Probably the largest surviving type is the herd at Somerford Park. That place lies in Cheshire, about midway between Lyme in the same county to the north and Chartley in Staffordshire to the south; each is a few miles westward from the foothills of the Pennine chain. Though such near neighbours of the Chartley herd, the Somerford cattle appear to be highly immune from tuberculosis. The family of butchers which has dealt with the offcasts of this herd for the last sixty years has never known tuberculous disease to be found in the carcass of a slaughtered Somerford beast. Tuberculosis abounds in the shorthorn cattle of the neighbourhood. A further instance of their natural immunity may be mentioned. At the time of the cattle plague (rinderpest) some half-century ago, a farmer near Somerford had acquired a white park cow from his landlord, which stood in the cowsheds amongst forty-seven shorthorns. The plague carried off all the forty-seven shorthorns but left the Somerford cow in their midst unaffected. No cases of the plague occurred in the white park herd itself.

Deep-chested, large, handsome cattle, better milkers than any other known white park herd, the Somerford breed is particularly suitable to mate with the Kerry in the suggested attempt to obtain a type of animal which will show the milk and beef qualities of the shorthorn without its liability to tuberculous disease.

The experiment is being made. The first photograph (Plate, Fig. 1) shows the ingredients of the proposed new breed, Kerry heifers running with a young white park bull from the Somerford herd. The black ears and muzzle of the latter will be noted, and also that he is hornless, a characteristic of this herd. The Hamilton herd once was hornless, but now has acquired horns. Otherwise white park cattle are horned. The second photograph (Plate, Fig. 2) shows a fine bull of the crossed breeds, Somerford-Kerry, aged 2 years and 5 months.

The proposal is to establish the breed by interbreeding first-cross bulls and heifers. The reality or otherwise of their claims to immunity from tuberculosis can only be tested by much experience with great numbers of animals so produced. Meanwhile, this preliminary record of the experimental work which is being attempted may be of interest. The enthusiasm and great stockbreeding experience of Mr. Charles Sproston and the loan of the Somerford bull by Sir Walter Shakerley have made the experiment possible.

On June 26th I heard that the bull of the crossed Somerford-Kerry breed reacts to the tuberculin test. His temperature rose to 104.4°. The test was carefully conducted, the animal having been tied up for two days previously to get him contented in captivity. There is not the slightest other sign of disease; on the contrary, the animal is in magnificent condition.

The following is the view to which I incline as to the difficult fact that the tuberculin reaction is positive sometimes in animals which are otherwise apparently sound, or which, as Mr. Robert Mond has shown, continue in sound health for their full span of life subsequently. Assuming that the test accurately reveals the existence of a tuberculous infection, immunity is shown by the fact that the animal does not succumb to the attack. No animal is immune from attack. What must be sought is a type of animal which shows successful resistance to attack.

A MODIFICATION OF THE STOKES-GRITTI AMPUTATION.

BY

W. A. CHAPPLE, M.D., CH.B., M.R.C.S., D.P.H.,

MAJOR R.A.M.C.,

SURGICAL SPECIALIST, PAVILION ORTHOPAEDIC HOSPITAL.

(With Special Plate.)

THE human heel is Nature's stump. Every surgeon doing an amputation or a reamputation on the lower limb should try to reproduce it.

Syme's amputation is the nearest reproduction, and the Stokes-Gritti operation comes next.

Every stump should be fashioned where possible in the hope that it will bear upon its end some amount of the body weight; and every stump should be asked by the limb-maker to bear what share it can—it may be the whole weight, as after a Syme or a Stokes-Gritti operation,

or it may be one-half, one-quarter, or one-eighth. As time goes on the share will probably progressively increase. This gives a sense of compactness and stability to the limb, as well as a wider distribution of the burden. But so many failures have attended the Stokes-Gritti operation that it is not much in favour. I have the x-ray plates of five failures before me as I write.

One cause of failure is the displacement of the patella upwards by the pull of the quadriceps extensor. Another is the presence of pegs and other means to fix the patella down in order to resist this pull.

In recent cases I have cut the quadriceps attachment to the upper edge of the patella completely across, and then stitched the margins of the patella with catgut to the edge of the periosteum round the end of the femur. One or two additional deep catgut sutures will usually be sufficient, and a firm "button suture" through the skin flaps will make assurance doubly sure. This course was followed in the case illustrated in Fig. 1 (special plate), while the ordinary method was followed in that shown in Fig. 2.

AN ACID-FAST BACILLUS OBTAINED FROM A PUSTULAR ERUPTION.

BY

LOUIS COBBETT, M.D., F.R.C.S.,

PATHOLOGICAL LABORATORY, CAMBRIDGE.

THE bacillus was cultivated from chronic intractable pustules covering the back, buttocks, and thighs of a soldier returned from France. No micro-organisms were seen in the pus, and none could, at first, be cultivated from it. But subsequently there was grown, on more than one occasion, the acid-fast bacillus which is the subject of this note.

The patient, aged 24, was wounded in the foot; he returned home on a boat which was torpedoed and sunk in the early part of 1917. After being in the sea nearly an hour he was picked up and brought to England. The wound in the foot at first healed, but subsequently broke down again, and two operations had to be performed. For a fortnight he was treated in the 1st Eastern Hospital, Cambridge, by continuous immersion in the bath. It was about a month after this that the eruption was first noticed.

On February 27th, 1918, when first seen by me, the eruption had already been in progress for about eight months. During this period the man had been at a convalescent hospital, for the most part up and about. But he had been far from well, and at times confined to bed with sickness and giddiness. He appeared to me to be in good general condition, but had a somewhat dejected air, and moved slowly.

Back and buttocks were covered with swellings of various sizes and different stages of development; some were simply old red scars, others were just pointing and were much raised and indurated, measuring perhaps as much as an inch at their bases. From one of these was obtained a stringy pus, in quantity larger than one would have expected. What particularly struck me was the exceedingly chronic character of the inflammation and the deep-seated position of some of the lesions; for the most active pustules, though somewhat painful and tender to the touch, caused far less trouble than an ordinary boil, and spots which were watched from time to time seemed to make little appreciable progress. Moreover, there were a few swellings, distinctly fluctuating, which were completely subcutaneous, and over which the skin could be freely picked up.

The patient was sent to me because the pus contained no bacteria visible under the microscope, and no micro-organisms—except a few staphylococci and once a diphtheroid bacillus, thought to be adventitious—could be cultivated from it. It was obvious, therefore, from the first that I had to do with lesions which were not those of ordinary suppuration, and a Wassermann test was carried out to clear the ground. The result was negative.

The pus was examined by me on several occasions, and various methods of staining were used, but no bacteria were ever seen in it, even when the stain was that used

for acid-fast bacilli. The pus differed entirely from tuberculous pus, the cells being well formed, and showing little sign of degeneration, being unusually clearly defined, but containing, I thought, more nuclear fragments than usual.

Cultures were attempted on various media. No visible growth appeared on egg or blood agar, or on ordinary agar cultivated anaerobically; but on agar in the presence of air five rather large cream-coloured colonies appeared, and these were found to consist of long slender bacilli. Subsequently the same bacillus was obtained in impure culture from an aerobic egg tube.

The bacilli stained well by Gram's method. When so coloured they were further treated with 5 per cent. acetic acid to see whether they possessed polar bodies. The only effect of this treatment was to bring out an irregular segmentation of stainable material, like that seen in bacilli of the diphtheroid group. Polar bodies were probably present, but they were not definitely revealed.

The resistance of the Gram-stained bacilli to decolorization with 5 per cent. acetic acid, their segmentation like diphtheria bacilli, and the fact that they were but feebly coloured with methylene blue, led me to try their acid-fastness, with the result that when stained with carbol-fuchsin, after the manner used for phthisical sputum, they were found to resist decolorization just like tubercle bacilli.

It has already been mentioned that the colonies grown from the pus were few in number. It is probable, therefore, that the bacilli were not numerous in the pus, and it is for this reason, we may suppose, that they were not detected by microscopic examination.

The small number of colonies which grew on the original tubes, coupled with the failure to render the bacillus visible in the pus itself, and, I must add, a superficial resemblance of the cultivations to those of the fish-tubercle bacillus (which I happened to have growing among my stock cultures), raised at first a suspicion that the new cultures might after all be nothing but the above-named species, got by some extraordinary accident into my plate cultures. The suspicion, however, proved unfounded, for the cultivation was repeated on more than one occasion from different pustules, and each time the same acid-fast bacillus was grown as on the first occasion.

Moreover, grown side by side with the fish-tubercle bacillus certain differences became apparent. For while both organisms grew well at 22° F., the new bacillus grew even better at 37°, at which temperature the fish-tubercle bacillus refused to grow at all; and at the temperature of the cupboard—say, 12° to 16° C.—the fish-tubercle bacillus grew well, but the new bacillus scarcely at all.

The early colonies of the new bacillus were not quite the same as they subsequently appeared after time had allowed for the adaptation of the micro-organism to the conditions of artificial culture. At first on glycerin-potato or glycerin-agar they were large, raised, and nodular. In colour they resembled cream, like tubercle bacilli. Their sides were steep, and their consistence crumbly, for when touched with the platinum needle they broke into fragments which refused to stick to the wire, and on agar slipped about the surface and eluded capture. In subcultures, however, the colonies were soft and no longer tended to break into elusive crumbs, and the colour became whiter. On potato the bacillus formed a continuous, finely-nodular, thick, whitish layer, which was never seen to become wrinkled, as so often happens with cultures of the fish-tubercle bacillus; moreover, it showed no tendency to develop in old cultures the blackish-purple colour sometimes produced on potato by the latter bacillus. But, like this microbe and many others of the acid-fast group, our new bacillus grew freely on potato which had been coloured with methylene-blue, and like them again it built up the blue colour into its colonies.

The bacillus itself, like its colonies, changed somewhat as cultivation proceeded. At first it was a long, slender, slightly curved rod which showed some trace of segmentation of its stainable substance, just as tubercle bacilli and other acid-fast bacilli are apt, in common with the diphtheria group, to do. But subsequently it became shorter and plumper, and usually appeared as a bacillus with a somewhat indefinite outline which stained badly (with carbol-fuchsin) except for a dark-red spot in the middle. This form is not uncommon with many acid-fast bacilli, and has been described by Theobald Smith as occurring in the bovine type of tubercle bacillus after long artificial

cultivation.¹ In both forms the bacillus was strongly acid-fast, resisting, after five minutes' staining in hot carbol-fuchsin, decolorization in 25 per cent. sulphuric acid and 70 per cent. alcohol. This decolorization could be pushed, as with other acid-fast bacilli, without danger of decolorization, but after acid the colour could slowly be washed out with absolute alcohol.

The pathogenic power of the bacillus for the guinea-pig seems to have been low. A drop of the pus from the patient was injected intraperitoneally into one of this species without producing any lesions visible when the animal was killed two months later. The results of injecting the culture itself are not yet known.

Cultivated on glycerin broth it formed a superficial film which remained flat and thin, and never became wrinkled or climbed up the sides of the flask like the tubercle bacilli in like circumstances. The fluid remained clear, but a somewhat dense deposit of growth accumulated at the bottom. Growth on various media was somewhat deliberate, but considerably more rapid than that of tubercle bacilli. It required several days to reach its maximum development.

REFERENCE.

¹Theobald Smith: Note on the Stability of the Cultural Characters of Tubercle Bacilli, etc. Reprinted from the *Transactions of the First Annual Meeting (1903) of the National Association for the Prevention of Tuberculosis, U.S.A.* (See Figs. 2 and 4, opposite page 6.)

Memoranda:

MEDICAL, SURGICAL, OBSTETRICAL.

THE INFLUENZAL EPIDEMIC IN GENERAL PRACTICE.

CAPTAIN BURNFORD's article in the *BRITISH MEDICAL JOURNAL* of July 20th raises a number of points of interest, but his suggestion that the epidemic is of the nature of a glandular fever is not in accordance with experience here. After an experience of perhaps 1,000 cases, I may say that glandular enlargements, whilst they occurred in moderate numbers, were not a predominant feature of the whole range of cases seen. With rubella and mumps there were, indeed, certain points of contact where glandular enlargements were prominent, but in no case did I see a rash, and in no case did the question of differential diagnosis seriously arise.

Swabs from the nasopharynx and tonsils were examined bacteriologically in twelve cases. The results were practically negative. No organism was found common to all cases, though an unidentified micrococcus was detected in several instances. The blood from these patients was also negative. There were distinctive differences in type between cases I saw at first and those seen later. At first cases were comparatively mild, and recovery was as prompt as onset was sudden. One heard of people taken ill at work or in the streets, and after a couple of days or more in bed, if freed of their pains, still extremely weak. The leading signs and symptoms were of the familiar type dealt with in your editorial of July 13th. Afterwards meningeal symptoms became a serious preoccupation, especially in children. Headaches have been intense, nose bleedings, and even ear bleedings, and symptoms referable to pressure within the ear have been common enough to justify a warning to the relatives that they were to be expected.

As a sequel to the severe head symptoms, complaint was frequently made of lumbo-sacral pains. Most of these meningeal cases were dangerously ill, though none died. Severe vomiting has been not uncommon, more especially in adults; recovery has been delayed, and mental symptoms were frequent.

In certain cases pneumonia was suspected, and in some occurred; but, as a rule, I think bronchiolitis is probably a good description of the actual lung condition. In some instances both head symptoms and pneumonic troubles were present, but usually the former ultimately became dominant in these cases.

Prophylaxis may be summed up in the words "free ventilation" and "fortify the power of resistance" in every possible way. The fact that the majority of our cases occurred in panel practice suggests overcrowding as a prime factor in the dissemination of the disease, as, of course, one would anticipate.