The Services.

CIVILIAN PRACTITIONERS AND ATTENDANCE ON NAVAL RATINGS.

THE scale of fees authorised to be paid to civilian medical practitioners attending naval ratings who are taken ill while on leave has been revised as from June 1st, 1920. The fee for each visit, to include cost of medicine and weekly medical certificates, is advanced from 2s. 6d. to 3s. 9d. for a distance of under one mile; for a night visit (reckoned from 10 P.M. to 7 A.M.) the fee is 5s. 3d.; for visits over one mile the day fee is 4s. 9d., and the night fee 7s. 3d.; over two miles 5s. 9d. and 9s. 3d.; over three miles 6s. 9d. and 11s. 3d.; and over four, but under five miles, 7s. 9d. and 13s. 3d. For greater distances an addition of 1s. for each mile over five by day, and 2s. by night. In very exceptional circumstances payment at a higher rate will be considered by the Admiralty.

ROYAL NAVAL MEDICAL SERVICE.

Surg. Cmdr. J. M. Gordon to the *Excellent*, additional; Surg. Lieut.-Cmdr. G. R. McCowen to the *President*, additional, for Porton Experimental Station; and Surg. Lieut.-Cmdr. (D.) F. W. Paul to the *Impregnable*.

ARMY MEDICAL SERVICE.

Col. L. P. More, from the half-pay list, is restored to the establishment.

ROYAL ARMY MEDICAL CORPS.

Lieut.-Col. F. W. Hardy retires on retired pay on account of ill-health contracted on active service.

The undermentioned relinquish the acting rank of Major:—Capt. M. Morris; temp. Capt. J. T. P. Wilson.

Cpts. C. A. Bignold (granted rank of Major) and J. H. Sharpe resign their commissions.

To be temporary Captains: E. O. Gilkes (late temp. Capt.), R. W. Collum, B. H. Woodyatt, F. L. Dickson.

G. A. Clarkson and C. W. Bennett to be temporary Lieutenants.

Officers relinquishing their commissions:—Temp. Hon. Lieut.-Col. P. Macdiarmid (retains the honorary rank of Lieutenant-Colonel). Temp. Major (acting Lieut.-Col.) H. W. M. Tims (granted the rank of Lieutenant-Colonel). Temporary Captains granted the rank of Major: P. McCool, H. M. Grey, G. W. B. Waters. Temp. Capt. T. J. Richardson. Temporary Captains retaining the rank of Captain: W. P. H. Lightbody, J. N. Turnbull, J. Maguire, A. E. Wynne, A. Chalmers, E. T. Larkam, J. K. Manson, R. R. Pirrie, W. S. King, J. J. McConnell, A. H. Priestley, E. F. O'Conner, C. S. Stollerfoth, S. F. Cheesman, D. Cowin, J. Macqueen, J. T. Macnamara, F. E. Johnson, T. H. F. Roberts, B. Langran, C. W. C. Robinson, R. J. Allsopp, E. Duke, T. P. Noble, P. C. C. Smith, H. H. Castle, D. Gaston, W. Mercer, S. Oliver, J. O. Garland, A. H. Ward, E. F. Lawson, A. Leigh, J. T. R. MacGill, G. W. M. Smith, R. T. Raine, F. W. Harlow. Temporary Lieutenants retaining the rank of Lieutenant: J. V. Coghlan, M. J. Woodberg, D. P. Fitzgerald, A. M. Moll.

TERRITORIAL FORCE.

Lieut.-Col. T. McDermott is placed on retired pay.

Capt. (acting Major) J. A. Cooke relinquishes the acting rank of Major on ceasing to be specially employed.

Major M. B. Ray to be Lieutenant-Colonel and to command 2nd London Casualty Clearing Station.

Major W. F. Munro (from T.F. Res.) and Capt. J. Taylor to be Majors.

Capt. R. Davidson to be Adjutant of the R.A.M.C. School of Instruction, South Midland Division (T.F.).

Cpts. (late R.A.M.C.) J. MacG. Johnson, W. Ainslie, and W. R. Watt to be Captains.

Capt. H. Mather (late temp. Capt., R.A.M.C.) and Lieut. G. A. Fisher (late King's Royal Rifle Corps) to be Lieutenants.

Major Y. T. G. Moore (retains the rank of Major) and Capt. E. L. Martin (granted the rank of Major) resign their commissions.

Cpts. C. H. Gregory, A. F. Perl, R. Raffle, and R. K. Merson resign their commissions and retain the rank of Captain.

TERRITORIAL FORCE RESERVE.

3rd Northumbrian Field Ambulance: Major A. T. Sissons to be Major. Capt. V. J. White to be Captain.

ROYAL AIR FORCE.

Medical Branch.—Capt. J. D. Cherry is transferred to unemployed list.

INDIAN MEDICAL SERVICE.

Lieut. Kombur Ramaswamy Krishnaswami Iyengar to be Captain.

The King has approved the retirement of Major H. C. Brown.

Dr. W. FitzGerald, Deputy Commissioner of Medical Services, North-Western Region, Ministry of National Service, and Dr. H. J. Ley, Medical Services, Christchurch Auxiliary Hospital, Hampshire, have been appointed Officers, and the Rev. E. E. Lavy, M.D., has been appointed a Member, of the Most Excellent Order of the British Empire for services in connexion with the war.

Correspondence.

"Audi alteram partem."

THE HEREDITARY FACTOR IN TUBERCULOSIS.

To the Editor of THE LANCET.

SIR,—I have read with great interest, in your issue of Oct. 30th, the comments of Professor Karl Pearson, F.R.S., on my paper, *Tuberculosis in Primitive Tribes and its Bearing upon Tuberculosis in Civilised Communities*,¹ and I feel that these comments call for a reply. I may say at once that Professor Pearson's communication shows me that I misunderstood his views. I took the expression "inherited diathesis" to mean "constitutional inability to resist tuberculosis inherited by the offspring from tuberculous parents or ancestors." It was against this conception that my criticisms were directed. I did not perceive that the inherited diathesis postulated by Professor Pearson was such as to be commonest where there is no tuberculosis and least common where tuberculosis is rife. Such an "inherited tuberculous diathesis" would, of course, be a bodily character quite unconnected with tuberculosis, but for the existence of which the human tubercle bacillus would be the only, and a specific, test. This proposition may, I think, be assailed from many directions, but I freely admit that it is not in any way touched by the argument which I brought against what I believed to be the accepted view of "inherited diathesis." Professor Pearson is right, too, in supposing that, in discussing the incidence of tuberculosis in children of tuberculous parentage, I failed to realise that the "inheritance" dealt with in his data was "one in which the average age at onset was from 25 to 30 years." I do not see that this has any bearing on my argument as, in these circumstances, there may have been intermittent reinfections and auto-infections from childhood on through early adult life, culminating in a breakdown of immunity under the stress of the onset of sexual function and the necessity to earn wages, factors that tell most severely at the ages mentioned. Such a break down of immunity might be expected to be commonest in those whose initial infection had been most massive, frequently the earlier born, according to my argument.

Admitting that Professor Pearson's theory of "inherited diathesis," properly understood, covers the isolated fact of the marked liability to infection shown by certain primitive tribes, I still hold that the theory of "absence of acquired resistance" is equally applicable. Either theory will meet the case. Here is a dilemma which must arise from time to time in statistical inquiry. A similar instance may, I think, be found in the magnificent statistical researches of Dr. J. Brownlee,² which have brought to light the existence of two types of mortality in pulmonary tuberculosis, the one reaching its maximum in the "young adult," the other in the "middle age" period of life. These two types of mortality may be equally well explained by Dr. Brownlee's suggestion that there are two types of tubercle bacillus with different clinical manifestations, or by my suggestion that there are two types of community, one being relatively "virgin soil," the other "sensitised" and relatively resistant soil to the same type of human tubercle bacillus. Here a final answer must be sought, not only in "hard statistical reduction of data," but also by careful and comprehensive laboratory work in typing bacillary strains from "young adult" and "middle age" cases. The questions at issue are too urgent and too vital to be left to any one line of inquiry. It has been proved beyond question that relatively susceptible animals, including man, are able to acquire a relatively high degree of resistance to tuberculosis through graduated infections with the tubercle

¹ International Journal of Public Health, September, 1920, vol. II., pp. 137-171.

² An Investigation into the Epidemiology of Phthisis in Great Britain and Ireland. Medical Research Committee. Special Report Series. No. 46. 1920.

bacillus. Whether an increased power of acquiring resistance is, or is not, transmissible as a hereditary character is a point on which statistical research may help to throw light. For the moment, what we most need is a fuller knowledge of the factors underlying immunity in tuberculosis to guide us in exploiting this power of acquiring resistance so that it may be used in prophylaxis and treatment.

In conclusion, I hope that Professor Pearson will accept my sincere apologies for an ill-expressed sentence which he reads as a "covert charge of manipulating theory." I hasten to assure him that such an idea never occurred to me. I have read Professor Pearson's papers with great interest and, although my unfamiliarity with statistical science led me to a misapprehension of some of his conclusions and my own observations and studies have obliged me to differ from others, I have nothing but respect and admiration for his great contributions to both medical and general science.—I am, Sir, yours faithfully,

S. LYLE CUMMINS,

Colonel, A.M.S.; Professor of Pathology, Royal Army Medical College, London.
Oct. 31st, 1920.

THE ELIMINATION OF MILK-BORNE DISEASE.

To the Editor of THE LANCET.

SIR,—Although the outstanding facts of the relationship between milk and disease are well known to the medical profession, it may be desirable to summarise and re-marshal them in order to develop and reinforce the argument to be submitted.

In the Second Interim Report of the Royal Commission on Tuberculosis, pages 36 and 37, issued in 1907, the following appears:—

A very considerable amount of disease and loss of life, especially among the young, must be attributed to the consumption of cows' milk containing tubercle bacilli. The presence of tubercle bacilli in cows' milk can be detected, though with some difficulty, if the proper means be adopted, and such milk ought never to be used as food.

And on pages 5 and 6 of the Third Report, 1909, the following:—

Tuberculosis involving the udder is comparatively common in cows, and in such cases their milk always contains tubercle bacilli, and is therefore dangerous for human beings consuming it. We found that the milk of cows obviously suffering from tuberculosis contained tubercle bacilli. The presence of tubercle bacilli in the milk of cows clinically recognisable as tuberculous confirms the opinion we expressed in our Second Interim Report that the milk of such cows must be considered dangerous for human beings.

Professor Delépine has established by animal experiment, not merely by bacterioscopy, that more than 6 per cent. of the milk-supply of Manchester contains virulent tubercle bacilli. Statistics are unattractive. No need to cite the figures furnished from Somerset House annually showing the mortality caused by human tuberculosis, because every practising physician is only too familiar with its ravages. Epidemics of typhoid and scarlet fevers, diphtheria, and epidemic sore-throat have frequently been traced to infected milk.

The following statements are authoritative: they are taken from Bulletin No. 56 of the United States Public Health Service, issued in 1909.

Trask compiled a list of 179 epidemics of typhoid caused by milk, 43 in Great Britain: of scarlet fever 51, in Great Britain, 26: of diphtheria the numbers were 23 and 8 respectively. It was not claimed that these lists were complete in that year. "Epidemic sore-throat" and "summer diarrhoea" are well known to be caused by impure milk, and there is evidence, not perhaps conclusive, that epidemic anterior polio-myelitis is associated with milk.

Knowing as we do that milk forms an excellent culture medium for micro-organisms, it would rather be a matter for surprise than the reverse if milk—carelessly handled and produced under generally unsatisfactory conditions—did not from time to time cause epidemics of these maladies. In the light of bacteriology we must agree that we can only hope to keep a fluid of such composition as milk free from pathogenic organisms by the exercise of a degree of care not called for in the case of other foods. Moreover, remembering this, we are the more likely to understand the very real difficulty of securing a safe supply.

It may be well to interpolate here the reflection that milk is the most important of all aliments. The saliva of infants less than 5 months old contains no ptyalin. Milk is essential for them. It constitutes the best form of diet for children generally. Those of us who have encountered cases of serious chronic disease who could not for any reason take milk will have special reason to appreciate its importance in the regimen of all invalids. But this all-important nutriment is produced and distributed under conditions which simply won't bear thinking about. Mistals are stables. That does not seem to be a startling thing to write. But food should be dealt with in places where the standard of cleanliness is that of kitchens. Horses are groomed daily, cows rarely or never. Why not? The consequence of this lack of care is that the farmer finds it necessary to "strain" his milk before pouring it into a churn in order to remove the larger particles of manure which it contains. And so on. All along the route from the udder to the consumer's mouth the care given to keeping this all-important fluid free from contamination is ridiculously inadequate. One should not apply such an adjective to a system fraught with consequences so tragic. Byres should be clean, airy, light; of adequate size in relation with the number of kine they are to house; their walls and floors should be of impervious material; the latter should fall with a uniform gradient to a properly constructed drain. An abundant supply of pure water is essential for several purposes—e.g., washing utensils, flushing floors, walls, and drains, and cleansing the persons of milkers. The commonly used open milk-pail should be replaced by others having lateral openings. The beasts should be groomed and the flanks and udders wiped over with a damp cloth immediately before milking. The milk from emaciated animals and from those suffering from mastitis should be rejected. The herd should be tested periodically (at least once yearly) with tuberculin. Precautions are essential to ensure that the test is a real one. Reacting individuals should be segregated. And, finally, the milk so obtained must be bottled and delivered unopened to the consumer.

By these means it has been demonstrated that milk can be obtained—not absolutely pure and free from contamination—but which may be regarded as reasonably safe. Farmers and dairymen must be paid adequately for their intelligence, care, labour, and outlay. Manifestly so. The result is that milk so produced is so costly that only the rich can afford to buy it. Thus, while one may realise that pure raw milk is the desideratum, one must be driven to the conclusion that it is idle to-day to advocate the provision of a supply of this quality for the people. Simply it is impracticable. We must be content to make haste slowly. By moderation in our demands, contenting ourselves with one step at a time, we may hope at last to attain the goal of our ambition, and secure a safe, non-disease-producing supply of raw milk for the people.

Meanwhile it would seem to be our duty as a profession trusted by the people—and rightly trusted—to insist that a safe milk, and only a safe milk, be placed on sale. By pasteurisation we can gain this security for all. Milk held at a temperature of 155° F. for 20 minutes is a safe human food. None of its digestibility nor nutritive value is lost. Its taste remains unimpaired. The increase of cost is inconsiderable.

Very much greater attention to this very important subject has been given in the United States than here. In New York for the last five years, and in Chicago for a shorter period, only pasteurised and grade 1 certified milk may be sold to the general public, and in some 95 per cent. of the larger towns pasteurisation, while not compulsory, is enjoined. In Bulletin No. 517, April, 1919, of the United States Public Health Service, Surgeon-General Rupert Blue made the following pronouncement: "A system of inspection and efficient pasteurisation will protect the people from milk-borne disease."

One need hardly cite authorities to secure the adherence of trained men to the doctrine that pasteurisation destroys pathogenic micro-organisms, but the experience of the Honourable Nathan Straus in New York leads one to look around for convincing argument to reinforce the mere statement of fact. He started the advocacy of pasteurisation 27 years ago, and lent the force of example to those of argument and persuasion by distributing annually in that city bottles and glasses of this safe kind of milk literally by the million. He zealously year by year preached the need for general measures to be adopted. Yet, as I have stated, it is