from time to time for many ages back, but what constituted a good site was a point but vaguely understood. Although the solid material of the ground is a matter of great importance, it is not the only point in the question. We now know that we have a subterranean, as well as a superterranean, ocean to deal with; that there is, at a varying depth beneath the surface of the ground, a vast sea, which makes sober fact of the imagination of the poet, when he said that—

"Alph, the sacred river, ran,
'Midst caverns measureless, to man,
Down to a sunless sea."

We know that this sea is perpetually in motion, and that, if we allow impurities to pass into it, it is capable of returning them to us with interest either in the water we drink or in poisonous emanations. We know, further, that we have a telluric atmosphere to deal with as well as our ordinary meteoric one, that this atmosphere contains a variety of constituents, and that its composition forms an index of some value of the impurities to which the soil has been exposed. Indeed, so great appear the telluric influences that a most important school of hygienists, of which Professor von Pettenkofer is the distinguished leader, is inclined to accord to them the paramount power for good or evil, to the exclusion of almost everything else as a direct cause. Whilst we cannot quite accede to this view at present, with the evidence we have, we still must admit, after the researches that have been made, that the soil is at least a most potent factor in the question. At the same time, the localists admit that other insanitary agents help, if they do not cause, the propagation of disease. But in the case of the action of drinking-water we can, I think, go further, for there are groups of cases where cholera has been propagated under circumstances which could hardly leave a doubt that the water was the active cause. Thus in Holland it was found that those people who drank the water of the Polders (or reclaimed lands) died of cholera at the rate 17·7 per 1000; those who drank well-water 16·8 per 1000; those who drank river-water 11·9 per 1000; those who drank rain-water filtered only 5·3 per 1000. The city of Amsterdam itself, supplied by an aqueduct with rain-water from the downs near Haarlem, had only 4 per 1000. Another striking point is that in Rotterdam during the epidemic, as soon as fairly pure water was supplied in the public streets by the authorities, the mortality immediately diminished by one-half, in spite of the difficulty experienced in getting the inhabitants to take it. I shall have occasion to cite other cases to you in the lectures on water during the course. On the questions of air and ventilation we have also certain definite data which serve as a basis of action in the supply of fresh air to habitations. So short a time ago as in the days of Arago, that distinguished philosopher thought 300 cubic feet an hour a sufficient supply for one man. We now demand ten times that as a minimum for health, and as much more as we can get in disease. In fact, our sole object now is to imitate natural open-air conditions as much as possible, by removing limitations wherever we can, and letting nature accomplish the ventilation itself. Of course rigour of climate introduces special difficulties, which have to be provided for. Many other points of interest might be touched upon, which, however, I shall have an opportunity of calling your attention to during the course. I may say, however, in conclusion, that a bright future is dawning for sanitary science, not only in our own but in many other lands. Formerly Health was talked about and sung about—called the first of blessings, *πρεσβιστή μάκαρων*, and what not; but comparatively little was really done. Now, however, the public is being steadily educated up to the level of knowledge, and a proof of it is the interest excited by the Congress of Hygiene and Sauvetage at Brussels, from taking part in which I have just returned. It is still in session, and has brought together many of the most distinguished men from the various countries of Europe. A variety of questions have been discussed and debated, and, whatever may be the immediate practical result, it cannot fail to be the commencement of a great movement, connected as it is with an exhibition of sanitary and life-saving appliances from almost every nation. The truth is that the time may perhaps come when people will think it less worth their while to fly at each other's throats, and more so to vie with each other in the common cause of humanity. Then perhaps they may come to acknowledge the truth of the saying of Cicero in his oration *Pro Ligario*: "Neque enim ullâ aliâ re homines propiùs ad Deos accedunt, quam SALUTEM hominibus dando."

THE TREATMENT OF ACUTE RHEUMATISM BY SALICIN.

BY T. MACLAGAN, M.D.

BEFORE the onset of winter I would again draw the attention of the profession to the beneficial action of salicin in acute rheumatism.

In my original paper on the subject* the following conclusions were given as the result of my then experience of the remedy:—"1. We have in salicin a valuable remedy in the treatment of acute rheumatism. 2. The more acute the case, the more marked the benefit produced. 3. In acute cases, its beneficial action is generally apparent within twenty-four, always within forty-eight, hours of its administration in sufficient dose. 4. Given thus at the commencement of the attack, it seems to arrest the course of the malady as effectually as quinine cures an ague, or ipecacuanha a dysentery. 5. The relief of pain is always one of the earliest effects produced. 6. In acute cases, relief of pain and a fall of temperature generally occur simultaneously. 7. In subacute cases, the pain is sometimes decidedly relieved before the temperature begins to fall; this is especially the case when, as is frequently observed in those of nervous temperament, the pain is proportionally greater than the abnormal rise of temperature. 8. In chronic rheumatism, salicin sometimes does good where other remedies fail; but it also sometimes fails where others do good."

A further experience of the remedy has confirmed me in the accuracy of these conclusions. In not one case of acute rheumatism have I found salicin fail to produce a speedy cure of the disease. I have therefore nothing to add to, nothing to detract from, the conclusion—"that, given in sufficient dose at the commencement of the attack, salicin seems to arrest the course of acute rheumatism as effectually as quinine cures an ague, or ipecacuanha a dysentery."

The points to which, in this communication, I would direct special attention are: first, the dose which should be given; and, second, the action of the remedy on the cardiac complications of acute rheumatism.

1. *The dose.*—What I said on this point in my former paper was as follows:—"The dose of salicin is from ten to thirty grains every two, three, or four hours, according to the severity of the case. Fifteen grains every three hours is a medium dose for an acute case. It is very possible that less might suffice; for I have not tried to find the minimum dose. It is very certain that a much larger dose may be given without producing discomfort."

Further experience has led me to the conclusion that it is well to give the larger dose; and that the best way to get the full and speedy benefit of the remedy is to saturate the system with it as quickly as possible. The more speedily this is done, the more speedily are the fever and pains subdued. I now, therefore, give the salicin to adults in a dose of twenty to thirty grains every two hours; in very acute cases I give that quantity every hour till pain is relieved. With relief of pain, sleep returns, and the hourly dose cannot be adhered to. But it is well to give twenty grains, at least, every two hours during the day, till the temperature is down to the normal. For a week afterwards the same dose should be given four times a day.

Salicin is an excellent bitter tonic—in my experience as good as quinine, and not apt to disagree as the latter is. I have always found cases of acute rheumatism treated by it convalesce very rapidly; treated in the old way, convalescence from that disease is a slow and tedious process.

I am specially anxious to call attention to the necessity for giving salicin in large and frequently repeated doses,

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because, in some of the cases which have been reported in the journals since my original paper was published, the dose given was too small to produce benefit. To give "from thirty to sixty grains per day" is to do justice neither to the patient nor the remedy; and to report a case in which such a dose was given as one indicating "the inability of salicin to arrest the disease," is to draw an inference which is unwarranted by the facts, and which tends to throw unmerited discredit on a remedy whose ability to arrest the progress of acute rheumatism has already been demonstrated in numerous cases. A case of acute rheumatism which gets from thirty to sixty grains in twenty-four hours—i. e., an average of less than two grains in the hour—receives practically no treatment, and is of no value as evidence either for or against salicin.

In the following case the beneficial action of the remedy is well seen.

Charles W——, aged twenty-four, had rheumatic fever six years ago. Was confined to bed for seven weeks. The heart was then affected.—May 8th: For three or four days has been suffering from what he calls "a cold." Chief complaint has been of pain in the back and limbs, with general sense of chilliness and discomfort. Yesterday the pain became more localised, its chief seats being the left shoulder and right knee. Passed a sleepless night. To-day has great pain in the left shoulder and in both knees, all of which are very tender to touch; the knees are slightly swollen. Has anxious expression; skin hot, not perspiring; urine scanty and high-coloured, loaded with urates; bowels moved by medicine; tongue moist and furred. Has a short, blowing, and probably old murmur with first sound at apex. Pulse 112; temperature 102°. To have twenty grains of salicin every two hours.—9th, morning: Bad night; no sleep. Great pain in both knees and in right elbow and wrist, all of which are swollen and tender; profuse acid perspiration. Heart's sounds as before. Pulse 120; temperature 102·3°. To have thirty grains of salicin every hour. Evening: Feels better; much less pain; can bear handling of joints; profuse acid perspiration. Pulse 100; temperature 101·2°. Continue salicin every hour while awake.—10th: Had a much better night; slept in short snatches, but was anxious to be awake in order to take the powders, every one of which, he says, does him good. Heart's sounds unchanged; perspiration abundant, but not so profuse. Can move limbs freely and without pain. Pulse 80; temperature 98·5°. Continue salicin.—11th: Feels quite well. Skin natural; tongue cleaning; pulse 68; temperature 97·8°. To have thirty grains of salicin four times a day. Remained well.

James S——, aged thirty; never had rheumatic fever.—September 20th: Has been ailing for several days, complaining of cold and sore-throat; to-day feels worse; has great pain in back, both hip-joints, and in limbs; skin perspiring, but not profusely; perspiration acid; tongue moist and furred; urine scanty and high-coloured; has some congestion of fauces. Pulse 104; temperature 101·9°. To have twenty grains of salicin every two hours.—21st: Bad night; great pain in hip-joints; abundant acid perspiration; heart's sounds normal. Pulse 112; temperature 102·5°. Continue salicin, twenty grains every two hours.—22nd: Passed a good night; slept fairly; is free from pain this morning; still slight acid perspiration. Pulse 80; temperature 100·2°. Continue salicin every two hours while awake. Has slight tinnitus aurium.—23rd: Good night; slept well; acid perspiration continues. Pulse 72; temperature 99·2°.—24th: Feels quite well. Pulse 68; temperature 97·1°. To have twenty grains of salicin four times a day. Remained well.

2. *The cardiac complications.*—What I said on this subject in my former communication was as follows:—"Regarding the action of salicin on the cardiac complications of rheumatic fever I have no experience. ..... But it needs not the details of cases to demonstrate that a remedy which curtails the duration, or mitigates the severity, of an attack of rheumatic fever, must of necessity diminish in a proportionate degree the risk of cardiac mischief."

The first part of this statement I have now to recall. I *have* some experience of the action of salicin on the cardiac complications, and shall presently give it.

The latter part of the statement I would in no way modify. There can be no doubt that the longer a case of rheumatic fever continues, the greater is the risk of the heart becoming involved; and that a remedy which cuts short that disease diminishes the risk to which the heart is exposed. Cure the patient in a week, and his heart is more likely to escape than if the ailment last for a fortnight.

From the fact that salicin so speedily cures rheumatic fever, we therefore infer that it is a valuable agent in preventing the occurrence of the cardiac complications of that disease.

Whether it is of value in the treatment of these complications after they have made their appearance is another question, to which I would for a moment direct attention.

The following case will serve as the groundwork of my remarks on that subject:—

Margaret T——, aged sixteen, nursery-maid. Never had rheumatic fever. Was quite well on April 12th. On the 13th felt out of sorts, and had a general feeling of cold, with some pain in the limbs. On the 14th the pains increased, and towards evening got very bad. Being anxious to continue at work, she got up on the 15th and went about as usual, saying nothing to anyone about her pains, which were now very bad in both arms and both legs. During the night of the 15th the pain was so severe that she had no sleep. On the 16th she got up, but was obliged to go back to bed. On the evening of that day I received a note from her mistress requesting me to see her as soon as possible, as she was afraid the girl was dying. On arriving at the house, I was informed that the girl was in bed, quite unable to move, and screaming with agony. I heard her cries before entering her room. The girl was not hysterical, but rather of a quiet and phlegmatic disposition, and her screams were evidently caused by pain.—April 16th, evening: Lies in bed, quite unable to move, and every now and then screaming with pain. The back, shoulders, elbows, wrists, knees, and ankles are all the seat of severe pain, but the knees and ankles, are most complained of. All these joints are slightly swollen, and so exquisitely tender that the least touch or movement causes her to scream. Has no pain in the chest. Skin hot, and not perspiring; tongue moist and furred; urine scanty, high-coloured, and loaded with pink urates. Has a soft blowing murmur, synchronous with the first sound of the heart, and loudest at apex, but audible over the whole heart. Pulse 112; respiration 20; temperature 103·8°. To have fifteen grains of salicin every hour till three powders are taken, and then one every two hours.—17th: Wandered at times during the night, but had occasional short snatches of sleep. Pain, especially in the ankles and knees, is still severe, but not nearly so bad as yesterday. Can move the right leg a little, and does not complain when the joints are touched; indeed she allows them to be pretty firmly grasped without complaining; yesterday the least touch caused her to scream. Tongue furred. Skin moist; perspiration acid. Urine scanty and high-coloured; bowels confined. The cardiac blow is softer in character, and precedes as well as accompanies the first sound at apex; still audible over the whole heart, but not so distinctly as yesterday. Pulse 96; respiration 26; temperature 102·8°. Has had eight powders—i. e., 120 grains of salicin. To continue to take fifteen grains every two hours.—18th: Passed a good night, free from pain. To-day feels quite well; has no pain in any of the joints, and can move the limbs without more discomfort than what is caused by a slight feeling of stiffness in the knees. Tongue cleaning; skin natural. Pulse 72, barely perceptible, and with difficulty counted; respiration 20; temperature 99·6°. Heart's action irregular; murmur still very soft; has lost its systolic character, and is now short and purely presystolic; distinct at apex, but scarcely audible an inch from that point. Up to this time has had eighteen powders, equal to 270 grains of salicin. To have fifteen grains every three hours.—19th: Slept well. Is quite free from pain, and feels quite well. Wishes to get up. Tongue clean; skin natural; bowels moved; urine abundant, of pale-amber colour. Pulse 70, feeble, and irregular; respiration 20; temperature 98·2°. Has had altogether twenty-seven powders, representing 405 grains of salicin.—The detailed daily report I need not give further. Suffice it to say that the pains did not return. The girl felt perfectly well, but did not lose the cardiac murmur. Three months after her illness I again saw her, and then she had a soft blowing murmur, preceding and running into the first sound, and