MOTOR NOTES FOR MEDICAL MEN.

By H. MASSAC BUIST.

FEATURES OF THE FRENCH MOTOR SHOW.

THE eighteenth international Automobile Salon in the Grand Palais will close to-morrow (Sunday, October 14th) and the seventeenth international Passenger Car Show promoted by the Society of Motor Manufacturers and Traders, under the patronage of the King, will be opened to the public at Olympia, Kensington, on Friday, November 1st. But it will be preceded, on Monday next (October 15th), by the yearly international Motor Cycle Show, which will, therefore, be the first of the motor exhibitions to be held in the enlarged building. The Paris Motor Car Show is purely French as regards 85 per cent. of the exhibitors. The British industry is represented by two makes of cars only, the Austin and the Rolls-Royce, the 7-h.p. chassis of the former make being the only example made in this country with a 4-cylinder engine of 1 litre capacity only, whereas French builders make several machines in this category. Owing to the state of the exchanges and to the 45 per cent. import duty, the British exhibitors in Paris are in much the same case as the American—they can be there for the sake of show, scarcely for business. General Motors, the great corporation that produces Chevrolet, Buick, Oakland, and Cadillac vehicles, is represented by a fine exhibit, especially of Buick and Cadillac machines, the three larger makes having brakes to all four wheels; this is a new feature of many American-made cars, as will be seen at Olympia, but a familiar thing in the cars of many of the leading French makers. No British exhibitor shows any chassis with four-wheel brakes in Paris, though many will be standardizing them or offering them as an option at Olympia, including Armstrong-Siddeley, Austin, Aston-Martin, the new 14-h.p. Bean model, Bentley, the new Beverley-Barnes, Deemster, H.E., the new 6-cylinder 21-h.p. four-speed Lanchester, Sunbeam, Talbot-Darracq, Vauxhall, Warwick, and Waverley.

Front Wheel Brakes for Popular Priced Cars.

The first big effort by the French industry to introduce front wheel brakes was made five years ago. Much has been learnt by French automobile engineers in the interval. M. Henri Perrot's patents for diagonal application, and so forth, have been combined with those of Captain Hallot, the inventor of servo mechanism; and a vast variety of engineering talent has been brought to bear on detail of problems of axle design, suspension, and so forth. The result is that, in regard to the application to standard cars, the development is in a satisfactory state as far as the French industry in general is concerned because its members have made many mistakes and learnt much. Further, the engineering talent brought to bear on the subject by Delage and Hispano-Suiza among standardized car builders, and by Talbot-Darracq among firms that experiment by way of racing, has had very valuable results. M. Perrot, who is regarded as the man with most experience in the world on this subject—more than half a generation of it, considers American automobile engineers as a class to be at the same point to-day that French firms were in this respect five years ago. Like the French, he expects the Americans will have to spend quite a couple of years experimenting before they develop front wheel brakes which can be placed in the hands of the ordinary user with perfect safety. Nevertheless, some American manufacturers, including General Motors, are using certain of his patents under licence; this comment applies to the general, not to the individual, American case. French experience to date, which extends over 20,000 cars of various makes in the hands of private owners, has proved that some sort of servo mechanism is absolutely essential for all but light and comparatively slow cars.

From the technical point of view front wheel brakes should not be studied as a brake problem only. Suspension and steering are so intimately related to brakes on the front wheels that the three must be considered as one problem; hence the difficulties. It is surprising to find that the use of any servo mechanism is almost entirely absent from the American designs. By contrast, in the designs used in this

country by the more responsible engineering houses of the widest experience it is observable that there is no hesitation about working the Perrot-Hallot patents under licence. But, as among the French makers, so among the British, such firms as Bentley, Lanchester, Sunbeam, Vauxhall, and others show extraordinary fertility of inventive resource, each dealing on wholly original lines with a number of ancillary problems hitherto overlooked.

Of exhibits at the French Show there is nothing much to add in respect of brake design, because undoubtedly the leading automobile engineers have there solved practically all the problems necessary for safe use in the hands of the public. It is observable this year that the leading axle makers are offering special axles, complete with front wheel brakes, thus making it comparatively an easy matter for car builders to apply these component units to their chassis.

A point which will interest medical men is that the 10-h.p. Renault models are now fitted with front wheel brakes. Again, Chenard-Walcker produces one chassis on which there are brakes on the front wheels only, and none on the back, an independently controlled brake operating through the transmission. There have been some changes in regard to the front wheel brakes and axle mechanism of the nominal 30/40-h.p. overhead valve 6-cylinder engined Fiat introduced last year. It has now been developed in detail to an extent that enables it to be standardized on a large scale. The 15/20-h.p. Fiat has lightweight aluminium pistons with thin cast-iron skirts.

Overhead Valve Engines on the Increase.

A census of the valve systems used at the Paris Show reveals that there is no question about the overhead valve gaining in favour at the expense of the side-by-side setting. It is observable that the French industry does not fit overhead valves for the mere sake of falling in with an assumed vogue. Practically all the builders employing this system of valve gear do so to obtain greater economy and greater power; and, what is not invariably the case in this country, they achieve both. The 8-cylinder-in-line engine tempts many manufacturers, including Rolland-Pilain, who have employed the type for racing, and Chenard-Walcker, who produces one with 69.5 by 130 mm. bore and stroke measurements. The latest Chapuis-Dornier engine produced by that firm of specialists, whose products are fitted to many Continental vehicles, is a 4-cylinder unit with overhead valves and only 1,100 c.cm. volume, the bore measurement being 59 mm. and the piston travel 100 mm. In nearly all designs the overhead valve gear is worked by push-rods and rockers enclosed in aluminium covers, this being the cheapest of the really effective forms of operation. The little Dornier power plant develops 20-h.p. on the Froude brake. Peugeot introduces a 10-h.p. model with 4-cylinder overhead valve engine, having detachable cylinder heads. De Dion-Bouton introduces a 20-h.p. 4-cylinder overhead valve engined chassis of 95 by 140 mm. cylinder bore and stroke, as does Rochet-Schneider. On all the larger Renault models this firm's small car practice of placing the gearbox on the front end of the torque tube is exploited. Delage uses a 4-cylinder overhead valve engine for his new 12-h.p. car. The motor has a five-bearing crankshaft, forced lubrication, and the chassis a gearbox giving four speeds forward and, of course, brakes to all four wheels. Both Citroën models remain without any important changes. From Belgium there are sent Minerva and Métallurgique cars of the smaller middle size with brakes to all four wheels.

A Cheap, Light, Silent, Covered Body.

There are in the Salon various examples, including those standardized on the Delage and the Talbot-Darracq chassis, of the patent Weymann silent, cheap, lightweight, flexible, durable, easily cleaned, covered body schemes, the British rights of which were acquired by the Rotax Motor Accessories, who have granted licences to Daimler, Rover, Sunbeam, and Talbot, among others; these firms will standardize this class of coachwork from the November London show onwards. I made a test of this type of bodywork on a large 40-h.p. Renault chassis, driven by the holder of the French aeroplane records, including sundry world's records,

which is another way of intimating that the tests of silence and so forth were very searching. The principle of the construction is to embrace a considerable amount of aeronautical engineering practice. Nevertheless the lines of the coachwork can be made whatever the purchaser desires. The main features of the constructional scheme consist of putting a flat platform on the chassis, and mounting the seats, instrument board, and so forth on that, the sides and roof of the covered body being a quite independent unit, and constituting a shell. It is a cheap body to make; and no coachwork so durable has been brought forward before. The one point of objection may be that, when it is brand new, it has not that mirror-like surface that can be got by ordinary systems of construction. Against this is the fact that these surfaces deteriorate sadly in anything from a month to three months' service; whereas the Weymann finish remains in its pristine condition for two or three years and, even thereafter, it is practically none the worse for wear. Things can be done with this construction impossible with any other. Thus a door may be forcibly twisted sideways, but on release flies back into its normal shape, none the worse. A very ingenious cam action is the principle of the wholly original door-lock, ensuring silence and absolute security. The lightness of the construction enables a chassis to behave with full scale, luxuriously equipped, and large covered body as though it had a two-seat open racing shell on it. For instance, on a large Renault the whole body, including the very ample cushioning and so forth, scaled $5\frac{1}{4}$ cwt. only, with all the usual glass and so forth.

What Doctors Need.

All the joints in this type of body are separated, as to their component parts, by canvas. The panelling is of a special synthetic leather which has some quite extraordinary qualities. For instance, in hot summer weather the car may be driven all day in scorching sun with an opening in the front windscreen only, so that the driver is protected from heat and dust, yet on getting out, though he will find the panels bulged somewhat here and there, yet by the time he has had lunch the coachwork will have reassumed its normal shape. In like fashion one of these panels may be punched really hard, and a welt raised on it. But, again, after a short time search for the blister will be in vain. Rather a curious story attaches to this quality. The inventors thought that, if this material were so serviceable for coachwork, what a fortune could be made in boots! After wearing boots fashioned of this synthetic leather for a fortnight, however, and finding that they came back to their original shape every morning, so that the user had the discomfort of putting on brand-new boots every day, it was realized that this quality was rather a disadvantage than a gain. All the sliding windows of the Weymann bodies are fitted in rubber channels. This body is, in effect, resilient and free from strain. The methods of construction and the materials used enable wringing stresses to be withstood; and the rattle-free condition of the machine is permanent. This type of coachwork has other important qualities from the point of view of the medical man in that, whereas one dare not dust an ordinary body because the surface would become scratched and lose its gloss, and one has to be very particular about washing for the same reason, by contrast this type of panel can be washed or dusted, in quite an unskilled fashion, without the vehicle losing its original appearance. The cheapness enables a limousine, or saloon body, as well as the landaulette type, to be produced at a cost not exceeding 10 per cent. more than that of constructing an open touring type body, the weight being approximately three-fifths only of the weight of a body of a similar style constructed on ordinary coachbuilding principles. Altogether it constitutes a very notable development of prime interest to the medical man at this juncture. There is nothing experimental about it, the type having been tested over several years. Further, never has such a degree of engineering knowledge been brought to bear on the problem of coachwork construction as is embodied in the very clever framework employed by

the Weymann principle. And the saving of voice strain in the course of a day's run has to be experienced fully to be appreciated.

Large Section, Low Pressure Tyres.

In 1916 the Dunlop Company experimented with large section, low pressure tyres. At the Paris Show a number of vehicles, particularly of the smaller sorts not over well sprung, are exhibited with proportionately very large section Michelin tyres, which will constitute a feature of exhibits at the forthcoming show at Olympia, where a number of vehicles will also be shown with Dunlop tyres evolved independently on this principle. From the purely technical point of view it should be pointed out that this is quite a different thing from fitting over-size tyres because these new style "comfort" or "balloon" low pressure, large section tyres are set on very wide rims, so that the strain on the walls is reduced materially. The main object is to ensure comfort on an ill-surfaced road. In other words, the tyre industry is here bringing forward something to cover the faults of the automobile engineer who does not understand springing, or who has not the money at his disposal with which to supply adequate springs to his vehicles. At an earlier period I should have regarded the development as dangerous. But now that the corded tyre principle can be exploited without infringing patents and is, therefore, being taken up universally as being by far the best method of cover constructing, these tyres can be run under conditions of relative abuse with much greater safety, and under-inflated to give very much better results along these lines than have been attained hitherto. Michelin offers 715 by 115 mm., 750 by 130 mm., and 775 by 145 mm. "balloon" or "comfort" tyres to replace the 80 mm., 90 mm., and 105 mm. sections.

One inevitable result of this new movement, however, will be that people will run anything from pedal bicycles to motor cars with ordinary tyres at low pressures. Than that nothing could be more extravagant, or dangerous. Such pneumatics are not designed for running below the pressures specified and there is grave risk of them coming off the rims at corners, and so forth. The over-size "comfort" tyre, as the new type is styled which is being produced by the industry both in the Old and in the New World, is designed for the special conditions it has to fulfil. Michelin even introduces a special type of safety ring which prevents a deflated tyre coming off at high road speeds, as has been demonstrated on the Continent on some racing cars. The roads there are less satisfactory on the whole than in this country and, of course, cars are driven at vastly greater speeds, for one thing because the open, level, and straight roads encourage that; for another because the surfaces are not treated for dust, therefore you must scorch or be choked with dust of other folk's raising. A number of automobile engineers who have tried these tyres on their cars state that the increase of comfort is great. But they find that when corners are taken at high speed, they seem to experience an inclination to sea-sickness.

There are many other interesting inventions in the Paris Show, but the majority are of no more than academic interest to medical men; incidentally, this applies to Mr. George Constantinesco's new form of transmission to dispense with clutch, gearbox, and back axle drive on a motor car. Whatever its merits this could not be standardized by manufacturers in this country for the coming season. The device has been evolved by the inventor of the "C.C." gear whereby machine guns were fired in war time through propellers of aeroplanes.

The Cambridge University Press has recently published for the Cambridge Philosophical Society the first number of a biological part of the *Proceedings* of the society, which until now have contained, in a single series, mathematical, physico-chemical, and biological papers. In separating the biological papers from the others it is hoped that a medium will be established for the publication of biological work of general interest done in the various departments of the university and possibly elsewhere. A Publication Committee, consisting of professors and other representative biologists, has been appointed. It is proposed to issue the new *Proceedings* in quarterly numbers.