident is inevitable or probable, such conduct will of itself be negligent. The traveler already upon the track is not obliged to keep looking around to see if a car be approaching. Such a duty on his part would be inconsistent with his right to the reasonable use to that part of the highway. When the traveler hears an approaching car, it is his duty to turn out. When he ought to hear it, not to turn out would be an important consideration in measuring his own freedom from negligence." Under the conditions given, however, that the driver did not hear it was no fault of his, and the company was to blame for not taking proper precautions toward the avoidance of accident.

THE SPONTANEOUS BENDING OF MARBLE.

One of our correspondents has sent us a photograph, which we have herewith reproduced, of a bent marble slab in Rock Creek Cemetery, Washington, D. C. The picture brings out a curious phenomenon which may be quite commonly observed in old graveyards. The slab in question has been in position over half a century, judging from the inscription, and during this time has sagged over three inches at the center. Its length is 70 inches, width 35 inches, and it has a thickness of 2 inches. The peculiar phenomenon is not to be confused with that of a slight concavity formed at the center of a slab placed in horizontal position and exposed for a long period to the weather. Such a concavity is caused by a slow solution of the marble in water caught on its surface, whereas in the present instance the thickness at the center of the stone does not vary materially from that at the sides, but a marked curvature is shown on both surfaces. In seeking for an explanation of this curvature, one is at first tempted to consider marble as a fluid, such as sealing wax or pitch, but possessed of much greater viscosity. Pitch in cold temperature is brittle and has all the appearance of a solid, but a heavier substance placed on the surface will, in time, sink to the bottom, and a lighter substance will very slowly float from the bottom of the pitch to the top. However, in the present instance, this explanation is not satisfactory.

For an authoritative opinion on the subject, we have submitted the question to the Director of the United States Geological Survey, and have been referred by



MARBLE SLAB BENT BY ITS OWN WEIGHT.

him to Vol. X. of the Tenth Census Reports, which contains some notes compiled by Alexis A. Julien, on similar occurrences in Europe, where the matter has been studied by some prominent geologists. One of the instances given is that of a slab in the marble veneer of the facade at St. Mark's, Venice, which at its lower end bulges $2\frac{3}{4}$ inches from the backing. The slab faces westward, and was found to become very warm in the afternoon sun, while its rear surface was kept cool by the backing. Another striking example may be found in the Alhambra in Granada, Spain. One of the two doorways that have been christened "La Mezquita" comprises three slabs of marble, one resting as a lintel on the other two, which are placed upright. A subsidence of the wall on the right side has exerted an enormous thrust upon one of the uprights, and the marble instead of breaking has simply bent outward about three inches. In the quarries near Rutland, Vt., the bending of thin slabs of marble supported only at the ends has frequently been observed. Fleurean de Bellevue discovered a dolomite possessed of this property, which he attributed to "a state of desiccation which has lessened the adherence of the molecules of the stone." De Bellevue seemingly confirmed this by experiments, which showed that inflexible varieties of marble, when heated, became flexible. However, owing to the exceedingly small quantity of water present in marble, this explanation is not satisfactory. A better solution of the problem has been furnished us by Geikie, who says that "irregular and closely contiguous grains of calcite which make up a white marble are united by no cement, and have apparently a feeble coherence." Prof. Julien's opinion is that "their contiguous crystallization has left them in a state of tension, on account of which the least force applied through pressure from without, or of the unsupported weight of the stone, or from external expansion by heat or frost, produces a separation of the interstitial planes in the minute rifts. Such a condition permits the play of the grains upon each other and consider-

able motion, as illustrated in the commonly observed sharp foldings of strata of granular limestones without fractures or faults. In such cases also I have observed that the mutual attrition of the grains has been sometimes sufficient to convert their angular, often rhomboidal, original contours into circular outlines, the interstices between the rounded grains being evidently filled up by much smaller fragments and rubbed-off particles."

Dr. Bedell's Double Electric Transmission.

In the current SUPPLEMENT we publish a discussion by Dr. Frederick Bedell, of Cornell University, on the joint transmission of direct and alternating currents simultaneously over the same set of wires. The "common conductor system," of which he is the inventor, requires two pairs of wires, each pair constituting a complete circuit for direct current. By coupling the forwarding wire of one circuit to the return wire of the other, the two will serve as a path for an alternating current, while the remaining two wires may be coupled for another alternating current. The course of each alternating current will be first along the forwarding wire and then along a return wire, according to the alternating directions of its flow, the circuit being completed through the ground. Thus the currents will not interfere with each other and the fluctuations of an alternating current will not be felt in the direct current circuits sharing the same wires.

The Death of James Glaisher.

With the death of James Glaisher there has passed away an old aeronaut. Forty years ago his exploits kept him much in the public eye. In 1862 he made a series of famous balloon trips. Ascending with Mr. Coxwell in a balloon of 95,000 cubic feet capacity, he reached a height of 26,177 feet. On September 5, in an ascent at Wolverhampton, he and his companion were nearly frozen to death. After registering observations up to a height of 36,000 feet Mr. Glaisher became unconscious. Mr. Coxwell contrived to pull the valve string with his teeth, thereby causing the balloon to descend.

The Industrial Exhibition at Osaka in 1903.

Osaka, one of the three imperial cities of Japan, is the center of great activity at this time, preparing for the Fifth National Industrial Exhibition, to be held there from March 1 to July 31 of this year. The exhibition, which is situated at Imamiya in the southern part of Osaka, will surpass in magnitude and beauty all preceding ones, and will bring before the public eye a fuller, more general representation of Japanese arts, manufactures, and resources in their latest development than has ever been seen before. The exhibit will be under the direct management of the Imperial Commission which is presided over by His Imperial Highness, Prince Kan-in. There will be special buildings for classified groups of the exhibits, and important among them are those of forestry, fine arts, agriculture, fisheries, manufactures, education, zoology, foreign samples, transportation, greenhouse, cold storage, aquarium, and machinery. There will also be bazars, restaurants, tea-houses, and the Ceremonial Hall within the grounds. Visitors to the exhibition will be fortunate in witnessing the two great religious festivals which will be celebrated at that time. The festival of Tennoji will gather over ten thousand priests to Osaka from all over Japan to parade through the streets in their ceremonial robes of rich brocades and brilliant colors. To those who attend the exhibition will be granted special privileges and free access to many places usually closed to all visitors, both foreign and Japanese.

Carnegie Institute's Grants to Johns Hopkins University.

The Carnegie Institute has made five grants of money to the members of Johns Hopkins faculty to assist original researches. They are as follows:

To Dr. Harmon N. Morse, Professor of Analytical Chemistry, \$1,500 for an assistant in his researches upon the new method he has evolved for measurement of osmotic pressures.

To Prof. R. W. Wood, \$1,000 to maintain a research assistant in his work. He has appointed Thomas Sidney Elston of the University of California to the position.

Dr. H. C. Jones, in new physical chemistry as it is studied in America, gets \$1,000 for an assistant in his researches. Frederick Hutton Getman, of Stamford, Conn., receives the appointment. His doctoral dissertation deals with an important problem in physical chemistry.

Dr. J. J. Abel, Professor of Physiological Chemistry, \$1,000, for the purchase of apparatus necessary to his researches in that subject. He is a leader in this branch of science in America.

Dr. J. B. Whitehead, in the physical department, has received a liberal grant to carry forward a research in the theory of a magnetic field developed by Maxwell, the English scientist.