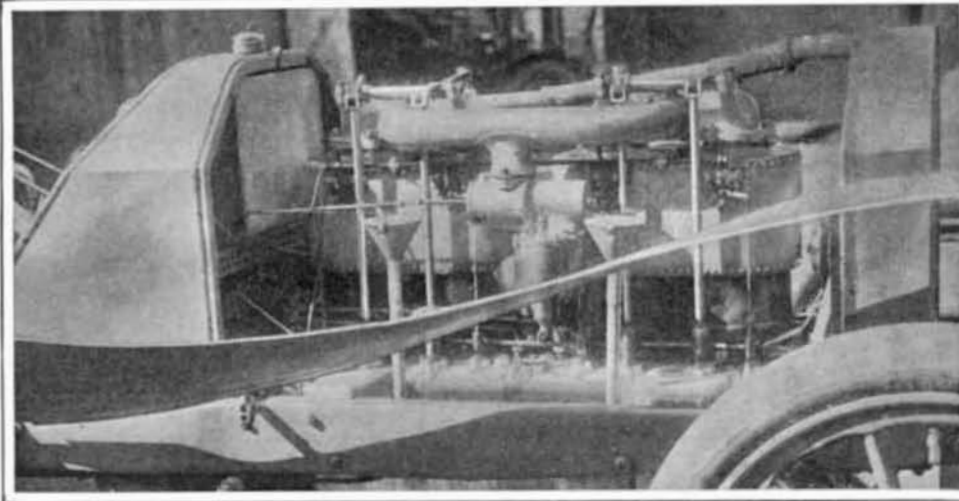


preparation from another manufacturer, or by another apothecary, the correct dose must again be determined experimentally as before. When drugs are standardized by chemical assay or physiological test, however, the physician escapes the humiliation of palpable impotence in the face of danger and there is no occasion for needless experiment at the bedside, where so frequently prompt drug action saves lives.

**A RETROSPECT OF THE VANDERBILT CUP RACE.**

That the third contest for the Vanderbilt cup was the most successful of the three that have so far been held, is to be credited largely to the great care and good judgment with which the Cup Commission and the officials in charge of the preparation of the course performed their several duties. Special care had been taken to safeguard both the contestants and the multi-

tudes that swarmed out to view the race; and if the onlookers had shown a proper appreciation of the efforts made for their protection, the injuries and accidents which marked the race would have been almost entirely absent. When it is borne in mind that the crowd deliberately tore down the fences which had been put up to keep them off the track, that they swarmed entirely across the road, and refused to draw



**Engine of the Locomobile, Showing the Arrangement of the Carbureter, Inlet Valves and Igniters.**



**The De Dietrich Racer, Which Finished Third, Ascending a Hill Near Roslyn.**



**Panoramic View of the Hairpin Turn at Old Westbury, Showing Tracy Starting to Round It in His Locomobile.**



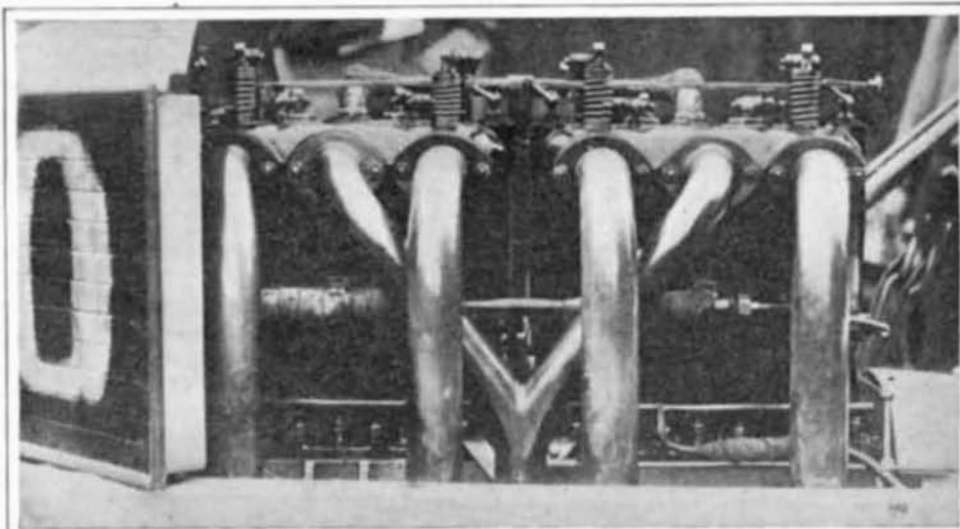
**Jenatzy Finishing. The Veteran Belgian Driver Obtained Fifth Place With a German Mercedes Car.**

Time, 5 hours, 4 minutes, 38 seconds. Average speed, 58.51 miles per hour.



**Wagner, on the Winning Darracq, Passing Through the Crowd at High Speed Just Before He Crossed the Finish Line.**

Time, 4 hours, 50 minutes, 10 1/2 seconds. Average speed, 61.43 miles per hour.



**Valve Side of the 100-Horse-Power Darracq Engine, Showing the Branched Inlet Pipe and the Four Separate Exhaust Pipes. The V-Shaped, Finned-Tube Radiator Is Shown at the Left.**



**Tracy Putting on Full Power at the Last Bend in the Hairpin. This Machine Made the Fastest Round in 26:21—an Average Speed of 67.65 Miles per Hour.**

## THE THIRD RACE FOR THE VANDERBILT CUP.

Machine	H.P.	Driver	1st lap	2d lap	3d lap	4th lap	5th lap	6th lap	7th lap	8th lap	9th lap	10th lap
Darracq	100	Wagner	28:26	27:56 2/5	28:17 1/5	27:41 2/5	32:09	27:22	27:41	30:45	27:54	31:58
F. I. A. T.	120	Lancia	30:27	29:34	28:54 3/5	28:17 2/5	28:17	33:02	28:21	28:39	29:06 2/5	28:59 3/5
Lorraine-Dietrich	120	Duray	30:18	28:52 3/5	28:10 1/5	32:57 1/5	28:26 2/5	29:45 3/5	28:04	31:09	28:00	27:52
Bayard-Clement	100	Clement	31:21	33:31	28:44 3/5	28:17 2/5	36:32	29:22	28:10	28:18	29:32	28:11 4/5
Mercedes	120	Jenatzy	30:02	30:16	29:09	28:05	34:34 1/5	28:38 4/5	28:22	28:17	37:44 2/5	29:29 3/5
F. I. A. T.	120	Nazzaro	30:41	35:03 1/5	41:23 4/5	34:21	29:21	28:57	31:49	27:57	27:25 2/5	Still running
Itala	120	Cagno	36:17 3/5	35:20	32:27 2/5	33:13 3/5	38:19 2/5	30:59	32:09	31:44	35:58 4/5	Still running
Thomas	115	LeBlon	57:32 3/5	31:42 2/5	30:47	30:07	30:33	38:38	30:56	30:49	31:21 2/5	Still running
Panhard	120	Heath	39:50	39:22 3/5	34:25 2/5	33:33	33:29	36:34	35:48 3/5	34:07 4/5	Still running	Still running
Locomobile	110	Tracy	38:48	38:53	44:51	31:37	26:21	38:23 2/5	40:26	33:57 3/5	Still running	Still running
Mercedes	120	Luttgen	34:32	32:14	32:14 3/5	30:41 2/5	34:04	50:12	37:36 3/5	33:14 2/5	Still running	Still running
Itala	120	Fabry	41:28	35:21 2/5	36:57 2/5	38:04 3/5	33:49 2/5	37:12 3/5	38:44	Still running	Still running	Still running
Christie	50	Christie	34:07 3/5	33:38 2/5	35:15 2/5	45:34	57:40	35:02	37:38	Still running	Still running	Still running
Haynes	60	Haynes	45:18	34:35 4/5	34:14 1/5	44:27 3/5	35:58 2/5	47:31	39:23 4/5	Still running	Still running	Still running
Hotchkiss	120	Shepard	32:26	31:37 4/5	30:54 1/5	30:23	33:53	30:23 3/5	Killed a spectator and retired.			
Fraye-Miller	110	Lawwell	33:34	1:20:40 4/5	36:11 4/5	39:57 2/5	Retired with broken fan					
F. I. A. T.	120	Wellschott	Broke steering gear									
Mercedes	120	Keene	Did not start, broken cylinder.									

back to the side lines until the cars were almost upon them, it is truly marvelous that the accidents should have been so few. This behavior of the public was unsportsmanlike and extremely unfair. It added greatly to the difficulties of the drivers, most of whom were from foreign countries and therefore, in a sense, our guests. All of the drivers agreed that the speed would have been far greater than it was, if the public had only kept clear of the track and had not, at critical points, obscured the view so badly. The interference was particularly bad at the turns, where, as the winner Wagner stated after the race, it was very difficult to determine just when to slow down and just where to commence to give the necessary degree of "helm" to the steering wheel. Several of the foreign drivers stated that they would never again race under conditions similar to those that obtained on October 6. Hence we are pleased to note that at a recent dinner of the Vanderbilt Cup Commission, it was positively announced that any future race would be held over a private racing course.

Apart from the inexcusable misbehavior of the public, the race of this year was an unqualified success, and although the result proved that the foreign makers still hold a considerable lead over our own, at least in the matter of building purely racing cars, there is satisfaction in the thought that the best car and the best driver won. Although the speed of the winning Darracq car last year (61.49 miles per hour) was slightly greater than the speed (61.43 miles per hour) of the winner this year, the average speed made by the five leaders was much greater than last year. This fact, coupled with the fact that practically all of the cars were running when the race was called, proves that the last twelve months have seen a decided improvement in the art of automobile manufacture. Moreover, everybody who followed the race closely must admit that the failure of the American cars was due chiefly to tire troubles, and not so much to defects in the machines themselves. It was the splendid quality of the tires used by the foreign machines, and the fact that all of them carried detachable rims, which contributed so largely to their better showing. On account of a slight rain which fell just previous to the race, the oiled road was rendered somewhat slippery, and non-skidding tires, with roughened metal treads, were found to be necessary. Although most of the foreign cars started with tires of this kind, the American cars unfortunately did not use them at the start. At the end of the first round Tracy, driving a 110-horse-power Locomobile, had his tires changed for those of the steel-banded non-skid type. When the tire company's supply of this type was exhausted, tires having steel-studded leather bands were substituted. None of the American non-skid tires showed the endurance of the foreign ones, and, as we have stated, it was largely for this reason that the American cars, or at any rate those of the normal type, made no better showing. That the speed was not wanting in at least one of these, is shown by the fact that the fastest round of the race was made by Tracy, who drove his Locomobile over the fifth lap of the course in 26 minutes and 21 seconds, which is equivalent to a speed of 67.65 miles an hour. It is estimated that on account of the many slowdowns at the turns, this machine must have been traveling at over 100 miles an hour on this round on the straight.

The 115-horse-power Thomas car, driven by the Frenchman Le Blon, was leading the American cars and was in eighth position when the race was called off, Le Blon being at that time on the last lap. Next to him of the Americans came the Locomobile, which was running on the ninth lap, being then in tenth position. The next American was the Christie machine, driven by its owner and builder, which was running

in the thirteenth position on the eighth lap; and in the fourteenth position and also on the eighth lap was the 60-horse-power American Haynes touring car, which by the way did not make so good a showing as to speed as it did in the elimination race of two weeks before. Except for tire troubles, Christie's little 50-horse-power touring car made such consistent running as to excite the wish that he could have been steering the powerful 100-horse-power racer which was disabled during his training for the elimination trial. The last of the American cars was the Frayer-Miller air-cooled car, which retired on the fifth lap with a broken fan. The experience of the three Frayer-Miller cars, each of 110 horse-power, seems to indicate that although this type is admirably adapted for touring cars, in which it has shown excellent results, it is not quite equal to the severe demands which are made when the horse-power exceeds 100, and the machine has to be pushed for five or six hours to the utmost limit of its capacity.

The performance of the winning Darracq car was highly creditable both to the maker of the machine and to its driver, young Wagner. Considering the crowded condition of the course and the loss of speed due to the use of non-skid tires, the speed of 61.43 miles an hour, at which the race was won, compares favorably with the speed made last year with faster tires and over a course that was less crowded and included fewer turns. The driving of Lancia, who came in second and whose average speed was 60.84 miles an hour, came fully up to the reputation of this great driver, who was the winner in last year's race, in which for 200 miles he averaged 72 miles an hour; and his failure to take the cup was undoubtedly due to the fact that his successful rival was driving a car that was just about an even minute-to-the-lap faster than his own. Duray driving the Lorraine-Dietrich car at an average speed of 60.27 miles an hour was a close third to Lancia, whose average speed was about one-half a mile per hour faster. The fourth machine, a Bayard-Clement, driven by young Clement, was one of the steadiest-running and most perfectly guided cars in the race, and in spite of minor troubles necessitating frequent delays, it carried Clement into fourth position at an average speed of 59.02 miles per hour. Fifth position was won by the popular driver Jenatzy in a 120-horse-power Mercedes, his average speed being 58.51 miles per hour.

Of the eighteen cars entered, two only may be said to have possessed features which differed broadly from the prevailing type. These were the two American cars, the air-cooled Frayer-Miller and the direct-drive Christie. The other sixteen were alike on all the broad features of their design, except one. Seventeen of the cars entered were driven by four-cylinder engines located over the front axle, and of these, eight were driven by shaft and bevel gears, and nine carried the chain drive. Particular interest centers, of course, in the winning car, which, in its dimensions and details of construction, differed somewhat from the rest of the machines. Its wheel base was short and its tread comparatively narrow. The small wedge-shaped radiator and the absence of the usual bonnet over the engines combined to make the machine look smaller and lighter than it really was. As a matter of fact, at the weighing-in it was found to be close to the weight limit. Throughout the race it ran with beautiful regularity, and as it swept by the grand stand it appeared to possess excellent steering qualities.

As to the prospects of the race for the cup in 1907 being held in this country, we think that, in view of the fact that a private course, free from dangerous obstruction, is to be secured, we may see the race run off here, and run off, moreover, under ideal conditions. Although the cup was won by a French machine,

France was not officially represented, the entries being made by owners in a private capacity. An Italian car was second in the race, and, of course, the Italians have the privilege of running the race off in Italy, if they so desire. But it is quite conceivable that the attraction offered by a private and special course may prove sufficient to make them forego their right of location in favor of America.

#### The Latest Death Test.

Although it is asserted by nearly every practising physician that the possibility of being buried alive can only occur where a medical examination has not been made, an eminent German physician and surgeon states that a stronger, absolutely reliable guaranty for discerning actual death is still demanded, and the demand has been met by the discovery of a new medium for ascertaining death with perfect certainty. This new death test consists in injecting a solution of fluorescine deep into the tissues. If circulation exists, the skin and mucous membranes become very yellow and the eyes assume the color of emeralds; if the circulation has ceased, none of these results occur. The discoverer proposes that at least two hours before the body is placed in a coffin, such an injection with fluorescine be made. If life is not yet extinct the injection does no harm, and the coloring within a short time entirely disappears without the slightest injury to the patient.

#### A New Process for Making Malleable Iron and Steel.

A new process for directly converting iron ore into malleable iron or steel by a continuous system has recently been made by two Australians, Messrs. Heskett and Moore. It is claimed that the new discovery will effect a saving of 25 per cent in the manufacture. The ore is simply concentrated by ordinary methods, or if it is magnetic it is separated electrically until the pure oxide of iron is obtained. The oxide of iron is passed through a revolving cylinder heated by waste gases from subsequent operations, and brought in that cylinder to a dull red heat. It drops from the cylinder to a second similar cylinder, and in the latter it is brought into contact with the deoxidizing gas, which is forced through and brought into contact with the heated ore. The heated ore is thus converted into a pure iron. Accompanied by and protected by the deoxidizing gas, it is passed into a third chamber or melting hearth, where it falls into a bath of molten iron, and is converted directly into steel or balled up as malleable iron.

#### A New Book Catalogue.

The publishers of the SCIENTIFIC AMERICAN have had a new Book Catalogue in preparation for some time, and it is now ready for distribution. Copies are being mailed to all subscribers of the SCIENTIFIC AMERICAN, SCIENTIFIC AMERICAN SUPPLEMENT, and AMERICAN HOMES AND GARDENS. Those who read the SCIENTIFIC AMERICAN in the libraries of the Y. M. C. A., or purchase the paper at newsstands, can obtain a copy on application. The Catalogue will be sent free to any address in the world. It contains 112 pages and over 5,000 titles and lists. Special attention has been given to classification in order to render reference easy. We should be pleased to send copies of the Catalogue to any friends of our readers who may be interested in scientific or technical books.

If metallic iron is melted along with copper or brass, it is said that part enters the alloy and becomes chemically combined, and the remainder separates in pellets or nodules of the hardness of steel. These nodules are the source of much trouble in brass, as they injure tools to an alarming extent.