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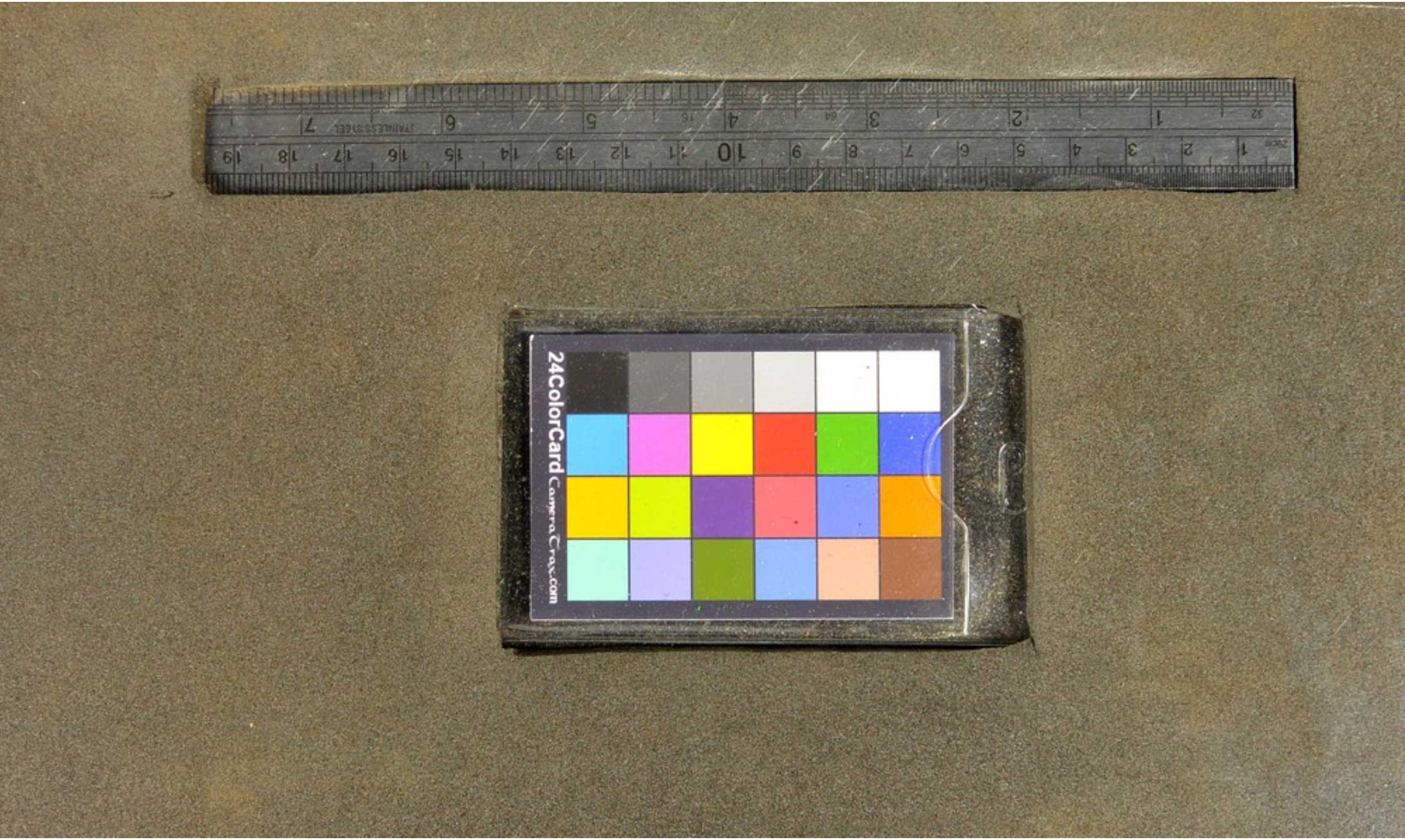
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ON THE USE OF ALKALIES IN RELIEVING PAIN.

Being a Paper read in the Section of Pharmacology at the Annual Meeting of the British Medical Association at Manchester, July-August, 1902.

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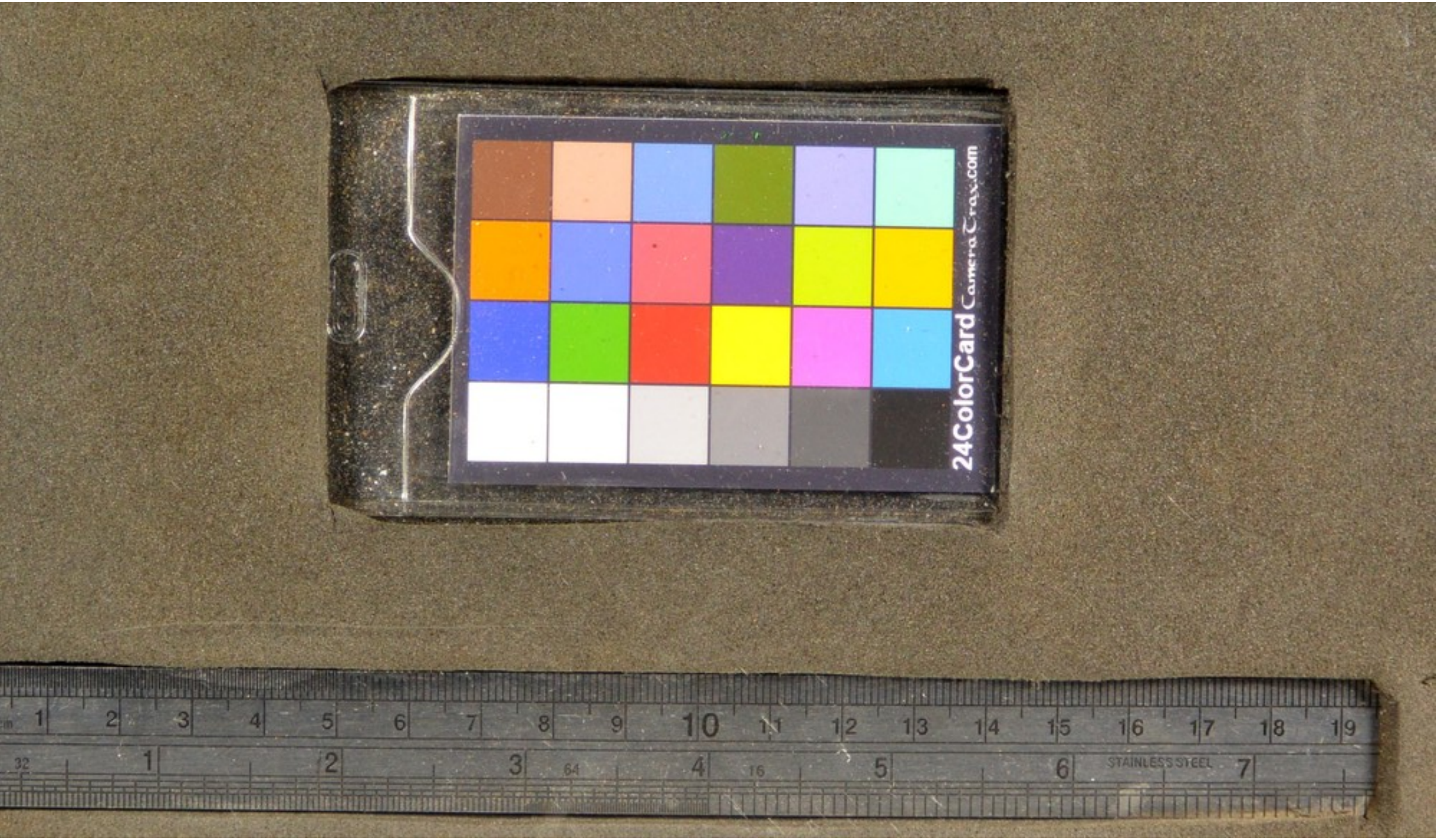
THE common physiological experiment of testing the reflex action in a decapitated body by dipping one foot into acid is instructive as showing the great power of acids to stimulate sensory nerves and the disappearance of the stimulation when the acid is removed. The presence of acid in a carious tooth is a most potent cause of toothache, and my friend and colleague, Sir Dyce Duckworth, has shown how toothache may be stopped almost magically by putting into the decayed spot a little cotton wool dipped in sodium bicarbonate and thus neutralizing the acidity. The sodium bicarbonate may be mixed with laudanum, or cocaine, or both, in order to lessen the irritability of the nerves of the tooth, but very often this is quite unnecessary, and the sodium bicarbonate is quite efficacious by itself. When pain is felt, not in one tooth only but in all, it frequently depends on irritation of the roots of the teeth just at the edge of the gums by acid fluid in the mouth, the gums themselves being sometimes a little retracted. This pain may be generally removed by rubbing a little sodium bicarbonate along the edge of the gums with the fingers or by thoroughly washing the mouth out with some sodium bicarbonate in water. The strength of the solution is no great importance, but a teaspoonful of bicarbonate in about half a tumbler of water usually answers very well. Such a solution, too, is very useful in cases where toothache depends upon caries occurring between teeth where cotton wool cannot well be applied. By squirting the solution between the teeth or by rubbing bicarbonate in between by means of a pointed wooden match the pain can often be relieved. Some recent observations that I made appear to show that diminished alkalinity of the blood may tend to cause pain in somewhat the same way as a positive application of acid to a nerve.

About six weeks ago I was unfortunate enough to get my hand poisoned by infection with a microbe which proved, on examination, to be a pure cultivation of staphylococcus pyogenes aureus. After the first wound had healed it was succeeded by a number of painful boils. These, like the first, were excessively painful, the pain sometimes being of a dull burning character like that caused by a burn. But at other times it became exceedingly sharp, as if a number of wasps were stinging all at once. Many years ago, when amusing myself with destroying wasps' nests, I had frequent opportunities of ascertaining what the sting of a wasp felt like, and, so far as my recollection serves me, the pain was exactly the same in kind and not more severe than the pain I felt in these boils. The burning pain was more or less continuous, but the severe stinging pain only came at intervals. It was only at the end of four or five weeks that I noticed that the stinging pain usually came on most severely between three and four hours after a meal. This is the time when the alkalinity of the blood is undergoing diminution by the absorption from the stomach of hydrochloric acid which has been secreted for gastric digestion, as well as of any other acid which may have been contained in the food or formed from it.

On some occasions there seemed to be acid eructations about the time that the stinging pain came on, and I thought that this pain, like a stomach cough, might be due to summation of stimuli. I accordingly took large doses, ½-teaspoonful to a teaspoonful of sodium bicarbonate by the mouth, with benefit, as I thought, both to the gastric acidity and the pain in the boils. One day, however, it occurred to me that instead of the stinging pain due to a summation of stimuli proceeding from the boils themselves and from the stomach, it might be caused by lessened alkalinity of the blood circulating in the boils. I accordingly applied a solution of sodium bicarbonate directly to the boils themselves, instead of taking it by the mouth. The result was most satisfactory, for in a few minutes after the application the intense stinging pain was relieved. This result suggests the possibility of a more extended use of alkalies in cases of neuralgia, and it also may help to explain the relief that is afforded in some cases of neuralgia by taking food. Hitherto one has been inclined to believe that the relief of pain was due to local depletion of the painful part by derivation of blood to the stomach during digestion; but in view of these observations, it appears not unlikely that this explanation is only a partial one, and that the relief really depends more on secretion of acid into the stomach and a consequent increase in the alkalinity of the blood than to any change in the circulation. If this be so, then the free administration of sodium bicarbonate and potassium bicarbonate in such cases may help to give relief.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