A Blood Transfusion Apparatus.

Dr. DANIEL McLELLAN (Vancouver, B.C.) sends an account of an apparatus for the direct transfusion of blood, with the introduction of citrated saline solution into the blood stream as it passes through the apparatus. An all-glass 20 c.cm. syringe is attached by means of an adapter and rubber tubing to the stem of a Y-shaped glass tube. The intake arm of the Y-tube is connected with the needle for the donor, while the exit arm is connected with the needle for the recipient. A cone-shaped glass valve is placed on each side of the Y-tube; the one on the donor side has its apex pointing towards the donor, the base of the one on the recipient side facing the recipient. Between the donor needle and glass valve next the donor a second Y-shaped glass tube is placed, to the stem of which a rubber tube 20 inches long is attached, connecting with a 300 c.cm. burette for citrate and saline solution. On this tube is a Murphy screw clamp and a cut-off clamp. Needles are 15, 14, or 12 gauge. The tables should be placed in the form of an L, or L reversed, or a T, the recipient's table forming the foot of the L or the cross of the T; the donor's arm slightly outward, the recipient's arm at right angles to his own body. The donor's needle is inserted towards the finger tips, the recipient's needle towards the heart. A standard with an adjustable goose-neck attachment stands in the angle formed by the two tables; from this goose-neck the burette is hung. A mixture of 2 ounces of a 3 per cent. solution sodium citrate with 18 ounces normal saline is used as diluent. Where small quantities of blood, such as 6 to 10 ounces, are being transfused the citrate may be cut off entirely after the first stroke of the syringe has been made. To expel air from the apparatus the long tube is clamped off, the burette is filled with warm citrated saline solution, and the Murphy clamp is screwed down to allow a moderate flow. The needles are immersed in a bowl of citrate-saline solution, the cut-off is released, and a few strokes of the syringe will expel the air; the last bubble may be removed by inverting the syringe. The automatic action of the valves now becomes evident; as the intake valve opens the exit valve closes and vice versa. To regulate the flow of the citrate-saline solution, place a suitable clamp on the rubber tube between the (burette) Y-tube and the valve next to it. Screw down the Murphy clamp tight, release the cut-off clamp; unscrew the Murphy clamp until the solution comes from the donor needle drop by drop, about 100 to the minute. The pinch-cock is taken off and placed on the tube between the (burette) Y-tube and the donor needle. The recipient needle should be inserted first, immediately loosening the tourniquet, and releasing the cut-off clamp. The liquid begins to flow slowly through the apparatus into the recipient, giving no chance for the formation of clot, and thus bridging over the interval of time between the insertion of the recipient and donor needles. The donor needle is then inserted, the pinch-cock removed, and by steady, easy strokes the blood is pumped from the donor to the recipient, the strokes being counted. By deducting the quantity of citrate-saline solution from the total, the actual amount of blood transfused is estimated. The apparatus may be obtained from Messrs. Down Bros., Ltd., 21, St. Thomas's Street, S.E.1.

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A Modified de Ribes's Bag.

Dr. J. E. HEPPER (Frimley, Surrey) writes to bring to notice a modification of de Ribes's bag which he has devised. The

object of the bag, he says, is to play the part of the membranes in those cases where the membranes rupture early in labour. The bag, when folded, can be introduced into the uterus, when the cervix is the size of a shilling, by means of long ovum forceps. It is pear-shaped, 2½ inches in diameter at the broad end and 4 in. long, and is made of rubber of medium thickness. The thin end of the bag is attached to a rubber tube, the other end of

which is fitted with a tap. It is important that all air should be expelled before introduction, and that a partial vacuum should be ensured by turning off the stopcock. When the bag has been introduced in the manner described, a Higginson's syringe should be fitted to the tap and the bag partially filled with water. One injection is sufficient. It is better to dilute with water than with air. The bag remains in position until the cervix is fully dilated, the number of hours in labour being thus considerably reduced. By a special device the broad end of the bag, when filled, is concave, so that it does not displace the foetal head. The pressure also is evenly distributed outwards against the inner side of the cervix, thus producing more speedy dilatation. The bag can be obtained from Messrs. Allen and Hanburys, Ltd., 48, Wigmore Street, W.

MOTOR CARS FOR MEDICAL MEN.

NEXT WEEK'S OLYMPIA SHOW:

A FORECAST.

By H. MASSAC BUIST.

THE nineteenth annual International Motor Car Show, organized at Olympia, Kensington, by the Society of Motor Manufacturers and Traders, under the patronage of the King, will be opened to the public on Friday next, October 9th, and will close on the evening of Saturday, October 17th.

This year's Motor Show will not be so remarkable for the number of entirely new chassis types that will be introduced as it will be for the quite exceptional all-round progress made in twelve months in the matter of developing in detail vehicles already on the market. In the latter connexion enterprise takes two forms: the pioneers of designs that are commercial have been always notable for the simple means by which they achieve results. An inspection of engine and chassis improvements made by the rank and file of manufacturers will reveal that at last the majority of them have become educated to the value of clean lines and to the necessity of "tidying up" their engines and chassis to reduce cost, to minimize possible loss of adjustment, and to ensure accessibility whenever that process should become inevitable.

THE QUEST OF ACCELERATION.

Of course, these characteristics are apparent also in the majority of the new car types that will be forthcoming. The inspiration of the design of most of these is a clear recognition of the fact that it has been possible for many years to travel as fast on a car, once it has got going, as is desirable; but that we are still far from the stage of vehicle evolution which will enable a driver to attain promptly, either from a standing start or after slowing down for traffic or at cross-roads, the speed at which he wishes to travel. That quality we call acceleration. As far as new four-cylinder engined cars are concerned, progress is being attained by the use of lighter reciprocating parts, including aluminium pistons; by developing, or altering, the valve system; by increasing thermal efficiency, using higher compressions, higher crankshaft speeds; by economizing heat losses, and so forth.

To give an instance, a very successful car in the service of medical men, the Hillman, will appear in entirely fresh guise with a 2-litre side-valve four-cylinder engine of such improved performance that this is now a mile-a-minute machine with proportionately good hill-climbing performance; quiet gears that can be changed instantly, as in racing practice, so that neither car momentum nor engine revolutions are reduced in the act; Hotchkiss type front wheel brakes on a much wider and longer chassis; and coachwork developed accordingly. Inspection resulted in my being able to count twenty-two fresh points in the whole scheme, not the least valuable of which is the mounting of the power unit on new-style oil-proof fabric insulators.

PURPOSE OF THE SIX-CYLINDER ENGINE.

But 1926 will not be known for the development of the four-cylinder engined type; nor for the increasing use of the overhead valve system, recruits to which include Arrol-Johnston and Galloway among those who exploit four-cylinder practice. Fiat will introduce the long-expected nominal 7-h.p. four-wheel braked small car with right-hand controls, even as Humber will bring forward a 9/20-h.p.

new-style light car with a four-cylinder engine having overhead inlet and side-by-side exhaust valves. Lagonda introduces a chain-driven, double overhead camshaft-driven, overhead valve, four-cylinder 2-litre engined, front wheel braked car, thereby entering a new market; and Straker-Squire re-enters the arena with a new push-rod operated, overhead valve, 1,460 c.cm. four-cylinder 11/28-h.p. engined chassis with Alford and Alder type four wheel brakes, having, however, the Whitehead system of hydraulic operation. About the only other notable firms which will present new moderate sized four-cylinder engined cars exploit the side-valve setting—namely, Swift, with a 1,954 c.cm. 12/35-h.p. type with front wheel brakes; Triumph, with a 15/50-h.p. side-valve four-cylinder engined machine, also with front wheel brakes; Clyno, with a 1,496 c.cm. side-valve four-cylinder 13-h.p. engined chassis, with a specially designed spiral bevel rear axle having proportionately very large diameter bearings, and a four wheel brake system absorbing the greater proportion of the speed by checking the front wheels; and De Dion Bouton, with a £10 tax side-by-side valve four-cylinder 10/20-h.p. engined, four speed, four wheel braked Rudge-Whitworth wire wheeled chassis at £255 only, with coachwork prices in proportion.

To discover the unmistakable trend of the motoring times, however, we must look to the new six-cylinder engined machines. These are remarkable for their number, for the variety of the systems of their design, and for their quality. The plain fact is that what the four-cylinder engine was to the two-cylinder engine type before the war, the six-cylinder engine is to the four-cylinder engine to-day. By means of secondary force vibration dampers, by using lighter reciprocating parts, and so on, it is possible to give a four-cylinder engine of the highest quality and of expensive production many of the characteristics of a first-class six-cylinder type, but, cylinder volume for cylinder volume, one cannot give it equal acceleration.

More Flexible Performances in all Categories.

That is the reason for the introduction at the forthcoming Motor Show of such an extraordinary variety of six-cylinder engined new car types, ranging from the 6½-litre overhead valve "Big" Bentley (wherein an overhead camshaft is driven in a wholly novel and unprecedentedly smooth fashion by triple connecting-rods); the 3,929 c.cm. double cast-iron sleeve valve six-cylinder engined Willys-Knight; the 3,880 c.cm. Burt McCullum type single oscillating cast-iron sleeve valve engined 25/70-h.p. Vauxhall with pear-shaped combustion head; the 3,180 c.cm. push-rod and rocker operated overhead valve 20/60-h.p. Star; the 2½-litre 18/50-h.p. overhead valve six-cylinder engined Crossley; the 2,540 c.cm. overhead valve six-cylinder 17/75-h.p. Darracq; the six-cylinder Calthorpe; the inclined side valve 2,565 c.cm. six-cylinder Calcott; and the 1,776 c.cm. overhead valve six-cylinder engined Singer down to the 1,500 c.cm. overhead valve six-cylinder engined Alfa-Romeo from Italy and 1,500 c.cm. overhead valve six-cylinder engined Steyr from Austria. Other machines could be named, but the foregoing will suffice to indicate the beginning of a tendency to offer six-cylinder engined cars of all sizes and prices with power units employing quite strikingly contrasted valve gear practice.

Again, among those who have specialized in the production of six-cylinder engined cars, notable advances have been made this year. There will be on view the first display at any exhibition of the complete range of Daimler cars—including one of only £16 tax rating, which is nevertheless capable of travelling at a mile a minute—with the new style, light, durable, steel double-sleeve silent valves and a baffle plate system which eliminates the smoke nuisance; also there will be introduced the "New Phantom" 40/50-h.p. Rolls-Royce with its six-cylinder overhead valve engine in succession to the side valve engined "Silver Ghost" type. Armstrong-Siddeley brings forward an overhead valve six-cylinder monobloc 18-h.p. engined chassis. Only one object is common to this wealth of enterprise: that smoother functioning which spells greater acceleration and hill-climbing power in conjunction with enhanced flexibility and, therefore, greater range of performance on the direct gear. That, and the provision of greater body accommodation, is why Sunbeam will introduce a 30/90-h.p.

eight-cylinder-in-line overhead valve engined chassis with a notably large diameter stiff crankshaft.

CHASSIS DEVELOPMENT.

The most obvious chassis development this year is the increasingly wide standardization of brakes to all four wheels. All Armstrong-Siddeley cars, all Swift, both Rolls-Royce, both Morris, both Rover, both Clyno, the new Hillman, and the largest Humber are among the recruits to the practice.

One has already seen several new-style cars, too, wherein the engine and gearbox are insulated from the chassis frame (or subframe, as the case may be) by setting the arms on flexible vibration and noise-absorbing mountings that are oil-proof. Quite a number of Coventry builders are exploiting this system, to the merits of which attention was drawn in these columns last year, though at that time the motor industry was unaware that such a facility was about to become available to it. Another very important forecast made then takes material form now in the new Vauxhall chassis, wherein neither shackles nor pins are used in connexion with the suspension scheme by half-elliptic springs, which need no lubrication, yet do not wear and do not squeak. Nor are they expensive constructions as far as these details are concerned. Further developments along these desirable lines are therefore assured in the evolution of the motor vehicle, for the majority of firms are always afraid to embark on any common-sense fresh practice until they find an automobile engineering house of world-wide repute making bold to lead the way.

PRICES AND IMPROVEMENTS.

The rise in the price of rubber, leading to an increase in the price of tyres that was not expected by car builders in the course of the past season, has had an unfortunate effect in retarding the progress of the world-wide movement to provide better yet cheaper cars. Manufacturers dare not increase prices; many of them are compelled to lower them; all are trying to do so. Therefore the only course the majority can take is to provide fewer improvements, or accessories, than they intended had the cost of tyres not been raised. Surveying the matter all round, they have done admirably well, for many manufacturers of the highest repute are marketing their cars, not merely at appreciably lower prices, but in every case in better form as regards one or more details. Clyno and Morris are examples of sensational decreases in price, accompanied in each case by quite a number of improvements in detail, all of a practical sort, such as the standardizing of front wheel brakes, and so forth.

Nevertheless, concerning the motor-car industry in the broadest sense, undoubtedly but for the increase of tyre prices we should have found all cars standardized with mechanically operated wind-screen wipers for the driver and in some cases for the occupant of the seat beside him too. In like fashion, had it not been for the bad effects of the rise in rubber prices—a matter of prime consideration for the medical man—the provision of means for preventing head-lamp dazzle without minimizing the amount of light available to him would have been the general, as distinct from exceptional, practice illustrated at next week's exhibition.

PREVENTING HEAD-LAMP DAZZLE.

The use of dimmers is a compromise, not a solution, of the problem of dazzle; therefore the American industry compromises, and the British industry also. But on the Morris-Oxford models there is no compromise; instead, Barker rotating dipping head-lamps of the type used by the King and the Royal family on their Daimler, Rolls-Royce, and other cars are standardized. There is therefore no longer any manner of doubt that twelve months hence car builders in general will standardize means to prevent head-lamp dazzle without in any way limiting the volume of light. There is more than one means of attaining this end, and where the builder of the greatest number of cars in the country leads others must follow in due course.

CHIEFLY CONCERNING COACHWORK.

The fact that completely successful results have not so far attended the very numerous and prolonged experiments

of car builders in this country is the reason why we shall have to wait yet another year for the advent of the standardized oil, grease, tar, rain, damp, and heat proof lacquer body finishes, such as Studebaker has been so exceptionally successful in pioneering in America in big car practice. But Mr. Edge has been bestirring himself, and considers that he is justified in introducing a scratch-proof body finish scheme on the A.C. car.

As regards design, in the middle-size categories one British manufacturer after another who has standardized central change speed and gear lever positions is providing offside controls. The salesman's argument that this cannot be done without it being exceedingly inconvenient for the driver to have access to his seat from his own side of the car is absolutely without foundation. Numerous designers have shown for at least a decade how this can be done quite effectively, and if individual designers are so unintelligent as not to avail themselves of common knowledge, at least they cannot pretend that a driver has to enter and leave his seat as often as he has to change speed or use the handbrake. Those acts are inconvenient, to say the least, in cars of restricted accommodation occupied by motorists in winter attire. That is one reason why, even in the small car category, several machines will be presented at the forthcoming show with right-hand instead of central controls. In the case of the most luxurious cars we find Rolls-Royce abandoning a three-speed centrally controlled gearbox on the 20-h.p. chassis, and providing a more compact four-speed still quieter gearbox with offside control.

Other novelties to be shown at the exhibition will be reviewed in these columns next week.

PUBLIC HEALTH SERVICES IN HUNGARY.

THE Health Section of the Secretariat of the League of Nations has published a memorandum on the public health services in Hungary, by Dr. Alexander De Dobrovits, Councillor of Section in the Royal Hungarian Central Statistical Office. Though the population of Hungary is now only seven to eight millions, the account of its health administration is longer and more elaborate than that relating to Germany, noticed in our issue of July 4th, 1925 (p. 20). The subjects dealt with are grouped under seven heads—public health organization, duties of health personnel, public health institutions for the sick, the campaign against epidemics, temperance campaign, child welfare, and measures for the protection and improvement of public health.

The administrative organization of Hungary consists of a Ministry and three sets of local authorities. The supreme direction is in the hands, not of a Minister of Health so called, but of a Minister of Labour and Social Welfare, who has charge of no fewer than fourteen departments, including sickness, workers' and disability insurance, war victims' relief, poor relief, housing, and child welfare. Each of the departments has a chief and a clerical staff, whilst the Minister has two under secretaries; altogether the staff numbers 336 persons, including the Minister and secretaries, twenty-two medical officers, and four pharmacists. There is a National Public Health Council, which is an advisory committee with medical members. The advisory and administrative bodies of county or urban municipalities are (a) a municipal committee, and (b) an administrative committee. The former has a membership ranging from 48 to 600 according to population: this larger figure must seem extraordinary to readers acquainted with local government in this country. The chief municipal medical officer is a permanent official whose duties include expert medical investigation in police matters and attendance at medico-legal *post-mortem* examinations. He signs and registers the diplomas of medical practitioners and midwives in his area. A district medical officer has more or less similar duties, and is a regular permanent county official appointed by the prefect. The capital city, Budapest, has a special organization. The smallest units of administration in Hungary are called communes, and possess, within limits, important autonomous rights. Each local authority for an area with 5,000 inhabitants and upwards must appoint a

medical officer of health; smaller communes may be grouped into cantons for that purpose. The officers may practise privately outside their own areas. Medical officers are *ex officio* members of the magistracy and council; they are appointed for life, and among their numerous official duties are medico-legal inquiries.

In general medical practice there has been no reciprocity between Austria and Hungary since 1898. In Hungary a diploma to practise is not conferred until after a year's probation in a hospital: some foreign diplomas cannot be validated in Hungary. The Minister of Labour and Social Welfare may hold special examinations and grant certificates essential for holding municipal, police, and forensic appointments. Post-graduate tuition at the universities is organized by a central board.

Midwifery practice by women has, since 1921, been confined to those with a legal diploma; previously a certificate by the chief municipal medical officer sufficed as a substitute for a diploma; the course of training covers ten months. Midwifery certificates issued abroad must be validated in Hungary before being effective. Places with 2,000 to 5,000 inhabitants must have two qualified midwives, those with from 5,000 to 10,000 must have three, and above 10,000 an additional midwife is required for every 5,000 of population.

Death certification is compulsory; burial is not permissible without it. Certificates may be given by (a) medical practitioners; (b) persons who have passed a test of competence, or have been trained by a medical practitioner; and (c) in the absence of a certifying official, by a member of the local authority appointed for the purpose. There is a prescribed terminology for specifying causes of death. Burial should take place between forty-eight and sixty hours after death. Where an autopsy is necessary "the police shall conduct" it, but there is no statement as to whether the actual examination may be done by a layman.

Pharmacies rank as public health institutions, not commercial establishments, and are under Government licensing and supervision; there is a university diploma of doctor or master of pharmacy; the requirements seem stringent. The price of drugs is fixed by the Minister in an annual tariff, and a pharmacist failing to adhere to it may be punished.

Official medical salaries are graded; they are given in the memorandum in gold crowns. There are curious provisions as to allowances in addition to salaries—for flour, sugar, lard, wood, and coal, one pair of boots a year, clothing material at reduced prices, and a lodging allowance. The Government tried to regulate the private fees of practitioners by a standard scale, but abandoned the attempt.

Hungary has four classes of hospitals. In 1921 there were 184 institutions, with 26,451 beds, 243,575 patients, and 7,342,854 days' treatment. Some belong to the State, some are "public" though not State-supported, and others are private. The State is responsible for treating the indigent poor, whether in hospitals or not, and for the cost. There is a sickness insurance scheme for industrial workers and another for civil servants, but we cannot attempt to enter into details.

Notification of epidemic diseases is compulsory, but not for tuberculosis; the law prescribes compulsory treatment for venereal disease; "it is, however, very frequently impossible to enforce it."

A temperance campaign is conducted mainly by philanthropic societies which are federated into a national league. "Speaking generally, however, these organizations have not yet succeeded in obtaining any very important results." A child welfare scheme is supported by a statutory National Sickness Relief Fund. A State home is provided for neglected children. Many are sent to children's colonies. "Nine-tenths of the children entrusted to the State homes are placed in families who offer every guarantee of good character." They are medically supervised. The number in the homes is stated to be close on 42,000.

Environmental sanitation as regards purity of air and soil, water supply, house sanitation, industrial hygiene, school hygiene, food inspection, and other such matters, is conducted on lines more or less like those of this country.