by staphylococcal injections in the manner I have described above. The opsonic index in one case rose from 0.8 to 1.8 after the first injection, and after three injections he states: "My face had by then almost cleared up, and my back was greatly improved; also some hard, indurated glands in my axillae were very much smaller." The other student experienced even greater relief, and thereafter found it much more easy to keep the boils in check.

Multiple Staphylococcal Abscesses.

An infant at Guy's Hospital, under the care of Mr. F. J. Steward, was suffering from multiple subcutaneous abscesses which very nearly killed it. Altogether seventy-five abscesses developed, and others threatened. As fast as some were opened others appeared. The case seemed hopeless. It was found that the abscesses were staphylococcal. A vaccine was prepared and injected at intervals, with immediate cessation of the formation of fresh abscesses, followed by rapid and complete recovery.

I might multiply these examples indefinitely, but I think the above are sufficient to indicate the benefits to be obtained from careful vaccine treatment, particularly in cases of local tuberculous mischief, and in cases of staphylococcal troubles such as acne, boils, and abscesses.

It will be asked whether tuberculin is of any use in the treatment of phthisis. I cannot yet answer definitely. I have not yet tried it myself, but if controlled by opsonic index estimations I think it is worth trying in some cases, in addition to the recognized sanatorium and other hygienic measures.

It is particularly in the localized tuberculous diseases that it does good, effecting great relief or even cure in the case of tuberculous skin troubles and bladder affections. One of the surgeons at Guy's Hospital expresses the view that many tuberculous affections which are at present treated mainly by surgeons will in the near future be treated by physicians, and cured by tuberculin without operation. Whether this is to be so or not it is premature to say. Tuberculin and staphylococci raise the opsonic index for a time only. When the injections cease the opsonic index will in time fall below par again very likely, so that the patient may become again liable to invasion by the microbes. He is, however, no more liable to their attacks than he was before, and if a lesion can be cured by the vaccines once, a relapse or a recurrence can be cured by them again. It is unwise to stop the injections too soon; and it is unwise to depend upon the injections alone, to the neglect of hygienic, medicinal, surgical, and other general measures.

Hitherto most of the cases treated have been very severely ill; vaccine treatment has often been adopted only when surgical and all other measures have failed, for example, in cases of tuberculous ulcers, cystitis, lupus, acne, and so on. Seeing that, in spite of this, Wright is able to say that "it is not a question of the achievement of success in a certain percentage of cases only; up to the present it has been a question of uniform success," I think it will be agreed that this additional method of antimicrobial treatment well deserves to be tried early, and not merely as a last resort.

REFERENCE.

¹ I might mention that there is a growing literature upon the subject, and I would refer to papers by Wright, Bulloch, and others in the *Royal Medical and Chirurgical Society's Transactions* for 1906; to the *Practitioner* for July, 1906; to the *Guy's Hospital Reports* for 1906; and to the *Lancet* for October 27th, 1906, which contains a most interesting paper by Drs. Turton and Parkin, with detailed accounts of 34 cases.

NOTE ON THE TEMPERATURE OF JAPANESE HOT BATHS.

By LEONARD HILL, M.B., F.R.S.

THE Japanese have been noted for indulgence in very hot baths. I recently had the opportunity of finding out whether a Japanese gentleman of my acquaintance could really stand a bath hotter than a European, and to determine whether his body temperature rose in the manner to be expected.

My friend affirmed he could stand very hot baths, but not the hottest baths of all in Japan. I found he could endure a bath of 44.5° C. (114° F.) for only a minute or two while totally immersed except for his face. The bath was raised (from 103° F.) to this temperature in about five minutes. He came out feeling faint, and asked for the window to be opened. His rectal temperature had risen to 39.5° C. (103° F.). He told me that the Japanese usually sit with the head and arms out of water.

Under such conditions they may stand a considerably higher temperature; they must habituate their skin to stand a high temperature as we habituate our tongues to hot drink. If totally immersed excepting the face their body temperature must, of course rise, as I found to be the case.

A friend in Japan has sent me the following interesting account of the thermal baths at Kusatsu, which, a Japanese artist tells me, are used particularly for "illness that destroys the nose" (syphilis). The intense derivation of blood to the skin, and the rise of body temperature induced by these baths, must have a powerful effect, and ought to be a most efficient way of increasing both the supply of blood and its opsonin and the activity of the phagocytes in cutaneous affections.

The chief constituents of the Kusatsu springs are mineral acids, sulphur, iron, alum, and arsenic. The temperature of the springs is extremely high, ranging from 100° to 160° F., while the baths are generally 113° to 128°.

The chief public bath, called Netsu-no-yu, has three divisions of increasing degrees of temperature. Even the Japanese, inured as they are to scalding water, find their courage fail them, and the native invalids are therefore taken to bathe in squads under a semi-military discipline, to which they voluntarily submit. This system is known as Jikan-Yu, or "time-bath," because the hours are fixed.

Soon after daylight a horn is blown and the bathers assemble, dressed in white cotton tunics and drawers, as many as can find room taking their first daily bath. After stripping they begin by beating the water with boards in order to cool it—a curious scene; and then most disrobe, while the greatest sufferers swathe themselves in white cotton. Each bather is provided with a wooden dipper, and the "bath master" directs the patients to pour 250 dippers of water over their heads to prevent congestion. Attendants are on the watch, as fainting fits sometimes occur. To keep up their courage a kind of chant takes place between the bathers and their leader on entering the bath and while sitting in it, a trial which, though only lasting from three and a half to four minutes, seems an eternity to their festering bodies. After the lapse of about one minute the bath master cries out, and the others all answer with a hoarse shout. After a little he cries out "three minutes more." After another short interval he cries out "two minutes more," then "one minute more," the chorus answering each time. At last the leader cries "finished," whereupon the whole mass of bodies rises from the water with an alacrity which he who has witnessed their slow, painful entry into the place of torture would scarcely credit. Two more baths are taken during the forenoon and two in the afternoon, making five altogether, at which the same routine is observed. The usual Kusatsu course includes 120 baths.

MEMORANDA: MEDICAL, SURGICAL, OBSTETRICAL.

AN EXPERIENCE WITH VERONAL.

Mrs. F. sent for me August 18th, 1906, and gave the following history: The day before she awoke with a headache, and, to relieve the pain, was given two powders by a friend about 11 a.m. After sleeping for a couple of hours she awoke feeling dazed and stupid, quite unable to stand or walk, and with distinct double vision. During the evening the symptoms were more marked; she was reeling and tottering, scarcely able to put one foot before the other, even with the assistance of her friends. At 10 p.m. she was seen by my friend, Captain Craig, R.A.M.C., who found her in a semi-paralysed state, with sluggish pupils, diplopia, thready pulse, scanty urine, and normal temperature. In the morning Captain Craig and myself saw the patient together. She was drowsy and complaining of tingling sensations in the arms; pulse, 84, soft and compressible; temperature, normal; pupils, sluggish, though of about normal size; reflexes, superficial and deep, quite gone. I tried to raise her to the sitting posture, and as I did the head fell back, and several jerking movements were made to bring the head into the erect position. This could not be done, owing, as the patient described, to the heaviness felt in the occipital region. There was complete anaesthesia over the entire right lower limb, and on the left complete as far as the knee, and partial over the rest of the limb. There was also some anaesthesia over the trunk, but sensation in the arms was normal. The next day considerable improvement had taken place, sensation was normal over the trunk, left lower limb, and the upper portion of right lower limb. During the next