OBSERVATIONS
ON
THE CHANGES
WHICH
THE ANIMAL BODY UNDERGOES
IN A
HOT CLIMATE SOON AFTER DEATH.
BY JOHN DAVY, M.D. F.R.S.
COMMUNICATED IN A LETTER TO SIR JAMES MACGRIGOR.

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Kandy, Ceylon, June 14th, 1818.

MY DEAR SIR,

SINCE I had the pleasure of addressing you last, I have collected in the prosecution of my professional duties, some observations on the changes which the animal body in a hot climate undergoes soon after death, and prior to putrefaction, to which I should be happy to call the attention of medical men.

Immediately after death, before the body has lost its heat and flexibility, the heart and arteries, as well as veins, are full of blood which is fluid as in life, and every part may be considered nearly

in the same state that it was in before the fatal event took place.

But if several hours be allowed to elapse before the examination of the body is made, for instance, from twelve to sixteen hours, new appearances will present themselves. Little blood will be found in the great arteries; coagulated blood or polypi will be found in the auricles of the heart; the viscera will appear more or less turgid with blood, especially the lungs and the lower part of the viscera; the peritoneal covering of the gall-bladder, and the adjacent parts of the liver and intestines, will have assumed a dark-greenish hue; and lastly, should there be much bile in the intestines, the intestines in general and peritoneum will be discoloured and rendered of a light green.

Farther, if the interval between the death and the examination of the body be still greater, as from twenty to thirty hours, still greater changes will have taken place. The serous and mucous membranes in general will appear red and inflamed, and especially those parts which are most exposed to the action of blood, as the valves and the lining membrane of the heart and bloodvessels; any serum that may be effused into the ventricles of the brain, between the pleuræ or in the pericardium, will be more or less tinged with blood; the viscera will appear dark and livid, and the skin along the track of the great vessels streaked of different hues from extravasated blood.

These changes which I have described generally, I have observed in a variety of different instances. Most of them are familiar appearances in morbid anatomy.

It is a well known fact that the blood soon after death, I believe before it has time to coagulate, partially forsakes the great vessels and accumulates in the viscera, particularly in the lungs, liver and spleen; and it may perhaps be accounted for, by means of the slow coagulation of the blood after death, and on the principles of gravitation, capillary attraction, and the relaxation of the animal fibre.

It is also, I believe, a well known fact, that bile immediately after death begins to penetrate the substance of the gall-bladder, exude and stain the contiguous parts; and its exuding from the intestines, when it is abundant in them, is only what might be expected considering the similarity of parts. The phenomenon in both instances may be explained, perhaps, without much difficulty, by referring it to the relaxed state of the membranes and their affinity for the colouring matter of bile, with which, judging from the durability of the stain, they appear to combine chemically.

The appearances of inflammation, in consequence of the exudation of bloody serum, are the only phenomena which I have described that have

any pretensions to novelty; they seem to admit of an easy explanation. Bloody serum appears just as capable of penetrating relaxed membranes as bile; and, like bile, the colouring matter of blood appears to be attracted, and to combine with dead animal substances, and especially the white textures of the body; as is easily illustrated by the simple experiment of immersing a piece of white membrane in blood, or, what is better, blood and water, for twenty-four hours, when it will have acquired a red and inflamed appearance, that cannot be removed by simple washing, nor indeed entirely by maceration in water for several hours.

The false appearances of inflammation in consequence of the absorption of the colouring matter of the blood are phenomena, I conceive, not unworthy of the attention of medical men, both in relation to pathological anatomy and medical jurisprudence. These false appearances are in many instances so exactly like the true, that I doubt if the most experienced anatomist would be able to distinguish between them. I have made the trial with medical friends, by asking their opinion of parts that had been coloured by immersion in blood, and, without the least hesitation, they have pronounced the parts strongly inflamed; I have even in some instances remarked an apparent increased vascularity, bloody serum having entered the minute vessels, which during life conveyed only colourless lymph; and I am acquainted with

several cases in which I believe inflammatory appearances the effects of exudation, were considered by medical men as phenomena of genuine inflammation that had taken place during life; indeed it was the consideration of such cases that first drew my attention to the subject.

I may observe farther, that these *post-vital* changes (if I may be allowed the expression) take place with different degrees of rapidity, according to circumstances, and more especially according to the state of the solids and fluids and the temperature of the atmosphere; generally speaking, the warmer the air is, and the greater is the tendency of the body to putrefaction, so much the sooner and the more decidedly will it exhibit the phenomena in question.

To conclude, I may express my conviction, founded on what I have seen, that in the majority of cases no minute examination of the dead body is of any value if more than six hours, in a hot climate, are allowed to elapse between the fatal event and the dissection. And certainly in many instances the time that has elapsed should be accurately noted.

I have the honour to be,

My dear Sir,

Your very obedient humble servant,

Sir James Macgrigor, M.D.

Director-General, &c. &c.

J. DAVY.