THE OLYMPIA MOTOR SHOW.

NEW STYLE MOTOR CARS FOR MEDICAL MEN.

By H. MASSAC BUIST.

THE International Motor Car Show was opened under the patronage of the King at Olympia, Kensington, on October 17th, and will remain open until the evening of Saturday, October 25th, Sunday excepted. The charge for admission on Monday, Tuesday, Wednesday, and Thursday will be 5s., on other days 2s. 6d. The hours are from 10 a.m. to 10 p.m. on each day. This is the eighteenth show organized by the Society of Motor Manufacturers and Traders, and it is a little unfortunate that again this year it is taking place during the period of a general election.

Visitors will find that drastic reductions have been made in the cost of the cars shown; these reductions have been effected not only to clear stocks, but also because many individual enterprises have embarked on quantity production to an extent hitherto unknown in British practice. The reductions are the more remarkable because the British trade is heavily taxed and is badly situated with regard to labour costs. The trade in the United States is protected by a 25 per cent. import duty, while the French industry is protected by a 62 per cent. tariff, and wages in France are something less than a third of those paid in this country. It is encouraging to find that in many instances British-built vehicles are being sold at prices which are competitive with foreign products. This applies not only to the so-called "light cars," but to middle-size cars also. It is quite a mistake to accuse the British motor industry of want of enterprise; this exhibition shows that it has answered the challenge created by the unequal competition due to the tariff laws of other countries. The result of the broad-minded policy pursued by the Society of Motor Manufacturers and Traders is that the British public, including, of course, medical men, can choose from the cream of the output of motor factories of foreign countries as well as of their own. All that is asked by the British industry in connexion with the present show is that, given equivalent merit at approximately the same prices, the home-built car should be chosen, thereby giving employment to British labour.

NEW CHASSIS TYPES.

This year's show is remarkable in that its prime interest lies not in the introduction of quite new chassis types but in the fact that it is representative of the current motor manufacturing enterprise of all parts of the world. The reasons for the relatively few changes are twofold. In the case of many manufacturers their existing models have been developed in detail because they were introduced as entirely new types either one, two, three, or four years ago. Having proved successful, the practical thing to do is to refine and otherwise perfect them as opportunity offers and further experience is gained. The other reason, unfortunately, is that there remain, quite inevitably, a number of car types, made both by foreign and by home builders, which have been over-produced and which have to be cleared. There is a sound reason for the introduction of each of the new cars. There has never been more commendable designing in general than characterizes the novelties introduced, and this applies to the evolution of the small-engined car, as distinct from the small car of cramped accommodation—two absolutely different things, which American experts still fail to appreciate but which should be fully grasped by even the non-technical British public, albeit this is not yet always the case.

NEW CARS.

The entirely new home-built types presented for the first time at a motor exhibition are as follows:

20/40-h.p. £20 tax "straight-eight" cylinder 2,493 c.cm. Belsize with four wheel brakes: chassis £695; saloon-landaulette £1,050.

£16 tax 1,991 c.cm. overhead valve six-cylinder engined Marlborough "sports type" chassis with front wheel brakes, £400.

18/55-h.p. £19 tax overhead valve 2,540 c.cm. six-cylinder engined Talbot car with internal expanding front wheel brakes on a six

brake system; four speeds, right-hand controlled; complete with five-seater all-weather equipment, £825; seven-seater saloon-landaulette £1,090.

12-h.p. £12 tax 1,699 c.cm. side valve four-cylinder engined Arrol-Johnston, with four wheel brakes: four-seater complete, £360.

15/45-h.p. £16 tax 1,991 c.cm. six-cylinder engined Calthorpe chassis with Rubway contracting band front wheel brakes: chassis £318.

45-h.p. £52 tax 8,458 c.cm. double-sleeve valve six-cylinder engined, 18 ft. 4 in. wheel base, 60 in. track Daimler chassis with four wheel brakes—the largest chassis yet standardized—£1,400.

14-h.p. £14 tax 1,944 c.cm. four-cylinder engined Gwynne chassis: £360; four-seater £410.

9/20-h.p. £9 tax overhead valve water-cooled four-cylinder 1,074 c.cm. engined Rover one-door four-seater, complete with electrical engine-starting and car-lighting as well as all-weather equipment, three-speed gearbox, worm drive, balloon tyres, £185; three-door four-seater on longer wheel base, with *de luxe* body, £215.

14/45-h.p. £14 tax four-cylinder overhead valve (overhead cam-shaft driven) 2,120.57 c.cm. engined four-wheel braked Rover, with right-hand controlled four-speed gearbox, bevel axle driven, enclosed internal expanding mechanically controlled four wheel brakes, with Dunlop balloon tyres and a mile-a-minute speed capacity: five-seater complete, £550.

In regard to entirely new types from abroad the 15-h.p. sports type overhead valve engined Lorraine may be mentioned; each and all are meritorious cars of their kind, but relatively few of them concern the average medical man. Of the Rover types, the earliest information was published in these columns last month when the chassis were described in detail. For the medical man who wants great powers of acceleration and good hill-climbing capacity the Talbot is worthy of remark. It is economical in fuel, tyres, and tax in relation to its performance and great durability. It is by no means experimental, for it was designed by Mr. Louis Coatalen, the Sunbeam engineer, and its main details are uncommonly like a more up-to-date version of the smallest six-cylinder engined Sunbeam car, which is not now listed. The Talbot is built at Kensington by the new management, and it represents the latest practice of the firm; it is of a type which ought to restore it to the enviable position it enjoyed in the larger middle-size car market before the war.

From Canada come the £22 tax 3,102 c.cm. overhead six-cylinder monobloc engined Buick five-seater, £395, with contracting band front wheel brakes and balloon tyres; also the £28 tax 3,995 c.cm. side valve six-cylinder engined three-speed Studebaker with hydraulically controlled expanding shoe four wheel brakes, four- or five-seater, £415 complete.

13/35-h.p. £13 tax 1,873 c.cm. four-cylinder engined Triumph with balloon tyres, Lockheed-hydraulic four wheel brakes, Enots grease gun lubrication to the chassis, and Marles steering gear, saloon £495 complete.

18/50-h.p. £18 tax 2,850 c.cm. four-cylinder engined Swift with four speeds controlled by the right hand, large diameter rear wheel brake drums equipped with two sets of shoes mounted side by side, one pedal operating in synchronism with Perrot type front wheel brakes and the other (outer) set controlled by hand lever: touring model £595 complete.

America introduces the six-cylinder Lockheed-hydraulic four wheel braked, three speed, semi-balloon tyred Chrysler touring type at £465; and the smallest four-cylinder car made in the U.S.A., the 16/45-h.p. £17 tax 2,378 c.cm. Rollin designed by Mr. Rollin White, of White Steam Car fame, with internally expanding four wheel brakes, balloon tyres, disc wheels, "one-push" oil gun chassis lubrication, system three-point rear suspension: five-seater £343.

From France comes the 15/50-h.p. £16 tax 2,484 c.cm. four-cylinder engined front wheel-cum-transmission internal expanding shoe braked Berliet chassis at £450; the 16-h.p. £16 tax 3,016 c.cm. four-cylinder engined Chenard-Walcker with no brake drums on the back wheels, all braking being through Hallot automatic servo on the transmission shaft and on the front wheels in synchronism, on a system which ceases to operate directly the wheels lose momentum, in other words, the moment the wheels become locked; the 20-h.p. 3,745 c.cm. overhead valve six-cylinder engined Hispano-Suiza with the firm's distinctive four wheel braking system; and the £12 tax 10-h.p. 1,552 c.cm. double-sleeve valve engined Voisin with exhaust vacuum controlled Dewandre front wheel brake system.

EXAMPLES OF NEW PRICE SCALES.

It may not be good policy to take a car in its first year of production unless it follows, in the main, a design of which the given firm has had long previous experience, and there-

fore embodies nothing experimental. A medical man wants a car that is not merely low in price, but which will not cost him much in taxation: the tyre, fuel, and lubricant bills of which shall be moderate; which shall be a good hill-climber, of reasonably good acceleration, and equipped for all weathers. Hitherto many a small car that has fulfilled most of these requirements has failed in regard to the accommodation for driver or passenger.

It is in this connexion that the most all-round progress has been achieved by the industry, as well as in reducing prices, this year. Take Coventry's contributions alone, and observe the excellent fruit that the pioneer work of the Standard Company is bearing now in other directions. That concern was the first to appreciate that when a small engine is put in a car, if that vehicle is to be useful it must provide full scale accommodation for driver and occupant. This year we find among Coventry's products the 10-h.p. Singer, the 10-h.p. Swift, the 11-h.p. Hillman, the 9/20-h.p. Rover, and so on, all marketed with greater accommodation. That this applies also to Birmingham is shown by the developments in connexion with the 11/22-h.p. overhead camshaft-driven overhead valve Wolseley, the accelerator pedal of which is now placed on the extreme right, thereby affording much more leg room. Other

FIG. 1.—De Dion Bouton 12/28-h.p. Coupé-cabriolet 2/4-seater. Interior of bodywork showing occasional seats drawn forward.

examples from various parts of the country could be cited, but a few illustrations of each point must suffice.

It is highly satisfactory to note—and on this point the medical man should be careful to investigate for himself—that where chassis have been lengthened to provide more body space, generally they have been strengthened in section proportionately; this is essential. Many chassis are made wider. The practice of fitting balloon tyres to small cars is almost universal. The popularity of the Dunlop cord type, which scores of manufacturers are standardizing, is observable. Provided the steering is designed properly, this is the class of vehicle for which the balloon type of tyre is really needed, and on which it can be made eminently satisfactory. In connexion with larger scale cars it is to be observed that America favours the use of the balloon tyre of the straight-sided variety; whereas few manufacturers on the Continent follow this example, though they are willing to supply such tyres as an extra to the buyer's order—in other words, on the purchaser's judgement, not on the manufacturers'. Practically the same situation obtains in regard to the industry in this country. This decision is not the outcome of lack of enterprise, but has a sound basis. The Belgian industry does an interesting thing in the case of some of the Minerva cars, which come under the heading of the full scale middle-size car, and which are equipped with what are styled "semi-balloon" tyres; in other words, tyres that are of not exaggeratedly large section nor of pronouncedly low pressure.

MODERATE PRICES.

While in nearly all cases development in detail is shown, as may be seen in regard to the scale of accommodation, nevertheless the most important appeal is under the heading of price, in which connexion we may take such well known all-weather equipped types as the following, and quote the figures to give an idea of the very widespread efforts that have been made to open a new series of possibilities to the medical man whose means are limited strictly.

£12 tax A.C., £275; £12 tax Arrol-Johnston, £360; Austin "Seven," £155; 8-h.p. Rover, £160; Morris-Cowley 2-seat, £175; 9/20-h.p. Rover 4-seat, £185; 10/26-h.p. Singer 4-seat, £215; 10-h.p. Swift 4-seat, £235; 11-h.p. Standard with Kineton 4-seat body, £200; 11-h.p. enlarged and widened balloon-tyred Hillman saloon, £385; 14/28-h.p. Morris-Cowley 4-seat all-weather equipped with four wheel brakes, £285; £12 tax 2-seat Bean, £335; £10 tax 2-seat Belsize, £280; £11 tax 4/5-seat Bianchi, £325; £10 tax 2-seat B.S.A., £240; £11 tax 2-seat Calcott, £265; £11 tax 2-seat Calthorpe, £235; £8 tax 2-seat balloon-tyred Citroën, £145; £12 tax balloon-tyred 4-seat Citroën, £225; £11 tax 2-seat Clyno, £175; £16 tax 5-seat Crossley, £395; £6 tax 4-seat Daimler, £600; £12 tax 4-seat Darracq, £425; £13 tax 2/3-seat De Dion Bouton, £475; £15 tax 4/6 seat De Dion Bouton, £650; £14 tax Delage 5-seat, £475; £16 tax 5-seat Delaunay-Belleville, £650; £24 tax 5-seat Dodge, £395; £16 tax 4/5-seat Durant, £188; £10 tax 4-seat Enfield-Allday, £350; £17 tax

FIG. 2.—De Dion Bouton 12/28-h.p. Coupé-cabriolet. Interior details showing occasional seats folded back.

six-cylinder Essex, £295; £11 tax 4-seat Fiat, £340; £23 tax 4/5-seat Ford, £125; £11 tax 2-seat Galloway, £265; £8 tax 4-seat Gwynne, £235; £11 tax 2/3-seat Hillman, £358; £8 tax 2/3-seat Humber, £240; £21 tax 5-seat six-cylinder Lorraine, £645; £11 tax 2-seat McKenzie, £250; £19 tax 5-seat Overland, £165; £11 tax 4/5-seat Peugeot, £295; £12 tax 4-seat Phoenix, £365; £28 tax 5-seat F.W.B. Studebaker, £415; £12 tax 4-seat Sunbeam, £570; £14 tax 5-seat F.W.B. 14/40-h.p. Sunbeam, £685; £9 tax 4-seat 10/23-h.p. Talbot, £365; £14 tax 4/5-seat 14/40-h.p. Vauxhall, £625; £11 tax 2-seat Wolseley, £275.

THE DOCTOR'S "OCCASIONAL FOUR" COUPÉ.

De Dion Bouton introduces this year, on a 12/28-h.p. four wheel brakes chassis, an "occasional four" coupé type of good interior illumination and notably easy access. The seat beside the driver is tilted forward when it is desired to enter, or to leave, the rear collapsible seats, which are accommodated very neatly when not in service. Ample accommodation is afforded for luggage when the rear seats are not being used. It is to be noted that the English fashion of rear suspension by cantilever springs is employed. Front wheel brakes have been incorporated in De Dion practice for some seasons. This type of all-enclosed body affords two really roomy front seats, sliding independently of one another on rails, and locked at once in the position most comfortable to the occupant of each.

The doors are uncommonly wide, one being provided on each side, so that it is possible to have direct access to the driver's seat. The front seats are built on the scissors principle

so that a light push on the back rest causes each seat to slide forward towards the windscreen, where it lies folded up out of the way, leaving a gap of 18 inches through which to pass to the rear seats. Even in the case of the driver's seat, which, of course, is impeded in its forward motion by the presence of the steering pillar, nevertheless 14 inches of space is available if it is desired to have access to the rear seat from his side. In the rear of the body are provided two folding seats each about 14 inches square. When not in use these slide out of sight into pigeon-holes in the rear squab. Those riding in these seats can face either forward or *vis-à-vis*. Even when two passengers occupy the rear seats still the luggage capacity is adequate, a hinged flap in the boot giving access to a tunnel which is the full width of the body and open at its inner end. Four frameless plate-glass windows, controlled by easy lifting handles and self-locking when in closed position, are provided, together with a V-screen. This, and all other De Dion bodies, are equipped with rubber insulating buffers interposed between the body and the chassis round the dash to prevent rattle. Nine barrel-shaped buffers are employed on this particular body, and ten circular rubbers are interposed between the dash and the body proper. The mounting of coachwork on rubber buffers, originated by Lanchester, is somewhat widely exploited this year.

COACHWORK SCHEMES.

That metal will not be superseded and that wood will be the material which will be eliminated presently from body-building is illustrated by the methods in which the Austin bodies are built of steel. The steel body has been standardized by Dodge in America for years, and it is interesting to note that in the new American Rollin car three-point flexible suspension with single-point attachment at the rear is used to solve the problem of chassis twist, which causes noise in covered bodies. To-day, not only does little labour cost much money, but men who know how to wash down a car without destroying the varnish are not available, because the younger generation has not been trained to this. Hence the interest of what is, in effect, superenamelling, in that the colour is put on together with the varnish. Many very quick-drying systems have been evolved, notably the Dupont de Nemours, whereby a hard enamel-like surface can be achieved on a metal body, and can be washed down and polished without any of the care needed for paintwork with an ordinary superstructure of varnish. With these new methods scratches and other blemishes can be repaired locally without revarnishing the whole body. This is why certain American manufacturers are taking up the principle. It cannot be used on woodwork exposed to the weather. Much of the timber used for making cheap bodies nowadays is relatively green, and, in any case, is cured artificially.

GENERAL TENDENCIES.

The influence of the British Empire Exhibition over much of the detail of design, alike of chassis and of bodies, is shown at this show. Instances are afforded by the 14/40 Vauxhall, the 18-h.p. Armstrong-Siddeley, the Empire Arrol-Johnston model, the redesigned 14/40-h.p. Sunbeam, which is now fitted with six wheel brakes and is a reproduction on a lesser scale of the remarkable 20/60-h.p. type, in all of which vehicles there is ample ground clearance, generous provision of body width, and low centre of gravity. The practice of providing proportionately much wider doors is almost universal. It is to be found even on such cheap constructions as the 9/20-h.p. Rover, the 10-h.p. Swift, and the 10/26-h.p. Singer, and has been always a characteristic of Standard car practice.

Sometimes the widening of chassis is accompanied by the provision of larger brake drums, illustrated in the smaller Singer and the 9-h.p. Rover models. Again, Standard is one of the firms that has not hesitated to borrow a discovery from racing practice by using large diameter brake drums, to the great gain alike of efficiency and economy both of brake linings and of tyre wear. In regard to engine practice, we find the use of the Lanchester vibration damper for balancing the secondary forces in the crank case coming into general practice alike in England and America, because it is commercially a practical proposition.

With few exceptions manufacturers do not introduce larger engine models than formerly, though there is the case of the Daimler, also the Belsize "straight-eight," which latter, however, has only a 2-litre engine. Buick introduces a 20-h.p. six-cylinder type to supplement its existing 27-h.p. type; and it is significant that the 2,300 c.cm. four-cylinder engine Rollin car, brought from America by the designer of the erstwhile White steam car, with four wheel brakes, is called the smallest four-cylinder engine car made in the United States, a point that gives us at once the difference between American and European engine practice, since that engine is three times as large as some of the well established European types.

FOUR WHEEL BRAKES.

Though in France I have been working on the idea for twenty years, yet to-day, when most manufacturers are giving attention to it and a large number are actually standardizing some scheme, I realize that not one car builder in three who standardizes cars with four wheel brakes to-day is doing so on lines that are desirable as regards safety, economy, wearing life, and so forth. That ultimately four wheel brakes will be a standard equipment of all cars, including the lightest, because of their light road adhesion, is hardly open to doubt. It has taken more than ten years to get the light car accepted as a permanent type, and I have spent at least as long in advocating the possibility of fitting a small engine into a chassis which provides, nevertheless, full scale accommodation for the occupant. That work is coming to fruition this year in a general fashion, as many new style small cars listed are testifying. We must not expect to reach my ideal, of 1 cwt. of vehicle weight for 1 cwt. of passenger weight transported, for, possibly, twenty years. The vehicle having 1 cwt. of car per 1 cwt. of passenger will be all-metal built—a system wherein the transatlantic manufacturer, turning out, possibly, a million against our hundred thousand, would have no advantage.

GOVERNING FACTORS IN IMPROVEMENTS.

The work of perfecting engines and rendering them flexible goes ahead. Therefore by conventional methods it is possible to make simpler gearboxes, and hence there is less urgent need for torque converters to displace them. In like fashion the coming of the balloon tyre may in part hold up chassis development, for it succeeds in disguising the faults of suspension in certain cars, especially as the average user has not the advantage of handling a couple of score, or more, different makes of motor carriages every year, and thereby keeping in touch with the latest achievements, and so ever recasting his standard of judgement. Many a car that seems to steer well and to ride smoothly to the average user is, as a fact, a third or fourth ranker in classification under those heads. If we could enable buyers—alike among existing motorists who desire new machines, and among entirely newcomers who do not understand the niceties of cars—to know exactly the relative merit of each car in its category, there would not be a dozen types of cars on the world's market to-day, and their users would have the best in each class at a lower price than they have to pay for the worst car to-day, because production of the leading types of each class would be on a scale representing in each country the most economical conditions of production.

Engine volume is no guide to engine performance, and, in general, there is one standard of engine performance in the New World and quite another in the Old. Much more is expected here of an engine than in America. Therefore, to consider an American car cheap because it has an equivalent nominal engine rating with a European is to be led astray. The way to achieve satisfactory motoring is to get the machine that fulfils requirements, irrespective of design. In this country many firms have re-rated their engines—for instance, the Humber, Singer, and the Wolseley—this year. The overhead valve gains many converts, by far the most general system of operation being by a camshaft in the crank case working vertical pushrods and rockers, though there are notable exceptions. Other engine developments include the general spread of

forced feed lubrication. To this end, too, filters have been furnished to the pumps and aluminium pistons are gaining in favour. We no longer consider it necessary to raise the bonnet to start an engine, even in cold weather; hence the general use of stranglers operated from the dashboard.

There is a distinct movement, particularly on behalf of the British industry, to provide change-speed gear and hand brake control levers on the driver's right, this being in response to public demand; instances among small cars are the 10-h.p. Swift and, among middle size, the 14/40-h.p. Vauxhall. Among the middle car classes there is a tendency for British practice to revert from the American to the Continental system in providing four speeds forward, despite the fact that no engines are more flexible than the best English makes, for the reason that America cannot get the Continental scale of power output for volume which our manufacturers do, and that, in general, Continental manufacturers do not provide the flexibility which our best manufacturers do because abroad the demand is mainly for an engine that shall function much like an aircraft power plant—namely, that it shall be able to run slowly as well as at high speed on the straight, clear roads. In this country, on the contrary, with its twenty miles an hour speed limit and its tortuous roads, it is impossible, even if the law be ignored, to go in average country at the full capacity of an engine for more than a few hundred yards at a spell. Therefore we want flexibility always. The use of four speeds assists a flexible engine, particularly in hill-climbing, wherein cars in this country are at a disadvantage because our hill roads are ill graded, whereas hill and mountain roads abroad are graded scientifically. Therefore our hills are relatively more difficult to climb, and it is better to have a greater number of speeds. Nor do drivers in general object to changing gear as much as they were wont to do, because of the increasing use of the plate clutch; also of the provision of better profiles for gear teeth and lighter controls, and the use of clutch stops, whereby much double clutching can be eliminated. The plate clutch is a British invention which is being taken up now all over the world.

BETTER CHASSIS.

In regard to chassis construction, the fabric universal joint for the propeller shaft—the hardest worked of any on a chassis—finds an increasing number of users to the great saving of expense. Some manufacturers who have used these joints in the past are making them of more generous proportions this year, a point which newcomers would do well to note. Apart from cheapness, these joints have the advantage of not needing lubrication.

Disc wheels are not making much progress in use on small cars; but an interesting example of their introduction to some of the most expensive vehicles is afforded by Lanchester. Many manufacturers are using lower frames: an instance is the Austin 20-h.p. model with Carlton body, giving a large, well lit interior of exceptional proportions and very easy of entrance. The 14/40-h.p. Sunbeam has proportionately a much lower hung chassis of greater width and excellent lateral stability.

Maintenance is facilitated, as well as efficiency ensured, by the very pronounced increase in the use of grease gun lubrication for chassis, a practice which will unquestionably become universal because it ensures grease being applied to all the points of a chassis which need it, and very rarely get it, unmixed with road dust or grit, by the methods of oiling hitherto used. This grease gun system is adopted by American and Continental manufacturers, including Darracq, as well as by numerous English manufacturers.

Front axles have undergone modifications in face of the introduction of front wheel brakes; an instance is the 20-h.p. six-cylinder Wolseley, which is of a correct section. Examples of correctly designed axles in this respect include the 40-h.p. Fiat, the 14/45-h.p. Rover, the 20/60-h.p. Sunbeam, and the 20-h.p. Lanchester—three distinct systems. For the first time the 40/50-h.p. Rolls-Royce is shown with front wheel brakes of a very special design and fair performance, as I found in trial. The firms marketing front wheel brakes as standard include Austin for all models, Lanchester, the new 12-h.p. Arrol-Johnston, as have the 14/45-h.p. Rover, and many other quite new

types. Vauxhall extends the principle, hitherto standardized on the 30/98-h.p. type, to the 23/60-h.p. type. Some manufacturers like to couple up the transmission with the front brakes, and to keep the rear wheel brakes independent. In France there is the Chenard-Walcker chassis with no drums on the back wheels, a scheme that has been copied in that point by one American manufacturer. Front wheel brakes are optional on certain Armstrong-Siddeley, certain Crossley, certain Daimler, the 14-h.p. Standard, the 14/28-h.p. Morris-Oxford, and on the side valve four- and six-cylinder engined Fiat models, and among very many others.

PRICES OF FOREIGN CARS.

To show that reductions in prices are not confined entirely to British makers, the 15/40-h.p. 2-litre engined Bianchi chassis is now listed at £395, the reduction of the different models complete with coachwork ranging from £80 to £160. The three-quarter English-built coupé body on this is listed at £670; the four-seater all-weather English body at £715 complete; this is also the price of the English-built four-seater saloon. Bianchi displays original practice in supplying forced feed lubrication to the gearbox, gaining power and reducing noise. The quite new 15/50-h.p. four-cylinder engine is of the overhead valve type, and Perrot automatic type four wheel brakes are provided to the chassis on a system that furnishes the car with six brakes in all. Louis Renault, one of the pioneers in standardizing front wheel brakes on really engineering principles, employs them even for the £9 tax £250 8.3-h.p. three-seater type now without any prejudice to the amplitude of the steering lock. This small machine is also equipped with balloon tyres.

SOME POPULAR CARS FOR MEDICAL MEN.

One of the comparatively few British firms to introduce entirely new chassis this year is Calcott, whose 12/24-h.p. type is fitted with an all-weather equipped four-seater body at £375; and the four to five-seater at £525; the three-seater semi-coupé costs £365. The design of the chassis does not differ from well-proved practice, the power being transmitted through a dry plate clutch to a gearbox giving four speeds forward, controlled by the driver's right hand; the back axle is driven by silent bevel gear. The braking efficiency is proportionately much greater than on any former Calcott type. The clean lines of the chassis are commendable, and it should have good wearing qualities. This engine comes within the 2-litre category.

The 11-h.p. Hillman engine has been developed in detail to meet the equipment of the car with "balloon" tyres and of the new wider and more commodious coachwork provided. A better system of lubrication by forced feeding is furnished for the power plant. A gear pump is driven from the rear end of the camshaft to ensure the circulation of the lubricant. In place of a dipper stick for ascertaining the oil level, a convenient two-level tap is fitted, furnished with a handle placed accessibly above the tray between the bearer arms and the side of the power plant. The equipment on this car is very complete, including dash lamps, licence holder, petrol gauge, air strangler on the dash, carpets on the floor, electrical Klaxon horn, windscreen wiper, hood cover, spring gaiters, five-lamp lighting set, and so forth. The four-five seater all-weather body is available at £375 on this pattern.

Standard's introduction of the Piccadilly four-seater saloon on the 11-h.p. chassis at £275 represents a new note in values; as does the £200 five-seater all-weather Kington body on the same chassis. The £14 tax four-cylinder overhead valve engined Standard chassis is listed at £295, and with Warwick all-weather body at £385. The Pall Mall five-seater saloon on the chassis costs £475 complete. All 14-h.p. Standard types can be furnished with a system of front wheel brakes.

The three-quarter coupé-cabriolet on the developed 10-h.p. Swift chassis is listed at £275, and the four-seater, or the two-seater with dickey, on the same chassis at £235 in each case. The wheelbase of this type has been lengthened by 9 inches, so providing much more leg room and seating capacity. The four-seater models possess three doors, each

of commendable width. The running-boards have been brought much nearer to the ground, and valances added to fill in the space between boards and frame. The springing has been developed to take the more commodious coachwork, and Hartford shock absorbers are standardized.

Italy introduces the 15/50-h.p. £15 tax 2,294 c.cm. overhead valve four-cylinder engined Bianchi, with internal expanding front wheel brakes: chassis £440; 4/5 seater complete £555; also the 50/100-h.p. £45 tax 7,372 c.cm. overhead valve eight-cylinder-in-line engined Isotta-Fraschini, with the firm's distinctive four wheel brake system: chassis £1,395; 4/5 seater complete £1,750.

ACCESSORIES.

The Accessory Section is by no means the least interesting of the show. It constitutes an exhibition which itself would occupy several days fully to investigate. Though chiefly connected in the minds of the motoring public with the sale of cars and the building of high-grade coachwork for chassis, Mann, Egerton and Company exhibit also (Stand 369) much interesting garage and motor-house equipment, together with clever and attractive fittings for the car. One is a neat smoker's companion. For the thoroughly equipped garage there are bench milling machines, an air compressor and tank, a pressure cleansing tank, a mileage test tank, a grinding machine and attachments, an engine stand, a first-aid equipment, a wheel alignment gauge, and so forth. The M.E. atomizing air valve, exhaust car heater, petrol-oil cans, plug holders and cleaners, are other items of interest.

Those who suffer from cold when motoring in winter should inspect the "everlasting foot warmer and foot muff," exhibited by A. W. Gamage (Stand 258). Of course, this firm shows also an extraordinarily complete range of motor equipment and accessories. The Gemmy flooding-from-the-dashboard device for the carburettor, the Ford-Fixe combined exhaust and inlet washer, and a spare petrol can combined with the foot rest, are shown by Messrs. Johnson, Neal and Co. (Stand 375). Messrs. S. Smith and Sons (M.A.), Ltd. (Stand 429), show the popular K.L.G. sparking plug—used by practically all the competitors in important races—the need for which increases as standard motor car engine efficiency is improved. "Rectaskid" is the name of a thin ball bearing inserted between two main leaves of each road spring, the claim being that it reduces skidding; the principle will be explained to visitors at Stand 269.

ELECTRICAL APPARATUS AND TYRES.

The reputation achieved by Exide batteries is made plain by the exhibit of the Chloride and Electrical Storage Company (Stand 290). There is on view an interesting battery that has been in continuous use for twelve years, taken from the first Cadillac car equipped with an electric engine-starting car-lighting and engine-ignition system, this being the first firm in the world to standardize the electrical engine starter. A redesigned model of the now long proved Lodge priming plug, with a number of distinctive features, is shown for the first time. A new Lodge-Ford plug is among many interesting types that include the smallest sparking plug ever made (Stand 426). Examples of various types of Zenith carburettors, of which over 5 million are in use, include a special model made for rapid fitting to Morris-Cowley and for Morris-Oxford cars. Various technical improvements have been made in the 1925 Zenith, ensuring still greater efficiency and petrol economy; all these devices are now sold complete with filter under the float chamber and an air strangler over the inlet port, ensuring easy starting on the coldest morning (Stand 477).

The Dunlop Rubber Company's exhibit includes the low-pressure, large section "comfort" or "balloon" tyres, evolved as a result of many years' experience, in the course of which admirable restraint has been used, instead of rushing on the market prematurely to meet an anticipated demand. The Dunlop wired-on "balloon" tyre is claimed to be the safest large section type, and the security of the method of rim attachment is made plain by demonstration on the stand. Chevrolet, Swift, Vulcan, and such-like cars, with 31 in. by 3½ in. beaded-edge normal tyres, will take 31 in. by 4.40 in. "balloon" tyres without

alteration of existing rims. Of course, the firm continues to make its well known corded tyre types, both of the beaded-edge and of the straight-sided varieties. Among the accessories marketed by this firm is a special jack for use with cars fitted with balloon tyres (Stand 500).

THE VOLUNTARY HOSPITALS IN GREAT BRITAIN.

WORK OF THE JOINT COUNCIL.

THE fifth annual report of the Joint Council of the Order of St. John and the British Red Cross Society concerning the provincial hospitals of Great Britain has been published.

Dr. F. N. Kay Menzies, director of Hospital Services of the Joint Council, has collected in this report a large amount of valuable information about the work of voluntary hospitals during 1923, and so follows the example of the late Sir Napier Burnett, who originally instituted the issue of these annual reports. He draws attention to the fact that whereas in 1921 the ordinary income of the hospitals failed to meet the ordinary expenditure by £419,135, and in 1922 this deficit still amounted to £74,978, in 1923 the ordinary income exceeded the ordinary expenditure by £213,694. In 1920 only 44 per cent. of hospitals had a surplus of ordinary income, in 1921 this percentage had increased to 51, in 1922 to 57, and in 1923 to 66.

The object of the report is defined by Dr. Menzies as being the presentation of the position of the provincial voluntary hospitals with reference to the facilities available for treatment, the extent to which they are utilized by the community, the annual cost of maintaining these facilities, and the sources and expenditure of the financial resources by which they are maintained. Out of 755 hospitals, with 44,403 available beds, 710 hospitals, including 43,404 available beds, are reviewed in this report. In the London area, which is not included, there are 116 hospitals, with 13,002 available beds; the total, therefore, in Great Britain is 871 voluntary hospitals, with 57,405 available beds. With regard to the finances of these hospitals in 1923, the total expenditure was £6,381,115, and the total receipts £7,689,072. Of these total receipts £7,051,248 was raised by voluntary effort, the remainder being derived from public services (£550,918), and grants from the Voluntary Hospitals Commission (£86,906). These figures comprise both the ordinary and the extraordinary income and expenditure. Dr. Menzies remarks that it is now impossible for any person to maintain the old argument that the voluntary hospital system finds its justification in the fact that by it a vast amount of sickness and suffering is cured and relieved at little or no cost to the public purse. He considers that it should be argued rather that the strength of the voluntary system and the real justification for its continuance should be based upon the fact that this immense volume of work is carried out more efficiently and more economically than it could be by any other known method or system. Comparing the two years 1922 and 1923, it is interesting to note that in the former year 2,090,855 patients were treated at a cost of £4,946,299, whereas in 1923 2,861,306 patients were treated at a cost of £5,162,393. It is thence possible to estimate that the cost of a patient in 1923 works out at £1.80, against the cost of £2.40 in 1922.

In an address delivered last June to the British Hospitals Association, Dr. Menzies attempted to demonstrate the considerable growth of the responsibility of public health authorities in connexion with the provision of treatment for disease, and the full text of his address is published in the report. He now draws attention urgently to the great need of providing greater facilities for treatment of ophthalmia neonatorum and infantile paralysis. He refers to the report of the Departmental Committee on the Causes and Prevention of Blindness (1922), and suggests that it is almost a national scandal that ophthalmia neonatorum should be still responsible for approximately 30 per cent. of all cases of total blindness in this country, not to mention the large number of cases of partial blindness. The disease is eminently curable if prompt and efficient treatment is provided in the earliest stages, but, generally speaking, throughout Great Britain inadequate provision of this kind