

liquid the standard target is modified by the cloudiness of a 10 mm. column of the liquid and matched photometrically with cross illumination through the plunger, the visual effect in all cases being that of disappearance of the target.

By means of a standard solution and a complimentary light filter, illumination is standardized by bringing the light of the special lamp to a distance corresponding with the extinction coefficient.

92 (2324)

The influence of the ingestion of potassium chlorate, sodium chloride and water on the oxygen capacity of the blood.

By VICTOR ROSS (by invitation).

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The experiments reported here were undertaken in order to compare the effects of the ingestion of potassium chlorate, sodium chloride and water on the oxygen binding capacity (hemoglobin) of the blood. Dogs were used. The last meal was given 18 to 24 hours before the experiment was begun but the animals had free access to water at all times except during the course of the experiment when they were kept in metabolism cages. In this manner it was hoped that when the experiments were begun the hemoglobin of the dogs' blood would be at the physiological level and that normal variations would be avoided as far as possible.

A dose of 0.5 gm. of potassium chlorate per kilo of body weight was given by stomach tube in one per cent solution (equivalent to 50 cc. of water per kilo). At the end of two, four and six hours blood was taken from the jugular vein, following which the dog was given 25 cc. of water per kilo. This made a total of 125 cc. per kilo. A final blood sample was taken 24 hours after the beginning of the experiment. Blood oxygen capacity determinations were made by the Van Slyke method.

The results show that there may be no fall or a slight fall in oxygen capacity *after two hours* in those cases where the oxygen capacity before feeding potassium chlorate was less than 20 volume per cent. In these cases, however, there was a fall varying from 0.17 to 1.6 volume per cent at the end of *four to six hours*. By this time the dogs had had, in addition to the potassium chlorate solution, one or two doses of water (25 cc. per kilo), as explained above. On the other hand, animals showing an initially higher oxygen capacity (21.5 to 23 volume per cent) suffer a fall of from 1.6 to 2 volume per cent after *two hours*. In general the higher the oxygen capacity before feeding the greater and more rapid the fall. Since no methemoglobin could be detected in the spectroscope the drop in the oxygen capacity is not the result of the conversion of hemoglobin to methemoglobin.

When sodium chloride was given, 0.5 gm. per kilo of body weight in one per cent solution, followed at two hour intervals by 25 cc. of water per kilo, similar effects on the blood oxygen capacity were observed. Here also, the greater the original value the larger the drop and the more sudden. These results for sodium chloride are similar to those obtained by Haldane and Priestley^{1,2} in their hemoglobin measurements when they fed solutions of sodium chloride to humans.

When water alone is given, 50 cc. per kilo of body weight, followed at two-hour intervals by 25 cc. per kilo, the blood oxygen capacity falls in the same manner as when solutions of potassium chlorate or sodium chloride are fed. Although only two experiments were performed with water the results are clear. A drop of 1.5 volume per cent and of 2 volume per cent was observed, the dog with the originally higher value suffering the greater fall. Haldane and Priestley found that water ingestion did not alter the hemoglobin concentration of human beings. The discrepancy may be due to the fact that our dogs received proportionately much larger quantities of water. A 70 kilo man would, on our basis, take 3,500 cc. of water *within a very few minutes*.

The results indicate that (a) the degree of temporary dilution of the blood as evidenced by the lowered oxygen capacity values is approximately the same for solutions of potassium chlorate

¹ Haldane, J. S., and Priestley, J. G., *J. Physiol.*, 1915-1916, 1, 296.

² Priestley, J. G., *J. Physiol.*, 1915-1916, 1, 304.

and sodium chloride as for water alone, (*b*) since the fall in oxygen capacity is not so great for dogs with lower original values as for dogs with greater values, there is an arrangement for protecting the concentration of the blood against disturbing influences, (*c*) no methemoglobin is formed when potassium chlorate is fed under the above named conditions.

93 (2325)

Studies concerning the significance of *Streptococcus hemolyticus* in scarlet fever.

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The more or less constant presence of *Streptococcus hemolyticus* in the throats of individuals suffering from scarlet fever has been generally recognized for many years. This organism is also the preponderant causative agent of such septic complications of the disease as otitis media, adenitis, interstitial nephritis, arthritis, and septicemia. Such widespread and general relationship of streptococcus to scarlet fever naturally gave rise to the view, supported by a number of investigators, that streptococcus might be the etiological agent of the disease. Belief in the validity of this conception led to the preparation and trial of antistreptococcic sera for therapeutic purposes. For some of these efficacious results have been claimed. On the other hand another group of investigators has asserted that streptococcus bears only a secondary relationship to scarlet fever and cannot be assigned the principal causative role. Discussion of this question was carried on for many years and became part of the larger controversy concerning the nature of the whole group of organisms generically designated as *S. hemolyticus*. The balance was finally tipped against the etiological importance of *S. hemolyticus* by Jochmann, who claimed that it is unreasonable to suppose that a specific disease such as scarlet fever can be caused by an organ-