MOTOR NOTES FOR MEDICAL MEN.

BY H. MASSAC BUIST.

THE SHOWS AT OLYMPIA AND WHITE CITY.

THERE is such an unprecedented variety of motor carriages at the Motor Show organized at Olympia and the White City by the Society of Motor Manufacturers and Traders, under the patronage of the King, that the medical man is in sore need of some guide to those features likely to appeal to him. The display is, internationally, the most representative organized in any part of the world. It replaces the yearly show in Paris, which was not held last month. It precedes the great American shows. Therefore, for the time being, London is the motor mart of the world. Late enemy countries excepted, the industry of every country taking a part of any importance in motor building is adequately represented, the number of American makes on the market being particularly noteworthy. The exhibition is marked by the introduction of a large number of entirely new makes of cars, but a goodly proportion of them have not adequate manufacturing facilities behind them to justify their receiving the patronage of the medical profession, whose prime need is a tested design offered by financially well-established firms; reliability and economy of cost, together with absence of the speculative element, are essential to doctors' service. Last year 271 makes of cars were on the British market. According to the *Autocar*, that number of builders and assemblers has now risen to 302, of which 149, or less than half, are British. The varieties of types at the current exhibition number 459, because many of the makers market more than one model.

Misleading Talk about Price Cutting.

At this season there is talk to the effect that the cut in car prices is the chief feature of the show. If, however, we take the prices asked at this season last year, and compare them with those ruling to-day, it is scarcely true to say that there is anything in the nature of price cutting to be observed; far less that it is a general tendency. The reason is plain. In the interval of twelve months we have all had to revise our ideas of the value of money, particularly as all classes of manual workers are receiving higher and yet higher wages, with the result that the costs alike of raw materials and of labour for building a car are unprecedentedly high. In a few cases this has been offset by the coming into production of factories on large scales, in which the dead, or overhead, charges which have to be divided over each vehicle are naturally lower as the output grows. Those dead charges are more or less fixed factors in running a given establishment, and cannot be cut very appreciably merely because output falls off.

The real note of the show is that for the first time anybody going to an exhibition of this sort with a view to placing an order for a post-war car shall really secure delivery within a reasonably early period. Last year orders were given without any guarantee of delivery. At least half the last manufacturing season was productive of no results whatever. That was owing to successive labour troubles. The situation to-day, however, is that, in the main, production is on a scale adequate to meet demand. As for falling prices, it may be pointed out that, whereas at this time last year the cost of a Rolls-Royce chassis was £1,750, to-day it is £2,100, which is also the cost of the 1921 six-cylinder Napier chassis with overhead valve engine, and the six-cylinder Lanchester chassis costs £2,200. While there are not many cars that cost as much as these, the plain fact is that practically all the larger cars are costing quite as much as, if not more than, was asked for them twelve months ago, though many are marketed at prices lower than those that had to be asked last summer, when production was on relatively a small scale, but dead charges remained stationary. Moreover, such cars as the Willys-Overland are not cheaper than last year, the price of the types with covered coachwork being now dearer.

Coming Taxes a Prime Consideration.

In face of the fact that for the most part doctors placing orders for cars now will not seek delivery of them until January 1st it may be pointed out that a prime consideration for them in buying at this time did not obtain

formerly—namely, the new scale of taxation. One may take it, broadly, that a car beyond 20-h.p. Treasury rating is not needed by the average doctor. The new tax is £1 per horse-power, therefore a 20-h.p. Treasury rating car involves an expenditure of £20 a year for tax alone.

Under this head it is interesting to observe that no country is offering better value for money in the 20-h.p. class than does the Austin Company, which has been in fuller production, perhaps, than any other firm in this country during the last twelve months, and whose product is now well proved. In the interval sundry new models are being introduced for this market, as instance the 19.6-h.p. four-cylinder Crossley. Both these vehicles may be taken as about the limit of the possible requirements of the medical man, each being suitable for a specialist whose need may be for a relatively fast car carrying covered coachwork and required on occasions to make fairly long journeys.

The average medical man, however, may find these, and such vehicles as the 16-h.p. Sunbeam, too expensive to maintain. But there is ample choice in other directions. Among tested products there is the 15-h.p. four-cylinder Wolseley with overhead valve engine. It is now in full production, and will therefore well repay attention. A like remark applies to the improved post-war models of the nominal 12-h.p. Rover car of the water-cooled type, with detachable cylinder head. This machine is put on the market in very complete fashion, and has sundry improvements in it that may be noted later. Coming down the scale of power, and therefore of prices, one notes in one direction the 10-h.p. three-speed Wolseley-Stellite (Stand 62, Olympia), which, as a two-seater with dickey seat behind, is of about the right power and price for the average medical man. This, like the Rover, is a long proved design, despite its striking originality, the points of which have been well tested in service. There need be no hesitation about buying machines of this character: their economy of running is evident.

This year there is introduced one notable recruit to the overhead valve type of engine—namely, the Standard Company, of Coventry, which has long specialized in a type of car of the size, price, and power, as well as maintenance costs, eminently suitable for medical men. In reviewing the exhibits one notes with regret that such a striking design as the air-cooled Enfield-Alldays, introduced last year, has failed to materialize in standard form because some £100,000 worth of special plant is needed to lay down the work for standard production on satisfactory lines. But the firm is bringing forward a new style small car on what may be called conventional lines.

A Type as a Text.

Any disappointment under this head is offset, too, by the big advance made by the Rover Company with the horizontal engine with two opposed cylinders of the air-cooled variety. This is styled the 8-h.p. model (Stand 57, Olympia). It has now come into full production at a specially equipped works separate from the Coventry factory, and situated at Birmingham. When these cars were first issued in standard form they were engaged in various competitions, in all of which they distinguished themselves. Since then large numbers have appeared on the road in private ownership.

In face of the cost of production in the post-war period, there is here something particularly interesting to the medical man on many grounds. As to price, this is £300 ready for the road. As to performance, the car can be driven up to 40 miles an hour. Of course, the best running is got between 20 and 30 miles an hour, which is fast enough for the average medical man. On long journeys the petrol consumption has worked out in standard examples as economically as 45 miles to the gallon of petrol; 40 miles to the gallon can be practically guaranteed. The horsepower is generous in relation to weight, the engine giving fully 14 h.p., and the total weight of the vehicle being under the half-ton. The suspension is by quarter elliptic springs fore and aft; therefore, the worst one would get on a pot-hole road would be great plangency. To receive a jar is impossible with this system of springing. The vehicle is well worth studying, too, as illustration of how to avoid complication. Here the lines are extremely simple. There is strength without undue weight. There is nothing about which the medical man need be shy. It is generally imagined that an air-cooled engine in a car is a difficulty. The fact, however, is not so. The difficult thing is to devise an air-cooled engine which can be made to run quietly, like the water-cooled variety. The Rover Company has come nearer solving this problem than any firm I have observed so far. It has got on to production of this class of vehicle on a scale not yet attempted by any

other firm in this country, nor on the continent of Europe. The American industry has never attempted anything in this line. Nor is it at present inclined to do so.

The Air-cooled Car as a Standard Product of Low Price.

In face of the approach of winter, one merit of the air-cooled car from the medical man's point of view may be mentioned: it removes entirely the need for worry about the engine when left in the cold. For example, during a visit to a patient the cylinders cannot crack in winter, because there is no water in them to freeze. As to refinement of operation, the plate clutch, the employment of a worm drive just as on the large Rover car, and so on, are notable features of refinement. This has not the coarseness of cycle car practice, but all the refinements of car practice. Yet the design especially aims at saving initial cost while ensuring long wearing life and economical consumption, therefore the minimum maintenance and running costs. The design of the bodywork, the features of the Lucas lighting fitted as standard, the method of driving the dynamo for it, and so forth, have proved satisfactory in service. In short, this is one of the post-war types of vehicle for the doctor of which more certainly will be heard.

The larger section of the medical profession now has to regard motor car buying from an entirely different point of view. Young doctors have taken wholesale to the use of motor cycles this year, not because they prefer them, but because they were the only motor-driven machines they could get at the price they could afford. Such a proposition as this small Rover has running and maintenance costs more on the motor-cycle scale, therefore enormously cheaper than anything provided by any American or foreign car on the market. As to a suitable motor vehicle in which the driver is adequately protected from the weather, there is nothing to challenge this production in the current show. Years of manufacturing experience on a large scale have been needed, and the expenditure of scores of thousands of pounds in the laying down of special plant to enable each part to be made to the best advantage. So many hundreds of these vehicles are in the hands of the public that the manufacturers have the reports of their behaviour, and know precisely in what details to effect modification here or there. In short, they are assured that each example issued from the factory from now onwards will be more satisfactory than any that has gone before. In motor building there is need not merely to get your design and your plant right; you have, besides, to get your works hands working in team fashion.

I am inclined to take this car as a text not merely because among last year's novelties designed with a view to solving the cost problem this is about the only notable one in the low price classes that has materialized and enhanced the reputation of long established sponsors, but also because it gives one heart to continue one's isolated campaign against a most regrettable tendency that is all against the interests of the doctors, and for which the motor pressmen in general may be said to be no less responsible than, perhaps, the American industry. I refer to the fact that the tendency to overload cars with superfluous accessories by process of standardizing them as though they were essential seems rather to have increased than diminished. Motor manufacturers in general are not at all keen on piling one "gadget on another" on a car. But they have to do so because a fashion is set on the other side of the Atlantic and because writers on motor topics in the technical, no less than in the lay, press are disposed to imply that this, that, or the other device is a necessary part of a complete vehicle. If the little Rover car is looked at it will be discovered that all that is necessary to run a car is there; but nothing that can be dispensed with. Would that one could write the same about cars with water-cooled engines:

Doctors and the Exhibition.

It will be observed that, whereas last year a table of features of cars likely to be of interest to medical men was published in these pages on the occasion of the first exhibition of motor cars in England after the interval of war, no such figures are given in the present issue. The reason is that it was necessary then to review everything in the way of moderate cars introduced to public notice, including contributions — often interesting for individual features embodied in them — by firms of limited manufacturing resources. The smaller the output the easier it was for such concerns to proceed with their production programmes, despite the difficulties presented successively by the moulders' and other strikes,

because the smaller production the easier it was to get supplies of castings, springs, and other essentials between the interruptions occasioned by labour disturbances. At that troubled period the essential thing for medical men, as for other car users, was to discover, not the ideal vehicles for their purposes, but what types could be produced that would suffice. Happily, in the interval the big producers with ample resources for the best methods of production have been able to achieve very large outputs. Therefore this year, for the first time since the start of the campaign, there is no call for doctors to buy "anything that can be supplied on wheels." Instead they may choose. A result is that the makers established on a big scale can give the best value for money and the best types of tested cars. Altogether better and more trustworthy machines are available among the well established makes, which, however, are not numerous.

An Overhead Valve Engine Standard.

The 9.5-h.p. Standard car (Stand 59, Olympia) has rendered yeoman service to the medical profession since the firm first marketed this chassis as one of the earliest of the really creditable contributions towards the provision of a small car of economical running costs combined with durability such as is suitable for the doctor. As a consequence a demand has arisen for a somewhat more powerful car to take a four-seater body. To meet this the company introduces a 11.6-h.p. engine of 68 mm. bore by 110 mm. piston travel, giving a volume of 1,593 c.cm. with overhead valves, the cylinder heads being detachable and the engine lubrication forced. An electrical mechanical engine starter and car lighting system are standard, and the proved 9½-h.p. chassis features are incorporated in this longer wheel base 11.6-h.p. type, which is standardized with two- and with four-seater bodies that reveal in their details practical knowledge as well as originality. Ready for the road, the four-seater weighs 17 cwt. as an open car with a luggage grid. In this model the squab of the rear seat can be lifted open and retained by toggle-arms, while access is had to a large and shallow compartment for storing the side curtain windows of the special hood. Moreover, the front seats are arranged to fold ingeniously, are adjustable for reach, the cushions being square, so that they can be reversed, and the back squab is suspended from a metal frame with a broad band that can be laced tightly or loosely according to the wish of the user. The valve rockers are lubricated by pressure. There is provided at the front of the cylinder head a small extra water-pipe running to the top of the tank of the radiator to prevent steam lock occurring during extra hard work. The power given by the engine is ample for the coachwork and passengers accommodated on a wheelbase which provides ample leg room for the occupants.

Improvements in the Swift Models.

There are sundry improvements in the 1921 four-seater 12-h.p. Swift model (Stand 47, Olympia) which employs a Zenith carburettor in conjunction with a C.A.V. electrical engine starter and car lighting system. The silent chain drive for the distribution gear is adjustable for wear. The general lay out of the engine, as of the chassis, is on well-proved, orthodox lines. In regard to the coachwork there is this year a marked improvement. The slightly tumbled-in top to the sides of the four-seater standard body is an attractive feature. The colour scheme is grey with apple-green upholstery. The alterations in the 10-h.p. Swift model include the provision of a hand-brake inside the body. There is also a better form of accelerator pedal. The carburettor is equipped with an air strangler. An electrical engine starting and car lighting set is standardized. For the rest, save for very minor refinements, the chassis remains as hitherto. It will be noticed, however, that the price of these cars is lower than that which ruled during the past summer. This is on account of the increase of output enabling the "on costs," as they are styled at the factory, to be distributed over a larger number of cars, with the result that the price of each works out lower.

The new car introduced by Enfield-Alldays — which made a notable attempt last year to break new ground with a remarkable five-cylinder air-cooled engine which it subsequently proved impossible to put into production because over £100,000 worth of plant was necessary to equip a factory specially to build the car — is a 10-h.p. four-cylinder water-cooled machine constructed on orthodox lines to achieve refinement in a small car. The engine has a bore of 63½ mm. and a piston travel of 117½ mm., giving a volume of 1,488 c.cm. swept by the pistons. The lubrication is mechanical. The gearbox gives three speeds forward and the final power transmission is by spiral bevel

gear in the back axle. The rear springs are cantilever. This is not a "mass-production" car; the coupé and other special bodies are made to order, only the two- and four-seater open types being standardized. (Stand 63, Olympia.)

The 1921 10-h.p. Singer Light Car.

An additional universal joint to the propeller shaft; the furnishing of an Autovac feed in conjunction with the employment of a fuel tank in the rear to the achievement of a better balance; the simplification of the bonnet scheme; and a wider dickey seat, are the chief changes in the 1921 model of the 10-h.p. Singer Light Car, a type so popular that there is no need to depart from it beyond incorporating detail improvements in the scheme from year to year. The engine is of the same size as formerly, 63 mm. bore by 88 mm. piston travel, giving a volume swept by the pistons of 1,096 c.cm. This engine is in a sense uncommon nowadays in that the cylinders are cast in pairs. Some of the alterations incidentally make for cheaper production. The new dickey seat unfolds upwards and outwards. The other half of the boot of the car hinges upwards and can be locked by means of wing nuts in any position desired. The rear part of the body is 6 in. wider than in this year's model. The removal of the dickey seat reveals a hole in the floor board that gives access to the filler cap for the petrol tank, which has a capacity of over six gallons. Therefore this car has a greater range on a single charge of fuel than have the earlier models with the gravity tank on the dash. This transference of the fuel tank enables the dash to be made of neater appearance, and to accommodate full easily the instruments disposed symmetrically on either side of the small oblong cupboard wherein maps, glasses, books, and other small articles can be put. The bonnet is composed of three separate members, the two side ones being hinged at the bottom so as to open outwards. The third, the neatly rounded top member, rests on the radiator and dash, and is held by springs to the side by four small clips. By removing the top piece and opening the sides outwards the engine can be exposed in a few seconds. On the coupé model the taper lines from the dash to the bonnet are straight in place of being curved. The cooler is carried by a cross tube lying between the front ends of the side members of the frame and braced at the top by an adjusting rod anchored to the water outlet pipe on the top of the cylinder block. This arrangement enables the radiator to be dismantled, or put on, much more easily. The valve covers are now fashioned of pressings. A clip has been made to keep the ignition wires well away from the exhaust piping. Instead of fitting the ignition wires direct on to the sparking plugs they are provided with terminal clips. (Stand 93, Olympia.)

Contrasted Types of Middle-size Cars.

Perhaps the feature of the Humber exhibits that will attract most attention on the part of the medical man is the 10-h.p., otherwise the smaller four-cylinder chassis, equipped with coupé body. (Stand 32, Olympia.) This little car, which is listed at £750 ready for the road, is neatly finished in dark blue with black leather collapsible hood. It accommodates two people comfortably, and is well designed for doctors' work. The cooling is by the natural circulation of the water, and the oiling is automatic by pumps and troughs. A Smith carburettor is used. The gearbox gives three speeds forward and a reverse, the final drive in the back axle being by bevel gear.

The Morris-Oxford and the Morris-Cowley four-cylinder cars are supplemented by a six-cylinder model, the engine of which is alone shown. It has a bore measurement of 70 mm. and a piston travel of 102 mm., giving a volume of 2,355 c.cm. swept by the pistons. Therefore, this machine will come under the 17.9 h.p. Treasury rating. The power plant, as well as the chassis, is to be made entirely at the Cowley works. For this model the Lucas electric equipment has been selected, including the gear for starting the engine and a Zenith carburettor. The final power transmission is designed to be by spiral bevel gear in the back axle. Fore and aft suspension are to be by half elliptic springs. (Stand 97, Olympia.)

The new Phoenix model is rated at 18.2 h.p., being furnished by a four-cylinder engine having overhead valves and overhead camshaft; the bore measurement is 85 mm. and the piston travel 135 mm., giving a volume of 3,064 c.cm. swept by the pistons. This engine is built in a unit with the clutch and gearbox, the final drive being by spiral bevel in the back axle. Relatively quiet running is achieved by off-setting the camshaft in relation to the valves, securing a low lift cam which operates a high lift valve. The valve ports are cored in the detachable cylinder heads, the inlet ports being almost in a straight

line from the carburettor to the valve. The cantilever rear springs are set inside the longitudinal members of the frame. The gearbox is furnished with three speeds forward. (Stand 54, Olympia.)

A low-built new car with proportionately wide track and long wheelbase in conjunction with cantilever rear springs is the 19.6-h.p. Treasury rating four-cylinder Blackburn car, introduced by a firm hitherto associated with the aviation industry. There is nothing experimental about the design, which rather follows generally approved practice. But the appearance of the car is distinctive and pleasing. The cylinders are cast in pairs, having a bore measurement of 89 mm. and a piston travel of 127 mm., giving a volume of 3,160 c.cm. swept by the pistons. The layshaft is placed at the side of the main shaft in the gearbox, both shafts being short, rigid, and mounted on ball bearings. Four forward speeds are provided. Helical bevel gear is furnished to the back axle, which is of the full floating type. The transverse members that act as bearings for the gearbox are removable, this part of the construction being quite out of the ordinary and illustrating the aircraft engineering experience of this firm. The plans are to give first deliveries in the early part of next year at a price provisionally stated as £800 for the chassis.

The French Mass-Production Car.

Despite a number of difficulties, the French manufacturer has done notable things in the mass production of the Citroen car introduced at the show last year by the British concessionaires, Messrs. Gaston, Ltd. (Stand 308, White City). The car is now made for this market with steering and hand-brake control on the right side of the vehicle. The scheme of the chassis, well designed and soundly made, has not been departed from. The features embrace the use of an ingenious form of double quarter elliptic rear springing; the front suspension being by quarter elliptic springs. The coachwork is on standardized lines throughout. It is claimed that this car does full thirty miles to a gallon of fuel. The final drive is by herringbone gear in the back axle. The chassis is now built as a complete unit, the aluminium dash and electric lighting equipment being quite separate from the coachwork. The propeller shaft is now tubular throughout its length. The tie rod under the front springs has been dispensed with owing to the adoption of slightly stronger springs. The forward end of the upper leaves slides in the axle, but the front of the lower leaves is fixed to the axle. The pedal for the mechanical engine starter is now placed close to the central gear change mechanism. The four-seater touring car is standardized at £495, and the coupé with extra folding seat at £625, the bodies being on standardized lines throughout. The disc type of wheel is also standardized.

The 15-h.p. four-cylinder Darracq, with 85 bore and 140 mm. stroke measurement, giving a volume of 3,178 c.cm., is introduced this year with a detachable cylinder head and an external ribbed exhaust manifold. The aim is to reduce to the minimum the likelihood of carbon deposit, as well as to increase the power by approximately 10 per cent., a Smith multi-jet carburettor being adopted. It is bolted to the cylinder block on the right side and warmed from a by-pass off the circulating water. The changes made in the gearbox housing result in its being stiffer. Relatively long cantilever rear springs are used. They are attached to the back axle by two shackles, both the main and the secondary leaves having an eye rolled on their extremities. The petrol filter cap is big and equipped with an efficient filter. (Stand 85, Olympia.)

Delage introduces a 15-h.p. four-cylinder model of 80 mm. bore by 150 mm. piston travel, giving a volume of 3,016 c.cm. swept by the pistons. Front-wheel brakes, which are a distinctive feature of the six-cylinder type introduced by this firm last year, are not standard on this four-cylinder model, but they can be supplied as an extra. Ordinarily this would not be a satisfactory practice, because the front axle has to be designed specially to take the extra weight and strain, and the steering should also be schemed specially. The knowledge of these facts possessed by the Delage firm has led it so to design these details of the four-cylinder model that there is nothing experimental about the application of four-wheel brakes to it. They are, however, rather unnecessary for the average service of a doctor, particularly as very big back brakes are furnished. (Stand 34, Olympia.)

Miscellaneous Features of Small Cars.

Among the new small cars introduced is the 10.5-h.p. Treasury rating four-cylinder Galloway with detachable

cylinder heads, forced lubrication, and features which include the bolting together of the engine and gearbox, unit fashion, to carry the pedal assembly, hand brake and central gear change lever. The rear suspension is by quarter elliptic springs, and the forward springing semi-elliptic, detachable disc wheels being standardized. (Stand 21, Olympia.) The novelty of the Willys-Overland programme this year is the 21-h.p. four-cylinder, monobloc cast, Willys-Knight double sleeve valve engine, having a bore measurement of 92.1 mm. and a piston travel of 114 mm., giving a volume of 3,031 c.cm. swept by the pistons. This type was introduced to the American market about half-way through the war, so that it is well proved. The cylinder head of this monobloc casting has a detachable aluminium cover. The clutch is of the single plate type. The gearbox gives three speeds forward and the final drive is by spiral bevel to a semi-floating live axle. The car is standardized either as a five-seater, or as a Sedan. (Stand 83, Olympia.) The Calthorpe coupé is listed at 550 guineas; and a new model is introduced with a saloon body at 600 guineas. The chassis displayed this year represents a logical evolution of one of the vehicles that pioneered the small car movement, this year's type having a single plate clutch, gate change gear control independent of the frame, and a new hood laced to metal supports. A fan has been added to assist the cooling, and is equipped with an adjustable whittle belt, which is also employed to drive the dynamo. (Stand 92, Olympia.) The 1921 Lagonda coupé model is marketed at £495, with a larger engine and longer wheelbase. This car has overhead inlet valves and aluminium pistons. The folding top of the dickey is made in two pieces hinged together, the forward section folding back on to the rear part, which is also hinged. The under side of the folding top is upholstered to form a support for the passenger's back and shoulders. A detachable seat cushion is mounted over the spare-wheel housing. (Stand 17, Olympia.) The wiring and instruments on the 10.5-h.p. Treasury rating four-cylinder water-cooled Charron-Laycock car, built by the Sheffield firm of W. S. Laycock, are carried on an aluminium dash and instrument board, as on large cars. Side valves are used, and the detachable cylinder heads are machined inside. The price of the two-seater, with double dickey seat and full equipment, is £625. (Stand 84, Olympia.) Each of the 1921 A.C. models is equipped with an auxiliary spring that takes the form of an extra leaf cambered the opposite way to those forming the spring proper. The aim is to reduce rebound. (Stand 122, Olympia.)

It will probably be agreed generally that the outstanding exhibit among the smaller cars is that of Bugatti, this firm having carried the victory in the international Voiturette race in France last August, when it made notable showing as well in regard to holding the road as concerns speed and reliability. Suffice it to point out that an examination of the design of the springs, which is unusual and simple, as is the fitting of four valves per cylinder to the engine, will give a very good notion of the trend which high-grade design may take. As to accommodation, perhaps, this is rather smaller than the average car required by a doctor. (Stand 50, Olympia.) A new type of radius rod is furnished to the Douglas light car, which is further distinctive in that it is equipped with the A.F.S. patented helical suspension system. (Stand 23, Olympia.) The Duplex light car makes its appearance this year in the guise of a machine equipped with a four-cylinder engine having a bore measurement of 66 mm. and a piston travel of 109 mm., the Cox carburettor being used. (Stand 124, Olympia.) One of the few small cars that comes within the 1,500 c.cm. class to be equipped with a gearbox giving four speeds forward and to be of sufficient power to carry a four-seater body is the Fiat, the design of which shows no notable changes, and follows well approved practice throughout, being chiefly remarkable for clean lines. (Stand 114, Olympia.) The engine of the 1921 Hillman standard model has been enlarged to give sufficient power for the demands made in regard to coachwork and hill climbing. In addition, there is introduced this year the Hillman "speed model." (Stand 65, Olympia.) The engine of the Mathis has each valve cap so large as to cover both the inlet and the exhaust valves of each cylinder. (Stand 179, Olympia.) The McKenzie Light Car is now fitted with a Coventry-Simplex engine. (Stand 109, Olympia.) Instead of the Baby Peugeot, which is produced no longer, there is an 11-h.p. four-cylinder model shown as a two-seater for £490, the bore measurement being 65 mm. and the piston travel 105 mm. The gearbox gives four speeds forward. Other features embrace a worm drive and the furnishing of cantilever springs. (Stand 94, Olympia.)

The cleverly designed A.B.C. Light Car introduced last year makes its reappearance, there having been little occasion to alter the clever and original design of Mr. Granville Bradshaw. The engine is an air-cooled two-cylinder horizontally opposed type. The control gate is unusual in that it works vertically. The gearbox has four speeds forward. (Stand 414, White City.) A gear-driven oil pump is furnished to the 1921 Deemster model; the re-designed clutch of which incorporates spring-loaded plungers that operate under the fabric to make the engagement easier. Stay rods have been fitted between the back axle and the front of the torque tube. A tie rod is placed underneath the casing. The gear and brake levers are in a more convenient position, being further back. An extra air inlet, controllable from the driver's seat, is fitted. The dickey seat is now wide enough to accommodate two passengers; and the boot to the body is larger and longer. (Stand 315, White City.) The chief novelty of the G.W.K., which has been the most successful of the friction-driven cars, is the placing of the four-cylinder engine in the ordinary position in the front part of the chassis; the drive is taken direct to the disc placed slightly in front of the rear axle. (Stand 335, White City.) Among new cars introduced at this season is a twin-cylinder, horizontally opposed, air-cooled power plant disposed immediately behind the driver's seat in the chassis of the "Unit No. 1." The power transmission is by friction discs, the final drive from the driven disc shaft being by chain through a reduction gearbox. The dummy radiator provides accommodation for a petrol can and spares; the steering is on the combined ratchet and bobbin type, ready means being provided for adjusting the cables; and the suspension is by quarter elliptic springs fore and aft. The adjustable seats of hammock type are unupholstered. (Stand 333, White City.)

The Accessory Section.

In the space at disposal it is impossible to deal adequately with the accessory section. It is not even possible to deal fully with such a display as that of Brown Brothers (Stand 169, Olympia) who pioneered the Duco spring gaiters that are standardized on a large number of cars to be seen in the buildings at the White City and Olympia. One of this firm's interesting novelties is the Duplex mechanical tyre pump driven off some rotating part of the engine and consisting of a double piston actuated by a crank which engages with a brass bush sliding between the two portions of the piston. This bush, which has a square plug, acts as a slide valve. Another of this firm's novelties is the Apex plug cleaner, which is an aluminium chamber containing a multitude of steel needles. If this is half-filled with petrol and a plug is screwed into it, when shaken violently it is claimed that both the points and the interior of the plug are cleaned rapidly. Again, as to dashboard fittings, there is a neat form of Duco clock, which is very flat, the method of attaching it to the dashboard being concealed. There are a hundred and one ingenious little tools which will appeal particularly to medical men by reason of neatness. Several will save the owner-driver much labour when giving that little timely attention to his car that saves the running up of a repair bill.

The exhibit of the Zenith Carburettor Company (Stand 191, Olympia) embraces a full range of their carburettors for all types of cars; also vari us sectioned special carburettors with complete inlet pipes and adaptors for fitting easily to well-known cars. A feature is the special model for Ford cars that can be fitted without any alterations and which, it is claimed, effects a great improvement in the running. This will work quite well with benzol in the case of those owners who are lucky enough to be able to obtain supplies of that form of motor fuel.

Novelties Among the Tyre Exhibits.

If it may be written in general that there is a relative absence of novelties among the car exhibits, assuredly the same cannot be said in regard to the tyres and wheels displayed. Take as an illustration of sheer variety of enterprise under this head the display of the Dunlop Rubber Company (Stand 221, Olympia), which embraces Magnum type tyres with beaded edges for all standard sizes, including the new series of British standard sizes for light cars. Incidentally, it may be said that this work of the tyre organization in standardizing sizes also makes for better production and cheaper tyres. In the course of a few years the motor manufacturers of this country will not be calling on the tyre industry to supply such an unnecessarily wide variety of types as they have done in the past. As it is, our manufacturers are to be commended for making tyres of patterns suitable for American cars as well as for all the sizes requisite for British vehicles. There is introduced the full moulded

Dunlop tyre with special rubber non-skid tread built on multiple cord casings. These have rims suitable either for beaded edge or for straight-sided tyres, the latter having removable side flanges. Moreover, the Dunlop detachable wheels displayed embrace the wire, pressed steel, wood, corrugated disc, and combination disc and wire varieties.

The outstanding novelty on the Michelin stand (Stand 236, Olympia) is the new cable cover, produced by this company for the first time in December last, and since found so satisfactory in service that the firm is making a leading feature of it. The points it possesses in notable degree embrace resilience, easy fitting owing to its suppleness, and relatively large air capacity. The initial cost is about 15 per cent. more than for tyres constructed on the ordinary principle. But this is said to be more than offset by the longer wearing life. The company's tests embraced the running under the same conditions of load, pressure, and speed of an 880 by 120 mm. canvas tyre and a cable cover of similar size over an obstacle 2 in. high and 2½ in. wide. By means of the apparatus employed for observing this test it was found that the canvas cover absorbed nine-sixteenths of an inch of movement, while the cable cover absorbed a full inch, indicating greater capacity for shock absorption. Next came the endeavour to discover what energy was needed to drive these two types of tyres at a load of 1,320 lb. at 70 lb. pressure. The tyres were drawn along by a fly-wheel worked by an electric motor. The consumption of current showed that the canvas cover absorbed 1.8 h.p. and the cable cover 1.4 h.p., a difference of nearly ½ h.p., which would represent 2 h.p. on the four wheels of a car. To test this matter another way, an electric car was equipped with 895 mm. by 135 mm. covers, first of the canvas, then of the cable varieties. Under similar conditions it was found that the canvas cover absorbed 15.6 h.p. and the cable cover 12.8 h.p., a difference of nearly 3 h.p. in favour of the cable tyre. Another test consisted in letting a car roll down a gradient on to a level smooth-surfaced road until it came to rest. With canvas covers the car ran 318 yards, achieving a maximum speed of 18.64 miles per hour. With the new cable type of cover the car ran 440 yards along the level and attained a maximum speed of 20.50 miles per hour. Many other tests conducted might be cited, but sufficient have been mentioned to indicate that here is a very interesting innovation in pneumatic tyre construction. The other Michelin exhibits embrace the solid steel disc wheel introduced last year, after it had been used extensively in France before the war. The adoption of similar hubs for the whole series of these wheels of various sizes secures interchangeability. The nuts securing the wheel to the hubs are so formed that the rotation of the wheel tends to tighten the bolts, so that they cannot work loose. It is comparatively a simple matter to adapt a car to take a Michelin wheel. The company is stocking hubs for all the most popular makes of cars.

The main feature both of the all-rubber and of the steel-studded Beldam tyres (Stand 276, White City) consists of a long narrow strip of rubber standing up from the rest of the tyre, and supported on either side by protruded Vees. This design provides for the natural displacement of the rubber, and minimizes the "heaping up" which occurs in some makes of tyres. The projecting Vees also provide an anchorage and greatly reduce the possibilities of side-slip, or lack of grip, at starting a car, which is often a cause of wear. The Beldam steel-studded tyre has a diamond-shaped rubber non-skid pattern tread with oval pockets, in which are inserted steel studs whose surface is on the level of the surface of the rubber tread.

What is called the Rapson unpuncturable pneumatic tyre is displayed by Oylers Limited (Stand 226, Olympia). These pneumatic tyres are made in two types, the Richmond with heavy, square, non-skid tread specially constructed to withstand the strain and stress on the driving wheels of heavy and powerful cars; and the Richmond heavy round non-skid tyre designed for the front wheels of heavy cars to ensure easy steering, and recommended, besides, as an all-round tyre for light cars. These pneumatic tyres are made at the new and elaborately equipped factory at Richmond.

THE first meeting of the German Dermatological Society since the war will be held at Hamburg at Whitsuntide, 1921. The office of the society is at Breslau.

A GRANT of £5,000 from the British Red Cross Society has enabled the board of the Royal Infirmary, Sheffield, to add another story containing twenty-one bedrooms and sanitary blocks to the existing nurses' house. The nursing staff is being increased and their hours of duty reduced.

Correspondence.

A SOLUTION OF THE HOSPITAL PROBLEM.

SIR,—I have read Colonel Griffiths's letter with interest, and am convinced that he has got at the heart of the question. Though voluntary hospitals have rendered splendid services to the nation in the past, circumstances are now against them—too strong for them. During the more active period of hospital development, from the middle to the end of the nineteenth century, the boards of management undertook and carried out duties that could not have been so well performed by any other body; but under the new and profoundly changed conditions, and as the result of the financial straits to which those who have the management of the hospitals have been reduced, a new financial scheme with a different, and probably in the long run a sounder, basis must be devised. During the past three or four years I have seen much of hospitals in every part of the kingdom; coming into close contact with management, staff—lay and professional—and patients alike, and looking at the question from the point of view of all three groups I am satisfied that the levy on employees and employers (see No. 4 of Colonel Griffiths's letter), pressing lightly on individuals—even on employers of large numbers of workers—but providing, in bulk, a sum adequate to meet the cost of great developments, presents the most feasible scheme yet put forward.

For some time past the working man has come slowly but surely to appreciate the value of hospitals to him and his family, and has helped willingly to finance them, especially through organized collections in the workshops throughout the country—more so in the provinces than in London. But such support as has been given is insignificant in comparison with the amount needed adequately to maintain and extend these institutions. I am convinced that the time is ripe for the matter to be again brought before them with the object of gaining the means to place hospitals on a permanent footing. This the scheme now suggested appears to do. The working man, with his present income, is undoubtedly able to make the small weekly contribution suggested as being necessary for the upkeep of an institution in which his interests are so deeply concerned. Moreover, if I know anything of him, his spirit of independence only awaits instruction as to the best method of making it. In this way the few Poor Law infirmaries which now serve as general hospitals in large cities might have their status raised, and come to play a greater part than they do at present (the King's College Hospital authorities appreciate this), and the voluntary hospital expanded to meet needs, some of them very acute, recognized by all.

The hospital question (*pace* the *Times* medical correspondent) is more closely bound up with the housing question than is generally realized. Provide ample hospital accommodation, not only for fever and infectious cases but for "lying-in" and special cases, and, in addition to serious accidents or disease, even for minor affections, and the gravity of the housing question will be greatly diminished, and the gain to the health of the community far more than proportionately great.

Not the least of the advantages accruing under Colonel Griffiths's scheme would be the closer co-operation ensured between the general practitioner and the specialist—greatly to the advantage of the patient. We have arrived at a point at which the money subscribed voluntarily for the improvement of the conditions of hospital life is utterly inadequate, but with the resources that could be placed at the disposal of the hospital authorities as the result of a hospital levy the status of the Poor Law hospitals could be raised, the work of the general and special hospitals greatly extended and improved, and further provision made for others who at present are in sore need of it. Surely it is time to extend to the middle classes some of the splendid facilities provided for the working classes in the voluntary hospitals. Heavily taxed and rated, some consideration is due to them. Cannot they be allowed to share these hospital advantages should they claim the privilege?

Under the voluntary system it has been almost essential to the collection of subscriptions that elaborate buildings, sometimes not well adapted to the purpose they have to