THE MOTOR SHOW AT OLYMPIA.

DEVELOPMENTS OF INTEREST TO MEDICAL MEN.

By H. MASSAC BUIST.

THERE are many developments of special interest to medical men in the seventeenth International Motor Car Exhibition promoted by the Society of Motor Manufacturers and Traders, which was opened under the patronage of the King yesterday (Friday) in the enlarged Olympia buildings, Kensington, London, and will remain available, Sunday excluded, until Saturday night, November 10th. The prices for admission are half a crown on both Fridays and Saturdays and five shillings on all other days. The prices of the exhibits, alike as regards chassis and complete cars, are those which were fixed by the vendors, and which had to be reported to the exhibition organizers on October 15th. No changes, either in the way of increase or decrease, may be made during the period of the exhibition. The object of this rule is to let the inquirer know precisely how one product compares on the market with another under this head.

This is the majority year of the organizing body, whose series of yearly shows, of course, was interrupted by the war. The new hall adds 65,000 square feet of stand space, bringing the total accommodation to 170,000 square feet, exclusive of the large amount of space needed to provide circulating avenues between the stands. Two other exhibition buildings in the kingdom claim to be larger. But when the figures are gone into it is found that the total area of the given establishment is returned, the implication being that that is available for stand space. The regulation forbidding members of the trade to smoke while on duty at their stands has been repealed. This is regrettable, for the building, large as it is, is crowded throughout the whole period it is open to the public, so that every effort should be made to keep the atmosphere pure. Why should those whose business it is to serve the public and who have wares to sell vitiate the atmosphere?

OVER 500 EXHIBITORS.

This, therefore, is the first post-war exhibition of the sort which has been housed in London under one roof. In spite of the vast amount of space, it is not possible to accommodate all who would display. Several such are perforce excluded; and that after the space originally allotted, but since forfeited by firms which have gone into liquidation and are not eligible under the rules to display, has been redistributed. The natural lighting of the new building by day is all that can be desired, and the convenience of the additional entrance actually on the Hammernsmith Road will be greatly appreciated by the public. The new building has also made it possible to increase the catering accommodation, an improvement urgently necessary.

The total number of exhibitors is 526. There is a feeling this year that something should be done in respect of the British industry, the facts being that, on the one hand, it is in a very large percentage of cases placing vehicles on the market at less than the actual cost of production; and, on the other, that the number of passenger cars being absorbed by the buying public in this country this year is, according to the latest registration figures, exactly double the maximum attained in the boom period before the war. The explanation of the parlous case of the British industry in general is that the majority of this increased business has gone to the foreigner, notably to the American trade, to which we are paying £5,500,000 a year. Of course, the real cause is that, in the gross, there are far too many firms engaged in making passenger cars; and this is the only car-producing country in the world where the foreigner is able to do an appreciable business. America puts up an effective tariff wall against British cars despite the fact that her home industry is established on a scale producing 3,000,000 vehicles between January and September, 1923, hence the division of the manufacturer's dead charges over each car to sell reduces that item, very heavy in the case of a British manufacturer, to a negligible sum in the case of an American one. All the vehicles the U.S.A. sell in this country represent extra profit as far as that industry is concerned. The Continental exchanges, of course, favour

business in French, Italian, and Belgian cars in this country. German cars are not represented in this show, being still ineligible; but they are on our markets notwithstanding.

THE ONLY REALLY INTERNATIONAL SHOW.

Most of the international trade organizations abroad are modelled on the pioneer body which promotes the Olympia exhibition. But they differ in one important detail. Ours is international in name and in practice: theirs are international in name, but not in practice. Thus a British manufacturer may be a member of the *Chambre Syndicale* in France: but he has no voting rights and, when it comes to exhibitions, he can be allotted stand space only when the native industry has been accommodated. No voting rights could be obtained by a British manufacturer belonging to any of the other national motor trade bodies, either on the continent of Europe or in America. By contrast, in this country the foreigner, or his representative, can be a member of the Society of Motor Manufacturers and Traders enjoying equal voting rights with British car builders and vendors, and the right to secure stand space at exhibitions under precisely the same conditions as obtain in the case of a native. Certainly there is abroad nothing in the nature of a spirit of reciprocity in this matter, a point concerning which the public in general appears quite ignorant. What the average citizen should realize is that we are sending money overseas for a number of commodities which we could produce at home. If we do not order from home sources tens of thousands of skilled workers fail to secure work and, therefore, go on the dole; hence there is a double bill to pay, one direct and the other indirect. The buying public should understand the proportions in which cars of different countries of origin are bought each year so that we may devote any increase in the sale of motor cars in this country to getting some of the out-of-works back into our factories. For instance, the capacity for absorbing motor vehicles in this country with a population of 47,000,000 must be in excess of 80,000 machines a year, particularly as the majority of the cars are small, low-priced vehicles. In this connexion the enterprise of the British industry in pioneering this class of four-cylinder car must be borne in mind. America offers us nothing akin.

HOW CONDITIONS OF USE GOVERN DESIGN.

All this would be more or less beside the point were the British industry charging for its wares sums out of proportion to their value relative to foreign products. But it must be remembered that cars built abroad have to be suitable, primarily, for conditions obtaining in the countries of origin, and that, therefore, in certain respects the average foreign-built car cannot give the most suitable service judged from the point of view of the special road requirements of this country. It is for this reason that many types of British-built cars, designed with a special view to home service, have been found, year after year, to be unsuitable for conditions that obtain in the British market overseas. That is why America is supreme there to-day. In those countries of relatively few and, outside selected routes, of very makeshift roads, the conditions are the same as obtain throughout the greater part of the United States. Cars designed to fulfil them have not many qualities desirable for home service. Further, from the New World there has not yet come anything that is equivalent to our small, relatively light weight, refined, and high efficiency constructions such as are low taxed and economical in fuel consumption. I do not refer merely to the small car as such, which, as has been pointed out frequently in these columns, is, on analysis, commonly a car of cramped accommodation. Some examples of such practice come to us from the Continent. Nevertheless, most of the pioneering has been done in this class, as distinct from the cycle car, which is of no interest to the medical man. America has never tackled this problem for the sufficient reason that the conditions of her highways and byways render it impossible to find a home market for this class of goods.

The first message of this motor show to the medical man with a strictly limited sum to spend on his car concerns the so-called light cars that are small cars, but which will

nevertheless accommodate conveniently those of normal physique. Of such cars we have constructions of British origin and quality second to none, and to-day they are offered at quite amazingly low prices.

A YEAR OF IMPROVED CARS AT LOWER PRICES.

At the very bottom of the list we have the 2-cylinder air-cooled Rover now made available either with two seats and dickey or with "chummy" body, at £139 each only; this is the cheapest all-British car in the exhibition. We have also the 2-cylinder air-cooled Stoneleigh which, as a 2/3-seater, is available at £155; and in the water-cooled 2-cylinder type we have the 7-h.p. Wolseley available with ample leg room, at £199. Passing to the 4-cylinder category we find the 11.9-h.p. Morris-Cowley listed at £225 as a 4-seater; and a machine that is a classic of its kind, the overhead valve 4-cylinder 10-h.p. engined Wolseley, built by Vickers's motor manufacturing works, is available complete as a 2-seater with dickey at £250 only. There is shown for the first time at this exhibition the new 11.9-h.p. overhead valve 4-cylinder engined Standard that was introduced during the summer, and has been developed. The distinctive point of this machine is that, though it is a light car and is economical as to fuel, taxation, tyre wear, and so forth, nevertheless it is not a small car as regards the accommodation available for the occupants. On the contrary, it is on full-size car scale. Therefore, we have here what is truly the first light car, because in this case lightness is not achieved by any curtailment of accommodation. This machine is available with either 2- or 4-seat all-weather body at £235 only in each case.

HOW COST HAS FALLEN.

What has been occurring in the matter of prices cannot be better illustrated than by citing what has happened during the last three years. For instance, the 10-h.p. Wolseley was listed two years ago at £475; last year at £385, and it has come down this year to £250. Admittedly, in this case there is a difference in the specification as to the material of the upholstery and certain details like that. But the car remains a complete all-weather 2-seater of exactly the same accommodation; and the chassis is improved in detail. In regard to the 2-cylinder Wolseley, the price two years ago was £295; last year it was £255, and this year it is £199. This machine is a better one to-day than it was two years ago. The 8-h.p. Rover was originally introduced after the war—it has been on the market four years—at £300 when prices were at dizzy heights. Two years ago it had been brought down to £220; last year it was listed at £180, and to-day it is available at £139, and, again, we have to consider that this year it is an improved product. The air-cooled Stoneleigh, produced from the designs of Armstrong-Siddeley's engineers, and built under the direction of that firm, was £225 last year and £185 this year; it is available in an improved form for £155 to-day. The prototype of to-day's 11.9-h.p. Standard model had a smaller engine, a smaller chassis, and was altogether a different proposition, not in any way comparable in merit with the new type; yet two years ago that prototype was deemed extraordinarily cheap when it was introduced at £315, and last year, when certain processes of development had been in operation, it was also held uncommonly cheap at £295; but to-day, in a fully developed form with a much larger engine, larger track, longer wheelbase, and ampler accommodation, it is £235

ENTERPRISE IN THE MIDDLE RANGE.

What has been happening in regard to the prices of middle-sized British cars? The same thing. Take the case of the famous 12-h.p. Rover car of 13.9-h.p. Treasury rating. The first cars available after the war cost £725; two years ago the figure was £650; last year it was £550; and to-day the 4/5-seater is £495 in altogether improved form, as instance the standardization of shock-absorbers and the provision of four instead of three speeds forward, together with many other improvements in minor details. This Rover model—proved by medical men years before the war—is now to be listed at its Treasury rating and is styled, therefore, a 14-h.p. (instead of a 12-h.p.) type. Again, take the 14-h.p. overhead valve engined Sunbeam car that was introduced two years ago at £725 and listed

last year at £685. The price remains the same to-day as last year; but there is a notable difference in the product. The most obvious of the many improvements included in this type is the provision of special front wheel brake system which this firm, that attained the foremost position in competition last summer by winning the blue ribbon event of the motor racing world, the Grand Prix of the Automobile Club de France, has evolved during many years of first-class, international, long distance road racing. Indeed, it was the first British firm to introduce brakes to all four wheels as standard on its largest 6-cylinder model last year, for the front wheel brakes on the 7-h.p. Austin are of a construction that is not concerned with the particular problems involved in this development. If I could go through the list item by item, it would be found that most cars represent better value for money to-day in that there is more in each machine as listed now than formerly; instance the extraordinary Overland de luxe model, the equipment of which is a catalogue in itself; and which sells for £295. Of course cases could be cited in which prices have been cut in even greater proportions, but I have sought deliberately examples of motor wares for which there is demand, each of which has attained an honourable reputation in its line, and is marketed by firms not forced to jettison their stuff but which are, on the contrary, trying to work at a reasonable commercial profit. That is essential if the motor buyer is to be given service, without which, no matter what price he pays for a car, it is a dear bargain because he cannot get, among other things, spare parts at commercial prices as and when he wants them. Unquestionably a very large proportion of members of the trade and industry is in the position of having goods to jettison, hence prices are being cut right and left. That, however, the individual must judge for himself when he inspects the display. After all, there is a vast difference in the appearance of those machines which are plainly a drug on the market, and those of some pedigree for which there is equally plainly a current demand.

HAVE PRICES AND COSTS TOUCHED BOTTOM?

One of the points concerning which the medical man will certainly be curious is this: How am I to know that if I buy a car now I am getting it at about bottom price, at least for this year? A matter which one would not bring before the public in general may be mentioned here in a semi-confidential way to members of the profession that they may judge for themselves. Dealing with cars for which there is a demand, and without indicating definitely whether the given machine is of British or of foreign origin—I shall cite points which happen to concern both categories—of machines that are being actually built now, as distinct from those which were built some time ago and which have to be got rid of somehow, one manufacturer is being supplied with sparking plugs at 4½d. each though they cost shillings to make; and another manufacturer, also of big output, is being supplied with carburettors at half the bare cost of producing the castings. I could cite examples, too, in regard to electrical equipment and other accessories. In fact, one of the notes of the year is that machines are being supplied with quite an extraordinary amount of auxiliary gear: I will instance the elaboration of the instrument board, the provision of clocks, gauges, reflectors, tyres, and so forth. Here we have the key to the riddle. The accessory industry in general is in a parlous state and much stock has to be jettisoned by some firms. The car manufacturer avails himself of that opportunity both to make his vehicle more complete and to pass the benefit, without any profit to himself, direct to the buyer, because he realizes that it is to the advantage of both parties. Therefore much of the reduction in car prices is due to the fact that the accessory industry in general is supplying the manufacturer at losses that certainly represent an average of 10 per cent. It is a mysterious method by which the bankers seem to be content to keep accessory factories going; if they were not liquidating stock in this way, in many cases they would be closed in three weeks. Those that understand the case can judge for themselves whether accessories to be made henceforth can be produced and supplied under such conditions. I am convinced they cannot. We have touched rock bottom,

as far as the accessory maker can render it possible for the car builder to lower his costs. One idea of certain accessory makers, of course, is to get their wares on quantity production schemes, then go to manufacturers on a lesser scale and point out to them that such and such a popular car-builder has placed orders and that, therefore, they will be out of the fashion if they do not have the given accessory. Another aspect is that if the vendor gets a given accessory on quantity production cars, when each renewal is needed the private motorist will buy that accessory—not at the figure at which the car-builder has acquired it, but at a price which will reimburse the accessory maker for the loss he has incurred in supplying the car in the first instance. It is a weird and unhealthy way of business; and I am satisfied from my own investigations that the really sound firms in the accessory industry are standing by and letting anybody's accessory be thrust to the fore, or jettisoned, rather than themselves undertaking to manufacture at a loss. The state of the exchanges greatly complicates this matter. In connexion with steel and other raw materials which the chassis builder needs, the indications are that these will tend rather to rise than to fall.

FACTS THAT MAKE THIS A MEMORABLE EXHIBITION.

The outstanding general tendencies this year are, not that there is any appreciable number of new models worthy of attention in what are called the small car classes, but that the smaller middle size chassis, rated anywhere about 14 h.p., is attracting the attention of an increasing number of serious manufacturers, many of whom are listing important fresh contributions under this head, each at moderate prices and designed especially for the owner-driver. There is the new 12/30-h.p. Sunbeam, designed much on the lines of the already well known 14/40-h.p. type—but without front wheel brakes—and which is listed with 4-seat body equipped completely at £570. This is in every sense a Sunbeam product as regards quality. Then there is a new 4-cylinder side valve engined 14-h.p. Bean car with four speeds forward and right-hand control, complete with 4/5-seat body, at £395; and a new 14-h.p. overhead valve 4-cylinder engined three-speed Armstrong-Siddeley car, listed complete as a 4/5-seater of uncommon ample accommodation at £360; the design of the latter is quite unconventional but sound. It is of light weight, the idea being to put on the market a British-built car that will compete with American machines without, however, attempting anything so absolutely futile as to imitate transatlantic methods of construction. The Armstrong-Siddeley is intended to be suitable both for the overseas and for the home markets, and to provide those particular aspects of refinement characteristic of the British car of the higher grade which it is not possible to embody by American methods of construction irrespective of price. This machine works out economically as to prime cost, tax, fuel, lubricant and tyre consumption, the last by reason, especially, of the form of drive and the method of suspension. The long and the short of it is that to-day the medical man can get an all-weather, full scale, middle size car at a price that two years ago he had to pay for a small car of cramped accommodation. Nor is purchase price the only point in that in the interval fuel, lubricant, and tyre costs have fallen amazingly; and carburation efficiency and tyre durability have been increased to an extent which enables middle size car costs under these heads to-day to be quite as economical as light car costs were three years ago. If for this reason only, the exhibition would be memorable in the history of motoring in these islands.

THE GENERAL PRACTITIONER'S CHIEF NEED.

In general there is certainly an increasing desire on the part of the designer to provide more accommodation for the driver and passenger on a motor car. We see this not only in such schemes as have been mentioned already, but also in the Wolseley development of some moderate priced, middle size models wherein the chassis width has been increased and therefore wider bodies have been possible. We have the same effect, too, in the relatively wide new 14-h.p. Armstrong-Siddeley. Another point which is important to the medical man is that there is a tendency not merely to answer the general demand for right-hand control of the brake and gears—the central control is often a

nuisance, especially in the season when heavy coats have to be worn—but also to provide, in the case of middle-powered cars, four speeds forward on the Continental principle, instead of three, which has had quite a vogue in this country and which is still very popular in America. Three speeds are adequate to certain constructions provided the engine has flexibility and pronounced acceleration and that the power-weight ratio is favourable. But this is rare. Wolseley this year has furnished four speeds to the 15-h.p., overhead valve, 4-cylinder engined type and many another example of this could be cited, alike in models already familiar and among entirely new types, as witness the 14-h.p. Bean, the new 15/80-h.p. 6-cylinder Maudslay, and the new 21-h.p., overhead valve, 6-cylinder engined Lancaster, which last is of interest rather to the specialist than to the general practitioner; as is the new 21-h.p. 6-cylinder four-speed Rover and the new 20/60-h.p. four-speed Sunbeam. For the medical man's service it is essential that a car should have a quick acceleration without straining the engine, which may often be cooler than the precise temperature that represents its most efficient working and the most favourable condition of the lubricant as to viscosity. Most modern engines will "open up well"; but when relatively a short distance has to be run, and comparatively long spells of idleness for the car between stages, so that the engine and gears are generally in a semi-cool condition, it is often possible to assist the mechanism appreciably by having four speeds instead of three. The doctor's problem is much the same as that which has concerned our great passenger-carrying corporations, including the London General Omnibus Company, whose difficulty for years past has been, not how to make vehicles that will travel faster as to maximum speed, but which will be able to accelerate from rest to the normal running speed in minimum time. That is how time is saved between halts. Nobody wants to travel at a mile a minute on his ordinary occasions; but most medical men want to get going from a stand to twenty miles an hour in as few yards as possible. That is where the four-speed gearbox will be of assistance, as is the increasingly general use of a "hot spot" in connexion with the carburation.

CHASSIS LUBRICATION MADE EASY.

Another point of economy is the welcome spread, especially in regard to middle size and small cars, of grease gun lubrication which was taken up by a few manufacturers last year. Now it is standardized by nearly half the builders of British cars at a popular price. Already it is plain that it will be a universal practice in two or three years. This method ensures the positive entry of the lubricant to the point of the chassis which it is desired to lubricate, and it is made possible to get at those points which have been inaccessible, thereby dirtying the operator, yet, hitherto, failing to achieve the object in view. Overhead valves continue to increase gradually in favour, and it is to be noted that this year those firms employing the system in fresh types are more or less all justified in that they are obtaining greater economy and greater power, which is more than could have been written truthfully about a number of firms that have produced cars with overhead valve engines in past years. The reason appears to have been that it was considered that it would be a selling point despite the fact that the given builders had not gone to the pains, or expense, of acquiring any first-hand knowledge of the why and wherefore of this system of design.

The greatest of all mechanical developments of the year is the wide exploitation of brakes to all four wheels. These are not necessarily required by medical men. Certainly members of the profession must be warned seriously concerning many front wheel brakes furnished to the cheaper classes of cars, again very obviously because it is foreseen that there is to be a vogue for this class of braking. Certain manufacturers are putting such accessories on their cars without themselves having had sufficient experience to appreciate all the problems involved if the system is to be made satisfactory. If it is not, I maintain that it is a positive menace to road users. There are to be seen at Olympia many cars, especially of the cheaper sorts, fitted with four-wheel brakes which will prove dangerous. Unfortunately for our purpose, the law of libel does not allow me to specify them.

A WORD OF WARNING ABOUT FRONT WHEEL BRAKES.

Therefore the only thing I can do in the interests of medical men is to advise them to inquire carefully into the history of the fitting of front wheel brakes to any given car. Of the French industry in general it may be recorded to its great honour that it has had five years' experience of front wheel brakes. The majority of the French builders of cars of any quality are standardizing systems which embody, in any case, servo mechanism, chiefly under the Perrot-Hallot patents. M. Henri Perrot was the first to discover some of the other basic principles involved in the safe application of brakes to the front wheels. He is really the father of the whole movement. Italy sends a notable version of front wheel braking in the 6-cylinder 30/40-h.p. Fiat, which is a chassis possessing remarkable qualities for the needs of any who may have occasion for a covered carriage to serve often as an economizer of time over the railway service, and which shall be of strictly reasonable prime cost and a high degree of refinement and efficiency. This system should be studied. A bare chassis is shown with the now well proved hydraulic control which this firm has been one of the first to bring to a practical stage, as a result, incidentally, of its unsurpassed experience in first-class racing events.

A note of the year is that Sunbeam was the only firm to standardize last year a front wheel braking system of genuine engineering merit, wherein the problems involved were faced frankly and solved; this year the British industry is emboldened to bring forward great numbers of variants. Moreover, after several years of experimenting the American industry has devised some standardized front wheel braking systems and has, too, provided more types, such as the Marman, than are marketed in this country. But in general it is important to note that M. Henri Perrot, whose patents are worked under licence in America by such firms as General Motors (who market the Buick, the Oakland and Cadillac 4, 6, and 8-cylinder cars that are now fitted with front wheel brakes), has expressed the opinion in writing in the U.S.A. technical press that the American industry in general is in the same state in regard to four-wheel brakes to-day as was the French industry five years ago. As to our own types, several car builders, including Bentley, Daimler, the 21-h.p. Lancaster, Maudslay, Rover, Sunbeam (14/40-h.p., 16/50-h.p., 20/60-h.p., and 24-h.p. types), and Vauxhall have well thought out schemes standardized on certain models. In the cases of the 30-h.p. 6-cylinder Armstrong-Siddeley and the 14-h.p. Bean, and in regard to the 20/70-h.p. Crossley type, such accessories are supplied as extras at the buyer's option. But in regard to the more powerful 6-cylinder cars made in Britain, it is observable that neither Lancaster with the 40-h.p., Napier with the 40/50-h.p., nor Rolls-Royce with the 40/50-h.p. 6-cylinder chassis furnish brakes to the front wheels. The two former, however, have considerably increased the diameter and area of their brakes on the back wheels. Napier is the only firm concentrating on one large 6-cylinder model only, which is available in a longer wheel-base type, and Rolls-Royce introduces a longer wheelbase on the big 6-cylinder chassis.

NEW TYPES AND NEW CAR BUILDERS.

As Rolls-Royce introduced a 20-h.p. 6-cylinder overhead valve engined car last year, so Lancaster, hitherto concentrating on a large 6-cylinder, introduces this year a 21-h.p., overhead valve, 6-cylinder, monobloc engined chassis with front wheel brakes, four speeds forward, and the Lancaster suspension and worm drive features. Rover introduces a nominal 21-h.p., 6-cylinder, side valve engined, four-speed, worm-driven car with Perrot-type front wheel brakes; Maudslay enters the car industry with a 15/80-h.p., 6-cylinder, overhead valve engined, four-speed chassis of notable design; and Sunbeam introduces a 16/50-h.p. and a 20/60-h.p. overhead valve engined chassis, both with 6-cylinder engines and brakes to all four wheels on the special Sunbeam principle. The 4-cylinder 14-h.p. Armstrong-Siddeley, 4-cylinder 14-h.p. Bean, 11.9-h.p. Standard, and 12/30-h.p. Sunbeam types make their debut at the show. Of course, there are introduced some new makes of cars, those that will be seen for the first time at the enlarged

Olympia, including the 10-h.p. Triumph that was brought out last summer, the 10.4-h.p. Windsor, the 12-h.p. Westcar, and the 24/80-h.p. "straight-eight" Beverley-Barnes. The last named is a £28 tax, overhead valve, 3,994 c.cm. engine volume machine with a gearbox giving three speeds forward, spiral bevel-driven back axle, brakes on all four wheels at a chassis price of £750. The builders are Lenaerts and Dolphens of Beverley Works, Willow Avenue, Barnes. But despite the chassis price being moderate, this is too ambitious a vehicle for the average medical man. Therefore, in connexion with the problem of designing front wheel brakes in general I may state that it was impossible at this stage to get a better example of what has been learnt in the five years during which these accessories have been employed in France, where over 20,000 individual private owners have had experience of them, than in the 12-h.p., 4-cylinder, overhead valve engined, four-speed Delage car which is on exhibition at the show. Hispano-Suiza, Peugeot, and Renault have also done notable pioneer work in this connexion. That will give an idea of the basic principles that have to be dealt with. It illustrates admirably the Perrot-Hallot servo mechanism and other patented schemes. Among the Americans who work under some of these patents, it is observable that in the Buick car introduced by General Motors the four-wheel braking system works on the principle of shoes expanding in drums on the rear wheels and contracting bands on the front wheels; while in the Cadillac the process is exactly reversed. Continental and British makers do not favour the use of contracting bands for the reason, among others, that it is not possible to get absolutely even pressure over every fraction of the contact surfaces. General Motors is the largest individual corporation in the world producing cars, and in the case of three of its makes (including the Oakland) it has fitted front wheel brakes this year, after several years of experiment. Against this, on the Chevrolet and Oldsmobile cars, which it also builds, front wheel brakes are not furnished this year.

NEW LIGHT WEIGHT, SILENT, COVERED BODIES.

Quite the most notable development in regard to coachwork for the medical man is the Weymann cheap, light weight, silent, durable, patented covered body, which was dealt with at some length when the recent Paris Automobile Salon was reviewed. It was shown by Delage and Talbot-Darracq. The system is illustrated at the Olympia exhibition by those builders, and among other licensees, Daimler, Rover, and Sunbeam, who are standardizing this class of body, which can be made as commodious as the chassis can accommodate, yet the total weight will be not more than that of an open body. The principle embodies aircraft engineering practice as regards the construction of the framing, the jointing, the general use of wood, and so forth. Traditional coachwork practice is reversed completely in that the doors, sides, back, and roof constitute one member entirely independent of the floor and seats, which are a separate unit erected on the chassis. The hinges, the cam action handles, the methods of attachment, the grooves wherein the windows slide up and down, and so forth, are each the subject of a patent, the result being lightness, durability, low cost, and absolute silence. The last is a great factor for saving fatigue in the case of those who have to drive more or less all day long, and often at night. It is possible to speak in this type of covered body without raising the voice any more than one does in a room. I have found that to be a true claim. There is no squeak or rattle. This is a type of body, too, which does not lose its original gloss but, on the contrary, looks as well after long use as at the beginning. Against that, it never has the mirror-like, showroom finish of the average car of to-day, which loses its pristine brightness within, unfortunately, less than three months, never to recover it again. Talbot put one of these closed bodies on a 12-h.p. chassis, and it actually weighed 80 lb. less than the open touring type of car. The fabric used for the panelling is synthetic leather, which can be dusted as well as washed by unskilled labour without injury—an important matter, for if one attempts to dust an ordinary car the varnish surface is cut. From that moment the process of deterioration is exceedingly rapid.

INTERCHANGEABLE COACHWORK.

Unquestionably that is the most notable fresh contribution to the problem of coachwork made this year. It is important to observe that these advantages are all obtainable for a lower price than an ordinary covered body. The medical man can have the advantage of using a complete saloon on a chassis which otherwise would be somewhat overloaded with a cabriolet, or coupé, which is bound to become creaky in relatively short time. Moreover, as far as tests have gone, the Weymann bodies have been found capable of withstanding extremely varied climatic conditions such as great heat in the day and cold at night. The warping that occurs in such circumstances is temporary only, for the body recovers its normal form with the subsequent change of temperature. Of course there are other developments of coachwork schemes as standardized on low-priced vehicles. There has not been much improvement as far as open types of bodies with collapsible hoods and temporary side curtaining schemes are concerned; the chief improvements have been in the direction of eliminating rattle and rendering more simple the process of fixing. Observe in this connexion the improvements made in the series of Standard cars. Moreover, interchangeability of component body parts has been achieved, and this firm has devoted a special factory to the building of these bodies. Thus, in the event of a door, or a panel, or window, becoming damaged in an accident, the replacement is as quick, prompt, and economical as possible, in that the given part has merely to be ordered and it will be found that it fits in position exactly. This is made possible by the developed methods of construction and by the materials employed. These bodies are better made as to certain details than transatlantic bodies; certainly, America has not attempted anything so simple and efficient from the point of view of replacement of parts.

SUNDRY DEVELOPMENTS IN DETAIL.

The wheelbase of the Dodge has been increased to 9 ft. 8 in., the body is lower, and the rear springs, which are now of the underslung semi-elliptical type, have been increased from 45 to 55 inches in length. The front ones are also longer as well as wider, being built up of more and of thinner leaves. The brake pedals are larger, the hand-brake and gear levers have been moved forward, giving more leg room and making it easier to get in and out of the body; and a Yale lock has been built into the transmission, rendering it possible to double-lock the car when not in use. The steering wheel has been improved in appearance, all the electrical connexions being inside the column. Louvres have been provided in the sides of the bonnet and the grouping of the instruments on the board is improved. Drum type headlights are employed to harmonize with the new and greatly improved body lines, and a combination of tail lamp and stop signal is mounted on the licence plate bracket on the rear cross member of the frame. This lamp operates automatically, being a valuable "safety first" device. The bodies are now longer and lower, being equipped with deeper seats providing more leg room. The touring car, painted mole grey with nickel radiator, costs £355; the blue sedan with black bonnet, valances, and head, £495; the oriental maroon landaulette with black wings and valances, and nickel radiator, upholstered in antique leather or Bedford cord at option, with English-built body, is listed at £495 also.

Four types of 4-cylinder De Dion-Bouton touring chassis are marketed this year, the 12/24-h.p. being a side valve engine type, the 12/28-h.p. an overhead valve engine type with brakes on all four wheels; the 15/43-h.p. type having overhead valves with four wheel brakes and cantilever rear springs; and the 22/65-h.p. type also has overhead valves and four wheel brakes, together with cantilever rear springs. The first named chassis costs £380, a reduction of £51 7s.; and the complete 3/5-seated all-weather torpedo £540. The 12/28-h.p. model with overhead valves has a wheelbase 4 inches longer, the chassis costing £445, which represents a reduction of £66 7s., from which £20 more can be deducted if front wheel brakes are not desired.

A CONTRAST IN TYPES.

The Renault range for 1924 includes five chassis; the three smaller have 4-cylinder engines and the two larger

6-cylinder power plant. The smallest in size is the 8.3-h.p. type with 3-seat body, or with two seats and dickey, at £265 complete in each case. The developments in these chassis were dealt with in these columns on the occasion of reviewing the Paris Salon. This firm is one of the three pioneer small car makers of France. A remarkable mechanical development is that some of the practice of the small cars is now applied to the larger and most expensive vehicles also. Of course, the larger types have brakes to all four wheels; only the smallest one is lacking them.

The horizontally opposed, twin water-cooled cylinder engine 9-h.p. Ariel chassis, that was introduced last year, remains unaltered, and in the interval has scored 100 per cent. success in the light car class in the London-Lands End trial. The single shell body standardized has been improved considerably, the rear seat having been widened so that two adults can be accommodated. The retail price of the standard vehicle with 4-seat body is £165 only. What is styled a *de luxe* model—the buyer having the choice of three colour schemes and the standard equipment—embraces all-weather hood, side curtains, hood bag, Dunlop Clipper cord tyres, Lucas five-lamp lighting set, motometer, speedometer, and spring gaiters. It is sold at £180, or, if the Lucas electrical engine starter is provided, for £12 more.

The 10.4-h.p. side valve engine 4-cylinder £11 tax Calcott model is now shown as a 2-seater and dickey type with all-weather curtains for £265 only, a single shell body type being listed at £20 more. In the second named occasional seats are provided behind the two front ones.

Sundry mechanical improvements have been incorporated in the 11-h.p. 4-cylinder side valve engine Hillman chassis, including a dry plate clutch with a neat form of withdrawal gear; also a compensating gear for the brakes. The prices of the 2-seat and 4-seat types have been reduced by, approximately, £90 each, yet the engine running has been improved and the brake application is also praiseworthy. The generously padded upholstery is of real leather and the angles of the seats are well planned. The side panel equipment is now all of metal work finished in dull black, instead of nickel plate, thus reducing the labour of cleaning. The rear side panels can be joined together across the car to form a screen for the back seat. A useful fitting is the provision of a two-way tap in the fuel tank whereby it is possible always to have a reserve of one gallon. The 2-seater is listed at £350 and the 4-seater at £8 more.

The list of new British car types includes a side valve engine 2,121 c.cm. 4-cylinder Arrol-Johnston listed complete at £398; and the Cluley (2,190 c.cm.), Hands (1,870 c.cm.), Meteorite (1,753 c.cm.), and Whitlock (1,753 c.cm.) 6-cylinder cars.

"COMFORT" TYRES AND ACCESSORIES.

As at the Paris show, so on this occasion, a novelty of note is introduced by the enterprise of the tyre industry, notably that of the Dunlop Company in the guise of "giant" section tyres designed to be run at low pressures with safety. The aim is really for the tyre industry to assist the chassis manufacturer in the matter of comfortable suspension; to be quite plain, to hide faults of bad suspension. Hence the wide demand for large section, low pressure tyres on the part of many Continental manufacturers of small cars who have to deal with very bad road conditions and, therefore, have to make their springs much harder than we are accustomed to in this country. It would be an unsafe movement were it not for the fact that the corded system of construction renders the covers very much stronger than before, and that the principle takes into account the stresses of corner work, and so forth, these large section tyres fitting on proportionately very wide rims. Interesting experiments have been carried out in France concerning the effect of these tyres; they have been punctured in racing at a mile a minute without ill consequences. But the majority of Continental expert drivers who have tested them consider that they exercise a certain effect on the steering. Against that the gain in riding comfort is admitted. The Dunlop Company experimented with the type as far back as 1916, when it fitted a 13.9-h.p. Rover car with a set. There are many other exhibits on the stand of this firm, including all the corded sizes; three types of wheels—disc, wire, and steel; and so on. Incidentally, the Society of Motor Manufacturers and Traders has requested

the Royal Automobile Club to organize comprehensive trials of low pressure tyres in 1924.

In the carburettor section interesting exhibits are the Hobson power jet type; and the newest triple diffuser Zenith. There is also a special Zenith type for Morris cars. Other exhibits on the Zenith stand include air stranglers and controls for standard types of carburettors; also a range of special inlet pipe fittings enabling this system of carburation to be applied to any make of car.

A development in connexion with sparking plugs is a miniature Lodge type for use on miniature engines; also for fitting in positions where it is impossible, or difficult, to employ an ordinary size plug. This model is known as C.E. Another Lodge exhibit is the well known priming plug to facilitate starting an engine in cold weather. This ingenious device has been improved in several details.

The Gamage display in the accessory section is a minor exhibition in itself. Incidentally, it is interesting for the wide range of foot-warmers; and the various types of gloves and gauntlets for keeping the hands and wrists warm.

THE NOBEL PRIZES IN MEDICINE.

THE Nobel prize in medicine for 1923 has been awarded jointly to Professor Macleod, F.R.S., and Dr. Banting of Toronto; that for 1922 jointly to Professor A. V. Hill, F.R.S., University College, London, and to Professor Otto Meyerhof, of the University of Kiel.

The award to Professor Macleod and Dr. Banting is in recognition of their researches into the action of insulin and its use in the treatment of diabetes. As we have so recently given a full account of these researches, have published Professor Macleod's address to the International Congress of Physiology in Edinburgh, and as we are about to publish his Cameron Lectures on the nature of control of the metabolism of carbohydrates in the animal body, we may be excused from any statement of the grounds which have fully justified the award.

Professor Hill's work is perhaps less well known to the profession. Every member of it will congratulate Professor Hill, who has just succeeded Professor Starling as Jodrell Professor of Physiology at University College, London, on this recognition of his work, and will be delighted at the honour done to medical science in this country. This is the first time that the Nobel Prize has been awarded to an English physiologist, and thus the reproach is removed that the premier school of physiology has been somewhat neglected by the awarders of the Nobel Prizes.

The award of the Prize in Medicine to Professor A. V. Hill, who is a physiologist and who does not happen to possess a medical qualification, is a direct testimony to the belief that the development of medicine depends upon the foundation provided by its basic sciences. In this respect the award is peculiarly significant, for the outstanding feature of Professor Hill's work is that he has applied to the problems of physiology the mathematical methods appertaining to the more exact sciences of physics and chemistry. Professor Hill's early career gave a good indication of his future career, for in 1907 he was third wrangler at Cambridge, and later, in 1909, took a first class in physiology in the second part of the Natural Science Tripos. Similarly he first became Lecturer in Physical Chemistry at Cambridge but afterwards turned to physiology. His great work has been the accurate analysis of the processes which occur during muscular contractions. This investigation called for the most delicate refinements of experimental technique, and was carried out in the early stages on the isolated muscles of the frog. When medical men recall the weary hours they spent in their youth with the frog's gastrocnemius and an induction coil, they may possibly feel a little surprised that anything of good or importance should come from such a source, but the development of these researches has been a brilliant demonstration of the manner in which important practical results follow any increased knowledge of fundamental principles.

The progress of Professor Hill's researches has been roughly as follows:

He first made exact measurements of heat production resulting from muscular contraction, and demonstrated the

relation between the quantity of heat produced and the initial length of the fibres of the contracting muscles.

He also showed that the muscle is a machine which in the first instance has 100 per cent. efficiency, and effects the complete conversion of its potential energy to heat or to mechanical energy. The establishment of the relations between the length of muscle and the extent of heat production provided the basis for the "Law of the heart" enunciated by Professor Starling, which explains how the heart can adapt itself to different conditions, and also explains how the process of compensation in heart disease is effected.

Professor Hill next studied the time relations of heat development during muscular contraction, and found that heat production occurred during two periods; first, during the period covering the contraction itself, and then during the process of recovery. Here his work linked up with that of Fletcher and Hopkins, since it was evident that the first phase of heat production, which occurred anaerobically, was associated with the production of lactic acid, whereas for the second phase oxygen was necessary and lactic acid disappeared, so that the muscle was put back in the same condition in which it had started.

The work of Meyerhof contributed to the further analysis which showed that the glycogen of the muscle was the source of the lactic acid, and that in the recovery process between one-sixth and one-quarter of the lactic acid was oxidized, thus accounting for the heat production, while the rest of the lactic acid was reconverted into glycogen, which, on further excitation, could be broken down again to give rise to energy and lactic acid.

Professor Hill in a recent lecture declared that the final experiments in any physiological problem should always be on man, and he has followed this practice in his own researches. In studying the respiration exchanges of man during exercise he found that the process of consumption of oxygen by the muscles in man was identical with that in the isolated muscle of the frog. The presence of oxygen is not necessary for the muscular contraction itself, but since oxygen is essential for the recovery, muscular capacity will soon fail unless abundant oxygen is available for oxidizing a portion of the lactic acid and furnishing energy for replacing the muscle in a condition in which it can contract again. Thus during extreme efforts the body can work at a pace far in excess of its oxygen supply, and, as Hill has put it, the muscle goes into debt for its oxygen during violent exertion; the extent to which this debt can be incurred depends upon the amount of lactic acid which can accumulate without affecting the muscular contraction, and this quantity, strange to relate, is almost identical in the muscle of frog and man. Thus when running a 100 yards race the whole effort practically is made on credit, whereas in a cross-country race the rate at which the competitor can travel is limited by the power of the body, as regards circulation and respiration, to supply the muscle with sufficient oxygen for its current needs.

Professor Hill's researches have thus made possible a much deeper insight into the whole process of muscular activity, whether it be of heart or of skeletal muscles, and have enabled us to form a much clearer conception of the complex intracellular processes which are involved in every vital activity. These conclusions have thrown a flood of light on the conditions regulating violent muscular activity in athletics, and they form a new basis for the study of muscular fatigue. Obviously this new knowledge will be of enormous value in therapeutics—for example, it should be of the greatest assistance in the study of the causation and prevention of heart failure in disease.

Professor Hill's conclusions with regard to the fundamental laws governing muscular activity were supported by the work of Professor Otto Meyerhof, who shares the Nobel Prize. Professor Meyerhof commenced researches on the same subject independently; he studied especially the chemical processes involved in muscular contraction, and showed the nature of the reaction which provided the necessary energy for muscular contraction. His results have confirmed those of Professor Hill in almost every particular and have resulted in more accurate appraisement of the balance of the isolated muscle than would have been possible from Professor Hill's researches alone.