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The Car

A JOURNAL OF TRAVEL BY LAND, SEA, AND AIR. ILLUSTRATED.

Edited by the Hon. JOHN SCOTT MONTAGU, M.P.

VISCOUNTESS BARING

Photo. by] [Lafayette

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A JOURNAL OF TRAVEL BY LAND, SEA, AND AIR. ILLUSTRATED.

London, December 24th, 1902.

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"THE CAR" CHRISTMAS NUMBER

was published on December 17th.

Among many other features of interest, it contained a remarkable article by Vice-Admiral Lord Charles Beresford on the ATLANTIC SHIPPING COMBINE.

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Wednesday,	**December 24**	**4h. 52m.**
Thursday,	**December 25**	**4h. 53m.**
Friday,	**December 26**	**4h. 53m.**
Saturday,	**December 27**	**4h. 54m.**
Sunday,	**December 28**	**4h. 55m.**
Monday,	**December 29**	**4h. 56m.**
Tuesday,	**December 30**	**4h. 57m.**

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EDITORIAL JOTTINGS.

After the Competition.

The Car competition will come to a close in the issue of December 31st, and I then propose to start a series of acrostics, most of which will have something to do with motor-cars. Prizes will be offered every quarter to those producing the greatest number of correct solutions. The popularity of these competitions in other weekly newspapers makes me think that the readers of The Car may also like to have something with which to while away an idle hour or two.

Shooting Parties and Motor-Cars.

Motor-cars are being more and more used for shooting purposes. In wet weather, when one's horses have to wait to either take the guests out or bring them home, colds and chills are frequently the result, and it is seldom that horses can stand two or three continuous days of exposure and hard work. But with the motor-car it is different—for the attendant just covers the seats with a waterproof rug and all is well. Also, should the day be wet until noon and then clear up, a motor-car can be at once got out at a moment's notice and used to convey the party to some outside cover or to some place where ducks and tea can be shot. In a few years time there will probably be few manors where there is extensive shooting which will not possess automobiles, and those who cater for the supply of motor-cars for country gentlemen should shortly do a good trade. Some form of protection against weather is advisable, for all the party may not be young and robust. A motor game-van is also a possibility, but to go through the soft roads in the woods it is necessary that it should have very broad wheels. For soft ground work the horse has as yet got the advantage over the motor-car, for it pulls upwards and onwards, whereas the self-propelled vehicle has a tendency in damp ground to cut through the top surface.

Buying Christmas Presents.

If the larger form of motor-cars are useful for shooting parties, the London electric brougham for "madame" has been greatly in evidence this past week in connection with her Christmas shopping. Up and down Bond Street and through Piccadilly and Regent Street, and in fact all over the shopping world of London, there have been any amount of smart electric broughams and some small petrol cars during the past few days. Perhaps after a time these electric vehicles will become cheaper to buy and less expensive to run, for at present they can only be a luxury of the comparatively rich. Already the conversion of town traffic has been partially made, and Mr. Singer will no doubt before long find some means to increase his supply of vehicles, and at the same time reduce the expense. But however this may be, it is only fair to say that Mr. Singer has undoubtedly been the pioneer of the electric brougham traction in London.

G. G. Junior Quite Excellent.

May I advise my readers during the Christmas holidays to pay a visit to the Gaiety Theatre and see the motor-car scene. Mr. George Grossmith is quite excellent in company with Mr. Payne. The noise of the starting of the motor and the way that Mr. G. G., junior, works the speed levers is just what one would expect from an actor who has a motor-car of his own. In any other hands the scene would have lost half its charm. Might I suggest to Mr. Grossmith that an old woman with two waists, one natural and the other caused by the wheels of the car, should be dragged in, and also a dog in two halves, the one wagging its tail and the other barking loudly. This might be a change of "business" of an amusing character. Talking about dogs, it is a curious thing that under a comparatively light car dogs seem to take no harm. A car of mine the other day accidentally ran over a small Scotch terrier belonging to a friend; but after wearing a worried look for a day or two all was well, I am glad to say, with doggie.

Quot Homines, tot Sententiae.

In nearly every motor-car police case the differences of opinion as to speed are startling. Of course we know that no two human beings see things quite alike, but the difference in the speed as estimated by the driver and the policeman are sometimes really short of marvellous, and yet there is no reason to suppose that either side are knowingly perjuring themselves. The following may be taken as typical estimates:—

Motor-car speed per hour:—

Mécanicien's private opinion	12 m.p.h.
His opinion when talking to his friends	20 ,,
Policeman's private opinion	14 ,,
Policeman's opinion in court	28 ,,
A farmer's opinion when his pony was frightened	50 ,,
Maker's guaranteed speed	16 ,,
Actual speed	10 ,,

How the Constable Judges.

Many policemen, unless they are accustomed to see motor vehicles constantly, are apt to judge the speed by the noise. There are certain French-made voiturettes—we will not mention names—whose mechanical clamour

would entitle them to rank with M. Serpollet's "Easter Egg"; while, on the other hand, there are cars of upwards of 20 h.p. which make hardly any sound, even when running at four times the legal limit. There is also something in the position of the driver and occupants of the car. A strained attitude, with eyes nervously trying to pierce the distance, suggests speed, and also apprehension of consequences; whereas the experienced and wise motorist will always, when policemen are near or not, sit back comfortably, point out to his companions the beauties of the surrounding district or objects of interest, say "good morning" and wave his hand affably to the guardian of the peace as he passes. "If," thinks the constable, "the driver of this vehicle can take his eye off his machine and look around him, he cannot be going so fast as I thought," and so the matter passes from his mind.

Payment by Instalments.

Why does not someone start a company to buy motor-cars direct from the makers for cash, thereby getting the advantage of a full discount and resell to the private customer on the same system as pianos are often sold—that by payment by instalments? There is many a man of moderate means who would like to buy a motor-car and would give say from £250 to £500 for it, but he cannot afford to put down so large a sum at once. If the buyer, however, could pay by monthly instalments, spread over say one or two years, the matter might be easily arranged, and I am sure that the company would soon do a flourishing business. Ordinary traction engines are sold on this system to farmers and others who work them from different centres in the country, and also furniture and various other goods which are commonly bought in large quantities for considerable sums, can be purchased in a similar fashion.

Mr. Claude Johnson Resigns.

We publish this week an interesting interview with Mr. Claude Johnson, who has been secretary of the Automobile Club since its foundation, giving reasons for his resignation. Of course I have been aware of his intentions for some time past, but discretion forbade publication. As Mr. Johnson is a personal friend of mine, it is a difficult and delicate matter to express my feelings with regard to this news. He has laboured since the earliest start of the motor-car movement by day and by night, in fair times and foul, for the benefit of the Automobile Club and for the good of mechanical locomotion generally. He has done far more than an ordinary club secretary, for he has been an originator of ideas and organiser of the means by which they could be carried into effect. He knows his own mind, and has a strength of will which few people who have not been brought into intimate personal contact with him would suspect.

Lucky for Someone.

I can honestly say that any firm or individual who takes advantage in the future of Mr. Johnson's services will be lucky indeed. This is not an oratorical flight of imagination but merely a hard fact. The executive committee will be forced to face a most difficult question when they come to appoint his successor, as the future club secretary will have to be both organiser and secretary. A great portion of the present secretary's work has been in connection with the duties far removed from ordinary secretarial work, and without constant and unremitting attention the club will find a difficulty in holding its own in times to come as the leading organisation in connection with automobilism. That the Automobile Club wants an exceptional man is obvious, and the corollary is that the club must be prepared to pay handsomely for brains and experience if it can get them.

The Petrol Controversy.

The petrol controversy is still far from being settled. Some days ago a prominent member of the trade wrote to the Assistant Goods Manager of the London and North-Western Railway giving some further points. The attitude, however, of the railway companies in general was shown by his answer, and another conference which was held on December 17th effected nothing further, the railway companies refusing to meet in any way the demands of the trade. The wisest step to take next would be for us to approach the Board of Trade and to put our case before Parliament again in the session commencing on February 17th. Parliament is not so over friendly to railway companies that they can despise a general appeal to the many M.P.'s who are themselves motorists or friendly to automobilism, and it should not be forgotten also that the dyeing, cleaning, tar distillery, and other trades are also seriously affected by these new and absurd regulations.

Why not Imitate the Best?

All the improvements shown this year at the Paris Salon are alterations which can easily be adopted by any English maker who takes the trouble to study the different designs and copy them. Why do not, for instance, the Daimler Company, of Coventry, take up the Daimler-Cannstatt system of water-cooling, which would relieve their cars of two-thirds of the weight of water now carried—a considerable item. Then again the throttle ought to be universally used on every car. One also wonders how long it will be before some English makers of horizontal petrol engines become converted to the vertical form. The Delahaye Company, almost the last representative in France of the former type, has now discarded it and uses the vertical engine.

Are they Waking?

Lord Stalbridge has at last been stung to semi-activity by the attack of the committee of North-Western shareholders, and been forced to appeal to the rest of his shareholders, asking them to suspend judgment on the questions under discussion until they have heard the other side. But is there another side to the proper presentation of accounts, the building of locomotives sufficiently powerful to haul reasonable train loads, and the retirement of senile and totally incompetent directors? The North-Western can be partly judged by any competent railway authority as it stands to-day. To take one instance only, go to Euston and watch the departure of any main line express. If the train is composed of more than the equivalent of seventeen of the old coaches, weighing something well under 250 tons, the train has, by a standing order, to have two locomotives. What does this mean, except that the Crewe works fail to build engines powerful enough for this ordinary daily work, and consequently more engines and more men have to be constantly employed than are necessary.

Science and the Bluejacket.

The Navy, from its very infancy, has always been the more scientific of the two great services of this country, and, nowadays, the torpedo men and gunners, and even the ordinary sailor-men, are necessarily imbued with a certain amount of science. Technical words enter largely into the conversation of the men on the lower deck of a man-of-war, and certainly the name recently given to a new public-house at Malta may be taken as a sign of the times, for it is called the "Ohm." Perhaps we shall soon see the "Ampère Tea Shop," and a rival to the "Ohm," called the "Revolt." By-the-bye, talking about sailors, on one of the ships in the Mediterranean Squadron, a midshipman the other day, who had just fired within a few feet of one of the ward-room officers, said, on being forcibly remonstrated with, "I am so sorry, sir. I thought it was only another midshipman."

PARIS GOSSIP:

FROM OUR OWN CORRESPONDENT.

WHEN these lines are published the Automobile Salon will be coming to an end. One can sincerely say that it has been a great success; in fact, greater than the most sanguine promoter could have hoped. Cars to the value of more than 6,000,000 francs, light and heavy, of all sorts, were exhibited; while on some days there were 40,000 visitors paid for admittance to the Grand Palais.

At the last meeting, the committee of the Automobile Club voted a sum of 15,000 francs to be spent in organising the automobile meeting fixed for next February. A Circuit du Sud-Ouest, 350 kilometres for cars, light cars, voiturettes, and motor bicycles, has been decided upon. There may also be tourist reliability trials and kilometre and mile races. All these should be run with alcohol as fuel.

The news that the American Automobile Club was to take part in the race for the Gordon Bennett cup was received here with much interest. As you probably know, Winton and Harkness are to be the drivers of the Transpontine racers. The German challenge is now expected, and ought to be sent in the course of a few days. Though the Benz Company are working hard on racers for 1903, the cars defending the colours of the Kaiserland ought to be three Mercédès.

In spite of the cold, records have been beaten on the official road of the Automobile Club, the celebrated Dourdan Road, thanks to the special authorisation granted by the Prefect of the Seine et Oise department. While Henry Fournier on his Mors monster could not do better than Augières on the kilometre—exactly 29 sec.—his brother, Maurice Fournier, on a Carreau motor bicycle, covered the mile, flying start, in 1 min. 5 sec., thus beating the world's records for machines weighing less than fifty kilogrammes. Dominique Lamberjack, on a Griffon machine, made the kilometre in 39 1-5 sec. And all this when the thermometer was approaching zero!

An aerial hotel is the latest idea! M. Broet has just ordered from M. Mallet, the famous balloon constructor, an aerostat of 56,496 cubic feet capacity, which is to bear the name of "Djinn." The car is to be a regular house—6 ft. 1 in. in length, 4 ft. 2½ in. in width, and 5 ft. 10 in. high. This extraordinary car will be furnished with a bed, a table, chairs, kitchen utensils, etc. Where is progress carrying us to?

Speaking of aerial matters, I must not forget to say that Santos Dumont is anxious to have a race with the Lebaudy brothers, the latter having declared that the speed of their "Jaune" was greater than that of the "Santos-Dumont, No. VI.," winner of the Deutsch 4,000 franc prize. The Brazilian responded by throwing down the gauntlet, depositing £1,000 with the Aero Club Committee, and declaring himself open to receive a challenge for anything up to £4,000. Santos intends using his "No. VII.," fitted with two Clément motors of 80 and 100 h.p. each. But, perhaps, as Shakespeare says, this is all "Words! Words!"

M. Serpollet has received an order from Santos Dumont for a 40 h.p. steam motor, which is to be fitted to a navigable balloon of large dimensions, and all previous aerial records are expected to be eclipsed.

The big race of the Automobile Club of Belgium, the Circuit of the Ardennes, will certainly be held for the second time next year. The start will be made from Arlon, a town a few kilometres from this year's circuit road, and the arrival, at the fifth lap, will also be at Arlon. If a circuit of 150 kilometres were required, the race would certainly pass through German territory.

The Paris Municipal Council have decided to acquire four electric fire engines on the same model as the two our firemen possess already, and which have rendered service with extraordinary success. A saving of about forty per cent. should be made by using automobile engines instead of those of the horse-drawn type.

The possibility of an Austro-German-Belgian inter-club run to Paris next June is still being considered. The itinerary from Berlin would be the same as that of the last Paris-Berlin race, though, of course, reversed. The Vienna *chauffeurs* would drive directly to Berlin. The homeward journey will be in "go-as-you-please" order.

The annual automobile congress will in the future be held alternately in Paris and the provinces. The 1903 congress is to be held in the metropolis, Lyons in 1904, and, of course, again in Paris the following year.

Baron Henri de Rothschild, ardent motorist and eminent medico, has just founded a new hospital, the Polychnic, situated in the Rue Marcadet, in the Montmartre quarter. The millionaire doctor, well-known under the name of Pascal, has built for this model hospital an automobile ambulance having a 28 h.p. motor.

AMERICAN ENDURANCE CONTESTS.

A MEMBER of the American Automobile Club, Mr. H. S. Chapin, has been making more or less practical suggestions with regard to the recent New York-Boston and return endurance contest. In an interview on the subject, he said that "everyone who took part in the recent Boston endurance run, was agreed that the prohibition in regard to speed was a great drawback. It really prevented anything like a fair test of reliability. By speed," Mr. Chapin said, "he did not mean, of course, breakneck scorching, but legitimate speeding, with reasonable precautions for the public safety, exactly as they saw every day on the public speedways. Instead of a three-days run out and three-days back, he would suggest that each day's run be over a distinct course, and that the local authorities be asked in advance to grant a special speeding permit for the day." When asked could they legally grant it, he replied: "Certainly. The law makes provision to meet such cases, just as it allows for keeping streets clear of traffic during parades or public festivals. However, that is a matter which could be arranged for by the committee ahead of the contest. If one locality refused, then try another. With a speed limit say of thirty miles an hour, it would then be necessary to classify the contestants according to their speed qualities and in proportion to their price. For instance, a car costing 1,000 dollars would not be expected to travel as fast as another costing 2,500 dollars. Say the former was rated at fifteen miles an hour, then give it a maximum of twenty miles; so that it could show its real endurance under the severest conditions." Thus it will be seen that the Americans (despite all the outcries against speed which have been published in the press across the Atlantic), are beginning to realise that the trials of the cars in such contests as the Paris-Vienna or the Paris-Madrid competitions are absolutely genuine tests of all their real qualities of speed, reliability, and endurance. Only the very best cars can win, and these naturally command high prices on the market, when their all-round excellence of construction has been demonstrated.

MR. C. JOHNSON'S RESIGNATION.

A RETROSPECT, SOME IMPRESSIONS, AND A PROPHECY.

JUST as the Automobile Club seemed an integral part of the motor movement, so did Mr. Claude Johnson seem part and parcel of the Automobile Club. The rumour that he had tendered his resignation after five years of hard, uphill, pioneering work was so much of a surprise that we called at 119, Piccadilly, upon the earliest opportunity.

"Quite true," said Mr. Johnson, and then, seeing the query in our eyes, "No, sorry, but I can't tell you why; personal matters, and I dislike them."

"But surely you can tell ——?"

"Well, the fact is I realise the club can never pay a large salary to its secretary—it would not be justified in doing so. Therefore I must either abandon ambition or remove to a sphere where there is a less limited horizon."

"Which is the new 'sphere,' then, may we ask?"

"I don't know yet. Nothing is decided; but I have been approached."

"You must find it rather hard to leave a club for which you have done so much?"

"Yes; and especially as I have made many friends through its medium. It was only an infant organisation when I joined it, in fact there were only about one hundred and fifty members then, and now there are more than 2,000 over that number. Young men have chiefly aided me in the movement, as, for instance, Mr. Roger Wallace, K.C., who became chairman of the club about the same time as I became secretary. He was then, I think, only forty-three while I was thirty-three. The club owes a great deal to him. He has steered it through troublous waters, and has been indefatigable in his attendances and in keeping a guiding hand on club affairs. Mr. Frederick R. Simms, who made up his mind to copy the French by forming an automobile club, and who, with the Hon. Evelyn Ellis (the first user of a petrol car in England), was founder of the club, is a second young man. Harrington Moore, who did all the work in connection with the foundation of the club, and whose labours I fear are forgotten, was also a young man. Look at Shrapnell Smith, who made the Liverpool Self-Propelled Traffic Association! He is, I believe, quite young. But he has done splendid work in the organisation founded by Sir David Salomons (a most generous financial supporter of the club and its minister for foreign affairs) which was amalgamated with the club in its early days."

"Amongst the members who honour me with their friendship, there are two of about my age who have done invaluable work for the club and the cause. One is your chief, the other is Mr. Alfred Harmsworth. Members of the club little realise what they owe to Mr. Harmsworth. It was only Mr. Harmsworth's private guarantee that made my 1,000 Miles Trial Scheme of 1899 possible. He gave money for prizes for competitions whenever I asked for it; he lent his cars for county council demonstrations whenever required; quietly, in the background, he was always ready with a helping hand, and the advice and encouragement of so daring and successful a pioneer were of great value to a young man like myself, when forwarding a movement which was sneered at and ridiculed five years ago in a manner almost incredible nowadays."

"Then there were Colonel Holden, F.R.S., the Superintendent of the Gun Factory at Woolwich, Professor C. Vernon Boys, F.R.S., and Mr. W. Worby Beaumont, three busy men, eminent scientists, who from the outset gave me invaluable assistance as judges in trials and as members of the committees to the club. One cannot omit the name other hard workers who have consistently sacrificed themselves. Mr. Frank H. Butler, Mr. Alfred Bird, Dr. Boverton Redwood, and Sir John Thornycroft I owe much to, while Sir John Macdonald, Mr. T. W. Staplee Firth, Mr. Phillips, the Hon. C. S. Rolls, and Mr. Paris Singer have also done much for the cause."

"The work of the club must have grown enormously since you joined it?"

"Yes, it has been a snowball, year by year doubling and trebling itself amazingly. The past twelve months, with the Reliability and Tyre Trials, has been the hardest; indeed, the work of organisation has been far too much for a single pair of secretarial shoulders."

"Your leaving is bound to make a difference to the club?"

"Oh, no; the committee have an admirable man in view, I believe, and the work of which I speak will have to be divided. There should be one secretary for the sporting section, another for the club's internal affairs, and a third for the Motor Union. Possibly, too, it will be found more convenient to have individual secretaries for the motor-cycle contests, of which the club will make a special feature during 1903, as well as for the Motor Van Trials, certainly the most important undertaking the club has ever attempted. Next year will be one of unprecedented strain for the organising heads of the club, but I am confident everything will go as prosperously as before."

"What a host of stories you could tell!"

"Anecdotes? Yes, I could fill a book with them. Afraid I haven't time now—just off to Paris."

"Well, *bon voyage*—and in your new sphere of life, too, wherever it is!"

"Thank you. Good-bye!—a Happy New Year to THE CAR!"

UNILLUMINATED LUMINARIES.

THE ignorance of legal luminaries in technical subjects is the subject of a delightful jotting in *Freeman's Journal*. To understand the technology of motoring, says our contemporary, one must be something of a gas engineer and an electrician, or at least must have some experience of the pastime. In the recent motor case held in Dublin, some most amusing incidents showed how great was the lack of knowledge on this subject. In view of future cases, the leading lights in the Four Courts should purchase a motor-car for joint use, and thus get familiar with the main features. In the case referred to one learned counsel continued to describe the car as "getting up steam," though the car was driven by petrol, and, of course, had nothing to do with steam. His lordship rebuked one witness for having apparently contradicted a previous witness, who had laid it down that in changing speeds the driver should have his hand on the "cam." Now the "cam" in question lies in the very heart of the machinery, and is surrounded by rapidly-revolving wheels. The insertion of a hand in such a place would lead to instant destruction. One of the counsel also asked the following very Hibernian query:—"If you properly repaired a leaking water tank before it is sent out, would it be a proper repair?"

OUR frontispiece this week is a portrait of Lady Baring, who married as her second husband Viscount Baring, eldest son of the Earl of Northbrook. Her ladyship is often to be seen in her electric brougham about town. She is devoted to motoring, and is shortly, we hear, going to possess a petrol car of her own. Lady Baring often stays with her father-in-law, Lord Northbrook, at Stratton, and has therefore one of the best roads in England, viz., the Basingstoke to Winchester Road, at her very door. Her ladyship has a wide circle of friends and is one of the most charming of English ladies.

CARS AND HOW TO DRIVE THEM.

No. XV.—THE LOCOMOBILE. By W. H. Buxton.

HAVING been asked to write a few hints upon the driving and care of the Locomobile, I will request the reader to follow through the operations from the start, viz., taking the car in hand when entirely empty. I assume, of course, that the general principles of the machine are understood.

Filling Boiler and Tanks.—The first requisite is naturally that of petrol. The operations for filling are as follows: — Remove the footboard and close the valve between the air and petrol tanks, in order to save what air pressure may remain, then fill the tank to within an inch of the top so as to leave some air space. After having replaced the cap and screwed it firmly to a seat, this air valve may be opened. The pressure should then be raised to, say, about 60 lb. on the gauge. Care should be taken here that the petrol valves on the burner are closed. Then, after having filled the water tank, the boiler has to be made half full; this is done either directly by means of a hose through the blow-off valve, or with the use of the hand pump. During this operation the safety valve is kept open to allow the air to escape.

Photo. by] MISS MAUDE HAY-DRUMMOND ON HER LOCOMOBILE [*Argent Archer*

Lighting Burner and Raising Steam.—Now that we have the car provided with water and petrol steam can be raised, and we will turn to the burner. Both doors should be open in order to receive the torch when ready. The torch should be heated to a dull red heat, but not too hot (as there is danger of melting the gauze in the torch), and then screwed into the right-hand valve of the automatic, the long tubes projecting into the burner, with the short nozzle tip into the so-called mixing tube. Before introducing a match into the burner, it is well to open and close quickly the valve which supplies the petrol to the torch; this is done in order to avoid any possibility of danger resulting from loose joints, and to see that the torch properly vapourises the petrol. When it is seen that no petrol escapes from any of the joints a match can then be introduced into the burner, and the valve opened slowly until the flame burns strongly and with a blue tint. This torch, or auxiliary burner, when heated, changes the liquid petrol into the form of a gas, and is required only when there is no steam in the boiler. The flame is now allowed to burn as it is until steam escapes through the safety valve to expel the air. This should then be closed and a pressure of about 30 lb. waited for. When this is attained there is enough heat in the boiler to vapourise the petrol, and its circuit to the burner can now be shortened in the following manner:— The left-hand or main supply valve is slightly opened, and the valve supplying the auxiliary burner is tightly closed and the torch removed. Before removing the torch, however, assure yourself that this supply valve is closed tightly,

otherwise, petrol would escape and undoubtedly light from the flame contained in the burner. Now, after having closed both the doors of the burner, the main supply valve can be carefully opened about two turns.

Lubrication.—The car is now ready for running, with the exception of one thing, which is, perhaps, the most important of all, viz., that of *lubrication*. The first thing to be done is to fill the cylinder oil cup with a heavy mineral oil, first allowing any water which may be contained therein to escape through the drip valve; after being certain that the cup is entirely full the cap may be screwed tightly to a seat, and the supply valve opened one eighth to one quarter of a turn. Then all bearings on the engine should be lubricated with a light engine oil. The greatest cause for complaint with the Locomobile engine is from the fact that it is not sufficiently lubricated, and the most important bearings are those of the crank shaft, crank pin, and crosshead slides. In oiling one of the engines the writer usually follows a certain course in using the can:—

Crank pin bearings, then main bearings; eccentrics; second main bearing and crank pin bearing; then the crosshead with its two slides; the two valve stems; the second crosshead with its slides; and finally the pump lever fulcrum.

After having completed these operations—which, although at first sight may seem lengthy, are really short and soon become second nature—the car is ready to start.

Starting.—The driver takes his place at the right side of the seat, holding the throttle lever in his right hand, the steering lever in his left, and his foot in the vicinity of the brake lever, but never upon it. After having opened the auxiliary throttle, the throttle lever is pushed very slowly forward, allowing steam to enter the cylinders. That it should be done very slowly is essential, because when the steam strikes the cold cylinders it is bound to condense, and, therefore, time must be given to allow it to escape through the exhaust, otherwise the condensed steam is very hard upon the packings of the engine.

Stopping.—To stop the car the operations necessary are to close the throttle lever and apply the brake very gently at first.

Reversing.—For reversing, the procedure is similar to going ahead, except that the reverse lever is thrown down, but care should be taken after having reversed to see that the reverse lever is in proper position for going ahead. A beginner is very apt to forget this at first.

Special Caution.—Before commenting upon the care which should be taken of the different parts of the Locomobile, one most important caution should be brought to notice, which should always be borne in mind by the driver. When anything happens that requires attention, and you are in doubt as to the nature of the difficulty, extinguish the fire immediately; the trouble may then be investigated at leisure, for when there is no fire there is absolutely nothing which can occur to further injure the car. Let us now consider the hints on the different parts of the machinery in the order of their importance.

Engine.—As has been previously stated, the most important factor for the successful working of the engine is that of proper lubrication. When this is assured, the bearings should be inspected from time to time, to see that there is no lost motion (*i.e.* wear), particularly in the in-main and crank-pin bearings. One great source of difficulty is caused from the fact that, when any slight difficulty shows itself, proper care is not taken to immediately remedy it. One thing in particular which might cause a considerable amount of work, if not seen to at the right moment, can be avoided by simply attending to it immediately, namely, when the piston or valve stem packings show signs of leakage, the nuts should be at once adjusted by the use of a screw-driver (a very easy matter), as if these are not kept properly tightened, the packing is apt to blow out, or the nut drop down and get jammed between the crosshead and the casting, a thing which causes annoyance, but which can be prevented at the first sign of steam leakage by simply giving the nuts, perhaps, one complete turn.

Boiler.—This is claimed to give the greatest amount of difficulty, but, in reality, it should not give any, when one point is continually borne in mind, *i.e.*, that the Locomobile is not a hot air engine, but requires steam in order to propel it. Sufficient steam is generated by keeping water in the boiler, and keeping it properly cleaned. A very good rule is to blow it off after every long run, and occasionally rock the car to stir up dirt from bottom of boiler, that may accumulate through taking dirty water, and, from time to time, to introduce a small quantity of paraffin in order to clean it. The unpleasant difficulty caused by scorching the boiler may occur in three ways:—

(1.) By firing up the car when there is no water in the boiler.

(2.) By allowing the boiler to become empty when on the road.

(3.) By blowing off the boiler without first putting out the fire.

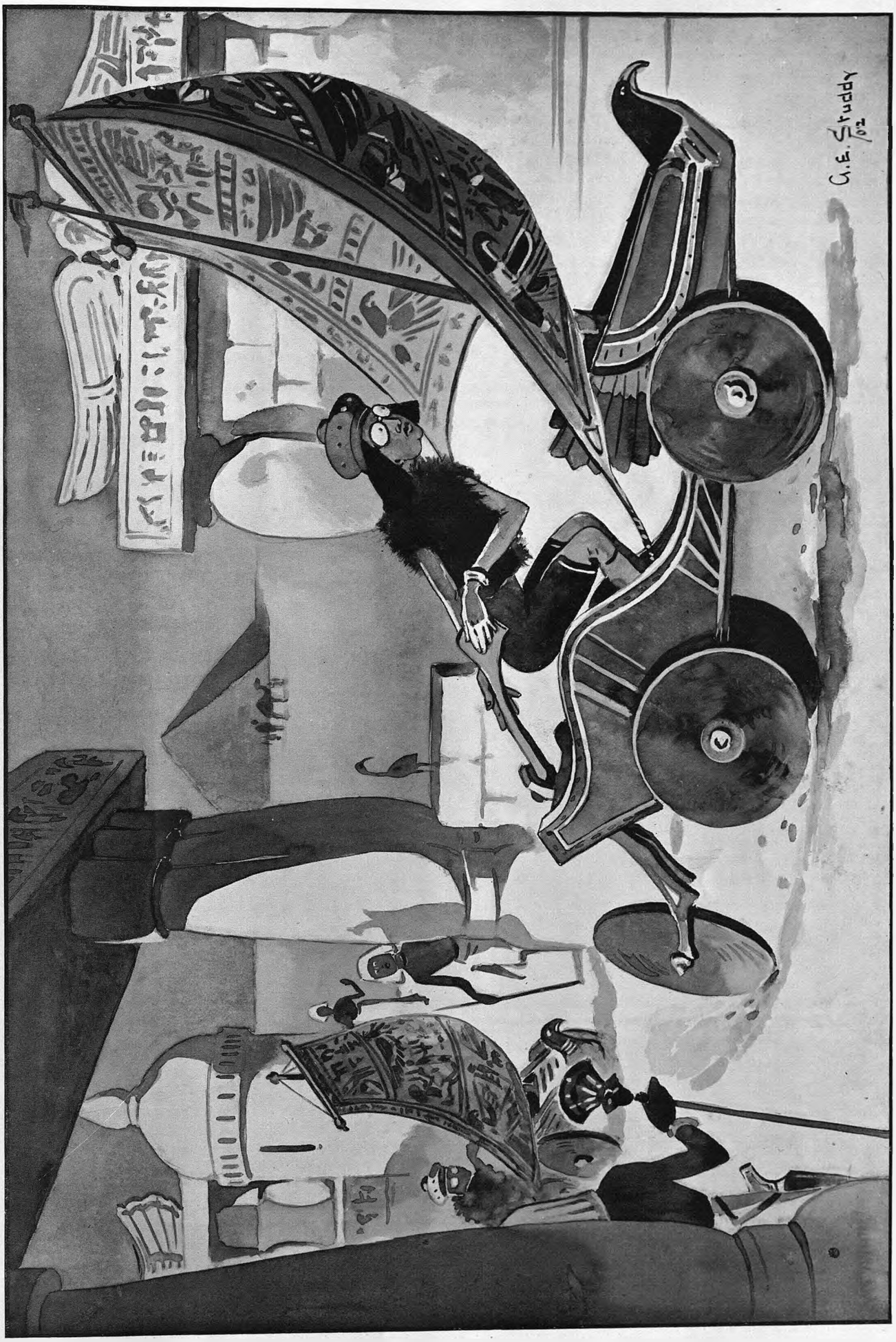
As for the first cause, it is a very good habit to look at the water level in the gauge glass before introducing the hot torch into the burner; by so doing this trouble cannot arise. As for the second cause, the fact of the car not being supplied with a hot-air engine should be continually borne in mind until the operation of supplying the boiler with water becomes second nature. It is never safe to run the car when the water-level cannot be seen in the gauge glass. A moment's stop may prevent a number of hours' delay, and, at all times, a good rule to go by is that it is "better to be *safe* than sorry." Referring to the third cause, this difficulty may be overcome by getting into the habit of first putting out the fire when arriving at the *garage*. When one is sure that this is always done first, then any other operation upon the car can be done with a knowledge that nothing further can occur to injure it.

Chain.—Lack of proper adjustment of the chain may lead to its jumping off or running too tight, thus using up an unnecessary amount of power. The adjustment is very simple, and is effected by either lengthening or shortening the strut running between the engine and rear frame. Having loosened the check-nut, it can be properly tightened; it should have a tension of a trifle more than on a bicycle. With this, and keeping it properly cleaned and well lubricated, no further difficulty can be experienced.

Running Gear.—All bolts and screws should receive attention from time to time, in order to be sure that they are not loose, and proper care should be taken to keep the bearings sufficiently tightened. The front wheel bearings, which are very easily inspected, should be packed with vaseline every two months. The four rear axle bearings should be oiled as regularly as the engine. Let me here reiterate the fact that the greatest amount of difficulty with the Locomobile is caused from the fact of insufficient lubrication.

(To be concluded.)

To English eyes one of the most interesting features of the Paris show is outside the Grand Palais, and not within. Every day the Salon is visited by large numbers of automobilists on their own cars, and these are drawn up in extended array along the pavement of the Petit Palais, with their bonnets facing towards the magnificent façade of the Grand Palais. On some days the line of cars, though closely packed side by side, is extended right round the corner of the Metropolitaine Station, and a considerable distance down the Champs Elysées; in fact we counted over 300 of them at one time. Of course, the cars include numerous up-to-date types, but the wearing capacities of motor vehicles are displayed in an interesting fashion by the presence of no small number of patterns that are no longer on the market.



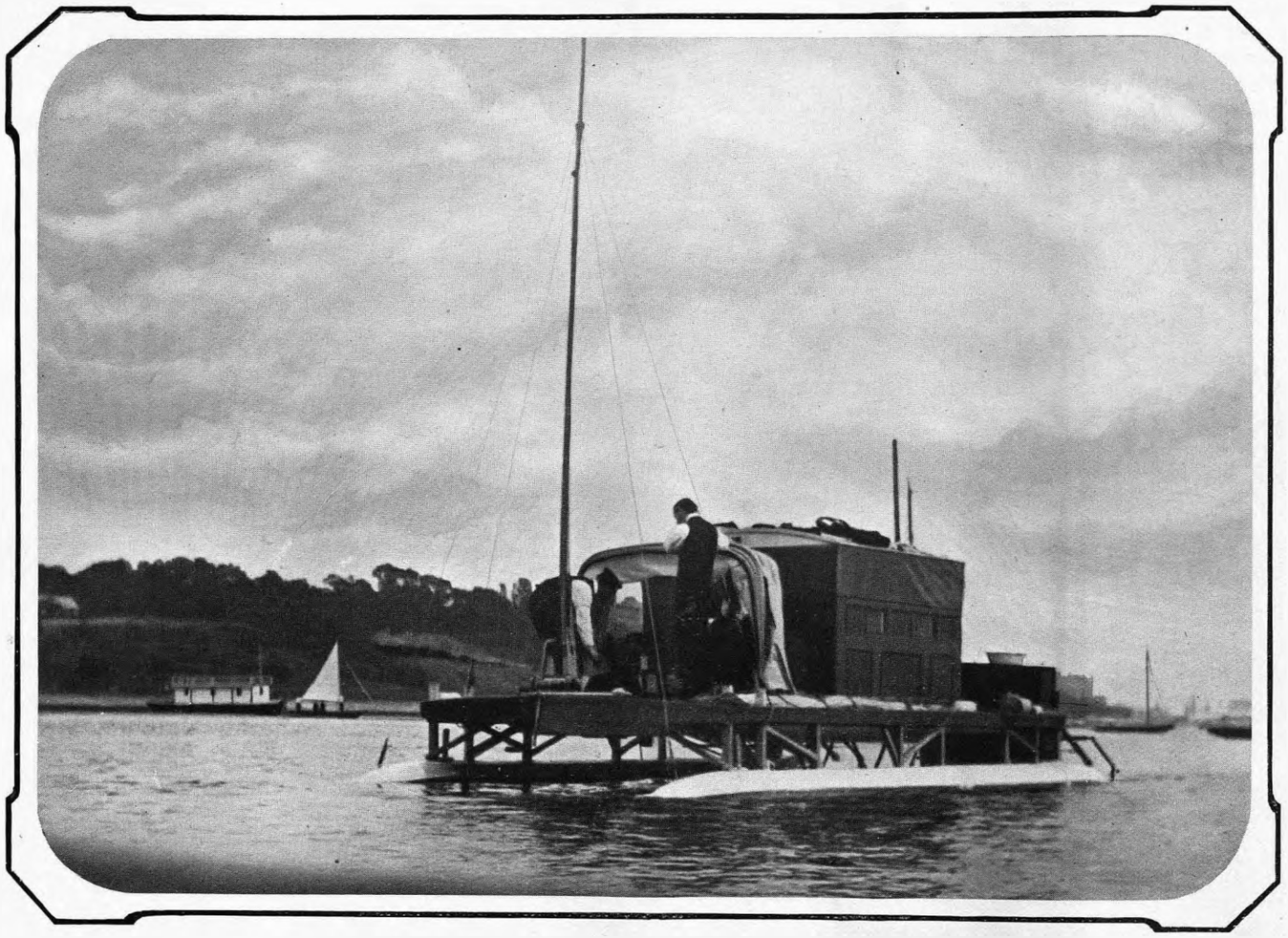
THE EVOLUTION OF THE MOTOR-CAR. No. II.—THE EGYPTIAN AGE

A MOTOR BOAT FOR CONSUMPTIVES.

TRULY "the ubiquitous automobile" is one of the journalised phrases which though hackneyed are permissible for their aptness. In the air, on and under the waves, and in the nooks and crannies of the earth the motor is forcing its way, while the uses to which it has already been put are many and curious. One of the most novel adaptations of the new locomotive power is an electrically-propelled boat built as a hospital for the victims of phthisis. This craft opens up new possibilities for the open-air treatment, for the breeze of the briny and the health-giving ozone is ever in the lungs of the patients, while the opportunities for change of scenery form another important advantage of this very modern lazaretto.

America—one is almost tempted to say "of course"—claims the credit for this ingenious combination of mechanical and therapeutic science. The design was that of a doctor, who had had some previous acquaintance with automobilism. Like many other ideas which have emerged from an American chrysalis, the motor hospital is in use in the mother country, and is at present cruising round the English coast. The photograph we give on this page was taken while the craft was lying in the waters of Westcliffe-on-Sea, where, naturally enough, it excited much interest and curiosity among the visitors.

Electricity is the motive power, but the vessel is also equipped with sails in case of the engine becoming disabled. The boat floats upon two torpedo-shaped cylinders, and, being of a good width, rolling in rough weather is reduced to a minimum. The house is comfortably furnished; indeed the advantages of both land and sea travel are combined with their disadvantages eliminated. The hood on the fore part of the vessel is for the purpose of enabling the patient to take full benefit of the air in all weathers. The craft is thoroughly seagoing, and long voyages could be undertaken were it not essential to keep near land for other reasons. It has quite fulfilled the expectations of its constructor, and in all probability more of these motor hospitals will be seen around our shores in the near future.



A CURIOUS CRAFT: A MOTOR BOAT FOR CONSUMPTIVES

A NATURAL CONCLUSION.

THE Sixth Chamber of the French Court of Appeal has given a judgment which interests automobilists and automobile manufacturers. M. Le Fraper bought from M. Loisel a Decauville machine, which, after running well for a certain length of time, finally broke down on account of a crack having appeared in one of the cylinders. The purchaser sued M. Loisel, the vendor, and the Société Decauville as the manufacturer guaranteeing the cylinder. The suit had, as its object, to obtain an order of the Court setting aside the sale in virtue of Article 1,641 of the Civil Code, which allows of this in cases where the article sold had a concealed fault. The Court nonsuited M. Le Fraper, who appealed.

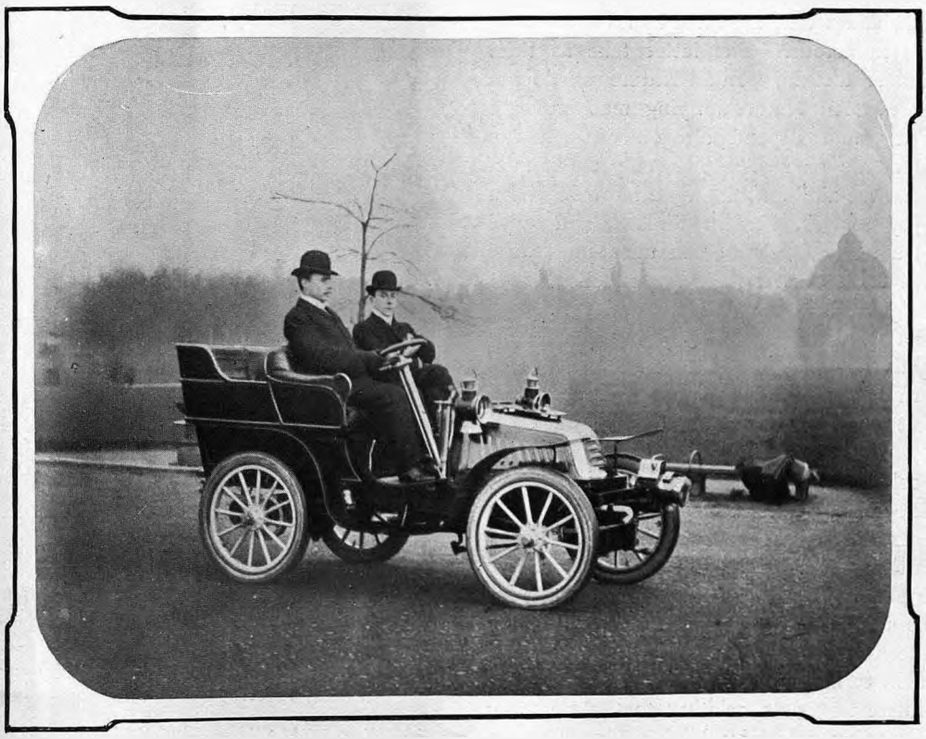
After hearing counsel on both sides, the Appeal Court confirmed the judgment of the lower Court. In the course of the judgment the Court declared: "That it adopted the view of the lower Court that the existence of a crack in the cylinder could not furnish grounds for setting aside the sale. This is only admitted in case of an irreparable fault, and in the present case that organ could be easily and rapidly replaced. The gratuitous replacing was always offered by the defendants." The consequence of this judgment is that the guarantee of a manufacturer only entails on him the replacing of the defective part.

A SCHOOL OF MOTORING.

A SCHOOL of motoring was certainly a want of the times, for it is not always good for us to be dependent on a *chauffeur*. Besides, there are many, increasingly many, who cannot afford the luxury of such a presiding genius. Some, too, have a liking for mechanics, which they believe they can indulge profitably in motoring, and the instruction of a school should assure them on the point. It is also an excellent thing to feel confident that you are being taught by a good man, and a school whose credentials you can test is calculated to afford this assurance.

One might go on to enumerate the advantages of an educational institution for motorists. Suffice further to say that, even if it did not produce a class of skilled owners, it should give us a good and reliable body of British *chauffeurs*.

It has been left to Mr. Archibald Ford, of Liverpool, to organise such an institution under the designation of "The School of Motoring." The school has only been in existence for a few months, but it has already achieved very useful results. It has, at any rate, shown that there was an opening for some system of practical tuition.



MR. ARCHIBALD FORD AND ONE OF HIS PUPILS ON A 9 H.P. DARRACQ

The striking thing about Mr. Ford's course of teaching is its brevity. It will be something new to the non-motoring public to learn that they can pick up in a week—to be precise, eight lessons of about an hour and a half each—sufficient knowledge of the motor and its working to face the roads on their own account. Perhaps, if this were more widely realised, motoring would be more general than it is, for undoubtedly—as the writer knows—not a few are repelled by what they imagine are the difficulties of the machine. In his brief course, Mr. Ford does not pretend to tell all that is to be known, but he gives a sufficient grounding in the subject to permit any intelligent pupil to deal with and manage his own car.

For the purposes of tuition Mr. Ford, in the early part of the course, employs a Benz car, which, as he says, combines many of the principles of other machines, and in the later stages he uses a 9 h.p. Darracq, which, he considers, has a similar advantage.

The first lesson is, of course, confined to the general principles of the motor and the machinery. In the second lesson, it generally happens that a good deal of recapitulation takes place, and, besides that, transmission is taught. In the third lesson, the learner is allowed to drive the Benz car at second speed, which is slowly increased to about top speed. The fourth lesson introduces the pupil to top speed and curves. The latter are brought on gradually. They are, at first, easy, but before the lesson is done, the driver is confronted with some very sharp corners, which he is encouraged to negotiate on his own account. The fifth lesson is devoted to grounding the learner still further in the knack of dealing with the difficulties of the road, which he has now to take at increased speed.

In the sixth lesson, the pupil is brought among moderate traffic at second speed, and, in the seventh, he is again taken into traffic at rather increased speed. The eighth, and final, lesson of the course is a journey into town, through the busy streets, and the man who can face that is, comparatively speaking, full-fledged.

The scene of Mr. Ford's operations is Sefton Park, Liverpool, which affords a track sufficiently varied to test the beginner in all the ways of the machine. In these notes we have only given a bald outline of the curriculum of this interesting school; for it need hardly be said that, during the eight lessons, if the pupil has what is called a Scotch tongue in his head, *i.e.*, the knack of asking questions, he will be continually receiving tuition in oral hints.

The writer asked Mr. Ford if he had had any accidents, and the reply was in the negative. The care that is exercised is such as to prevent any untoward occurrence, and it may be said that before the pupil is brought into town traffic in the final lesson, he must show that he possesses sufficient confidence and nerve to face it without risk. One of the advantages, indeed, of such a course of instruction is to inculcate confidence. In one case, however, Mr. Ford found that the nerve of the driver had been so affected by a cycling accident that he advised against any pursuit of motoring, advice in which the pupil frankly concurred. One of the most puzzling pupils of the school was a young man who had all the appearance of a veritable country yokel. He never asked questions, and he spoke little, but, as it turned out, he heeded well, and became a most successful driver.

Mr. Ford's pupils come from all parts of the country, which is some indication of the fact that there was room for such a school as he has started. For teaching ladies, it should be added, there is a covered enclosure.

THE DOMINION OF THE AIR.*

THE bibliography of aerial navigation is much fuller than the bibliography of submarine navigation, and this is not to be wondered at, for flight in the air is a far more exhilarating and entertaining pastime than travel beneath the waves, for in the latter case one can see nothing and is perforce obliged to breathe "potted air." During the past few months no less than four volumes dealing with flying machines and balloons have made their appearance. We have had a little volume from the pen of Mr. Alexander; *Travels in Space*, by Messrs. E. Seton Valentine and F. L. Tomlinson (Hurst and Blackett); *Aerial Navigation*, by Frederick Walker (Crosby Lockwood and Son); and finally Mr. Bacon's book, which is the subject of our review. Ballooning as a fashionable pastime has caught on during the last few years. Aero clubs flourish in London and in Paris and ascents are frequent, while ingenious attempts are made to discover practical uses for the balloon.

The building of machines intended for directed flight through the air appears to have reached a standstill. There are, as Mr. Bacon points out, two rival schools—the "lighter-than-air-ites" and the "heavier-than-air-ites." The former construct machines that are lifted by a balloon, and they are the more numerous. The latter take as their motto Sir H. Maxim's dictum, "In all Nature we do not find a single balloon. All Nature's flying machines are heavier than the air, and depend altogether upon the development of dynamic energy." The only really successful "heavier-than-the-air" machine up till now has been that constructed by Sir H. Maxim himself, and until engineers produce a really efficient aeronautical motor, the problem of directed flight must remain very much where it is now. The navigable balloons of Mr. Stanley Spencer and M. Santos Dumont are exceedingly ingenious contrivances, but they do not add greatly to our knowledge of the laws that govern the movements of the upper atmosphere, and we must await with patience the coming of the ideal motor.

Mr. Bacon's book is a history of aerial navigation, and it is quite evident that thrilling tales of adventurous aeronauts and hairbreadth escapes of bold balloonists have more attraction for him than what he himself calls "the tedious technicalities of mechanical flight and the theory or practice of soaring." The work is thus one more fitted for the general reader rather than for the serious student, who, after all, has his journals and magazines, though even the latter may find some interesting data relating to the scientific voyages of Glaisher, Coxwell, John Welsh, Guy Lussac, Flammarion de Fouvielle, Tissandier, and other heroes of the upper air. As to the possible use of the balloon for exploration and research, Mr. Bacon hints that a balloonist may presently be able to provide himself with an unlimited reserve of potential energy (possibly by utilising liquefied gases), so as to be fitted for travel of indefinite duration. A future Andrée may be able to maintain his gas supply for six weeks, and thus have a good chance, if not of locating the North Pole, of alighting in some safe and accessible spot. Mr. Bacon himself has a scheme for exploring the unknown regions of Arabia, while Major B. F. S. Baden-Powell has put forward a project for utilising the constant north wind over the Nile Valley for the exploration of important unsurveyed country in Africa.

We may note Mr. Bacon's plea for the balloon on the score of its value to health. It is recorded that on one occasion a man of mature years made an ascent accompanied by his son, and after reaching some height, the youth remarked on how young his father was looking. They still continued to ascend, and the same remark was repeated more than once. And at last, having now reached attenuated regions, the son cried in astonishment, "Why, dad, you ought to be at school!" In this rarefied air all the wrinkles had come out of the old man's face and his cheeks were as chubby as his son's. There have been those who have seriously affirmed, that "more good may be got by the invalid in an hour or two while two miles up on a fine summer's day than is to be gained in an entire voyage from New York to Madeira by sea." Sky voyages reasonably indulged in may re-invigorate those depressed both in mind and in body, and may bring a light-heartedness, a glow of health, a sharpened appetite, and the keen enjoyment of mere existence.

There are several printer's errors in Mr. Bacon's volume (on pages 23, 104, 218, 221, and 231, for instance, are obvious mistakes), and exception may be taken to the arrangement of some of the chapters. It would have been better, we think, had Mr. Bacon dealt with the whole history of balloons in warfare in chapter twenty-seven. As it is, a good part of the story has to be pieced together from various previous chapters. This is one of the disadvantages of the chronological method of treating such a subject as that of aerial navigation.

* The Dominion of the Air: The Story of Aerial Navigation. By the Rev. J. M. Bacon. Cassell & Co. 1902.

MISPLACED CONFIDENCE.

WILD animals are quite accustomed to seeing objects moving on the roads and are apt to think them entirely innocuous. This confidence can now be taken advantage of, and shooting indulged in from a motor-car. Pigeons and rabbits can be shot from the front seat, and the sport is quite an interesting one. Mr. "Bunny," for instance, has been accustomed to regard with contempt the farmer's cart, for he knows that at the worst he will be able to dart into his burrow before the stone thrown by the farmer's boy can reach him. As there are no horses to startle on an automobile, you can stand up and shoot quickly, and when time and distance are calculated correctly, a fair bag is the result. Some day possibly we shall have poachers using a motor-car, and then the head keeper will be seen flying round on a poacher-catcher in the form of another car of superior power and speed. We suggest this as a subject for the consideration of the novelette writer.

GLASS FRONTS.

HARDY drivers of motor-cars despise the glass frames erected on many vehicles as wind shields. They say it brings motoring to the level of travelling in a railway car, and deprives it of all that bracing friction with the swift rushing fresh air which gives such a zest to rapid motion.

Wrap up the body and hands and feet as much as possible, but let the face be open to the free air, so that its brushing action stirs up the blood and acts as a grand tonic. Then you will not miss the music of its roaring wind when the good car cuts through the air at top speed; and Nature's friction brush will freshen up the skin of the face in a healthful manner.

"The Devil on the Highway" is the title the *Review* gives to one of its leaderettes. This inspired journal thinks that when the speed of an automobile is in excess of fifteen miles an hour, "under any circumstances, imprisonment as well as a fine should be invariably exacted as a penalty." Comment is needless.

The Algerian caravan will start from Namur on January 5th, and arrive at Marseilles on the 12th, and at Algeria on the 15th, the tour concluding about February 5th. The fees will be 1,675 francs, including all expenses, while the proprietors of cars will only have to pay 1,175 francs. All further information will be given on application to the touring committee of the Automobile Club Belgique, Place Royale, Bruxelles.

LUGGAGE AT RAILWAY STATIONS:

SOME NOVEL ARRANGEMENTS.

AT Christmas, at Easter, and all through the summer vacation, the problem of dealing with the mass of luggage which hourly pours into every terminus of the metropolis is one that looms large before the distracted eyes of harassed railway officials. Year by year the impedimenta with which passengers deem it necessary to burden themselves, or rather the railway companies, seem to grow in size and in numbers. The amount of luggage, too, has increased enormously, to the bewilderment of the officials and the inconvenience of the passengers. However, better things are in store for the traveller. We illustrate here three separate modes of conveying luggage which are already in working order. The first of these in point of time is that which may be witnessed at work at Victoria Station, Manchester. This is an aerial baggage conveyor, by means of which articles can be carried overhead and out of the way of the passengers from one platform to another. Along with the basket travels a boy who manipulates the conveyor, which is provided with a fairly comfortable seat. The system is, of course, being tried in a tentative way, but it has worked very well so far, and is to be applied shortly on a more extensive scale at this station. Quite within the last few days the London and South-Western Railway Company have installed an aerial luggage transmitter at their Woking station. By the courtesy of Mr. Charles J. Owen, we are enabled to reproduce a photograph and to give some particulars of this ingenious contrivance.

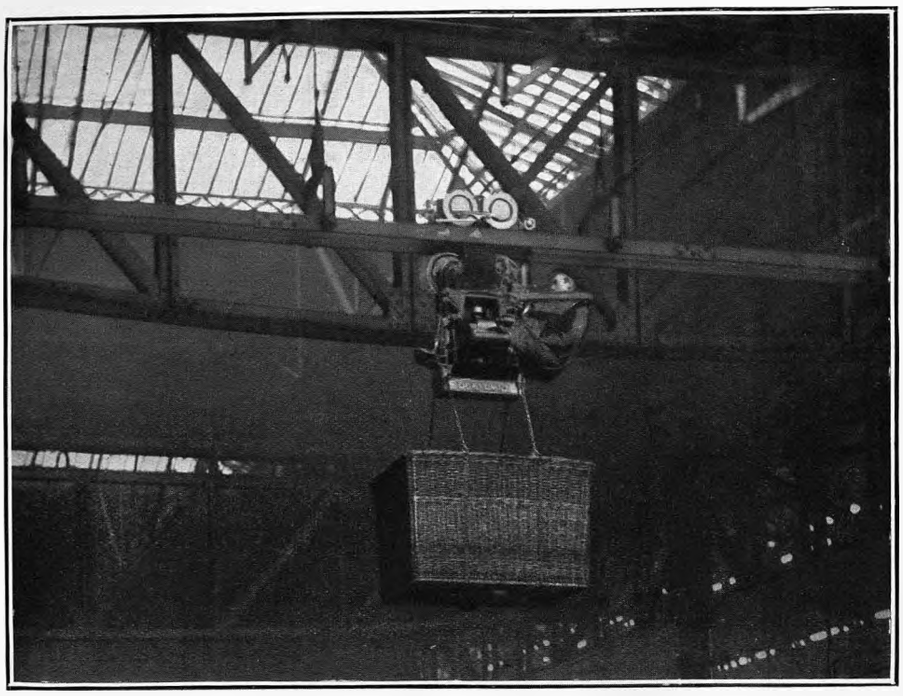
By permission of ["*Traction and Transmission*"

THE NEW BAGGAGE CONVEYOR AT THE QUAI D'ORSAY STATION OF THE PARIS AND ORLEANS RAILWAY

The transmitter has been provided to convey luggage and milk churns across the metals from one platform to the other. On the outside platforms iron towers are erected, each 32 ft. in height, the upper part being constructed with angle-iron posts and bracings, and the lower part of plate-iron set in a block of concrete as a foundation. The distance between the towers is 152 ft. Between these towers a strong cable is suspended to support the transmitter, which runs to and fro and is capable of bearing a strain of at least 20 tons, and there are other necessary cables for automatically "paying out," "returning," and keeping the transmitter in position. The height of the transmitter above rails is 22 ft. 6 in. Attached to the transmitter is an iron cage, 3 ft. 9 in. by 3 ft. 9 in. in the clear, and weighing about $4\frac{1}{2}$ cwt., which is large enough to take four milk churns, whose combined weight is about 8 cwt.

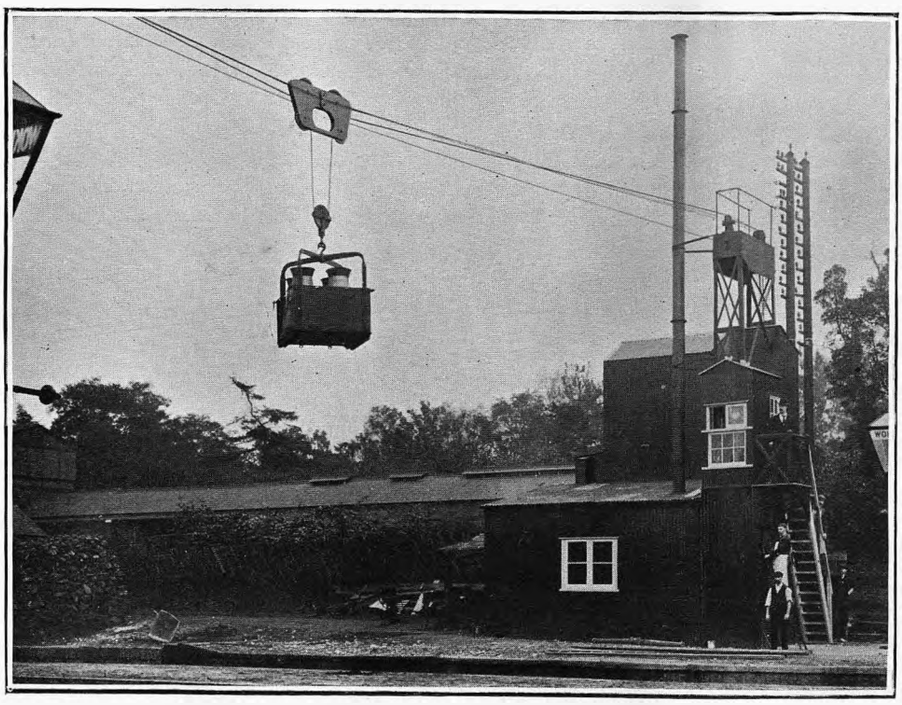
The power for working the apparatus is obtained by hydraulic machinery placed in a building on the down platform. The engine is a double cylinder high pressure hydraulic type, and a vertical boiler is also provided. The hydraulic pressure equals 1,200 lb. per square inch. A small room at the high level is attached to the building, and from here the transmitter is put in operation by the man in charge working the levers provided for the purpose. The time taken for picking up, transmitting, and unloading luggage from one platform to the other is about three minutes, the actual time for transmitting being about thirty seconds.

The third system to be described is to be found in operation at the new Quai d'Orsay station in Paris of the Paris and Orleans Railway. This terminus is one of the most beautiful in the world and was designed by M. Sabouret, now one of the managing engineers of the West of France Railway Company. Attention may be called to the magnificent clock, which is shown in our illustration and which is indeed more fitted for a cathedral or a town hall than a railway station. The Quai d'Orsay terminus contains several mechanical appliances worked by electricity, but the most important and the most interesting is that used for the luggage service. The baggage is shifted from various parts of the station on bands and carriers, the whole arrangement being very similar to the rolling or moving platform, which was first used on a practical scale at the Chicago World's Fair and subsequently at the Paris Exposition, and which is now in daily use in certain houses of business. The bands of the conveyer work at a speed of one metre (39 3-8 ins.) per second. They are made of flat Manila hemp, and each band is kept taut by a compensating roller. The bands are fitted with transverse leather strips and are driven by a dynamo and belt transmission.



THE AERIAL ELECTRIC TRAVELLER AT VICTORIA STATION, MANCHESTER

As to the question of the merits of the various systems which we have described for dealing with luggage at railway stations, we have not space to enter here. Doubtless the railway companies have information as to the working of each respective system, and have also had submitted to them numerous schemes by rival inventors. The porter and his truck seem doomed to gradually die out, to be replaced by some more convenient method of handling luggage and one more in touch with modern requirements. It is quite possible that in other places there may be different systems, but so far as we are aware, the three methods that we have described are the only ones at work at railway stations.



HOW LUGGAGE IS DEALT WITH AT WOKING

THE GORDON BENNETT RACE.

A PLEA FOR SCOTLAND.

"BRITISH motorists are at their wits' end," says an editorial writer in the *Edinburgh Evening Dispatch*, "to find within the British Islands a road course for the annual race for the Gordon Bennett motor trophy, the chief international prize associated with motoring. It was won last year on the Continent by an English car piloted by an English driver, and the next contest has to take place somewhere in the United Kingdom. Naturally enough strong objections are offered to a fast race of this kind taking place in any part of the country where the road traffic is considerable, and attention is being directed to Ireland in the hope of discovering a suitable locality there. Should such a course be found in Ireland, and road races be established there, that part of the country affected will reap considerable benefit. Not only do the races themselves attract large companies of well-to-do people for the dates appointed, but motorists of different nationalities will habitually resort thither in order to familiarise themselves with the course. For substantial reasons, therefore, this seems a matter which should receive the attention of some of the authorities of our Highland counties. There are tracts of country in the north which could provide without much local inconvenience a circuit of some thirty or forty miles, capable of being traversed the requisite number of times until the stipulated distance is completed. Our Highland roads, after some preliminary work by the road roller, would be quite as good as many of the roads in Germany, Switzerland, or Austria, and they would provide an excellent test of constructive merit and scientific skill. In the event of any of the Highland counties giving encouragement to this pastime, many hundreds of visitors would be attracted to the neighbourhood, to the great profit of hotel-keepers shopkeepers, and others. Should prejudice, however, prevail and Ireland be chosen, it will be Scotland's loss." From these remarks it would seem as though Scotland were as keen as Ireland for the honour of having the great race decided within her borders.

A FIGHTING MOTOR-CAR:

BY MAJOR CARTHEW-YORSTOUN.

THE armoured car at the Automobile Show in Paris has attracted a good deal of attention. It is a quaint-looking affair, having the appearance of a large inverted wash tub on a car, with a machine gun inside the tub. The tub is made of bullet-proof steel, and the machine gun has a shield attached to it. As the car stands at present it is evident that as a fighting machine it will not do at all, chiefly because no armoured protection is provided for the driver and some of the vulnerable parts of the mechanism of the car. It would, of course, be absurd to provide armoured protection for the worker of a machine gun, and none whatever for the driver and those portions of the mechanism of the car which, if struck by bullets, would disable the vehicle.

I understand, however, that the car in question was made up a few weeks ago in a great hurry, and is not considered by the makers in any way complete, but merely as an unfinished demonstration of the idea. As such I think it deserves attention, for though the idea of armoured fighting automobiles is by no means new, it is a notion that has as yet scarcely got beyond the region of theory and fancy. In the immediate future, nevertheless, I think that we shall see motor-cars largely used for military purposes. I doubt if they will ever take the place of horses dragging guns, except perhaps to convey heavy guns of position, but for the conveyance of stores, for the rapid transport of small bodies of infantry, for reconnaissance and to supplement the rifle fire of cavalry there is, I believe, a great field of usefulness for motor-cars. If war broke out to-morrow between France and Germany it is as certain as possible that in the initial stage, at any rate, large bodies of cavalry would act against one another, and that extensive reconnaissance and, as a consequence, innumerable cavalry combats would be a very marked feature of the campaign. That is what every cavalry officer is waiting for. Now if the war in South Africa has taught one thing more than another it certainly is the power of modern rifle fire, and the inability of cavalry to cope with riflemen in position. And yet few cavalry officers go so far as to think that cavalry should be turned into mounted infantry. In a word, the Boers would stop us, but they could not defeat us.

THE "C.G.V." ARMOURED CAR AT THE PARIS SHOW

Now what will happen when great bodies of cavalry bump up against one another? Imagine the cavalry division reconnoitring over the frontier in widely extended formation, and coming in contact with a cavalry division of the enemy. What will happen? They will at first, at any rate, "stick up" one another with dismounted rifle fire from small bodies all over the country, trying to get past one another and see what is behind the screen. Especially in a close country every road will be the scene of a combat to get down the road, and the side that has a predominance of rifle fire should gradually drive back the other.

It is here, I think, that machine guns mounted on motor-cars come in. A couple of armed armoured cars coming down the road might just give the predominance of fire required and clear out the enemy. And if in attack such cars might be useful, how much more so would they not be in retreat? To have to mount after firing and retire along a narrow road, with close country on either side and the enemy firing at you all the time, is about as disagreeable an operation as it is possible to conceive. With an armoured car, however, one could remain much longer, and then when the enemy began to get too close and thick, all you have to do is to drive away with your thumb to your nose and the fingers extended! Indeed, about the only things an armoured motor would have to fear would be cavalry getting behind and obstructing the road, or artillery fire. I should certainly not like shells bursting near my car, but I think by keeping on the move the gunners would find it hard to hit us, and, after all, one motor-car disabled and even captured is not a very serious loss. Indeed, putting myself in the position of a squadron commander reconnoitring with my squadron along the line of a road, and finding an enemy's armoured motor in front of me, I think he would cause a good deal of irritation. I should, no doubt, expect my patron to try to obstruct the road in his rear, that is if the car were quite unsupported. I might have to attack the car with dismounted men, but anyway, I am afraid the car would give me a good deal of annoyance and delay, to say nothing of possible losses. Though the armed car on view at the show is only a first crude attempt, I think it is not too much to prophesy that armoured motors carrying a machine gun will some day or other be very extensively used in warfare.

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NETTLE AND THE NAPIER:

BY ARCHIBALD MARSHALL.

Chapter III.

THE Napier's displeasure at the way in which he had been treated passed away when an intelligent mechanician engaged to attend to him arrived a day or two later, remedied the small complaints that had given him some discomfort, and did away with the results of the groom's injudicious cleaning. The building of a motor house was put in hand by his new owner, and, in the meantime, he continued to share Nettle's stable.

The mare behaved towards him with all the charming inconstancy of her sex. His somewhat arrogant assumptions of superiority and his good-humoured contempt for the claims of high lineage with which she had endeavoured, quite vainly, to overawe him, impressed her against her will, and when he was taken out for a run and returned in an hour-and-a-half, having covered a distance which she had once compassed in a whole arduous day, her feelings towards him began to be tinged with an unwilling admiration. Yet, on the other hand, her master, who was learning to drive the car, ignored her completely for at least a week after the Napier's arrival, took but little notice of her when he visited the stable, and never had her out once during the whole of that time, so that she was much troubled by jealousy. Moreover, the tolerant kindness of the Napier was hurtful to her vanity. He admired her as a pretty, useless, equine toy, but roared with laughter over her accounts of her deeds of prowess, was quite unabashed by her haughty rebukes, and entirely indifferent to her indignant expressions of resentment.

About a week after the arrival of the car its owner took it over to the farmhouse where Columbus lived his useful, blameless life. The Napier left the stable in a bad temper. "That fellow's getting careless," he had said to Nettle earlier in the morning of his attendant. "I'm not at all pleased with the way he's looked after me for the last day or two. There are lots of little adjustments he might make which would help me to run with more ease and comfort; and the tap under my carburetter is as loose as it can be. He's never given it a touch. It will shake out one of these days, and they'll find themselves at a standstill ten miles from nowhere. I can't run without petrol, and they never think of taking a spare tin."

"It seems a very curious thing to me that anyone should want to be constantly fed, while they are on the road," observed Nettle. "I shouldn't think much of myself if I couldn't go ten miles from home without a nosebag."

"I shouldn't think much of myself anyhow if I couldn't do more than you can," retorted the Napier. "You mark my words. If that tap isn't seen to, it will jolt loose, and I shall lose all my petrol. Then they'll learn a lesson."

Soon after the car had left the stable and Nettle was being led out to exercise, a maid came from the house with a telegram. "Mr. Corbin said you were to take this over to him to Wycherley Farm if it came while he was out," she said to the groom. So Nettle was put into the dogcart and soon found herself swinging along the road towards the stable, where she imagined Columbus and the Napier to be engaged in more or less acrimonious discussion.

As she mounted the last hill she noticed an iridescent line of liquid stretching in front of her along the middle of the road, and on turning the corner at the top she saw halfway down the long, straight road on the other side her stout old friend Columbus pounding up the hill towards her hauling the Napier car, with a chirrupping carter and a disconsolate mechanician forming part of the procession.

Nettle so far forgot herself and the obligations of a smart turn out to whinny in her glee, and Columbus's answering cheer was borne up to her on the breeze. "Eh, lass," he called out as they came within speaking distance of one another, "Ah'm tàaking t'owd cripple hoam along. T' groob's given out and he's feeling nobbut very poorly."

Nettle sniggered as she drew up alongside Columbus while the mechanician explained matters to the groom.

"They take a lot of pulling, these heavy busses. "Don't strain yourself, Columbus," she said with a side glance at the Napier, who seemed profoundly depressed and took no notice of her.

"Aye, he's a goodish weight," said Columbus, "especially oop t' 'ill. Happen he'll help hisself a bit when we get to t' top. But a' can tackle him. A' likes to help t' weakly. Happen he won't be so boomptious when ah've took him ho-am."

"*I* shall have to take my master home, I suppose," said Nettle. "It's lucky I came. It's such a mistake to trust to these new-fangled machines instead of good sound reliable horseflesh. You never know where they may lead you."

"How fast did you say he could go?" asked Columbus, "we've coom oop t' 'ill about four miles an hour. 'T won't make him dizzy, will it?"

"He can go fast enough for a bit," said Nettle. "So can all of us. It's the unscrupulous refusal to go at all on emergencies that I object to. Of course, it's the blood that's lacking. There's no pluck, no sense of responsibility."

The Napier maintained a gloomy silence during this conversation. Nettle looked at him and felt a prick of compunction. After all he had warned her that this breakdown might occur, and it was his attendant's fault and not his own. He was supporting his ignominious plight with fortitude, and it seemed rather underbred, she thought, to taunt him with it.

"Well, so long, lass," sang out Columbus, as the signal to move on was given to him. "Ah'll get him ho'am in an hour."

"He'd take himself home in ten minutes if he wasn't ill,' cried Nettle over her shoulder as she set off down the hill, and was instantly sorry she had spoken.

(To be continued.)

Herr Gurschner, the well-known Viennese sculptor, has just completed the hill-climbing trophy won by Mr. Henry Edmunds. It will be in the Automobile Club for Christmas.

A motor curiosity of a literary description is possessed by Baron de Zuylen in the shape of one of the original price lists of the Panhard and Levassor cars, which states that the top speed is sixteen kilometres per hour, a higher speed being considered as dangerous!

Next summer the Automobile Club will hold a festive function to leaven the load of their utilitarian undertakings. This is to be a gymkhana at Ranelagh Park on June 13th, unless that date should clash with the Gordon Bennett Cup race or other important event.

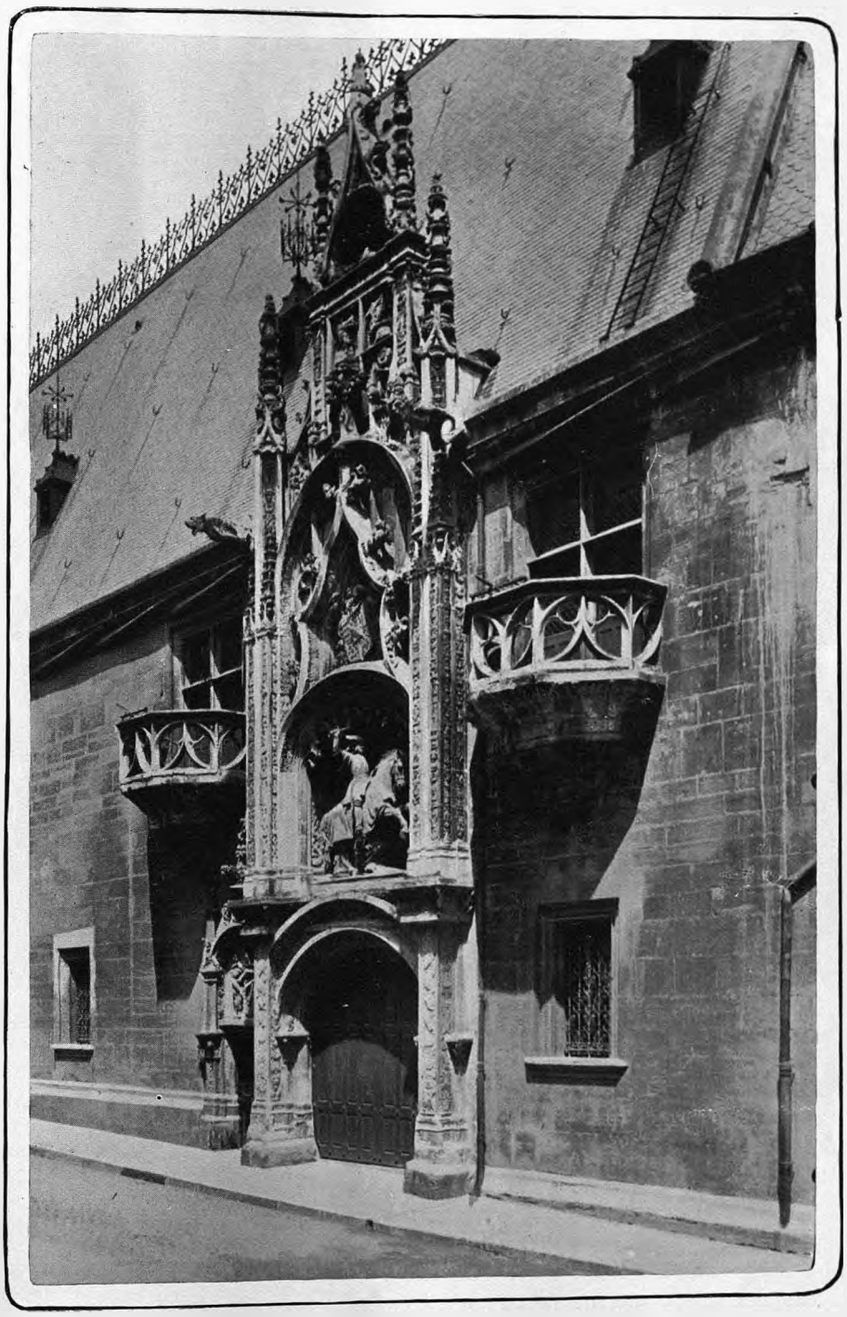
Bosnia is the latest country to join in the motoring movement. According to the report of the French Consul at Serajevo, motor-car services are being established in the plains of the river Save. Bosnia should offer a good field for enterprising manufacturers. It will be remembered that after the Paris-Vienna race several French tourists traversed the country and gave a practical exposition of the advantages of the automobile, which seems to have thus borne good fruit.

THE COMELINESS OF NANCY:

BY J. H. YOXALL, M.P.

(Concluded from page 124.)

AND now, back to the sixteenth century, to the portal of the ducal palace. It was built and carved in the year 1512; the equestrian statue is a restoration. The style of this doorway illustrates, with Renaissance additions, the latest form of domestic Gothic in France. In 1871 a fire broke out in the Palais Ducal; it burned away the famous stair by which the Dukes of Lorraine could mount to their bedrooms on horseback, and most of the rest of the building fell in. Yet the notable gateway still gives access to fine old *salles*, and the National Museum of Lorraine is housed in them. There hang, among other historic relics, the rich tent tapestries that chambered the last night's sleep of Charles the Bold on the eve of the battle of Nancy, 1477; there, too, is pictured, by contemporaries, the funeral pomp of the duke who died in 1608. In those old days three public ceremonies were famous and proverbial in Europe—the anointing of a King of France at Rheims, the crowning of a German Emperor at Frankfort, and at Nancy the funeral procession of a Duke of Lorraine. National feeling and patriotic pride were always intense in the duchy, and after the merging, in 1766, no province gave to France better soldiers or generals, and none fought more strenuously or yielded so slowly to the German rule than did the fair region of Lorraine. After 1871 so many Alsatians and Lorrainers streamed over the new frontier, keen to dwell in France still, that the population of Nancy was doubled in twenty years.



THE PORTAL OF THE DUCAL PALACE

Yet Nancy had been one of the first places where the revolutionary spirit was shown by the troops in 1790; Carlyle gives a vivid account of that. Opposite the Porte de la Craffe—at the end of a splendid avenued promenade, the Cours Leopold—is the Porte Désilles, an arch erected to the memory of the young officer who threw himself between the revolutionary garrison and the avenging royal troops, and, dragging at the matches of the cannoneers, in the hope of averting bloodshed, was himself slain.

Nancy is full of reminiscences of the long and chequered chronicle of France. In 1429, after her victories at Orléans and Patay, Joan of Arc came gloriously to Nancy, as befitted one who was called "Jehanne la bonne Lorraine," and she broke a lance gallantly in tourney before the duke on the vast Place de la Carrière.

The sight of this Place hints at Versailles again; the cathedral, seen in the background, suggests the church of St. André du Val at Rome. There is more than a suggestion of the Piazza of St. Peter's in the Palais du Gouvernement. Behind its carved arcade spreads the Pépinière, a vast pleasaunce, botanical and zoological garden, Regent's Park and Kew in little, all in one, and beyond the park the view shows the viny hills which surround the city of Nancy with gentle grace.

Art and nature have united to render Nancy comely, and her sons have written their names on Art's roll. Claude Lorrain, Clodion, Callot, Isabey are famous; to these and to her other notable offspring Nancy has erected monuments, and the lesson of Florence comes to one here, that where the city is beautiful and great, there shall citizens arise, famous in art and letters, noble in patriotism, wise in politics—the influence of environment upon youth is so strong.

Even yet I have left untold a third of the beauty and stateliness of Nancy, and have not more than touched upon the illustrious and pathetic chronicles of Lorraine. Not far away, in that French Derbyshire the Vosges, is Gerardmer, where the first patriarchal duke held his court of justice under an oak by the lake. Count Renaud was prisoner to the holy Roman Emperor, Henry V.; Countess Gillette, shut in a fortress, defied the Emperor persistently. The Emperor built a gallows under the walls, and sent a herald to say that the Count should hang on the morrow unless the fort was rendered. Countess Gillette gave birth to a son that night, and all her feudal soldiers saluted the baby; in the morning they shouted down to Count Renaud, who stood below, halter on neck, "Thou hast a son, we have sworn him fidelity; die bravely, and leave us to conquer and avenge."

It was this spirit that sent Duke Raoul and his vassals to make the last stand at Cressy and die for France. The great House of Guise took its rise in the duchy. René, the Troubadour King, was Duke of Lorraine. Duke Charles IV. was the greatest general of his time; his successor was "a great man, a hero, and a sage." The historians of Lorraine compare Duke Leopold, who gave Nancy its eighteenth-century grand air, to Solomon, Titus, Trajan, and Marcus Aurelius.

If "there is nothing more admirable, nothing that can higher elevate the soul than to watch a nation constitute itself, organise and increase its power, and finally take its due place in the system of states," then there could hardly be a more pitiful event for a people than when, on February 24th, 1766, Duke Stanislas the Good being dead, Lorraine, which had withstood the forces and the blandishments of Louis XI., Richelieu, Mazarin, and even Louis le Grand, heard from the lips of Louis XV.'s agent (who had lived at Nancy much as a British resident dwells at the court of an Indian Maharajah) the proclamation that thenceforward was joined and incorporated with France the ancient Duchy of Lorraine.

Upon that day passed away the Court and the metropolitan splendour of Nancy, and she became a mere city of the provinces of France. But even France can show no more sumptuous city; the "grand air" lingers about her regally; she is a dowager-duchess, stately and comely still.

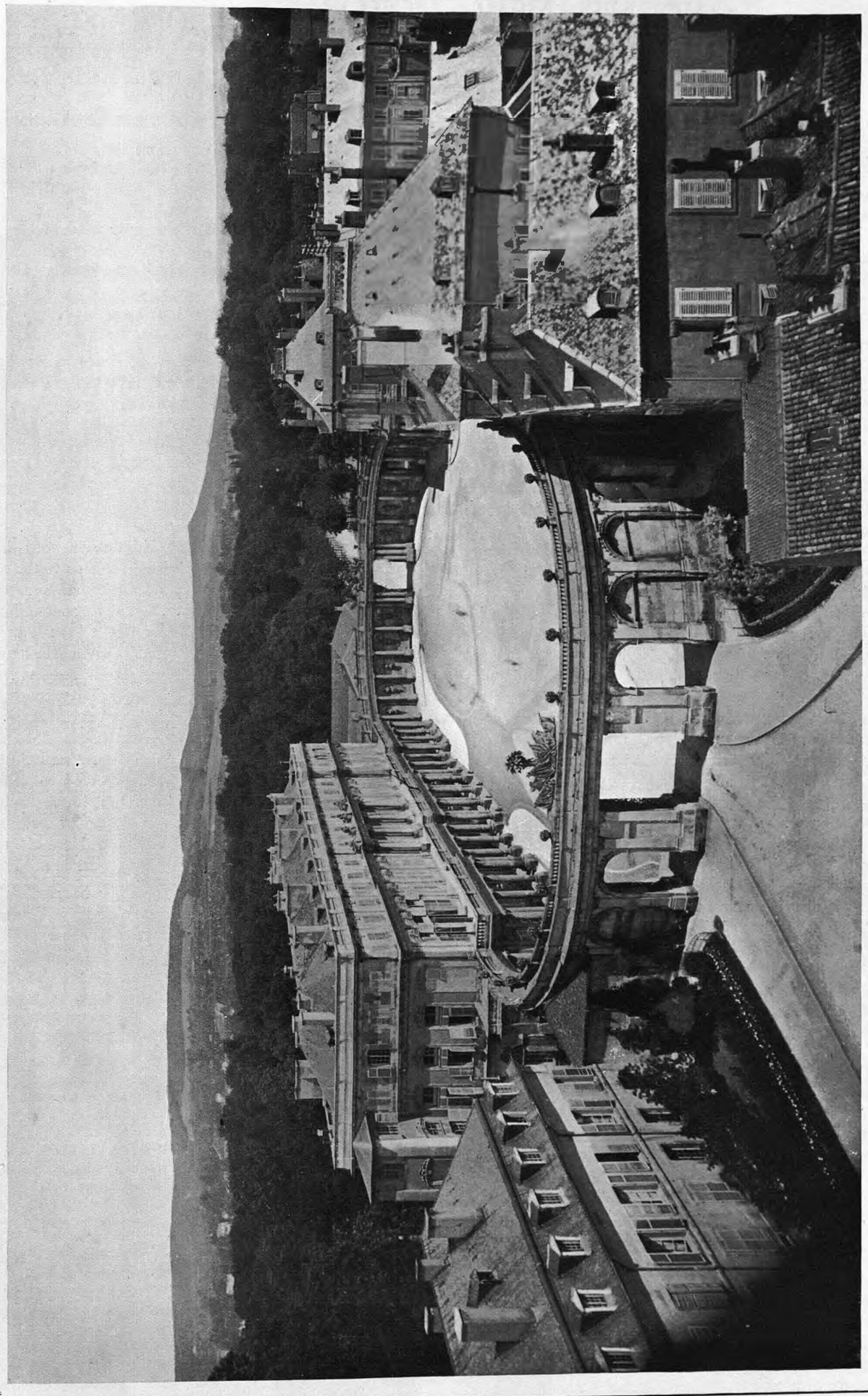
THE PLACE DE LA CARRIÈRE

ROADS AND THEIR MAKING.

GOOD roads are as essential to the automobilist as a good car, and therefore our readers will hear with interest that Mr. Thomas Aitken, A.M.I.C.E., has published a little book on how to make and maintain highways with efficiency and economy. The pamphlet, which is entitled *Good Roads*, appears under the auspices of the Irish Roads Improvement Association. This society has already done much to improve road locomotion in Ireland, and certainly Mr. Aitken's book should further the work considerably. Road-making in the Roman epoch, and also in England when the stage coach was the chief means of transit and transport, was the first of all the constructive sciences, but latterly it has fallen into decay. The advent of the automobile necessitates its revival, not merely for the sake of those who motor for pleasure, but for the benefit of the thousands who in the future will rely chiefly upon road vehicles for the marketing of their produce.

Mr. Aitken is one of the most eminent authorities on road-building of the day, and his work, dealing as it does with every detail of construction from the road bed, drainage, and foundation, to the surface coating, quarrying, and selection of materials, is of great importance. He deals also with the maintenance and repairs of roads, so important to the already over-burdened ratepayer, and there are several pages devoted to the best machinery suitable for the work. The new invention named the "Viagraph," which records with mathematical exactitude the unevenness of the road surface over which it is drawn, is illustrated and described. The Viagraph was invented by Mr. John Brown, F.R.S. President of the Irish Roads Improvement Association, and has met a long felt want experienced by road engineers.

Good Roads is published at 6d., and may be obtained from the Belfast centre of the Irish Roads Association (Hon. Sec. Mr. W. H. Alexander, 14, Lombard Street, Belfast).



THE PALAIS DU GOUVERNEMENT, NANCY

LONDON'S NEW MOTOR OMNIBUS.

THE first firm to start a public automobile service in Great Britain were Messrs. Stirling, formerly of Hamilton and now of the Stirling Motor Works, Granton Harbour, Edinburgh. This was at Hamilton in 1897, and a number of their cars were used in the only really large public service company—the defunct Edinburgh Autocar Company—ever carried on. Both these ventures failed, not because the public did not respond with ample pence to the provision of a better and faster service than the tramcars could give, but because no vehicle suitable in size and strength could be got to make the service pay. They all—whether foreign or British make—broke down under the hard work, and cost large sums in constant repairs, which, of course, also kept them off their work, entailing heavy loss.

To get over these difficulties a car was deliberately and carefully designed, which should avoid all those things which were weak points in this class of service. The first car to carry sixteen persons was run 12,500 miles in hard public service, mainly in Edinburgh (over very badly paved streets of granite setts), and for about 1,000 miles in the very hilly parts of Scotland, as a test before the second batch were laid down. On this test it ran fifteen hours a day with from twelve to twenty passengers without a breakdown, and with only £1 spent in repairs. After this a run was made from Glasgow to Morpeth, 180 miles, with no stop. Since then the car has been to London (more than once), to Birmingham (where it did six weeks of hard street service for fifteen hours a day), to York, etc., and is now kept at the works at Edinburgh after covering fully 25,000 miles without having been in the shops, and with under £2 spent on repairs (barring new tyres), for anyone to see and try who wants to be convinced of the possibilities of a good motor-car.

The omnibus is one of the same design improved and enlarged to carry fourteen passengers, and a very large number of this type will soon be set running in London by a powerful and enterprising syndicate, who seem to be of the American mind, which holds that it pays better perhaps to have a rapid service rather than to carry too many and have the waste of time of the stops for folk who ascend and descend from the roof. But Messrs. Stirling are building larger 15 h.p. vehicles for other parties in London, Edinburgh, and country places, who require them to take twenty-two or more passengers with top seats.

The 12 b.h.p. engine runs at 750 revolutions, and has cylinders 4 in. with a 5½ in. stroke, and is controlled by a patent governor which prevents the driver from going above 14·2 miles an hour. While the engine is thus automatically cut out, pure air is made to circulate through the cylinders in these idle strokes, thus cleansing and cooling them. The engine is all contained in an airtight crank chamber of special design, the piston being lubricated by splash. There are no pumps, the circulation being natural, and six gallons of water will last for a long time with no change, it being found that in six days, of fifteen hours each of hard service, less than a gallon has been lost. Nine gallons of petrol are carried, which are enough for a run of 130 miles under the heaviest work. Electric and tube ignition are both provided. No chains are used, the transmission being by means of a large aluminium friction clutch to a train of gears, giving speeds of 4½, 9, and 14 miles on hour (and a slow reverse), and thence by a universally jointed shaft to a driving-level pinion, engaging on the countershaft, on the end of which are steel toothed wheels which engage with toothed driving rings of a special metal attached to the artillery style road wheels.

Very powerful brakes are used, viz., a quick-action foot brake, acting by a wood-lined and water-cooled drum on the second shaft, and a very powerful and ingenious hand-lever brake working by an internal expansion arrangement of blocks inside the driving-wheels' rings. Either of these brakes will hold the omnibus when overloaded on the test hill of Edinburgh, which is 1 in 6. Wheel steering, with a special spring attachment to absorb shocks from surface irregularities, combined with an 8 ft. wheel base, enables this car to be handled in snow in a surprising way. The solid indiarubber tyres are 3 in. on the face to comply with the Act. The vehicle, unloaded, weighs 32 cwt., but the larger style, with top seats, weighs nearly 2 tons. The length over all (*i.e.*, platform) is 14½ ft.

Externally the omnibus is very handsome, being scarlet and black with bold gold lettering, and the interior is both comfortable and sanitary, having special spring cushions covered with washable French leatherette, while the large plate-glass windows can be taken out altogether in hot weather.

As Messrs. Stirling have at Edinburgh very large works, with a wide testing track of three laps to the mile, fitted with the latest tools, and have determined to produce in large numbers the 12 and 15 b.h.p. vehicles as omnibuses, parcel vans, and lorries (for loads up to 2½ tons), an important step forward has been taken in giving the general public and the business man the utilitarian benefits of the new means of transportation. Several railway companies and public bodies have already carefully tested and inspected the new omnibus, with a view to using them and the vans on the roads in place of putting down expensive light railways which take years to construct, even after the tedious procedure of getting an order from the Light Railway Commissioners, and there is the red tape of getting it opened by the grandmotherly favour of the Board of Trade. Stirling's motor works are also getting out for the railways a simple and light "omnibus on rails," with quick acceleration, for use on branch lines or in suburban services where rapid and frequent vehicles are best for competing with the street cars.

THE PETROL DIFFICULTY.

THE following correspondence has passed between the Secretary of the Clearing House and the Secretary of the Automobile Club :—

Sir,—I am directed by the committee of this club to express the hope that, should there be held at the Railway Clearing House further conferences between representatives of railway companies and those interested in the petroleum spirit trade, you may see your way to advise me beforehand of the date and hour at which such conference is to be held, and that the committee of the Clearing House will permit the representatives or consumers appointed by this club, namely, Sir John I. Thornycroft, F.R.S., Mr. T. W. Staplee Firth, and myself, to be present at such conference. C. Johnson, Secretary.

Sir,—Conveyance of Inflammable Liquids, Class "A."—Referring to your letter of 2nd instant, it is not expected that there will be any further conferences between representatives of the oil trades and the railway companies at present.

The railway companies have now before them all the points which have been raised on behalf of the trade, and these will be considered at a meeting to be held shortly, after which the traders will be advised whether any modifications of the present arrangements can be agreed to.

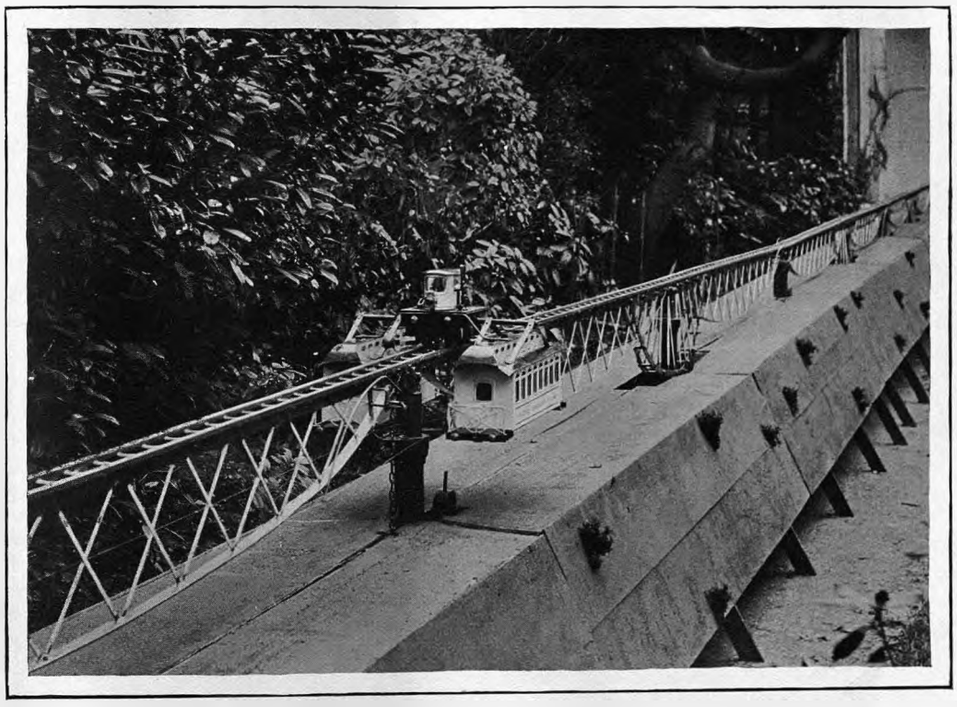
Railway Clearing House. H. Smart.

TWO HUNDRED MILES AN HOUR:

A NOVEL SYSTEM OF LOCOMOTION. By Herbert C. Fyfe.

AN inventor who proposes to build a railway on which speeds of 200 miles an hour are to be attained must expect to have his plans severely criticised and his ideas ridiculed both by the engineering fraternity and the general public. He may console himself by the reflection, however, that in the early days of railway enterprise scorn and derision were showered on the bold innovators who suggested speeds of twenty to thirty miles an hour when the steam engine had reached perfection. At the present day on some of the great north lines the trains for short distances reach speeds of over seventy miles an hour, and the Empire State express, in the United States, runs on some portions of her journey at the great rate of over eighty miles an hour. It would seem that we have now reached the limit of speed safely attainable on he ordinary two-rail track, and inventive minds are seeking for some new type of railway on which much higher speeds will be possible.

Certainly the most novel and startling scheme yet brought forward is that proposed by Mr. H. S. Halford, who has designed a 200 miles "Gravitation Railway." As yet the system has not been tested on a practical working scale, but the model lines which have been tried have so well borne out the inventor's theories, that a full-sized railway on the same principles may some day be constructed. The photographs herewith will explain to the reader the main features and peculiarities of the line.



THE GRAVITATION RAILWAY AND EMBANKMENT

In the Gravitation Railway the track is suspended on pillars and twin cars are suspended below the rails. The motion of the cars is caused simply by the raising of the track through the up and down movement of the supports, and as the centre of gravity is situated below the track the cars can be run at great speeds with no danger of derailment. The track from which the cars are suspended rests upon supports which can be raised and lowered by hydraulic rams. It is divided into sections, which, although firmly secured to each other, are jointed so as to form in a normal position a flush joist. Being, however, joined together by a pin passing through an elongated hole at the end of the girders, sufficient play is allowed for a slight sliding motion of one end on the other, and each section may at the desired moment be raised to a slight incline, sufficient to cause the cars suspended from it to glide towards the lower end by the mere force of gravity. The raising of the various sections in succession is performed by the carriage, which in its passage automatically opens the valves supplying the hydraulic rams, permitting the water to enter and to exercise its upward pressure. In just the same automatic manner the level of each section is restored after the cars have passed over to the next section. In his patent specifications the inventor of the Gravitation Railway mentions various devices for the raising and lowering of the supports. This may be done as follows :—

The cars upon reaching the juncture of two sections by their own weight press down a spring, which being connected with a piston rod opens the passage for the water into the compression cylinder driving upward the piston supporting the end of the rail. Mr. Halford also explains that the raising of the track may be operated at will from the car by electricity or other power. In the models which have been so far constructed, the inventor has used hydraulic power to supply the movement of the cars, and the reason for this selection has been the fact that it can be conveyed over great distances with comparatively little loss. It is quite evident that any other power could be utilised provided it is capable of lifting the various sections of the track to the desired inclination.

In the model line, which was 50 yards in length, the track was divided into six sections of 25 ft. each, which were raised successively to a gradient in each case of 1 in 72. Each section weighed about 100 lb., while the cars had a weight of 47 lb., and the water power to lift the loaded sections exercised a pressure of 50 lb. per sq. in., conveyed by means of rams having a diameter of 2½ in. In the centre of each section was a supporting cylinder which took the weight of the section, so that the raising rams had little more to do than to raise the weight of the cars. Only one of these was used for the support of each section in the model, but their number may be increased, and sections of almost any span can be made up to girders of standard length supported at their ends in raising rams which would rise proportionately.

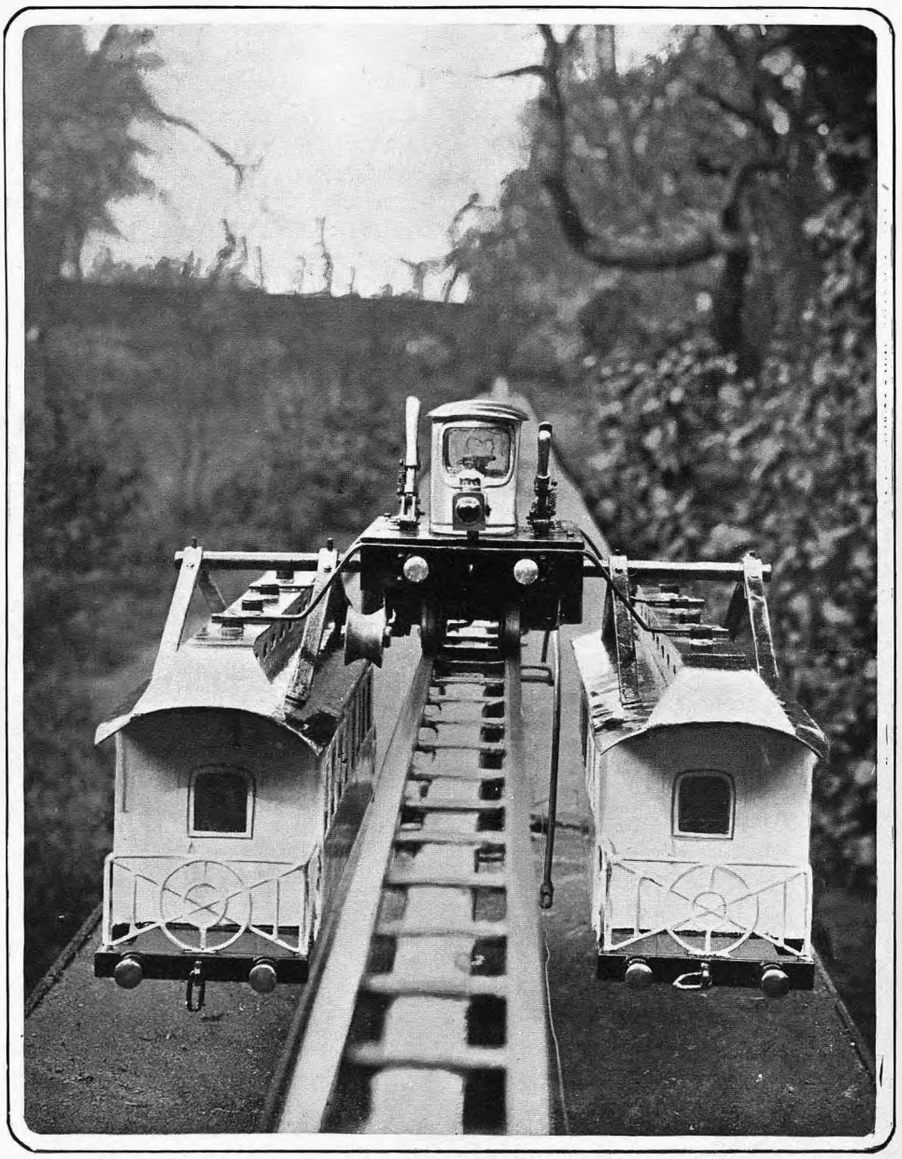
While the model line was in operation, some experiments

were made to test the increase of speed during the progress of the cars, and these show that Mr. Halford is correct in claiming for his railway an ever increasing velocity.

Number of Sections.	Time consumed by passing of Cars.
Starting section	8 seconds
Second „	6 „
Third „	4 1-5 „
Fourth „	3 1-5 „
Fifth „	2 2-5 „
Sixth „	2 „

The method employed by Mr. Halford for communicating motion to the cars was as follows :—

Water under pressure was admitted to the end columns ; the hydraulic ram was immediately raised 5 in. and the twin cars proceeded to run down the incline. About 5 ft. from the conclusion of the first section the car, by depressing a lever termed by the inventor an actuator, automatically admitted the water pressure below the piston of the column in front of it, which at once began to rise but did not attain its full lift of 5 in. until the car was well beyond it and descending the thus effected grade of the second section. The same operation was repeated all down the line, each column was raised in turn and the speed of the cars gradually increased until they were brought to a standstill. At no time was the car running uphill upon the level, owing to the fact that the rams did not rise to their full height until the car was over them, and the ram in the rear of the car did not begin to fall again until the car was clear of the forward section it supported.



THE CARS READY TO "GRAVITATE"

An engineering expert, speaking of Mr. Halford's Gravitation Railway, said that it should prove useful in many ways for the following reasons: On all other systems the greater the load the less the speed. In this the greater the load the more the speed. There is no need to stop for coal and water. Its natural tendency must be to increase in speed.

It will very naturally be said that the motion experienced by passengers in the cars through the continual raising of the hydraulic rams would prove exceedingly unpleasant. As this question has never been experimentally tested, it is impossible to refute the argument conclusively, but from a careful examination of the behaviour of the cars on the model line, it would appear that the lifting motion would be hardly perceived, so gradually is it produced, and so slight is the height to which the cars are raised. The cars are started and re-started by the moving of a lever in the driver's trolley, which causes the lifting of the track, and are bought to a standstill by the gradual application of powerful brakes.

An important feature is that the valves of the hydraulic rams can be opened at will from the car without any contact being required, no matter what the speed of the train should be at the given moment. When sufficient speed has been reached the driver pulls back the lever and the track remains level.

Paris is soon to have a newspaper called *Le Routier*, devoted to the interests of all who use the public roads. The first issue unfolds a seductive programme, and seeks to inculcate a love of the road and to ensure free access to the great public highways for everybody. All that automobilists want is fair play to every road-user, and they do not desire to trespass on the rights of anyone.

The Committee of the Automobile Club of France has been discussing the different systems of chronometers and the best means of obtaining exact records in competitive events. It has been decided that there are grounds for the organisation of an international competition of these instruments, to take place on February 9th next, and the club committee will be asked to offer a prize of 1,000 francs (£40) and various medals.

Count de la Vaulx is preparing for another excursion, and is constructing a balloon for aerial touring of a rather unique description. With one companion he proposes to leave Paris, navigating the air all day, and coming down to earth at night to the spot or region which may seem the most attractive when viewed from cloudland. They will start the next day, or perhaps some few days afterwards, always travelling in their balloon wherever the will of the winds transports the intrepid aerial excursionists. Instead of employing the phrase "rocked in the cradle of the deep," these bold aeronauts will give the poets materials for lines about being "borne on the wings of a cloud" or "reclining in the arms of the storm-king," Boreas. The balloon voyage in question will no doubt inspire the muses of all the long-haired bards of the Latin quarter, whose word-portraits are limned in the amusing pages of Henri Murger's book *La Vie de Bohème.*

CARS AT THE DELHI DURBAR.

THE motorist intending to visit the great Durbar at Delhi may at last rest contented, for the path of his pleasure is now cleared of obstacles. With regard to the announcement that the authorities have repealed the recent absolute prohibition of the use of motor-cars at the Durbar, the *Madras Mail* learns that this very politic concession has been obtained at the instance of a Madras firm, which had already made arrangements to do all its business at the Durbar by this means. The withdrawal of complete prohibition in this respect will bring peace to the minds of many, for not only is this means of transport especially adapted to a camp of the enormous extent of the one at Delhi—a camp indeed of magnificent distances—but also because many firms had gone to the expense of getting out a stock of machines in the hope of establishing at the Durbar what has been called "the vogue of the motor-car," and thus popularising it in all India. It is possible, of course, that the use of automobiles may have to be considerably restricted, and on occasion stopped altogether, but even a so restricted use of the motor-car will be better than its complete banishment. If, as has been said, the day of the elephant being over, the motor-car is to solve the problem of rapid locomotion in the future in those districts of India where railways are not likely to pay, the sooner the great people of India are impressed with its potentialities the better, and there will be no finer opportunity for its demonstration than that accorded by the forthcoming Durbar at Delhi.

Our Indian contemporary was one of the first papers to lift a pen in defence of the motorist's rights, and is to be complimented upon its progressive spirit. The Indian press as a whole seems very well favoured towards automobilism, so that when the long-looked for "vogue of the motor-car" arrives, it will not meet with the opposition shown towards the movement by many organs in Britain.

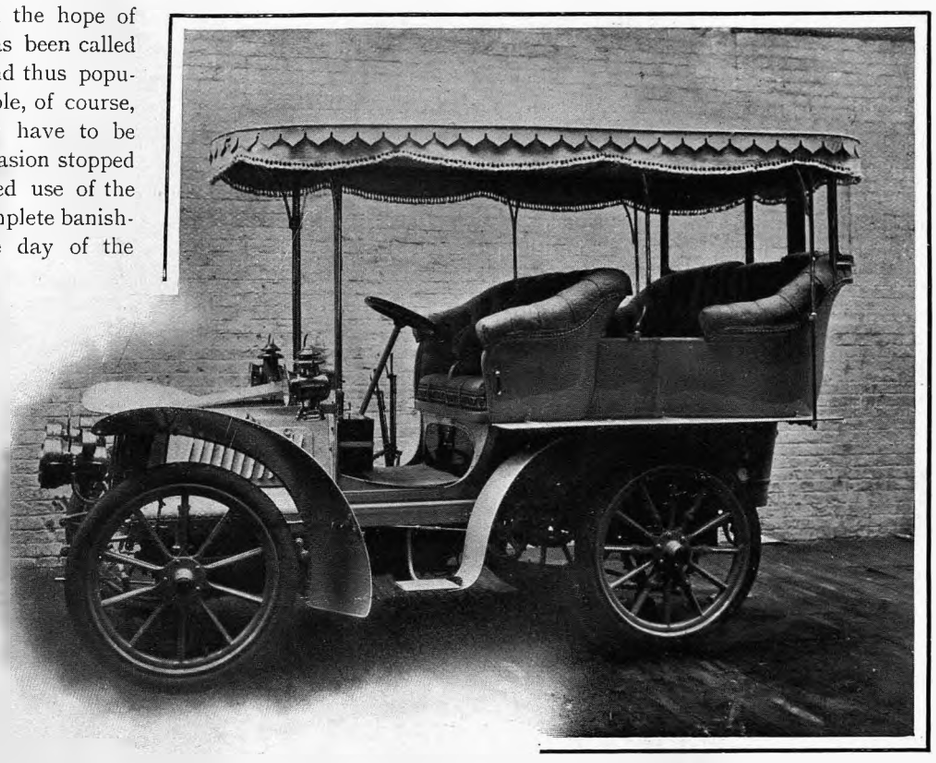
MISUNDERSTOOD TERMS.

IN motor language there has sprung up some curious misuses of terms and forgetfulness of their meaning. For instance, one constantly hears the expression—"chauffeur," and we frankly admit it has appeared in our columns on several occasions. But the word "chauffeur" is really the French term for the fireman on the footplate of a locomotive, and designates what in English we call the "stoker," or "fireman." So when we call the lady motorist the "chauffeuse" we might in English call her "stokeress," which does not sound in the least pretty. We talk about a sportswoman, or a fisherwoman; why not talk, then, about a motorwoman? Or, if we want to adopt a combination of French and English, might we suggest a word with a prettier sound—"motoriste"? The only case in which the term "chauffeur" might be correct is in the case of a Thornycroft lorry, or any other motor-car in which live coal or coke is used.

A BEAUTIFUL CAR.

FOR beauty of design and finished workmanship Mrs. Claude Watney's new car leaves nothing to be desired. The "Voiture Pipe" has by its merits taken a high place among the current types of automobiles, and so excellent a piece of mechanism deserves a beautiful setting.

Mrs. Claude Watney recently purchased one of these cars from the London Motor Garage Company, and the entire carriage work and colouring have been carried out in accordance with her own designs by Rothschild et Fils, and the result is a "creation" in a perfect shade of blue. The carriage is of the type known as "Roi de Belge"; the upholstery is finished in biscuit-coloured cloth, which had to be specially manufactured to obtain the exact tint required. A canopy with an entirely original dust screen, in the form of a bowed glass back, has also been fitted.



MRS. CLAUDE WATNEY'S NEW PIPE CAR

M. G. Laroze, President of the Nice Automobile Club, is to visit Paris seeking the necessary authorisations for the local motor-car trials. Prince d'Essling has renewed his donation of 2,000 francs for the fêtes, and M. Camille Blanc, President of the Société des Bains de Mer, of Monaco, will also renew his gift of 4,500 francs.

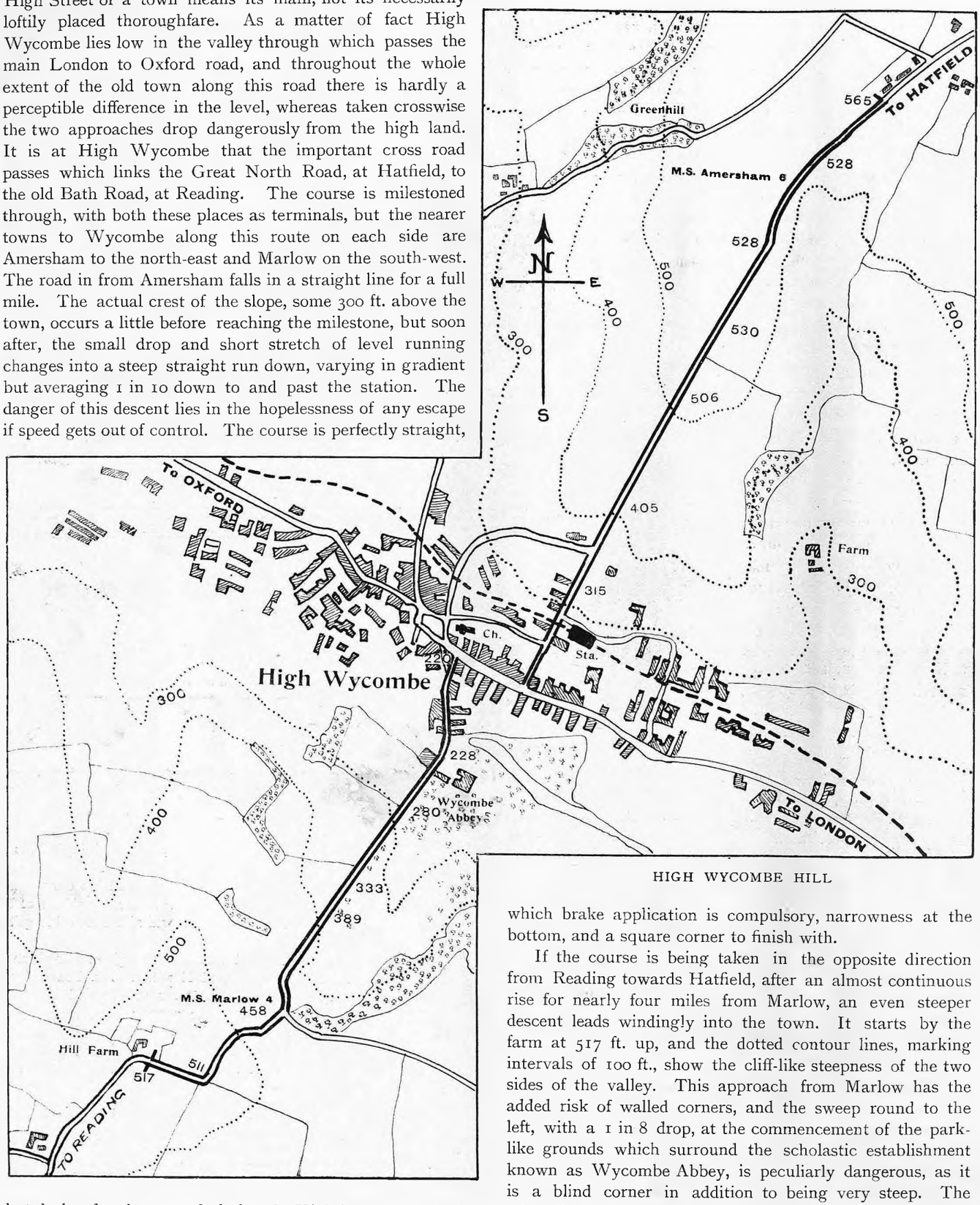
A case in which a motorist was certainly given fair-play was heard before the County Bench, at Reading. Mr. Frank Jarvis was charged with leaving a motor-car unattended outside a public house, at Sandhurst, for the purpose of having dinner. The defendant pleaded that he shut the engine off and put a secret catch on so that it was impossible for any interfering person to start it; and after this explanation the magistrates dismissed the case.

English manufacturers have often been justifiably accused of not taking proper steps to cope with foreign requirements in the shape of printed literature in the language of the country in which they are endeavouring to find a market. One of the British exhibitors, however, at the Paris show may certainly be said to have risen to the occasion, the Wolseley Motor Company having prepared a copiously illustrated pamphlet in French under the title of "L'Automobile de Cugnot à Wolseley," with numerous views of the extensive workshops of the firm at Adderley Park.

THE WORST HILLS IN ENGLAND:

No. IX.—INTO AND OUT OF HIGH WYCOMBE.

THE "High" in High Wycombe does not refer to its elevation, but to its importance, relative to West Wycombe and subordinate Wycombes, just as the High Street of a town means its main, not its necessarily loftily placed thoroughfare. As a matter of fact High Wycombe lies low in the valley through which passes the main London to Oxford road, and throughout the whole extent of the old town along this road there is hardly a perceptible difference in the level, whereas taken crosswise the two approaches drop dangerously from the high land. It is at High Wycombe that the important cross road passes which links the Great North Road, at Hatfield, to the old Bath Road, at Reading. The course is milestoned through, with both these places as terminals, but the nearer towns to Wycombe along this route on each side are Amersham to the north-east and Marlow on the south-west. The road in from Amersham falls in a straight line for a full mile. The actual crest of the slope, some 300 ft. above the town, occurs a little before reaching the milestone, but soon after, the small drop and short stretch of level running changes into a steep straight run down, varying in gradient but averaging 1 in 10 down to and past the station. The danger of this descent lies in the hopelessness of any escape if speed gets out of control. The course is perfectly straight, but the last few dozen yards, before the High Street is reached, are reduced to the breadth of a mere lane with narrow footpaths, and room enough for only one vehicle at a time, nor is there any opposing cross road on entering the High Street, so the descent contains all the elements demanding exceptional care, namely, steepness, length of time during which brake application is compulsory, narrowness at the bottom, and a square corner to finish with.



HIGH WYCOMBE HILL

If the course is being taken in the opposite direction from Reading towards Hatfield, after an almost continuous rise for nearly four miles from Marlow, an even steeper descent leads windingly into the town. It starts by the farm at 517 ft. up, and the dotted contour lines, marking intervals of 100 ft., show the cliff-like steepness of the two sides of the valley. This approach from Marlow has the added risk of walled corners, and the sweep round to the left, with a 1 in 8 drop, at the commencement of the park-like grounds which surround the scholastic establishment known as Wycombe Abbey, is peculiarly dangerous, as it is a blind corner in addition to being very steep. The take-off into the main street is narrow, but level running is reached before this final corner is encountered. Both descents end in closely built portions of the town.

ON THE CARE OF TYRES.

ADMITTEDLY the tyre question is a vexed one, but the want of proper care in this direction vexes it still more. There really are good tyres to be had now, and a great many automobilists have them; but it is quite interesting to compare the life of a set of tyres on two similar cars, for one set will last half as long again as the other. Hence, we must conclude that one man takes a great deal more care of his tyres than the other, and thoroughly understands them and the care they need.

After a car has been run for a hundred miles or so, there will be some cuts, some large and deep, some small. These should by no means be neglected, an hour or so should be spent in cleaning them out and plugging them with cotton wool and solution, or, better still, with a special rubber that can be obtained for the purpose. If these cuts are neglected they take in the wet, with the result that the tread becomes loose about the spot and peels off, and the only remedy is to send the cover away and have a new piece vulcanised in, or, if the damage is very bad and in several places, to have a new tread fitted. All this costs money, and when one recollects that the value of a set of average tyres is about £40, it is hardly worth while to spend more money when a little care would have saved it.

If a bad cut occurs leaving a fair size hole in the outer cover, it is perfectly useless to put on a piece of canvas only a little larger than the hole, the repair must be thoroughly effected in the following way:—Supposing there is an inch gash in the cover, the space round the cut should be cleaned for about six inches each way. Solution it and leave to dry. Three pieces of canvas will be required, and the first should measure about 8 in. This should be affixed, bringing the canvas down to the beaded edges. The next piece should project an inch or so over the first, lengthways, but need not go right down to the edges of the cover—say about half an inch off. The last piece should project an inch or so over the second and should also fall a little bit short of the edges. Three thicknesses of canvas are now fixed, and, so far as the inside is concerned, there is no more to be done. The gash should be cleaned out and plugged with special rubber. This kind of repair is the only one that will effectually hold a nasty cut (short of sending the cover away to have it repaired), and it should be borne in mind by those who put fancy little pieces of canvas over big gashes.

Tube repairs require time to make them a really satisfactory job, especially large ones, so it is best to do these at home, carrying spare tubes. It will be found a very good plan, after cleaning the tube for a patch, to rough it well; a very fine wire brush is the very thing for the purpose. This roughing will cause the solution to sink slightly into the rubber, and consequently the repair is far stronger. Patches supplied in repair outfits are always roughed on the side intended for solutioning.

The security bolts, which help to retain the cover in position, are very often neglected. They should be kept screwed up tight at all times.

Dust caps should always be kept on valves, as most valves (especially the Michelin) leak slightly, and as the dust cap has a washer inside this leakage is prevented. Automobilists who are fond of applying the brakes suddenly should recollect that they have tyres. Skidding a tyre along a rough road is one of the worst things possible for a cover. Oil splashing from the engine often reaches the front tyres, and as oil is one of the worst enemies of rubber, this evil should be remedied by fitting up light guards. If these facts are borne in mind and acted upon, it will be found that pneumatic tyres are not so black as painted.

COSTUMES AND CHATTER.

My dear Diana,—The whirl of Christmas presents continues right up to Christmas Day, and the week immediately preceding the festival is always one of the busiest in London. In the matter of these charming gifts royalty has always led the way. Our late Queen Victoria's favourite gift was a portrait of herself in a silver frame; and these, we may be sure, are now treasured as relics by those who were the fortunate recipients. His Majesty chooses the most charming and dainty gifts for those who have the honour of his friendship, such as pretty little enamelled and jewelled pencil cases, cigar cases, and cigarette holders of the newest designs; while Queen Alexandra frequently chooses photograph frames also, of the most beautiful description, with exquisitely chiselled gilt frames and handpainted mounts, while some which she has chosen this year have medallions of herself and the King upon them.

Photo. by] THE COUNTESS CADOGAN [*Lafayette*

The new royal train, which was used by the King and Queen for their journey to Gopsall Park, is one of the most luxurious and beautifully appointed in the world, as the furnishing of the various apartments is exceedingly artistic, suggesting luxurious drawing-rooms rather than railway coaches. The King's smoking-room is furnished with mahogany, inlaid with rosewood and satin wood. The chairs are of green leather, and the curtains and carpets are harmonious in tone with this colour. The drawing-room, or day compartment, is upholstered in paler green, with white enamel and satinwood furniture. In the Queen's bedroom the colour is pink. The whole carriages are lit with electricity, electric fans and heaters are provided, and the saloons are so arranged as to admit of a passage from one end of the train to the other.

The date fixed for the christening of Lord Castlereagh's little son was Tuesday, the 16th. The interesting ceremony took place at the Chapel Royal, and a large family gathering was present. The infant had three godfathers, who were His Majesty, Lord Londonderry, and Captain Meade. The Duchess of Teck acted as godmother. Lord and Lady Zetland are entertaining a large party for Christmas, and there will be some theatricals. Lord and Lady Cadogan have also been entertaining at Culford, and among their guests have been Lord and Lady Chelsea, Lord Lurgan, Lord Stavordale, Mr. Henry Stonor, and Mr. Gerald Cadogan. The following week Lady Cadogan goes to Birmingham to assist at the Irish Industries Sale, where she will be the guest of Lord and Lady Craven. Captain and Lady Margaret Spicer are also entertaining a party at Spye Park, which include Lord and Lady Westmorland, and Mr. and Mrs. Mark Pym; in fact, this is the season for country house parties, and their name is legion. Lady de Grey has just taken a flat in Bentinck Mansions, and is busily engaged in furnishing it. Some time ago, she let her house in Bruton Street to Mr. and Mrs. Leggett, to whom she has now sold it.

In choosing a new residence, the great conveniences of a

flat are beginning to appeal more and more to all of us, and London, in time, will become as much a city of flats as Paris now is. The wedding of Mr. St. John Brodrick and Miss Madeleine Stanley is fixed for January 5th, and it is probable that after the ceremony they will go abroad.

And now I must tell you a little of the wonders of the Pianola, the Orchestrelle, and the Æolian, which I viewed at the Orchestrelle Company, 225, Regent Street. For the benefit of those who do not know, it must be explained that the Pianola is an instrument by which an ordinary piano can be exquisitely played, and the most difficult and complicated works of the old masters performed by persons who do not know one note of music from another. This is indeed wonderful, is it not? And, what is more, it is true! When one thinks of how many houses there are in which a beautiful piano stands absolutely useless for want of a technical knowledge, which there has been perhaps no time or opportunity to acquire, then the extraordinary advantages of a Pianola become at once apparent. The Pianola consists of twenty-five felt-covered fingers, and the correct expression is given by means of three levers. The first lever gives control over the time, which can by its means be varied as much as possible, and the same freedom of expression obtained as that given by any artist. The second lever governs the touch. By means of this lever phrases can be accentuated, the melody brought out, and the human feeling expressed.

The effects produced are as instantaneous as when the hands rest upon the keys, and the result embodies all the musical personality of hand playing. The music is given in rolls perforated with small holes, which can be easily adjusted in the Pianola before playing, and the very smallest amount of practice is necessary to produce the most wonderful results. As many of those persons who have never learnt music, through want of leisure to devote to this exacting pursuit, are yet passionately fond of it, and most anxious to give expression to the hidden sense of melody which we all possess, the Pianola comes forward to supply this want in the most satisfactory manner possible. The Orchestrelle is also a grand instrument which, like the Pianola, requires no musical knowledge to be perfectly played, but, unlike the Pianola, it is complete in itself and does not need the assistance of a piano for its expression, and, as its name betokens, it represents the full power and harmony of an orchestral band, and the same class of music can be obtained, which cannot be got in any other way except by means of a full orchestra. The Æolian is an Orchestrelle on a smaller scale.

THE GODDESS IN THE CAR.

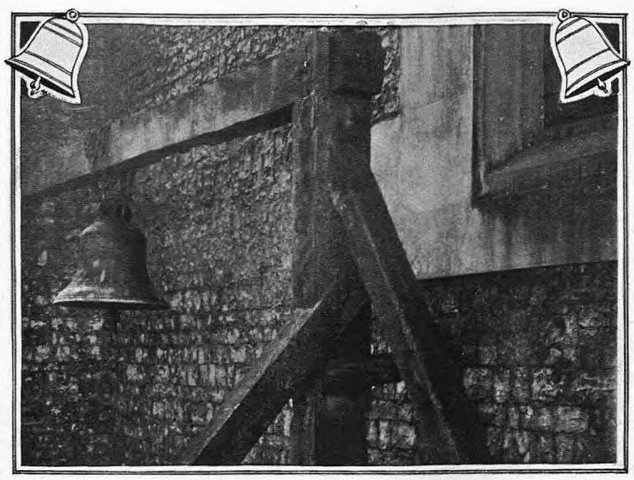
AUTOMOBILES are being used by plant collectors, and one has actually penetrated into the heart of the Federated Malay States, travelling from Selangore to Pahang, and crossing a mountain pass 2,700 ft. high. Dangers and difficulties were encountered in negotiating the narrow, winding, corkscrew-like, and precipitous roads, where the least error in steering might have dashed the car to pieces. On the other hand the saving of time was immense, and many rare plants and flowers were discovered.

THE friction between "Le Moto Club de Belgique" and the Belgian Automobile Club is regrettable. The annual report of the treasurer of the former shows that there are 2,467 francs to their credit, as against last year's balance of 1,000 francs. The Automobile Club has manifested a disposition to withdraw its hostility to the young society, and hopes are now expressed that the ties of friendship will be drawn closer and the union made complete.

FOR broadness of scope, safety for other motorists and the public, and a convenient mode of keeping in touch with the growth of automobilism the French laws are far superior to those of any other country. Placed beside the crude and grandmotherly Acts of England on the same subject, they put the work of our law makers in a very unfavourable light. The state laws of America, however, "take the biscuit" for ridiculousness. Eight miles is the speed limit in many places, and in parts of Michigan it is six. Clearly there is not much liberty for motorists in the "land of the free."

A REMARKABLE BELFRY.

SHENLEY must surely possess the most remarkable belfry in the country. Here and there bells hang on trees, and in several instances they are housed in separate buildings, but only in the Hertfordshire village is a belfry nothing more than a beam at the side of the church. Long ago the edifice lost its tower. In the eighteenth century it was repaired, and the square wooden belfry which had up to then surmounted it was placed on the spot which had been occupied by the porch. Some years later that went the way of all things mundane, and the three bells which the



THE BELFRY AT SHENLEY

church boasted at the time were hung outside the building at the east end, and only a few feet from the ground. This arrangement exists to this day, though now there is only one bell, the others having been removed to the chapel of ease, which is more conveniently situated for the majority of the villagers. Besides this extraordinary belfry, Shenley churchyard contains an enormous yew and some curious epitaphs; so it is worth a visit or even of being made the objective of a short run now the days are not long enough to go far afield.

BERLIN has now arranged for a permanent automobile racecourse, and also for a large exhibition building, in which an international show is to be held every year. The land is leased for ten years, and embraces nearly 200 acres.

AN American contemporary publishes an interesting article by Mr. Stoddard, who advances a theory that gyrostatic action is responsible in some measure for the violence with which some cars are known to skid when there is very little apparent cause for their so doing. It is of course well known that, if a rotating body be suddenly raised or dropped, its gyrostatic properties will give it a tendency to rotate round a nearly vertical axis. It is this action taking place in the fly-wheel of a motor when it is, as so often the case, rotating in the same direction as the driving-wheels which adds so much, in Mr. Stoddard's opinion, to the gyrostatic effort of the driving-wheels themselves, and he is convinced, by experiment, that if all motor fly-wheels were made to revolve in an opposite direction to the road-wheels, this gyrostatic action would be considerably neutralised, with a consequent reduction in the liability of the car to skid.

IN the Faubourg Montmartre a few days ago, about the hour of noon, a Parisian motorist was driving an automobile at the rate of about four or five miles an hour. Suddenly a pedestrian, wishing to cross the roadway, slipped while stepping from the footway and fell about 10 ft. in front of the car. The *chauffeur*, with great presence of mind, avoided a collision and continued his journey. The passer-by went his way without complaint, but all was not finished. A policeman arrived on the scene—"naturally, inasmuch as he was useless," as our Paris contemporary, *L'Auto Vélo*, puts it. Out came his note-book and pencil, and to enter a "contravention" against the unfortunate automobilist was the work of an instant, despite the indignant protests of the spectators and the *chauffeur*. Where the logic of the matter appeared was only manifest when someone made the remark to the policeman that there was neither accident, excess of speed, nor complaint on the part of the pedestrian. The policeman replied, "There is no complaint to-day, but . . . if there were a complaint to-morrow!" Truly a far-seeing police officer.

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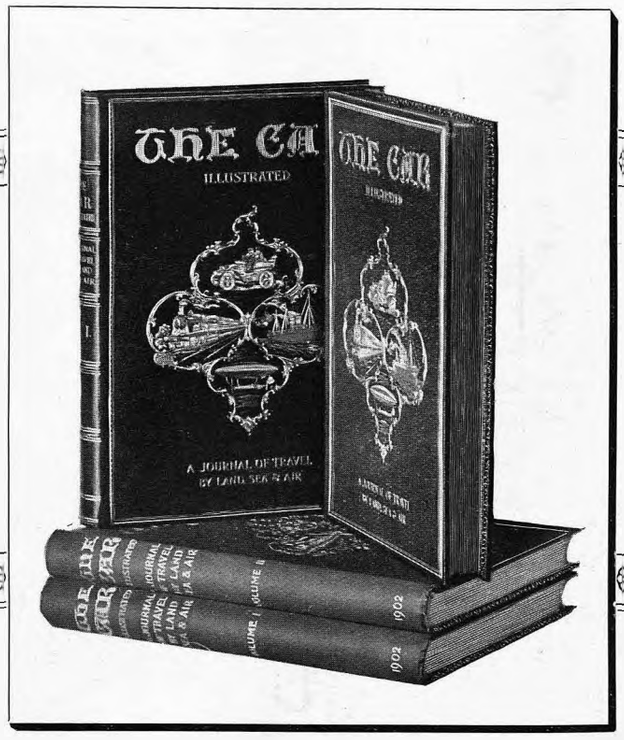

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THE PARIS AUTOMOBILE SHOW:

II.—MORE ABOUT THE NEW CARS.

NOW that fickle fashion has set the hall-mark of her approval on the Mercédès cars, it is not surprising that the exhibit of the great Cannstatt-Daimler firm at the Salon was one of the chief centres of attraction for present and prospective owners of cars, although, unfortunately for their enthusiasm, the 1903 types of Mercédès were not on view. It was given out, however, that these would be two only, an 18 h.p. and a 60 h.p. type respectively, the former being intended for touring purposes and the latter more especially for high speed work and for the great races in the coming season. The centre of the exhibit was a 40 h.p. *chassis* of standard pattern, and this noticed a fine boat fitted with one of their big engines in another part of the building, and this vessel, it was stated, could attain a speed of 20 knots an hour. They also show a photograph of a marine motor of 300 h.p. which they have recently completed.

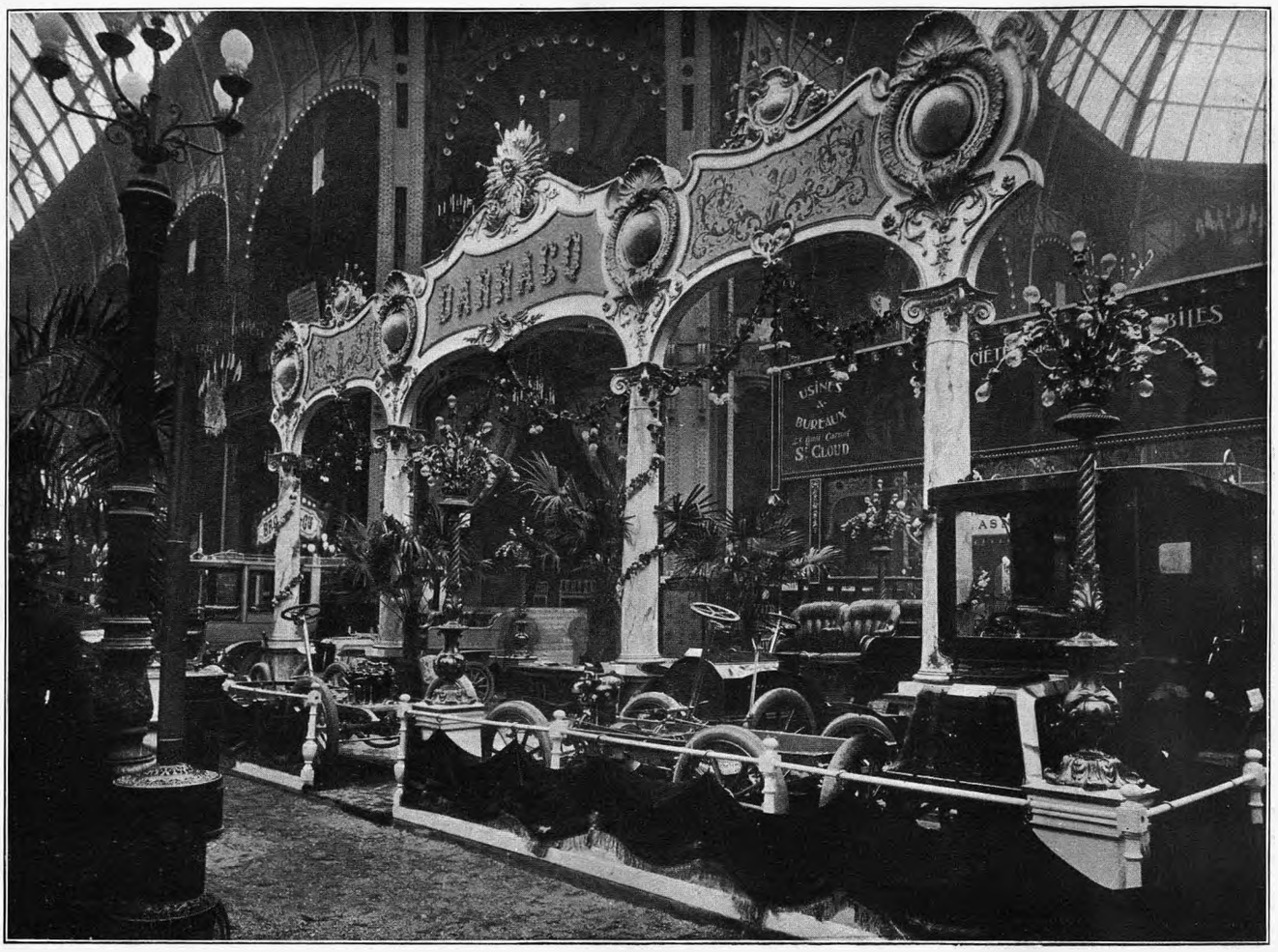
Darracq cars worthily uphold their reputation for being abreast of the times. The makers' 12 h.p. two-cylinder car for 1903 has already been seen in this country, so that especial interest was centered in their new four-cylinder car of 20 h.p., which in general appearance is a radical departure from previous Darracq practice. They have adopted an all-steel stamped frame and the honeycombed radiators

THE MERCÉDÈS STAND AT THE PARIS SHOW

has been described so many times during the past season that recapitulation is unnecessary. Additional interest, however, was lent to the study of this vehicle owing to the fact that several important parts of the gear were shown separately, and in such a manner that their purpose could not fail to be understood or the excellence of their workmanship realised. Several types of touring cars fitted with 28 and 40 h.p. engines were also exhibited, and it was obvious that no skill or expense had been spared to attain the height of luxurious comfort for the passengers. Although the Cannstatt-Daimler Company do not now give nearly so much attention to their launch-building department, we with low, flat engine cover. The cylinder head and valve chambers are of cast iron in one piece, and a really beautiful piece of work. The valves are on opposite sides, and are mechanically operated, all the valve motion being entirely enclosed. Electric ignition is, of course, used, the position of the contact-breaker being extremely novel. It is glass-fronted, and is placed on the end of its shaft just outside the front of the frame and immediately above the starting handle, so that it could not possibly be in any more get-at-able position both for inspection or adjustment. All the other parts of the engine are also extremely accessible. The car has four speeds, with direct drive on the top speed,

which are controlled by a lever immediately under the steering wheel, as on all other Darracq types. Special attention appears to have been given to the brakes, which are strong and well-designed. The brake on the gear-shaft is of shoe-clamp pattern, while the sprocket band-brakes are lined with metal. The long and flat carriage springs must add greatly to the comfort of the passengers, and the finish of the carriage bodies leaves nothing to be desired, whilst the control of the engine on this new vehicle is such that the makers claim that it is now one of the quietest cars on the market. It was noticeable that this firm, like a very large number of others in the show, had fitted their wheels with Michelin tyres having a thick flat corrugated tread, which, it is claimed, has very good non-slipping qualities.

An interesting exhibit is that of Messrs. Turgan, Foy, and Co., with steam tractors, tip-waggons, and omnibuses of 50 h.p. They have also a very comfortably-equipped well-finished tonneau cars are shown on this stand, but the exhibit of the most absorbing interest is the new frame with the four-cylinder motor of 18 h.p. This new engine has mechanically operated valves, throttle governors, and two forms of ignition; that is to say, either a high tension type with accumulators and contact-breaker on the dashboard or a rotary magneto. As regards the latter, it is noticeable that contact is made with each plug by means of a movable lever which can be instantly brought into contact with a fork spring, made of brass, which is in communication with the top of the plug, so that whenever it is necessary to test the ignition to see that each cylinder is firing properly, this operation can be immediately and effectively performed in the simplest possible manner and without the least danger of getting a shock from the current. Lubrication is under pressure, and particular attention appears to have been paid to the bearings and strength of the gear. The countershaft



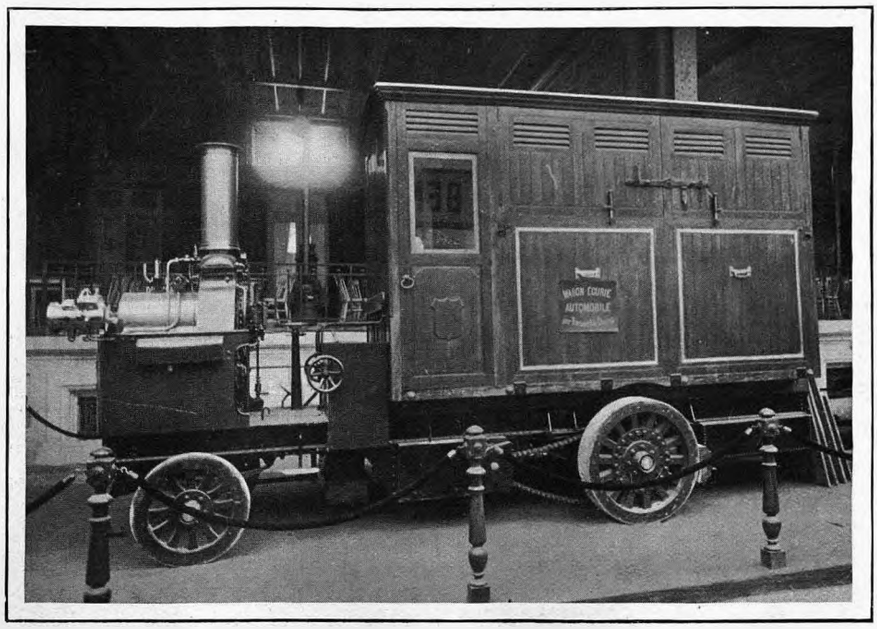
THE DARRACQ STAND

horse-box, which we illustrate; it should afford an easy method of transporting horses for short distances with absolute safety. All the internal fittings are designed on thoroughly sound lines, and include a separate compartment for a groom. Messrs. Turgan, Foy, and Co., are favourably known on the Continent for their good work.

Another firm which is constructing its 1903 models on lines which depart from the traditions of its house is that of Messrs. Peugeot, for not only has the mechanical part of these vehicles been redesigned, but the *tout ensemble* of the carriage itself has been radically altered, first of all by the now ubiquitous honeycombed radiator and the flat bonnet, and also by the use of the "Arbel" or stamped steel frame, with its front prolongation carrying the forward springs. The Peugeot workmanship has always been renowned for its soundness, so that we were quite prepared for the excellent work which we found here. A number of brake pulley is inside the gear-box, running in oil, and the brake consists of a strip of spring steel which passes twice round the drum; this is a powerful arrangement which could not be used unless running in oil. The motor is provided with long and flexible springs and equal-sized wheels, and should be an exceedingly comfortable vehicle. It is up-to-date in every particular, and we hear that energetic measures are being carried out in order to cope with the probable demand that there will be over here for cars of this power, which can be supplied at a very reasonable price.

A considerable departure from previous standard patterns has been made by the great firm of Mors in their new types for 1903. These are to be known as the 11 h.p. and the 18 h.p. cars, although as a matter of fact the brake horse-power of the former is twenty-two and of the latter thirty-two. They differ most markedly from the 1902 types in

general external form and in details of the motor. The new Mors frame is of stamped steel, tapering gradually from its greatest depth, in the centre of the car, to the ends in order to obtain the greatest rigidity with the least weight. The front part is also curved inwards from a point opposite the fly-wheel in order to leave a greater turning radius for the wheels. This certainly makes a car more easy to manœuvre.



THE TURGAN AND FOY HORSE-BOX

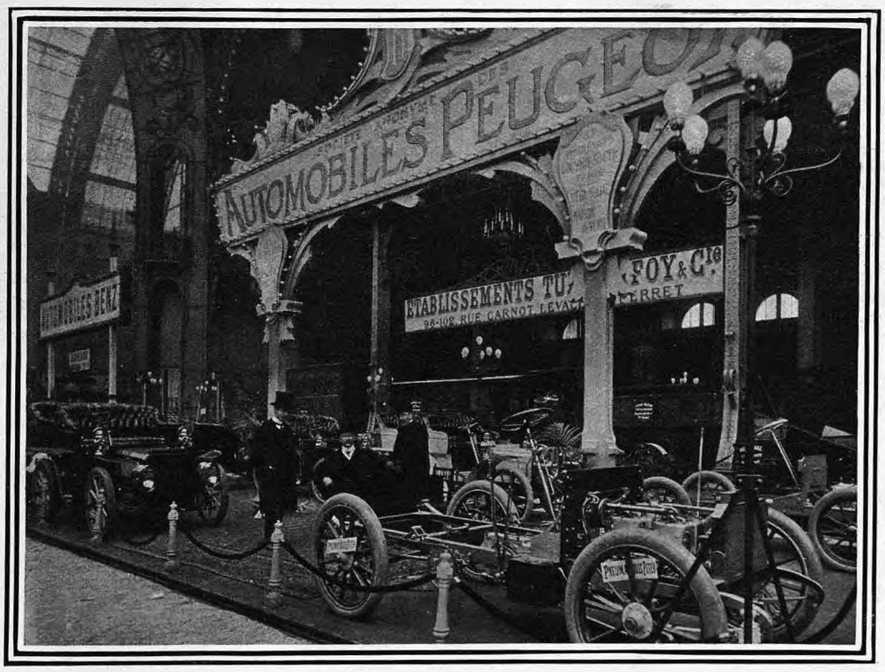
The 1903 motor is built up with cylinders and head of cast-iron in one piece, and a separate aluminium water jacket. The admission and exhaust valves are placed on opposite sides of the head and are of equal size and mechanically operated. The makers lay stress upon the fact that owing to the valves being of identical proportions, one valve and one spring are all the spare valve parts which the owner need carry.

A throttle governor is used, and consists of a fixed bush having several narrow ports in it. This is placed in a chamber left for the purpose, through which the stem of the induction valve passes, and inside the bush is a revolving valve, having corresponding ports, which is acted upon by the governor in the usual way, and which can be set to admit any required mixture of gas by moving a lever on the steering wheel. In addition to this there is a foot accelerator which opens the throttle wide when extra speed is temporarily wanted, as when negotiating traffic.

Hitherto the Mors type of magneto ignition has not admitted of any variation in the point of firing, but in the new cars the ignition can be advanced or retarded at will by means of a movable roller, which is interposed between the ignition tappet rod and its actuating cam. This timing arrangement can be regulated to a nicety by a lever working over a toothed arc on the steering wheel. The electric "interrupter" button, which every Mors driver likes so much, is still retained in its usual place on the wheel. Another improvement in the ignition is the much-needed provision for a method of adjusting the tappets instead of the old and crude necessity for forcibly bending them. The lubricators are no longer chain-driven, but are of an entirely new Dubrulle type, in which a constant supply of oil is insured by water pressure by means of a pipe connected up between the water-jacket of the cylinders and the lubricator. It is claimed that this system ensures much greater regularity of lubrication, as the water being hot maintains the oil at an even temperature in winter and summer, so that it will always pass along the pipes at a regular speed. The idea seems to be thoroughly sound.

With regard to the change-speed gear M. Mors follows his recent practice throughout, namely, of transmitting the power through a leather-faced clutch, and giving four speeds and reverse, the fourth speed being a direct drive from engine to countershaft. One lever controls all the operations. A flexible coupling on the driving shaft, between the clutch and gear-box, reduces friction to a minimum and prevents the clutch from getting out of line. The countershaft and gear-box bearings are provided with oil-ring lubrication. The essential alteration in the general appearance of the new Mors cars is, of course, due to the fitting of a honeycomb or *nid d'abeilles* radiator and long flat bonnet; the action of the radiator is accelerated by a fan at the back of it, which is driven by a belt off the engine shaft. That this form of water cooling is quite the best has been long apparent, and there is no doubt that nothing but their natural desire to get rid of their stocks of old types of radiators and fittings has prevented manufacturers from adopting it sooner.

Mention must be made of the brakes; each of these, the countershaft and sprocket, is double acting and lined with metal. The brake lever on the new cars is arranged so that it is forward when not in use, which has these advantages —that it is out of the way of the speed lever when one is manœuvring in turning the car round, whilst when in the "on" position it lies close up to the seat and leaves room for the driver to get off and on his car from his own side.



THE PEUGEOT EXHIBIT

Both the 11 h.p. and the 18 h.p. cars have equal-sized wheels and single instead of double roller chains. The front axles swivel on ball bearings, and are provided with "stops" to take all strain off the steering gear and prevent overlocking of the wheels. In design, material, workmanship, and detail, these 1903 vehicles are second to none in the Salon.

Gardner-Serpollet carriages are certainly improved and appeared to attract a good deal of attention. The 20 h.p. vehicles now have their water tanks in front, an alteration which gives them rather the look of a petrol car, and in other ways their general outline has been made more symmetrical. Their capacity for long distance travelling without stops for water has been increased by the addition of another condenser, whilst another improvement which has been made in all the standard pattern cars is the adoption of a method of regulating the supply of paraffin to the burner. Hitherto drivers of Serpollet cars, if not very expert, have been liable to flood their burners with too much oil, this resulting in imperfect combustion, choking of the burner, increased consumption, and poor running. Now, however, any excess of oil is automatically intercepted and returned to the supply tank. This fitting overcomes a long-standing difficulty, and can be installed on many of the Serpollet cars now running.

THE RENAULT STAND

A 20 h.p. omnibus which has been built for a school in Paris is an interesting exhibit on this stand, as the generator on this serviceable-looking vehicle is placed in front of the body, and there is no visible chimney. In the curious design of his racing car bodies Serpollet has always held a unique position. This year he has built a 40 h.p. racing car, which is new throughout. In appearance it is very striking, being exactly like an inverted canoe on wheels, part of the keel and floor being cut away for the accommodation of the driver. The greatest novelty in this new car will be found in the method of working the pumps, for instead of the well-known plan of controlling the "throw" of these by means of a graduated sliding cam, the end of the pump beam is now carried by a block working in an ordinary link motion actuated by an eccentric, and in this manner the lift of the pump can be regulated much more accurately than ever before to supply the varying calls on the steam. Again, instead of the two small handles previously fitted on the steering column for controlling the pumps, etc., two more accessible and much more workmanlike levers are fitted. The generator and under frame have been dropped a little lower, and an alteration has been effected in the generator itself, which now contains fewer tubes. These are longer than before, however, and are distributed in a manner which presents a greater heating surface, and the boiler fittings are now at the side instead of at the rear.

Delahayes have fallen into line with other makers, in so far as that all their light pleasure touring carriages are fitted with vertical motors instead of horizontal and with gear and chain transmission. There are certain other small features about their cars, in addition to the well-known good fitting employed and the fact that they are thoroughly well made. The present engines are built with their cylinders and valve chamber in one piece; and are exceptionally well cooled by reason of the fact that the water-jacket passes round the combustion chamber, valves, and all the working part of the cylinders; whilst the lower portion of the cylinders has an air space round it, which still further helps the cooling and at the same time provides a ready means of drawing hot air to the carburetter through a pipe, and thus maintaining an even temperature for the mixture. The cylinders have a removable cap on their crown to give facilities for cleaning and inspecting the cylinders. The motor itself is well-balanced and is fitted with two fly wheels, one on either end of the crank shaft, thus evenly distributing the weight on the bearings. It is interesting to note that Messrs. Delahaye still consider the horizontal engine the most suitable form of motor for omnibuses, drays, etc., owing to the great increase of floor space which is permitted.

Among the light carriages, Renault holds, perhaps, the premier position by reason of the extraordinary performance of his car in the last great race, but judging by the exhibit made by the firm at the Salon, it is evident that they do not intend to rest on their laurels. Great interest was manifested in the new 14 h.p. 4 cylinder *chassis*. This is fitted with equal-sized wheels and the usual tubular-stayed frame, the tubes being covered by a light rectangular wooden frame. The motor is of the firm's own design, with mechanically operated valves of equal size. The cylinder head is cast in one piece; the position of the sparking plugs is now at the top of the cylinder crown instead of at the side, and the governing is by throttle. The present carburetter is so set that it requires no adjustment or variation in the mixture. All the bearings throughout the motor and gear are lubricated under pressure from the exhaust, the axle bearings only being lubricated with grease. Powerful enclosed sprocket brakes consisting of an expanding ring acting on the inside face of the brake drum are now used. In other respects this car does not differ from those already so well known, Messrs. Renault appearing to be one of the few firms who are satisfied with their standard type of frame and with their system of water-cooling, although another exhibit on their stand, a 10 h.p. two-cylinder car, shows that they realise that the day of the single cylinder car is rapidly disappearing.

G. F. P.

Dr. Gatling, of famous gun repute, has been turning his attention to ploughshares. He has just invented a plough operated by a petrol motor. The plough can be worked at the cost of 8s. 4d. per day, and the inventor holds that it will do the work of thirty men and eighty horses. If this be so the farmers have here an invaluable helpmate. Should such an invention prove practicable, the goblin of "Agricultural depression" will soon be laid.

SANTA CLAUS—ANTI-MOTORIST:

A CHILDREN'S CHRISTMAS STORY FOR GROWN-UPS.

PATERFAMILIAS sat half-buried in his susceptible armchair.

He was vastly exercised in his mind as to fitting purchases to make in order to fill prospective vacuities in the stockings of the modern infants in his scientific nursery.

For weeks past he had been bombarded with questions as to whether Santa Claus would bring Teddy a motor-bicycle or Elsie an electric brougham. Dorothy had also been assimilating knowledge from "The Goddess in the Car."

"It must be a motor-something," Teddy had persisted.

Paterfamilias suggested a rocking-horse. Horses of all kinds were vetoed as archaic. "These are not palæolithic times!" said Elsie. "Shall I add *woad* to my toilet table?" asked Dorothy.

So Paterfamilias had sheltered himself in his armchair away from this storm of satire.

Suddenly jumping to his feet, he walked out into the slushy streets, having in mind a certain shop where lay a goodly store of saccharine indigestibles, multi-coloured candles, and all the gay and grotesque inhabitants of tinsel toy-land.

To his amazement, however, the glittering shop had disappeared, and in its place stood a neat establishment, with the legend on the shining brass-plate outside, "Santa Claus and Co. Please walk in."

In a smartly furnished, electrically lighted, automatically ventilated, liberally be-telephoned, and typewriter besprinkled apartment, was a jolly, jovial-monk-like figure sitting at an American roll-top desk.

On his silvery head rested a wreath of holly, in strange contrast to the dapper city clothes that garmented his capacious person. Gone was the flowing snow-flaked robe of the Santa Claus Paterfamilias knew in his childhood; gone was the big bag bursting with Noah's Arks and talking dolls. Gone, too, was the rubicund face and the merry eye; for care and worry had graven wrinkles on his brow. This was Santa Claus up to date.

Around him were copies of the motoring papers, and before him was an enormous stack of motor manufacturers' catalogues, each advertising the finest car on earth, announcements of rival exhibitions and invisible club runs.

"What with Panhards and Peugeots, Daimlers, Darracqs, and Decauvilles, Mors and Mercédès," he exclaimed, as Paterfamilias entered—"What with clutches, cams, coils, and carburetters, and a million little ones shrieking for motor-cars in their stockings, I'm at my wit's end. I shall strike."

And with that he stuck his shiny *chapeau* on the top of the holly wreath and swung out—and Paterfamilias awoke to find the fire had gone out also.

Now if Teddy, Elsie, Dorothy, or any other of our youthful readers do not receive an automobile this Christmas morn, they will know that the dream of Paterfamilias was no dream, but a peep into that other world where Santa Claus lives in the summer-time. For he really has "struck" and become an anti-motorist.

No more will the old gentleman dodge down chimneys and stuff the expectant stocking with golly-wogs and chewing gum. The filling of every stocking this Christmas will be undertaken by a mother or father or a sister or a brother, who will attempt to carry on the work which Santa Claus has resigned, and they will pretend that they are really Mr. Claus himself.

The moral is that it is just as foolish to cry for a motor-car before you are out of short frocks, as it is to cry for the moon before you are out of long clothes.

PAUL BONNAIS.

IMPORTANT CONCESSIONS.

THE Automobile Club secretary recently had an interview with the secretary of the Automobile Club of France in Paris. The arrangements by which members of the A.C.G.B.I. may pay their Customs dues at the club, and obtain there forms which will enable them to pass their vehicles into France for temporary use and bring them out again without going through the usual Customs formalities, are on the point of completion. An agreement between the London Club and the Paris Club has been signed, and 300 examples of the Customs forms have been forwarded from London to Paris for circulation to the various Custom House officials. As soon as the circulation of these forms is completed the Paris Club will inform the London Club that the latter may at once commence the issue of the Customs forms.

Another important matter which is now being dealt with is the arrangement by which the London Club may issue driving certificates to its members, in exchange for which the French Club will obtain and send to British members the driving certificates issued by the French Service des Mines. It is necessary to hold one of the driving certificates of the Service des Mines before driving a motor vehicle in France. These are two advantages which attach particularly to membership of the A.C.G.B.I.

TOLLS AND MOTOR-CARS.

THE importance of the Maidenhead toll question has been shown by the fact that as many as 300 motor-cars have been counted to cross the bridge on a single Sunday during the past summer. The town clerk of Maidenhead, however, has officially informed the Motor Union that the toll on motor-cars will be reduced to 2d., and stated that steps will be taken at an early date to abolish the toll altogether.

With reference to the toll at Hoarwithy Bridge, a letter has been received by the Automobile Club executive from Mr. J. C. Hereford's solicitors, pointing out that Mr. Hereford's case, which the Motor Union had expressed their willingness to support, might arise in a different way from what was expected and provided against, for it might be that under the Act the bridge keeper might refuse to allow Mr. Hereford to pass over the bridge unless he paid the sum demanded (2s. 6d.), in which case the solicitors considered that Mr. Hereford's remedy would be to pay such sum, under protest only, informing the bridge keeper at the same time that he should take proceedings against him for taking a greater toll than was due. Mr. Hereford would then have to summon the bridge keeper before the justices under the Bridge Act. The solicitors asked whether, under these circumstances, the Motor Union would still be willing to assist. The committee decided in the affirmative.

THE executive committee of the Automobile Club has before it several proposals with reference to speed tracks. The races committee is about to examine the site of the six-mile course which it is proposed to construct near London.

THE motor-car has now found a new opening. One of the most effective dinner tables which has ever been, was that decorated by Goodyear the other day, when the centre piece was a miniature model of a motor-car made entirely of scarlet geraniums, with every detail complete down to the very lamps and steering wheel; while all the other decorations were *en suite*, and the whole presented the prettiest appearance, being not only a novelty but a complete artistic triumph.

OUR CORRESPONDENTS' PAGE.

THE REGISTRATION OF MOTOR VEHICLES.

Sir,—Nothing could be better than your editorial notes in this week's Car, in that they point out how great is the difficulty in impressing sense upon bucolic bodies. But difficult as it is to make such people understand, the task is almost accomplished, and in three years the difficulty will disappear.

Our strength is to sit still; all interested in the advancement of the car may rest assured that the time of waiting will not be long, and that to make haste is to play our enemies' game. In the short interim there will be persecution, but the result is not in doubt, and at the end we shall have our way without conceding one item. Just now the bargain turns on numbering. When we were few and poor the suggestion might be defended; now that we are strong and established its concession would be, not a bargain but a gift. You, at an earlier stage, may have taken a different view, but I conceive that as a man of affairs you realise how things have altered. For the regular user of the road, driving his mechanical carriage as another man may drive his coach, there can be no numbering by consent; his sentiment is against it, and insistence will simply drive him back to the horse.—Yours faithfully, Bertram Blount.

Sir,—It was with great satisfaction that I read the decision of the joint committee of the Automobile Club to adhere to the policy of conceding, in any statute for altering the present absurd speed limit, that cars shall not be driven on the road without having on them some symbol which shall afford means of identification. I agree with the objection to numbers, but a name to be associated with a number in the register will serve quite as well, and be consistent with the old usage of naming coaches and the present practice of naming pleasure boats, yachts, etc.

We are told in certain automobile journals that what is proposed is quite unnecessary, and I notice that editors head paragraphs with "Let Well Alone," and correspondents sign letters with "Let Sleeping Dogs Lie." It will be obliging if they will tell us what it is that is "well" and to be left alone, and who are the dogs that are asleep. Until they do so, we may take the liberty of holding that there are more ostriches than dogs about, and that these proverbial expressions are as appropriate to the actual situation as was the solemn utterance of a certain sleeper at the bottom of the Hill Difficulty: "Then said Presumption, 'every tub must stand on its own bottom.'"

Meantime I shall continue to have the belief that things are anything but well, and that this is no time for sleeping. It is a time for all moderate men to dissociate themselves from a class of automobilists who sacrifice to their own gratification that kindliness and consideration towards their fellow citizens, the absence of which tends to make the life of others unpleasant and to rouse just indignation. One principal reason for proposing now to put a symbol on our cars, is that we desire our fellow citizens to know that we are out of sympathy with the apparent determination of some to use our roads as if they were made for racecourses, tearing along with roaring exhausts; in dry weather enveloping other users of the road in such a cloud of dust that for minutes they cannot move with safety, and so must sit until it settles down on them, while in wet weather they bespatter carriages and footpassengers with showers of mud—in a word displaying a cynical want of courtesy and consideration that deserves strong condemnation.

I say nothing just now of the great alarm caused to people—even those who are not abnormally nervous—and of the actual risk which express and race speeds on open roads necessarily gives rise to. I am prepared, as a protest against the conduct of such enemies of true sport, if some other gentlemen will do the same, to put a name on my car now, without waiting for statutory compulsion.—I am, &c.

Edinburgh. J. H. A. Macdonald.

It is stated that the Metropolitan Fire Brigade has abandoned the idea of constructing a special motor-engine and is seeking the aid of a motor-car company to help it out of its difficulty. This decision has been arrived at, says *Engineering*, "after spending a considerable amount of money—we believe £600—at a time when £25 spent in a Continental trip, and even a few shillings in London cab fares, would have led to the same results." Now a "tractor," to take the place of horses, is to be made by a motor-car company, and the brigade will experiment with it.

ANSWERS TO CORRESPONDENTS.

"Top" (Sheffield).—The car that best answers your requirements is the new four-cylinder Gladiator. You cannot do better.

"Oldsmobile" (Yorks).—We should advise you to substitute accumulators for your dry batteries, but see that they give the same voltage as the latter, or you will not get good results.

J. Hayton (Lancs) asks us to advise him on the purchase of a light steam car, as he cannot bear noise or vibration. The car must carry two people, and be easily managed. Price not to exceed £160.—The only vehicle fulfilling these requirements is the Locomobile, and we believe that £150 is the lowest priced vehicle of this type.

J. R. W. (Chislehurst) asks us whether he could buy a 14 h.p. car of a well-known make at a lower price by going direct to the makers at the French show.—We have no doubt he could place an order for one at a considerably lower price than he could get it over here; but as the output of the firm in question goes entirely into the hands of agents for some months to come, "J. R. W." would most probably find that he could not hope to get delivery until the end of next summer.

"Lofthouse."—Taking your list as it stands, we should place the cars as follows in order of merit and as suitable for your district:—No. 2, but with the 14 h.p. motor, four cylinders; No. 11; No. 6; No. 10; No. 1; No. 8; No. 4; No. 5; No. 3; No. 12; No. 7; No. 9. The quietest of these are Nos. 2, 10, 11, 3. The average cost of upkeep will be about 2¾d. per mile for these types of cars. Many thanks for your kind and appreciative remarks.

Darley Livingstone (Mayo).—You would find a petrol car more serviceable than a steam vehicle for your particular work, such as the 6½ h.p. Peugeot, but if you really prefer steam the Locomobile is the car to buy. With regard to your other question, you cannot do better than apply to Messrs. George F. Milnes and Co., Balderton Street, Oxford Street, W. They have a very suitable van to carry 1¼ tons; but we should advise you not to run faster than nine or ten miles an hour if you have such rough roads.

"Tyro."—The offer you have received for your car is a good one. The reserve you mention as having been put on a car of this type at an auction sale does not represent its market value, and it is doubtful if you will get more than you are at present offered if you wait to sell your car by private contract. The body you refer to is of tonneau form; the difference between it and the ordinary type is that the back seats are larger and more comfortable, and it has higher back-rests. Of the cars on your list we consider that the 16 h.p. De Dietrich gives the best value for the money, and is well worth the price being asked for it.

C. Young (Putney Heath).—Thanks for your very complimentary remarks about The Car; we are glad you find it so interesting. You cannot have anything better than a cement flooring for your motor house, and your argument against the use of wood is well founded. To avoid direct contact between the tyres and the cold stone floor you should use short pieces of thin hard wood; place these at the back of each wheel and roll the car on to them; or, if you intend to leave the car in its house for a week or more without using it, it is advisable to support it clear of the ground by means of "jacks" under the axles. If these are not available, the wheels should be turned a few inches every day, so that the tyre does not bear the weight of the car on one point for too long a time at a stretch; this is especially important in the case of solid tyres.

ADVICE AS TO MOTOR-CARS.

"WHICH SHALL I BUY?" is a question which hundreds of people are now asking themselves when contemplating the acquisition of a motor vehicle. In the majority of cases the prospective purchaser has no previous knowledge of automobiles, and has perhaps no experienced friend whom he may consult. Naturally he is bewildered by the immense array of cars of all types now before the public, each claiming to be the best.

To every reader of THE CAR we make this offer: On receipt of the necessary particulars as to the price which the reader is prepared to pay, the average speed at which he desires to travel, the nature of the road surfaces and gradients in his district, etc., we will advise him as to the most suitable car for his requirements and the best equipment as regards the make, type, and diameter of the tyres.