MOTOR NOTES FOR MEDICAL MEN.

BY H. MASSAC BUIST.

THE DOCTORS' MOTOR SHOW.

For the first time since the outbreak of war it may be written that a motor show for medical men is being held in London. The exhibition opened yesterday at Olympia, Kensington, and the White City, Shepherd's Bush, by the Society of Motor Manufacturers and Traders under the patronage of the King, reveals complete reversion of policy on the part of the world's motor car manufacturers. Instead of striving to discover how costly they can design their machines, practically all the leading houses in the world have devoted their enterprise to the production of moderate priced cars. Some have actually developed their schemes to include vehicles of sensationally low price, yet of sound design and construction. There is no longer any need for the young doctor to put up with a motor bicycle and side-car; the long-looked-for link vehicle between the motor cycle and the car has arrived in the guise of the 8-h.p. twin-cylinder Rover car, which I prophesied two years ago would be developed to this stage. It is now introduced at the rock-bottom price of £220—which has been arrived at by estimated reductions in the cost of labour as well as the new scale of raw material prices—as a vehicle developed in the light of experience in the hands of users. It is very much better than any previous example of the type that was introduced two years ago at £350, put on the market at the last show at £300, reduced late in the summer to 250 guineas, further reduced this autumn to 230 guineas, and now brought down to £220. If other firms could do anything like as much in the way of cutting costs we should be well on the road to creating a big demand for new style motoring. But the problem is so intricate that very few members of the industry have the brains, the daring, and the resources to solve it. The essence of the thing is never to lose sight of the fact that the public is ever demanding a better vehicle. That this achievement is possible may be illustrated briefly by pointing out that the new body fitted to the 8-h.p. Rover model has curved panels more on the lines of those on the 12-h.p. four-cylinder type. This new 8-h.p. body is stronger than the one it supersedes. The cushions are better sprung. To allow more room for getting out when the hood is up, the running boards have been fitted nearer the ground, and valances have been furnished to improve the appearance. The hood is also better, alike in regard to detail and finish. The steering wheel has been covered with celluloid, making it warmer and more comfortable to the hand.

Access may now be had to the magneto without moving the bonnet or radiator. The boot at the back of the car has been made deeper, and the spare wheel is fitted to the side of the car. A mud shield is furnished on the front axle, serving to keep all mud and dirt off the engine. The silencers have been improved and strengthened. In regard to mechanical features, valve clearance gauges are now supplied in all tool kits. These clearances being very important, it will be appreciated that it is a great advantage to have gauges whereby adjustment can be checked and, if necessary, effected quickly and with exactitude. Oil and petrol strainers are now fitted in suitable positions. In short, we are dealing with both a proved and an improved proposition, as well as one supplied complete at a sensationally reduced price, yet selling at a profit—a point which it is necessary to stress in that at this period so much material is on the motor market which is out of date in design; whereas Rover plans for creating the era of cheap motoring by car are only beginning to ripen.

THE VOGUE OF QUARTER-ELLIPTIC AND OF CANTILEVER SUSPENSION.

We could not call this a cycle-car proposition. Its outstanding merit is that it is a motor car proper with refinements, complete body work, quarter-elliptic suspension fore and aft, a single-plate clutch—such as is used now even on the luxurious 12-cylinder Fiat car—a gearbox giving three speeds forward, and a worm-driven back axle. The development is interesting not merely as a text for illustrating motor progress of service to medical men, but also because it has had a tremendous effect on the 1922 programme of the industry in general. The idea

of using four quarter elliptic springs in such a manner as to make the weight of all the springs themselves sprung weight was not originated by the Rover Company. It was exploited by Vickers in the Stellite car designed in the pre-war days by the Wolseley Company, which has in turn developed that principle into the post-war series of four-cylinder Wolseley cars. It is widely copied to-day, without, however, the use of the safety plate, which is the distinguishing Wolseley principle, though I note that the new small 8-h.p. Standard car is specified as employing the safety-plate scheme. The great point about this form of suspension is that it makes for economy as well as luxury, because it keeps the tyres on the ground, therefore they are not scraped away. On the other hand, it is impossible to get a jar, though the car may plunge if the road surface is very bad. All the firms associated with racing held hitherto that it was quite an impossible suspension for the larger sorts of cars. The successful introduction of the 15-h.p. Wolseley car, a refined, high-grade vehicle capable of accommodating all sorts of coachwork, has proved this contention to be absolutely wrong as far as standard vehicle practice for road service is concerned. I have driven such a car on bad surfaces in Cornwall at 53½ miles an hour, and it held the road well. On the other hand, of course, any firm attempting to race with that particular design of springing against competitors of equal efficiency using hard, half-elliptic springs, would be at a disadvantage. This indeed clearly illustrates one of the features in which we do not learn lessons from racing, though it nevertheless enables us to evolve valuable other features for standard cars. Suffice it to point out, among significant developments at this period, that a firm associated with racing so prominently as Darracq, whose chief designer is now Mr. Louis Coatalen, still of the Sunbeam Company, introduces an 8-h.p. four-cylinder overhead-valve engine small car with quarter-elliptic springs fore and aft, a model which is also to be made to the same design by Talbot. Moreover, a 10-h.p. Wolseley has beaten any car of equal engine size by doing three hours at 78.30 m.p.h. at Brooklands; and also by travelling 250 miles there at 78.67 m.p.h. with Blic ignition.

BEATING DOWN THE BARRIERS OF PREJUDICE.

The first Talbot of that type was taken by Mr. Malcolm Campbell, the racing driver, for a test at Brooklands. The 7-cwt. chassis was found to ride quite comfortably on that very solid surface at 56½ miles an hour with the engine quite indifferently tuned up because there was no question of racing against competitors. It was merely a matter of the manufacturers satisfying themselves how the type of chassis rode. The driver was astonished at the ease of riding furnished. There was never a jar. The incident is interesting as showing that now we have awakened folk of racing experience to the advantages of this particular form of design for standard car work, just as, at last, we have got the Continental manufacturers in general, and a number of firms hitherto prominently associated with racing in this country, to take to the full cantilever spring for the rear suspension of the larger classes of vehicle, as instance the current Hotchkiss, Berliet, Renault, Panhard, and other Continental models, and the new 14-h.p. Sunbeam, the new 14-h.p. Vauxhall, the new 14-h.p. Talbot, and the new 12-h.p. 1½ litre Talbot-Darracq. The use of quarter-elliptic springs fore and aft at this stage by other than firms making small cars is not advisable in that nobody else has spent the time and the money on investigation that has enabled the Wolseley to evolve this form of suspension as an entirely specialized device suitable in their practice for middle-size cars as well, as is proved beyond question in the case of their 15-h.p. vehicle.

A big movement to be observed this year is the introduction by some of the largest houses of small cars with quarter-elliptic suspension fore and aft, as instance notably, in addition to the established 10-h.p. four-cylinder overhead valve Wolseley and 8-h.p. two-cylinder Rover, the bringing forward of an 8-h.p. four-cylinder, overhead valve, water-cooled Standard car with this form of suspension; the already mentioned 8-h.p. four-cylinder overhead valve Talbot-Darracq and Talbot types; the B.S.A. 90-degree twin-engined, air-cooled model; the Belsize-Bradshaw twin-engined air-cum-oil-cooled car; and the new G.W.K., among many others that might be cited. In some cases,

such as the last named, the rear pair of springs are set at a tangent in relation to the side members of the frame, the idea being to damp out rolling tendencies. In the Wolseley system, which is the most highly developed of all, some of the patents employed damp out rolling tendency despite the fact that the springs are parallel with the side members of the frame. Of course, one of the difficulties of copying a development of this sort is the fact that the builder has to go warily or he will find himself falling foul of the pioneer's patents.

"THE BATTLE OF THE CYLINDERS" STARTS AFRESH.

Inasmuch as the outstanding novelties of the Paris show were dealt with in the JOURNAL of October 15th (p. 611 et seq.), this is not the occasion to touch on those matters afresh, save to point out that the most important of these novelties are to be seen at Kensington to-day; in this connexion particular attention should be paid to the new small Panhard, Delaunay-Belleville, Chenard-Walcker, Renault, Delahaye, Delage, Voisin, Ballot, Minerva, Citroen, Bugatti, Vinot, Zedel, Salmson, and such-like types. A study of the chassis details of these vehicles will particularly repay attention. Nor must one overlook the types standardized for a year or more but now brought forward at much lower prices, as instance, notably, the post-war designed 10-h.p. and 15-h.p. Fiat from Italy. I am, of course, dealing with middle and small-size vehicles, in which connexion it will be observed that the average Continental constructors use the four-cylinder water-cooled engine, which is even employed for the 5-h.p. Citroen and the new 7-h.p. Mathis, which latter will, I am afraid, not be shown at Olympia. At least, that was the situation at the time of going to press. By contrast, in this country, owing to the great success achieved by the air-cooled Rover, it will be seen that a large number of makers, including B.S.A., Belsize, Short (the aeroplane builders) Ashby, and so on, are using the air-cooled engine and are reverting to the two-cylinder type, of which we find examples in, among others, the horizontal, flat, opposed, 7-h.p., water-cooled, side-valve engine Wolseley, which is another novelty. Apparently many constructors imagine that the only possible way "to go after the Rover market," as the trade styles it, is to have some form of two-cylinder engine. It can be made with a much better balance than when it was designed as a horizontal type in the very early days. For example, the 90 degrees and 60 degrees can be designed to give quite a good balance; and the horizontally opposed type has really an excellent balance. But the surprise sprung on the exponents of these schemes by other members of the British industry has been reserved until the last moment and is something in the nature of a dramatic coup—as instance, the introduction of the miniature four-cylinder engine with overhead valves of the 8-h.p. rating by Standard, Talbot-Darracq, and Talbot.

THE CAMPAIGN OF PRICE REDUCTION.

Of course it is impossible on the mere ground of costs for these vehicles to rival the air-cooled Rover. But the astonishing point is that they run at least neck and neck with the average of other two-cylinder cars on the market. Some of the Continental four-cylinder overhead valve types will be sold in this country at prices that will certainly compete. For example, the price of the B.S.A. two-cylinder air-cooled overhead valve Hotchkiss engine car is £340, whereas the Talbot-Darracq four-cylinder overhead valve water-cooled proposition is £325. The former engine gives about 18-b.h.p. at 2,600 r.p.m., and the latter 20-h.p. on the break, it being set in a chassis that weighs 7 cwt. These last-moment developments—the Talbot-Darracq was not announced until just before the opening of the show—are confirmation of the forecast I made when last writing on the subject to the effect that the two-cylinder air-cooled engine's chief sphere is that, wherein it is possible to produce it to sell cheaper than any rival product with four cylinders, whether air- or water-cooled, or with side or overhead valves. It is only necessary to consider the prices of the Belsize-Bradshaw £275, Crouch £285, B.S.A. £340, two-cylinder side-valve water-cooled Wolseley £310, and so on, to realize that the more expensive types of two-cylinder engines do not constitute serious rivals, on the grounds of price, to the cheaper four-cylinder vertical engine propositions, such as

the 8-h.p. Standard £325 and the 8-h.p. Talbot-Darracq £325. On the other hand, neither the Talbot-Darracq nor the Standard compete with the Rover at £220. It must be had in mind that for every 10 per cent. that can be taken off the price of a vehicle between the £200 and £350 range, the public to which it appeals is multiplied manyfold. It appears that most of the designers of new style two-cylinder vehicles had no notion, on the one hand, of what large saving it is possible to effect in cost when, the period of experimenting being over, orders can be placed for raw materials in vast quantities, as for the 8-h.p. air-cooled Rover car, and, on the other, at what low prices certain firms are able to produce four-cylinder water-cooled engine vehicles. In addition to British enterprise in the latter direction, we must note the Continental work of Bugatti, Mathis, Peugeot, and Citroen.

The first message this show has for the medical man is that there is no need for him to indulge in experiment by buying cycle-cars. Nor, for that matter, need he buy unproved products, since the best proved ones are those available at the cheapest prices. But among some of the new style vehicles introduced there are some which, undoubtedly, will make a big reputation during the next twelve months. Therefore, if the individual medical man is not too much pressed for time, and has a talent for amateur mechanics, he may get good service out of some of the entirely new models introduced this year.

SPHERE OF THE AIR-COOLED ENGINE.

We are far removed from the early days of the cycle-car, when the motor-cycle V-twin engine was mounted on a four-wheeled chassis to which it imparted an uncomfortable degree of vibration and through which it transmitted power by very crude and elementary mechanism. Yet, even in present practice, a certain design of 90 degrees twin air-cooled engine has gained a name rather for performance than for silent running, a point that applies in lesser degree to the horizontally opposed twin type. The strength of the Rover offer rests on the fact that it sacrifices performance to a degree that is not material to the average user in order to achieve quietness of operation to a degree that is most notable and desirable. It would appear that, on technical grounds, the noise developed by the working of most air-cooled engines in small cars, is due to the ringing of the cylinders and to the poor design of valve gear details. The "clothed" cylinder type of engine, wherein the crank case extends above the cylinder walls, should do away with much of such annoying resonance. Doubtless, in the fullness of time, power and silence will be combined in one design. But at the moment quite sufficient power is available, and silence has been obtained to a reasonable degree in the one outstanding example. It could be exploited by all the manufacturers who have introduced two-cylinder air-cooled vehicles, for which, however, I do not predict a great future unless they can be produced to sell at prices that cannot be matched by any four-cylinder type. Of course, at this period some buyers will favour certain types of two-cylinder vehicles that give pronounced speed performance with the inevitable noises. That sort of machine, however, is not to be recommended for the medical man; one reason is that the effect on the nerves is very trying if the driver has to sit behind an engine of that sort week after week, year in and year out. Refinement of working is a very important point in the prevention of fatigue. Further, too many of the small machines put on the market with various sorts of engine that give spirited performance are distinguished by cramped body accommodation, a fault that applies incidentally to most of France's popular car productions.

FOR THE COUNTRY DOCTOR'S USE.

Medical men should always look very carefully at the body scheme, and see that it is such as not to involve a quarter or a third of the driver's body being exposed to the wind owing to the narrowness of the wind-screen, the clipping of the scuttle scheme to achieve streamline form on a miniature body, and so on. Meantime the principle of air-cooling may be accepted as satisfactory for engines of the capacity and type we have been considering, for it has been shown on hills in Devonshire and elsewhere that some of these engines can stand hill-climbing within reason. If my district were mountainous I do

not know that I should buy an air-cooled engine for service year in and year out; but where it is a case of anything like average country, including hilly districts, I should have no hesitation in acquiring an example of really proved practice. It must be had in mind that these types are proportionately powerful for the weight they have to move. For example, the Rover engine develops quite 14-h.p., so that there is 1½-h.p. per cwt. of vehicle. Again, the A.B.C. air-cooled car, which has been on the market for over a year, can be taken from the West End of London right through the crowded thoroughfares of the City, and back again, for a couple of hours, crawling behind omnibuses, and so on, yet it will not become overheated. An air-cooled engine has to be made well by experts, for its shortcomings as a type; and without reference to any particular manufacturer, include unreliability due to poor workmanship and material; excessive oil consumption; insufficient attention to detail; general lack of refinement; and relatively unsatisfactory balance. As usual, it is a case of commercial competition. The firm with the best headwork, going about the business determined to make a success of it, will launch nothing without due preparation, and will succeed in getting the business because its product will give reliable if not showy service. But for every one that so succeeds at least a dozen would-be successful concerns are destined to failure because they have not taken the essential preliminary precautions.

THE COMING VOGUE OF 1½ AND 2 LITRE ENGINES.

Having dealt with machines that come within the £350 and lesser price class, I now turn to a consideration of developments in the direction of nominal 10-h.p. to 14-h.p. machines. It is, however, necessary to point out first that the movement for providing greater horse-power for a given vehicle weight is general in British practice—at least, as far as machines up to the £16 tax are concerned. The tendency of the year's introductions of new models is, at last, to give attention, not to that minority of motorists who brag about speed attained on the flat, but to the vast majority of users who never want to go at excessive speeds along the level, but who wish to climb hills without effort, and like a car to accelerate in a manner which gives pleasure to the rider. From the moment engines were made more efficient and flexible it was possible to do this. But designers were conservative. Now, however, they have learned their lesson, with the result that we have small engines that have an excellently even torque, which is to say they develop good power practically throughout their range of crankshaft revolutions. This evenness of torque, combined with proportionately much lower gearing and lighter vehicle construction, enables a car to pick up in a way which has not been possible hitherto in the case of the middle and smaller classes of machines. We are at the opposite extreme of the early days of motoring, when every engine was overloaded and every car geared too high. Now we keep the power plant functioning well within its powers of performance.

It is plain that a new classification for motor engines may be expected in a very short time. One of the first of these is the two-litre size, which has been decided on by the French Automobile Club for the large car race for the Grand Prix next year. I remember being ridiculed in the technical press when, in 1914, I suggested that the small car class should be brought down to two litres at most, and that the large car class should be reduced to three litres. The latter was the size for the race this year. Now it is to be abandoned as being too large. Nowadays 130-h.p. can be got out of a three-litre engine, and proportionately good power out of a two-litre one. As to standard practice, there is introduced at the show the famous Ballot two-litre car, this being the only notable recruit to the industry of car building on the Continent this year.

EUROPEAN VERSUS AMERICAN POLICY.

It occurs to me while writing these notes that it is remarkable no mention can be made of American contributions to these developments. The plain fact is that I know from technical developments in the United States that many new points are introduced to U.S.A. chassis this year for buyers in the States. But those new points are not illustrated at the current exhibition, and vehicles embodying them are not available for purchase in this

country. Nor is this the only reason why I am bereft of material under this head. The American industry in general has decided, in the present conditions governing manufacturing operations in that country, that it is not possible to follow the lead of the foremost European houses in evolving these new-style small engines. Such engines require to be made to very close engineering limits: American builders do not think that a commercial proposition. That is fortunate for bankrupt Europe. It is precisely what our best motor engineers can achieve. Any visitor to the present show would be well advised to look at the design and the quality of the workmanship. The two-litre engine is illustrated by the introduction of a two-litre engined Minerva from Belgium; and, again, by a nominal 14-h.p. two-litre engine Sunbeam, and a similar type of Talbot car, both designed by Mr. Louis Coatalen. Round about this category there are many others, including the six-cylinder Singer F.A.C. types. Another size of engine which will certainly be adopted increasingly as a type—in face of the resumption by the Royal Automobile Club of racing in the Isle of Man with 1,500 c.cm. engine cars next year—is the 1½-litre engine. That was the limit for the 200 miles race at Brooklands recently, and, at an earlier date, for the French Voiturette Grand Prix race, and, earlier still, for the Italian Grand Prix race. The last named event was won by Bugatti cars at seventy-two miles an hour on a flat and straight course; the French Voiturette race at Le Mans was won by Talbot-Darracq at the same speed, though the course abounded in curves and varying gradients; therefore, by contrast to the Italian circuit, in France it was necessary to apply the brakes and to accelerate very often. The Brooklands 200 miles event was also won by Talbot-Darracq at 83.89 miles an hour, all which should be supplemented by the information that it is possible to-day, given fine weather as well as sound tyres, to travel 100 miles inside an hour on the track at Weybridge with a car of this engine volume. Before the war we should have thought it too small for a cycle car.

NEW CARS OF NOTE.

As far as standard practice is concerned, we have at this exhibition, not a racing machine but an overhead valve engine 1½ litre, nominal 12-h.p. Talbot-Darracq which has half-elliptic rear springs, therefore its suspension is pliant and has nothing to do with the solid non-resilient type of springing needed for racing. Again, the car has a plate clutch, therefore the gear changing is rendered easy. Other examples could be cited, though, apparently, in face of the tardiness of the European industry to resume races after the war, designers have wobbled very badly and have not built their engines quite closely to these limits. Thus we get some going in for approximately 1½ litre engines, others for about 1½ litre. But the generality are not at all "tidy" in their choice of volumes. In this connexion it would be far better if developments aimed always at certain definite volumes, since it is possible by these means to promote that healthy form of competition between manufacturers, even if they do not go in for racing, which makes for the maximum rate of progress in the minimum of time by gaining the greatest amount of interchangeable experience at the least cost. Nevertheless, under the heading of complete novelties in the relatively small car classes, I would advise the visitor to make a note to inspect the following, though not all of them are necessarily suitable for medical men. The point is that it will take but a few moments to glance at them, and by doing so the least technical visitor will begin to observe points (too numerous to be set out here), which will give him a basis for judging more accurately those designs which will be of service to him. All the cars mentioned in the following list are absolutely new models; it is not possible to give the prices in all cases at the time of going to press:

- £18 tax, six-cylinder, overhead valve, Armstrong-Siddeley, £575 chassis.
- £9 tax, 90 degrees twin-cylinder, air-cooled, Belsize-Bradshaw, two-three seater, £275.
- £10 tax, overhead valve engine 90 degrees twin-cylinder, air-cooled, B.S.A., with electric engine-starter, two-three seater, £340.
- £16 tax, six-cylinder A.C., 1,990 c.cm., with three forward speed gear-box embodied in the overhead worm-driven back axle; two-seater, £683.
- £8 tax, 5-h.p., four-cylinder, water cooled Citroen; two-seater.

- £8 tax, 7.9-h.p., V-twin, four-wheeled Coventry-Premier; two-three seater, £250.
- £9 tax, 60 degrees twin-cylinder water-cooled engine Crouch with quarter-elliptic springs fore and aft, the front pair on a super-imposed principle, and original steering design; two-three seater, £285.
- £20 tax, double sleeve valve engined, four-cylinder Daimler; chassis, £700.
- £13 tax, four-cylinder, four-speed Delage, with four wheel brakes.
- £12 tax, overhead valve engine Hotchkiss.
- £14 tax, four-cylinder, double sleeve valve engined Minerva, with cantilever rear springs; chassis, £670; five-seater, £895.
- £10 tax, four-cylinder, French-built Sa'mson, with three speeds forward, quarter-elliptic fore-and-aft springing; two seater, £285, with lighting set.
- £13 tax, 14-h.p., four-cylinder, push-rod operated overhead valve, aluminium engine Sunbeam, with battery ignition and cantilever rear springs; chassis, £575; four-seater, complete, £725.
- £16 tax, 15-20-h.p., four-cylinder Straker-Squire, with four-speed gear-box; four-seater, £725.
- £12 tax, 11-h.p. Star, with single-plate clutch, central gate change; chassis £395; two-seater £495.
- £10 tax, four-cylinder Singer, with quarter-elliptic springs fore and aft, and three forward speed gear-box; two-three seater, £395.
- £16 tax, 15-h.p., six-cylinder Singer, with three forward speeds and cantilever rear springs; four-seater, £675.
- £8 tax, four-cylinder Short-Ashby friction-driven two-seater, with central epicyclic gear control, cantilever rear springs, transverse front spring; complete £275.
- £11 tax, 1½ litre 12-h.p. overhead valve four-cylinder engine Talbot-Darracq, with Delco ignition and electric starter, a single-plate clutch, three speeds forward, gear-box bolted to engine, spiral bevel final drive, cantilever rear springs; chassis £545; complete car, £596.
- £11 tax, 10.5-h.p., four-cylinder Calcott, with three speeds forward, spiral-driven back axle; two-seater, £350.
- £14 tax, 14-h.p. Vauxhall, with aluminium alloy pistons, engine starter housed at rear of crank-case casting and dynamo at front, three forward speeds, spiral bevel-driven back axle, cantilever rear springs; four-seater open car, £750.
- £9 tax, 7-h.p. horizontally-opposed twin water-cooled cylinder Wolseley, with aluminium pistons, Blic battery, and coil ignition, three speeds forward, quarter-elliptic springs fore and aft; two-seater car, complete with electric engine starter, £310; without starter £295.
- £21 tax Vulcan, with split single-sleeve valve Howard four-cylinder engine and overhead worm-driven back axle; five-seater, £1,050.
- £8 tax, 8-h.p., 970 c.cm., four-cylinder water-cooled overhead valve engine Talbot-Darracq, with Delco electrical apparatus, single-plate clutch, three-speed gear-box, spiral-driven back axle, quarter-elliptic fore and aft springs; two-seater, complete, £325.
- £14 tax, 2 litre, four-cylinder, 16 overhead-valves engine Ballot.
- £9 tax, 10-h.p., four-cylinder monobloc Knight double sleeve-valve engine Panhard with reversed quarter-elliptic rear springs; four-seater, £615.
- £9 tax, four-cylinder double sleeve-valve engine Voisin.
- £13 tax, 12-h.p. Delaunay Belleville, with four-speed gear-box, pressed steel welded back axle; four-seater, £760.
- £13 tax, 12.1-h.p., four-cylinder Delahaye; chassis £480.
- £12 tax, 11.8-h.p., Vinot, with overhead-valve engine; chassis, £550.
- £13 tax, 12.1-h.p., Chenard-Walcker with overhead valve engine.
- £10 tax, 1,496 c.cm., overhead valve Dorman engine, four forward speeds, spiral bevel gear driven Seabrook with fabric disc joints at either end of the propeller shaft; two-four seater, £475.
- £10 tax, 8-h.p., four-cylinder overhead valve water-cooled engine 11 cwt. Standard three-speed car; chassis, £275; two-seater, complete, £320.
- £13 tax, 14-h.p. two-litre four-cylinder overhead valve aluminium engine Talbot with three forward speeds and cantilever rear springs; four-seater touring car, £725 complete.
- £12 tax, 14 cwt., four-cylinder Wolverhampton-built Turner petrol car with four speeds forward, worm-driven back axle, quarter-elliptic rear springs; four-seater, complete, £550.

PROVED AND IMPROVED DESIGNS.

In addition to these novelties, attention should, of course, be given to the progress made by those manufacturers who introduced new style cars at the two previous post-war shows in London. This is particularly needful at the moment, in that there have been great reductions in prices. I am not referring to those vehicles that are a drug on the market, but to designs that are really up to date. These changes have been rendered possible by the more settled state of engineering labour, and by obtaining raw materials at lower cost. Under this head may be instanced the proved overhead valve engine, wholly post-

war practice, 10-h.p. and 15-h.p. Wolseley cars, now available in considerably improved form at much lower prices. These are the sort of vehicles that have been copied by many of those who are introducing new schemes this year. Again, we have the four-cylinder side-valve engine 12-h.p. Rover, introduced in improved form as to detail, and at a very much lower price—namely, £650 complete. It is the cheapest of the 2½ litre engine cars of British construction by a house of repute at this exhibition. Again, I have not included in the foregoing list of new models the 3 litre overhead valve engined 16-h.p. Sunbeam car, the power plant of which develops 60 h.p., and which is capable of a mile a minute, though its taxation rating is low. Of course it is a big departure for this pioneer Wolverhampton firm to have turned over entirely to overhead valve engines for all its models; including the 24-h.p. 6-cylinder type. The chassis of the 16-h.p. is merely developed in detail to accommodate the much more powerful plant now furnished to them for the same taxation rating. The complete vehicles, too, are put on at low prices, particularly when one examines the details of the design and production of the overhead valve gear employed. This is not what may be called the cheaper commercial type with push rod and rocker mechanism, but, like the Wolseley, it is an expensive design. Both are quite distinctive. The two larger Sunbeam models have four valves per cylinder. Than these no firms have more experience of the overhead valve engine. But where there are scores of new style cars it is impracticable to deal with each in detail. Instead, I would give passing attention to a few general tendencies.

ALL-WEATHER BODYWORK.

Apart from this being a year of cars that are cheaper, power for power, accommodation for accommodation, the cars are cheaper to run, and they are furnished in more complete fashion, as witness, notably, the Humber, Rover, Swift, Standard, Wolseley and such-like vehicles standardized complete with entirely original hood schemes that embrace, between them, some important points for the medical man. In short, we have arrived at a big forward stage in the development of the all-weather body without involving the production of an appreciably heavier, or a more complicated, vehicle, than the type that has formerly been equipped merely with what used to be styled a Cape cart hood. As to hood gear in general, it will be observed that a number of these types—for instance, the Rover—have the extension arms spring loaded. In other words, these arms might be spoken of as compensated, because practically no muscular effort is needed to raise, or lower, the particular hood. Independent of this hood gear, but designed in conformity with the scheme of it, the front and back doors are provided with windows fashioned some of aluminium, others of specially stiffened fabric, the opaque portions being generally of celluloid, whereby in stormy weather the vehicle can be turned in a few moments into a completely weatherproof machine enclosed as much as a saloon. Of course the cheapness and lightness of the innovation is notable. Nor is this all. These new "dummy" windows, which are made to open and close with the doors, are quite independent of the hood scheme, and can be kept up in fine weather when the hood is down. Therefore they are made to serve as wind or dust screens for the occupants of the front and of the back seats. Another development in this direction is illustrated admirably in the standard Humber bodies, wherein a form of wind-screen for the occupants of the back seat—quite different from the clumsy contraptions we have had in the past—is incorporated to fold out of sight when not in use, yet it is immediately accessible and takes but a moment to put into place, and does not interfere with easy access to the doors.

THE ACHIEVEMENT OF GREATER COMFORT.

The combined rear scuttle and screen will well repay the study of the medical man, in that the Humber arrangement completely protects the occupants of the back seat, just as the occupants of the front seats in cars with scuttle dashes are protected. The whole thing is very neat and light, striking a new note in coachwork details. Wolseley, Singer, G.W.K., and Swift are also doing good work in this connexion. It is far better to fit

devices of this sort than to place on the instrument board of a car the unnecessary clock, which seldom functions reliably. Hence its welcome disappearance from a number of specifications of standard cars. Another point is that the central gear change control tends to fall out of favour. This is natural, because it fouls ladies' dresses, and so on, especially in cars with front seat accommodation clipped to achieve streamline effects. But weight and material are being saved by the use of banjo type back axles such as were originated by Maudslay at a period when its production was expensive. Afterwards the principle was taken up in America, so that it is now one of the cheapest types, its only rival being the back axle fashioned out of two pressings bolted together, which is certainly quite the cheapest and also one of the strongest forms possible. The system saves weight. It is really a principle evolved by Lanchester years ago. In nearly all cases where new designs are employed manufacturers appreciate post-war driving, and see to it that the foot-operated brakes do not act on the countershaft and through the transmission gear, but on the back wheels.

MECHANICAL TENDENCIES.

The British industry lags behind the French one in the adoption of front wheel brakes, the ultimate coming of which into general use is now assured in that M. Henri Perrot's diagonal principle is supplemented by a really notable invention, by a French artillery officer named Hallot, wherein centrifugal force is so employed that, as the wheel slows, the braking effort becomes less until, the moment the wheel stops, the brakes are withdrawn automatically. Thus, should a wheel become locked during the application of the brakes, that wheel is forthwith released immediately and completely, so that skidding is impossible on that score. The single plate clutch and the spiral bevel-driven back axle all gain adherents. The worm drive retains its partisans, but does not gain any. The popularity of the bevel drive wanes. One interesting feature in connexion with the worm drive is the use of it by Lanchester to drive the magneto, a very notable refinement of which more may be seen. As for the magneto itself, it loses adherents, while dynamo-battery ignition gains a number. Carburation is now arranged much more generally with devices to control the mixture under varying conditions of service. Aluminium is much more used for making lighter parts; but the industry in general hesitates to use it for pistons. Horstmann of Bath shows a machine with foot-operated mechanical engine starter, and the new 8-h.p. Standard can be started either by crank in the ordinary way or by a lever beside the driver. The three-speed gear-box gains greatly in popularity here, though not so much on the Continent.

VALVES, GEAR-BOXES, AND SUSPENSION.

There is a tendency for British constructors to build neat gear-boxes, bolted on the front ends of the torque tubes, though Singer has changed its practice in this connexion, and puts the gear-box in conventional position, instead of incorporating it in the back axle of the small car. As to taking the drive, the spring method is falling gradually out of popularity, for even on the new 18-h.p. six-cylinder Hotchkiss car, with a very original overhead valve operation mechanism to ensure silence, the drive is no longer taken through the springs but through a torque tube to the midmost frame transverse member. Other original valve gear is to be found on the Vulcan car already mentioned and on the Voisin machines. Wiring installations in connexion with electrical gear are very much improved. As to the growing use of the cantilever spring, it is noteworthy that very few of the Continental manufacturers trust it entirely for the rear suspension; French and Italian makers prefer to supplement it with devices for damping out oscillations when travelling at speed along the road. On one model Renault sets the rear springs at an angle to the side members of the frame, in place of parallel with them. Generally, in smaller constructions the gear-box is bolted up with the engine. "Straight-eight" engines are exploited only by the larger firms, with the solitary exception of Bugatti, who makes a 3-litre model of this sort. All the British makers introduce smaller cars than their previous models, with the exception of Singer and A.C., who introduce six-cylinder types, but as they are rated at only 15-h.p. each it will be

appreciated that they are not large cars. For the small constructions fabric disc universal joints are increasing in use, Citroën being among those employing them. The straight-sided tyre has not materialized to the extent we were promised. But this is probably due more to extraneous circumstances, such as trade depression, than to normal mechanical tendencies. Therefore visitors to the show would do well to study the interesting exhibits in the tyre section by the leading manufacturers. When trying cars medical men may be advised to pay little heed to the registering of the speedometers on them; to form poor opinions of vehicles that have to be rushed at rises to climb them promptly; and to remember that a car that is noisy, ill-sprung, or given to vibrate will deceive the passenger as to the speed at which it is travelling, because it will give the impression of going faster than is actually the case. On the other hand, the more refined a vehicle the more likely it is that one will underestimate its speed.

Medico-Legal.

FRAUDS ON MEDICAL MEN.

AT Greenwich police court on October 11th a man named Edward Thomas Johnson, described as an insurance broker of Forest Hill, was charged on remand with fraudulently converting to his own use the proceeds of a cheque for £15, of which he was bailee, the property of Dr. Denys Hallett. A clerk, W. H. Tomlin, was charged with being concerned with Johnson in obtaining the £15; also with obtaining other sums from other persons by false pretences. According to a report in the *Woolwich Herald* (October 14th), Mr. Lewis, for the Public Prosecutor, said that the prisoners had made statements admitting the offences, and Johnson had given a list of the doctors from whom he had obtained money. It appeared that Johnson wrote a letter to Dr. Hallett, in which he said it was necessary for him to arrange with a doctor in his district to examine candidates for life and accident insurance; that the fees would be one guinea for life insurance and 10s. 6d. for accident; and that he would be guaranteed 60 guineas in the year. The medical man accepted the position, and at Johnson's request agreed to effect an insurance on his own life, paying Johnson £15. This sum Johnson converted to his own use. The man Tomlin and a youth named Morris were sent to Dr. Hallett for examination, false addresses being given. In the other cases a similar procedure was adopted by the prisoners. Both prisoners pleaded guilty and expressed regret. The magistrate, Mr. Disney, committed Johnson for twelve months' hard labour, and Tomlin for six months.

The report of these proceedings in the Greenwich police court comes opportunely. As lately as September 17th we published in the SUPPLEMENT a Current Note headed "Insurance Policies: A Warning," reminding medical men once more to be on their guard against making payment to persons calling upon them and representing themselves to be insurance brokers. The warning was prompted by a particular case brought to the notice of the British Medical Association, in which a person representing himself as an insurance agent offered a doctor medical examinations for various insurance offices on the understanding that he took out a policy through his agency. We understand that the Medical Defence Union has received several complaints against the man Johnson and his accomplice, and had already put before the Public Prosecutor the facts of two cases of a similar character, although neither of these formed the subject of charges at the Greenwich police court.

THE Society for Cinematographic Instruction, New York, has devoted the past eighteen months to experimental work in hospitals and laboratories in order to ascertain the applicability of the cinematograph to the study of medicine, surgery, and dentistry; it is stated to be possible to record accurately and permanently every detail of any minor or major surgical operation. The society intends to establish a central cinematographic library in New York, and members and institutions will be able to rent or purchase at a nominal charge copies of the films. An exchange arrangement, we are informed, is also being negotiated with the medical profession in a number of European countries. Dr. James S. Edlin, New York, is president of the society.

FIGURES compiled by the Department of Public Welfare of the City of New York show that in 1918 there were 116 drug "addicts" under the care of the city hospitals, 339 in 1919, and 493 in 1920; for the first six months of the present year there were 337. The number of cases of alcoholism under the care of the city hospitals in 1919 was 1,145, in 1920 it was 1,024, and during the first six months of 1921 there were 567 cases.