

Agent.	Strength.	Failed to kill (minutes).	Killed (minutes).
Carbolic acid ...	1-40	3	4
" " ...	1-20	1	2
Trikresol ...	1-40	2	3
" " ...	1-20	1	2
Lysol ...	1-40	7	10
" " ...	1-20	2	3
Solveol ...	1-40	10	15
" " ...	1-20	10	15
Bacillol ...	1-40	4	5
" " ...	1-20	3	4
Creolin ...	1-40	10	15
" " ...	1-20	10	15
Sulphonaphтол ...	1-20	30	45
Formaldehyde ...	1 p.c.	60	—
" " ...	2 p.c.	30	45
" " ...	3 p.c.	25	30
" " ...	5 p.c.	15	20
Mercuric cyanide ...	1-1000	180	—
Sublamin ...	1-1000	10	—
Potassium permanganate ...	Saturated	10	15
Potassium permanganate and hydrochloric acid (Andrews) ...	1 p.c. each	4	5

Here, then, are twenty-two preparations, not one of which acts under two minutes, and most of them only after five.

My next endeavour was to find some preparation that will kill not in minutes, but in seconds. It was obvious that none of the organic compounds mentioned could be depended upon to do this in any strength which it would be practicable to use, and I had, therefore, to turn to the inorganic agents. Of the salts of the metals, corrosive sublimate is beyond question the most powerful, but this cannot be depended upon in its usual solutions, as I have already pointed out; and hence it must be combined with some other agent, or agents, if any increase in effectiveness is to be secured. The addition of hydrochloric acid to the extent of 10 per cent. was found to be very effective, but a solution of an irritant-like corrosive sublimate with another like hydrochloric acid would obviously be out of the question, on account of its local action; but if this action could be prevented, the combination might be useful. First, I experimented with a mixture which I found would kill *Staphylococcus aureus*, *albus* and *citreus* and *Bacillus pyocyaneus* in less than ten seconds. Then I tried weakening it, first as to one, then as to another ingredient, but always aiming to keep its limit of required time at about ten seconds. The ninth combination tried appeared to be as weak with respect to each of the active constituents as could be made, retaining that degree of efficiency—that is, to kill the pyogenic bacteria on silk threads, not in the skin—within ten seconds. I tried it against pus from a carbuncle and against two other specimens of uncertain origin, and, at the same time, I tried carbolic acid and

trikresol, which had proved to be the quickest in action of the twenty-two solutions above mentioned. Let me say here, that killing bacteria in pus is quite a different thing from killing them on threads and glass beads.

The carbuncle pus was killed by trikresol (1-40) in five and a-half minutes and by carbolic acid (1-40) in four; my mixture killed it in less than a minute, though not in thirty seconds. The other specimens of pus were both killed by trikresol and carbolic in two minutes, and by my mixture in less than thirty seconds.

Following are the results of attempts to sterilise the skin:—I have repeatedly soaked my hand (without any preliminary scrubbing) for two minutes, and then have had plantings made from material removed from about each nail and from scrapings from the skin of each finger and from the palm. Occasionally, I got a growth; but, as a rule, every tube of bouillon remained clean and sterile. A young man, whose duties include the daily cleaning of cages in the animal room, and whose hands were not the subject of much thought and care, soaked his hand (after ordinary washing) on ten different occasions for from two to five minutes; and each time each nail and finger was tested—*i.e.*, ten cultures were made. In seven of the experiments there was entire absence of growths; in one, a growth was obtained from one forefinger; in one, from one middle finger; and in one, from one thumb. That is to say, of 100 plantings only three showed growths.

At the Boston City Hospital, Dr. Monks immersed his hands for two minutes without previous scrubbing; the skin of both hands gave negative results, but growths were obtained from the nails of the right hand; the nails of the left hand were sterile. Three of the assistants did the same thing, but after scrubbing, and with these results:—

- Dr. H. Left hand sterile; nails gave growth.  
Right hand sterile; nails sterile.
- Dr. K. Left hand sterile; nails sterile.  
Right hand sterile; nails sterile.
- Dr. S. Left hand sterile; nails sterile.  
Right hand sterile; nails sterile.

Examination of the skin of Drs. H. and K. after being engaged in operating showed persistent sterility; but Dr. S.'s left hand yielded a growth. The mixture has been used also in several cases of lacerated wounds.

For my combination, I make no claims whatever, and no assertions that later might have to be recalled. I submit the facts as I have seen them. I do not say that everybody will get the same results that I have seen. To my hands and to those of my assistants, the mixture has caused no irritation beyond the same degree of biting that one notices when in contact with peroxide of hydrogen. Two of the surgical assistants reported slight exfoliation two days after trying it, but nothing more. I recognise

[previous page](#)

[next page](#)