a condition of equilibrium. In the same manner the equation for sickness is written thus:

$$K = f([J \rightleftharpoons O \rightleftharpoons A] \cdot p)$$

where K =sickness, f =a function, and p =the agent producing the sickness. Death, looked at from a dynamic point of view, may be expressed by the formula—

$$J \rightleftharpoons O \rightleftharpoons A$$

where $J=A=0$. The prognostic formula for gout is said to be—

$$K = J \rightleftharpoons O \rightleftharpoons A$$

whereas that for arterio-sclerosis is given as—

$$J \rightleftharpoons O \rightleftharpoons A_1 \cdot A_2 \cdot A_3 \dots$$

where A_1, A_2, A_3 are the integrals of the external circumstances. The volume is divided into three more or less equal parts, the first dealing with Habit and Organization, the second with Constitution, the third with Person—which includes as subheadings such things as inherited characteristics, adaptability, resistance, and the like. The book deals only with the general problems of prognosis on broad lines, and does not attempt to show how a prognosis should be reached in any individual case; the Professor hopes—or threatens—to produce another book on Special Prognosis later. The volume now before us is redolent of the midnight oil, wonderfully unpractical, and highly illustrative of the lucubrational divagations of which the Teutonic professorial intellectuality is capable. Its value we doubt.

NOTES ON BOOKS.

IN *Human Life and How it may be Prolonged to 120 Years** Colonel MACCABE provides a spirited summary of all the laws of health, most of which one would imagine to be as well known by the laity, to whom the book is obviously addressed, as they are to the medical profession. Perhaps the best feature of the book is the resolute attitude shown towards faddists of every description. The title suggests how advantageous it would be to live to the age of six score years, but one is rather inclined to agree with the words of the Psalmist on this matter (Psalm xc, 10). Unfortunately for the hygienist's contention, although the age period may in general be prolonged by a knowledge and careful observance of the laws which govern the human body, yet without doubt longevity is very largely a matter of heredity. The ancient of the English village living happily on amidst distressing sanitary conditions, with windows firmly closed against the admission of fresh air, is an excellent and ever-present example of the force of this contention. Possibly, however, some readers will be glad to observe that the author has failed to quote as an authority the judge mentioned in Whateley's *Annotations*, who, having observed and questioned all aged persons whom he met, found that one factor alone was shared by all alike—they practised early rising.

The twenty-eighth edition of *The Annual Charities Register and Digest*,⁹ issued by the Charity Organization Society, is a classified register of the charities in or available for the metropolis. Here will be found all the latest information about the thousands of charities to which application for relief can be made in affliction, sickness, permanent or temporary distress, and by those requiring the special forms of relief afforded by reformatories, miscellaneous associations, and, finally, a number of spiritual institutions. The book is as well known as it is indispensable to almoners of all sorts, and will often be useful to medical practitioners.

Dr. R. W. MACKENNA'S *The Adventure of Life*¹⁰ contains a series of chapters in which the author discusses life and its meaning, its connexion with freedom, pain, sickness, work, and other conditions familiar to all of us, in a cheerful spirit of philosophy, religion, and optimism. The book should be soothing and sanative to many of those broken in or by the war—a message of hope and help; it should find many readers.

* *Human Life and How it may be Prolonged to 120 Years*. By Brevet Lieut.-Colonel F. F. MacCabe, M.B., South Irish Horse, attached R.A.M.C. London: Grant Richards, Ltd. 1919. (Cr. 8vo, pp. 297. 6s. net.)

⁹ *The Annual Charities Register and Digest*. Being a Classified Register of Charities in or available for the Metropolis. Twenty-eighth edition. London: Longmans, Green, and Co., and Charity Organization Society. 1919. (Demy 8vo, pp. xx + 614. 5s. net.)

¹⁰ *The Adventure of Life*. By Robert W. MacKenna, M.A., M.D. London: John Murray. 1919. (Cr. 8vo, pp. xiii + 306. 6s. net.)

MOTOR NOTES FOR MEDICAL MEN.

By H. MASSAC BUIST.

THOUGH there are very few points in the exhibits at the Motor Car Show, which closes at Olympia on November 15th, that are of interest to medical men that we did not touch on last week, two matters call for mention. Owing to the fact that the process of elimination has already begun, some firms which drew the right to select stand sites in the ballot, and which took them up, found that they had nothing to show, therefore at a late stage there was a sort of game of General Post. Other exhibitors who had secured the less advantageous positions elected to engage those vacated. These changes affected the following exhibits mentioned in the table published in these pages last week; they are to be found at the stands bearing the numbers now mentioned in brackets: Angus Sanderson (67), Bentley (126), Chevrolet (96), Fiat (62), G. N. (6), Graham-White (44), Lagonda (3), Riley (108), and Ruston-Hornsby (22). Happily the Exhibition management provided excellent illuminated signs at the end of each of the circulating avenues indicative of the exhibits, so that it was not needful for the visitor to have a catalogue to find the cars of which he was in quest.

THE PUTTING UP OF PRICES.

Unhappily, the second point is one that has produced a very unfavourable impression. Car prices are liable to be raised any time in the course of the next few months owing, for example, to the quarterly meetings at which the prices are revised by the trade unionists. That was generally understood; but that the makers should wait until the Show was about to open, and that some who had announced very attractive propositions should increase them by sums varying from £50 to £100 per chassis was, to say the least, very undiplomatic. Nothing had happened within twenty-four hours to cause this sudden change, which must have been arranged in advance of the opening of the exhibition. But as the movement has not been participated in by more than a third of the exhibitors it is idle to set out a list of prices again. Suffice it that, among the more interesting and novel cars calculated to appeal to the medical practitioner, the figures are mostly as returned last week; hence such vehicles show up to-day in all the more striking contrast in the matter of value for money. For the rest, the industry will be well advised not to risk offending the motor-purchasing public by repeating such action on the occasion of the next show of the kind, when visitors will not be so indulgent and competition will be a great deal keener. What does the individual trader suppose is the effect on the mind of the intending buyer who is specially attracted to single out certain stands by reason of the prices announced for the exhibits on it, and who, when he comes to place his order, discovers at the last moment that he has to pay a good deal more money than the sum which he understood would suffice? Doctors will not be willing to find £50, £75, £100, or even more, as a surcharge on the purchase price of the car they require. Undoubtedly, therefore, the firms that had the wisdom to refrain from announcing their prices until they were sure they could deliver cars at certain figures have scored heavily in public esteem.

AIR-COOLED CARS AND DOCTOR'S WORK.

As to chassis, a few cars only stand out as calling for further mention—namely, the air-cooled Cosmos and Enfield-Allday and A.B.C. vehicles; the 10 h.p. water-cooled Wolseley and the Willy-Overland machines; as well as the Hammond and Hampton novelties.

First as to the application of the air-cooled engine to the service of the medical man. These constructions come under one or other of two categories: those that derive more or less directly from motor-bicycle practice, and those that are the outcome of knowledge gained in connexion with aircraft. In neither case should the medical man resident in hot countries use these classes of cars, at least until the makers have standardized them for twelve months. For one thing, none of the new-style vehicles has been tested under tropical conditions. On

the other hand, the same precautions need not be observed in regard to home service. The air-cooled motor-cycle engine evolved, by those who have experience of it, for light-car service, as the Rover two-cylinder V-type proposition, need not be regarded askance by the medical man. Usually his work is not of the long journey sort. Here he has an engine the cylinders of which are not liable to crack through exposure to extreme cold for the simple reason that they are without water jackets. Moreover, the whole scheme of the engine comes well within the knowledge of the average local repairer with a motor bicycle *clientèle*. Such men can even understand the horizontally opposed twin cylinder A.B.C. light car, air-cooled engine with overhead valves worked by push-rods and rockers. This car has heavily finned cast-iron cylinder heads, between which and the machined steel cylinder barrel is interposed an aluminium insulator for the purpose of transposing the heat more readily from one side of the cylinder to the other; for which reason the exhaust port is placed on the windward side. The combustion chamber is hemispherical in shape, and the short, stiff camshaft runs on ball bearings. It is a type that can be quickly grasped by the average garage hand, should repair be needed.

A COMING TYPE.

But in this first season of standardization and issue to the public, the three and the five cylinder air-cooled radial engined light car, wherein the marked influence of knowledge gained from aviation can be seen, should not be acquired by the average medical man unless he has a liking for and a knowledge of mechanics, or is satisfied that conveniently near his residence there is an agent properly equipped for repair work, who engages hands specialized on the particular new style of construction he selects. In my view the biggest risk run by the sponsors of the air-cooled Cosmos car, and of the five-cylinder Enfield-Allday cars, is from the repairers. At least one of the manufacturers, the second named, is aware of this and is providing against it by testing the knowledge of the agents and of their staffs, at intervals after the delivery of the first examples, which are now out because production has attained the scale of twenty-five cars a week. Of course this is not anything like enough to meet demand. Consequently in the interests of a notable step in car evolution, quite apart from the interests of any individual firm, subsequent deliveries will be made to those agents who prove under periodical examination to have made themselves proficient in the distinctive qualities of such mechanism.

We have got to such a stage in the evolution of the air-cooled car engine that in the interests of the motorists of the future we cannot allow such a development to come to an untimely end through ignorant handling. I am satisfied that sufficient knowledge has been gained to render it possible to construct satisfactory air-cooled car engines. When, too, there is such a margin of power, as is provided in the Enfield-Allday for instance, the engine of which can develop over 3 h.p. per cwt. of complete vehicle, there is no reason why, for medical service, such mechanism need ever be put to anything like the top of its performance. I am in hope that this car, and the Cosmos three-cylinder air-cooled vehicle, will figure in the Royal Scottish Automobile Club's touring trial of Standard Light Cars, starting on June 14th, 1920. Provided the first few hundred buyers are of the right sort I think the time has now come when we can launch air-cooled cars with confidence. Several thousand would-be motor owners in this country will find the maintenance of such constructions child's play after their experiences with aircraft.

We ought to be especially on our guard against accepting unfavourable reports, should they come to hand from private users, because it will be extremely difficult to know how much or how little the individual owner really knows about such novel schemes. I quite expect to hear some of the cars damned in whole districts, but I am equally certain that they will earn unanimous praise in other districts. Nor will the circumstances of flat and hilly country account for such differences of opinion. Hills have little terror to engines with such a high ratio of power to weight. Certainly the Enfield-Allday has been tested very thoroughly on long hill climbs.

OUTSTANDING DEPARTURES.

The chassis of both these air-cooled cars are original. Neither has dumbirons, for the Cosmos chassis employs the patented bell crank and horizontal coil spring suspension back and front; while the Enfield-Allday, with its even more unconventional box girder centralized frame, has true cantilever springs—not the quarter-elliptic sorts that are being mis-styled cantilevers by their manufacturers—set most ingeniously at a tangent from the axles to the frame members, with a result that the body should keep an even keel at corners, though, of course, in all these light luxuriously sprung constructions no car can have the same trim when the owner-driver alone is aboard it and when he has a passenger seated beside him. Nobody expects that. Neither is it necessary. The riding is equally agreeable in both cases where the steering is of the conventional as distinct from the left hand sort, which importers of the American cars are trying to get us to accept as a saving of expense—or rather, a gain to their pockets. The driver must always be on the car when it is travelling, but there are not always other folk aboard as well. As our roads should always have a camber of sorts, it follows that the driver ought to sit on the right, not the left hand, seat when motoring in this country.

The Cosmos engine is built up as a unit with the clutch and gearbox, whereas the Enfield-Allday engine is bolted to the aluminium casting at the front of the car frame, and the gearbox is suspended at the apex of the side members of that ingenious girder structure.

SOME OTHER CARS.

Among cars with water-cooled engines, the 10 h.p. Hampton has a four-cylinder overhead valve Dorman engine with adjustable tappets, aluminium block casting detachable cylinder heads, and cast-iron cylinder liners; while the Hammond is chiefly notable for having helical spring controlled suspension, a principle that will probably come into more general use for the simpler forms of cars.

The Stellite car may be said to have grown into the 10 h.p. Wolseley, in that, with its three-speed gearbox, tapered channel steel frame, among other additions, as well as a four-cylinder, overhead valve engine that develops as much as 20 h.p., this vehicle is now capable of a much faster turn of speed, and is, of course, really well equipped for hill climbing.

The Willys-Overland suspension is evoking much interest, not because it is being mis-called a cantilever system, which it is not, but because it is something new and good. Here, as in the 10 h.p. and 15 h.p. Wolseley cars, we have a big constructional departure, resulting incidentally in a total absence of dumbirons. On the Willys-Overland there are two springs only, each being of the semi-elliptic sort, but in plan the leaves take a broad V form, the extremities passing to that part of the axle where the pads are provided in normal practice; while at its mid-length the back spring is attached to the centralized extremity of the frame, which overhangs the back axle. At its mid-length the front spring is attached to the centralized front end of the frame, which projects beyond the front axle, so that the spring base is 30 in. longer than the wheel base, very plangent riding being provided in consequence.

SOME months ago the municipal council of Lyons established a "secret maternity" for the reception of unmarried mothers. It is the equivalent of the old foundling hospital, but freely open without inquiries or formality. It provides accommodation for forty-five patients; all the beds are now occupied, and there is a waiting list of 830. On the proposal of the mayor, M. Herriot, the General Council has voted £8,000, and an annual sum of £2,000 has been placed on the departmental budget.

THE total number of students of medicine in Switzerland in the summer session of 1919 was 1,678. These were distributed among the five universities as follows: Bâle, 244, of whom 21 were women; 40 were foreigners, including 3 women. Berne, 360, of whom 32 were women; 134 were foreign, including 21 women. Geneva, 342, of whom 66 were women; 159 were foreign, including 45 women. Lausanne, 237, of whom 25 were women; 57 were foreign, including 12 women. Zürich, 495, of whom 102 were women; 112 were foreign, including 41 women.