to the running boards and under part of the body-work, so that after going a very few miles no more lubricant is left than if no pains had been taken to replenish it. Therefore it is particularly essential to look to it that the grease put into the joints at either end of the propeller shaft is adequately secured in the covering to those connexions. If these parts are run dry, sooner or later a broken propeller shaft joint will be sustained, than which there is scarcely any form of motor accident more dangerous. If the fore end goes it drops like a pole, which the back axle has to jump. I have seen an ugly accident of that sort in connexion with racing, though fortunately the occurrence is very rare with touring cars, because, as a rule, there is considerable squeaking by way of warning. This risk of breakdown can to a certain extent be guarded against by having a strap so set underneath the propeller shaft as to catch it in the event of its dropping. These remarks, in any case, apply only to such cars as have open instead of closed propeller shafts. There are, of course, a large proportion of cars designed on these principles.

TYRE POLICY.

Brakes should be gone over, particularly with a view to ensuring that they are acting in an absolutely compensating fashion, the pull being equal on either back wheel. It is as well to take up any slackness of the steering, and particularly to supply all steering joints with ample lubricant. Next, as the car stands in the garage, the wheels should be checked for alignment. If a wheel be ever so little out of truth tyres wear in extraordinarily quick time.

Runs longer than those usual in the execution of the doctor's daily work demand also attention to the pneumatics. A tyre that is fairly well worn will nevertheless probably run quite satisfactorily for weeks, doing short journeys of anything from a few hundred yards to three or four miles at a spell, because in such circumstances the tyres rarely get hot, and in addition they are not highly stressed. But if run for scores of miles at a spell they are bound to get hot, and on long runs the pace is likely to be greater than when driving about in the ordinary course of professional work. Therefore, the medical man will be in pocket, in place of out of it, by taking off all tyres showing any appreciable wear, and replacing them with new covers before starting out on a run the length of which cannot be foreseen. The old covers can be brought into use again afterwards, and worn to the ordinary limits.

The really economical motorist is the man who uses his tyres, for whatever particular work he may be engaged on, just short of the limits of trouble occurring. It may seem wasteful to discard covers a little early, but in these days, when they can be retreaded practically under guarantee as to mileage to follow, the motorist will be well advised to have such work carried out rather on the early than on the late side. Let a thing go a little beyond the margin, and no amount of repair will ever make a satisfactory job of it. The extent to which tyres should be blown up depends entirely on the speed and on the car. Nobody can give advice that shall be of general application. Happily, however, if he will but inquire, the firm making any tyre used by the individual motorist will give him the best advice their experience dictates.

ANTIDYSENTERIC VACCINATION.

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At this critical period of international conditions haste compels me to omit all matter not of immediate practical interest, and I trust those authors who have devoted some time to this study and have made known their interesting observations will comprehend the omission of reference to their work. I hope at some future date to write a more complete article.

After recognizing from practical experience on man the impracticability of the employment of heated Shiga bacilli in subcutaneous injections in single or multiple doses, I tried several other methods, and at length arrived at a most simple and practical one, which I trust may render service should the occasion for its use arise during the

present war. Any race of *B. dysentericus* may, when treated, be so employed. The strains of Shiga alone, of all varieties of dysentery bacilli at the Institute, show in man an extreme reaction, this being due to their endotoxicity, which is present in both recent and old laboratory strains, living and dead.

This is the method: Take then a twenty-two to twenty-four hours' culture of *B. dysentericus* on a test tube of peptone agar, wash in saline 0.9 per cent. and centrifugalize, dilute the deposit in 2 c.cm. fresh saline; heat to 56° C. for one hour, count or otherwise numerate the bacilli per c.cm., and place the 2 c.cm. in 20 c.cm. normal, heated, pooled (two or more) human serums or 10 c.cm. normal heated horse serum. Let them remain together overnight. If I use the former, I place the mixture in the ice house, so that any possible spirochaete may be destroyed. After well centrifuging twice (the second time after adding saline to wash the bacilli), the deposit is mixed with 0.9 per cent. saline, so that 1 c.cm. contains 350 million bacilli to the c.cm. Preventive injections are to be made four at a time, and when possible in the afternoons; first dose, 1 c.cm., that is four injections of $\frac{1}{4}$ c.cm. each made in the left side of the back over muscular tissue, and where the braces or kit to be carried do not press (not in the arms). The skin is well raised, and injection made into the loose subcutaneous tissue. The second dose of 2 c.cm. follows about eight or nine days later in similar fashion, $\frac{1}{2}$ c.cm. quantities, on the right side. A third similar dose may be made.

I have been similarly preparing very endotoxic strains of Paratyphoid B, also A, typhoid, cholera, and *B. proteus*, etc., some for treatment, and have seen during the last year some most satisfactory results from therapeutic inoculations of typhoid and *proteus* bacilli.

The reactions most carefully followed have never in over 200 subjects been marked or inconveniencing. This reduction in both local and general reactions to the untreated micro-organism is really striking. In the last series of 75 preventive injections in a dysentery-infected service of a lunatic asylum there was but one subject who showed high fever the night of the injection; he, however, slept well, and the temperature was just over normal in the morning. My object in giving only 1 c.cm. for the first injection is to avoid too great a general reaction in the rare hypersensitive patient.

Results.—All subjects I have vaccinated live in endemic areas; so far there have been no cases among them.

Serological Examinations.—By contrast with the patients of earlier series who to the same dose of untreated Shiga bacilli showed determinable specific amboceptor and agglutinin properties in their serums, the serums of the subjects who had even three doses of bacilli treated by normal serums showed no fixation of complement nor increased agglutination. I have previously (*Académie des Sciences*, May 7th, 1912) made known such observations when applying specifically sensitized typhoid vaccines to man (Besredka principle).

These comparative findings in the serums of subjects after vaccination by bacilli treated with prepared specific horse serums, and in those after bacilli treated with normal human or horse serums are interesting.

Dopter (*Annales de l'Institut Pasteur*, 1910), after reviewing the literature of vaccine work with dysentery bacilli, has shown that the Shiga bacilli treated with specific antiserum give early and prolonged immunity in mice and avoid the negative phase that follows injections of untreated bacilli.

In the method I have above described will be noted the marked simplicity and rapidity with which a vaccine may be made—and used prophylactically and therapeutically—from the first pure culture of the particular micro-organism that is causing an epidemic, despite the numerous varieties in any group. On the valued suggestion of Dr. Roux, the eminent director of the Pasteur Institute, I have been trying the utility of a vaccine made by the addition of heated human serum and later adding saline without centrifuging after the micro organisms have been acted on by serum. This procedure simplifies technique, but my work is too recent to draw conclusions.

PROFESSOR ABDERHALDEN has accepted an invitation to become director of a research institute which is to be erected in Berlin.