NOTES ON HEAT AND "HEAT-STROKE" AT ASSOUAN IN THE SUMMER OF 1886.

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HAVING passed the summer of 1886 at Assouan, perhaps a few remarks on the heat and its consequences might interest your readers. The month of May was exceedingly hot; there was a large amount of sickness, and enteric fever was very prevalent. Five cases of heat-stroke were admitted to hospital; they were all slight cases, and speedily recovered. I propose to confine myself mainly to the month of June, which was the hottest month experienced.

During the hottest week (12th to 18th) the minimum shade temperature averaged daily 120° (less a small fraction). June 16th was the highest record, namely, 122.2° , and the wet and dry bulb showed a difference of 50.2° on that day. The minimum temperature at night for the same week showed an average of 87.2° . The average strength of the garrison for the month of June at Assouan was 2,469. The average number constantly sick in hospital for the month of June was 208.

The great heat affected the cases of enteric fever, which were numerous, very differently; in some it caused great prostration, high rises of temperature; in four cases it brought on "heat-apoplexy," which proved fatal; it prolonged convalescence, and left the patients very debilitated; in some cases it did not seem to produce any bad results.

There were forty-five cases of "heat-stroke" among the men, causing twenty-four deaths, and three cases among the officers, with one death; giving a total of forty-eight cases of "heat-stroke," and twenty-five deaths. A large number of cases of simple fever, due directly to the effects of the sun, but none of these were serious, and recovered soon; these were not diagnosed as "heat-stroke."

Under the heading "heat-stroke," the *Nomenclature of Diseases* gives: (a) sun-stroke; (b) heat-apoplexy. Personally, I am unable to distinguish between the sub-varieties, as most of the cases presented the same symptoms, whether occurring during the day, when exposed to the direct rays of the sun, or in the shade of their barrack-rooms, or at night, the latter being the most common.

Sir J. Fayer, in *Quain's Dictionary of Medicine*, describes three varieties of sunstroke: (1) syncopal, (2) asphyxial, (3) hyperpyrexial. The five cases that died out of hospital I cannot vouch for, but all the cases that were treated in hospital were of the latter type.

The *post-mortem* appearances were almost invariably the same: intense lividity of the surface, and one unfailing sign was the sub-conjunctival ecchymosis, which left a dark stain, in some cases more extensive than in others, but always present after death. I do not know if this appearance has been noted before, but in the cases here it was, I believe, invariably present and almost pathognomonic of the disease.

Only a few brains were examined, and these presented general engorgement of the vessels, especially at the base of the brain. Case 6 showed meningeal inflammation. The internal organs were invariably engorged with blood, the venous system being overloaded, and the blood non-aerated. The heart was generally flaccid and full of blood. The muscles were dark-coloured.

Not many cases occurred due to direct exposure to the sun's rays, and in the majority of those in which it did occur the men were probably more or less under the influence of drink at the time; the majority of cases were overcome either in the shade of the barrack-rooms, or in hospital, or at night. Two were found dead in bed. The mortality from "heat-stroke" was far higher in the summer of 1886 than in the previous summer. In 1885, though more exposed to the sun and not in such good quarters, the men had experienced the excitement of the late campaign, and had a considerable amount of work to get through, and consequently had not the time to get depressed, and were unable to indulge in alcoholic stimulants. In 1886 the men were fixed in quarters, which were hardly suitable to withstand any intense heat; there was a complete lack of all amusements, and a considerable amount of depression among the troops in garrison; they were prevented, as far as possible, from free indulgence in alcoholic stimulants. The older soldiers suffered equally with the younger ones, and in proportion more so; June 16th was especially fatal to the older men. Large solar topees were worn by the men, and they were kept out of the sun as much as possible. The nights were warm, but there was generally some breeze, so that sleep could be obtained. Fortunately a very dry heat prevails here, otherwise the mortality would have been far higher. Rations were liberal and good; vegetables somewhat scarce; two ounces of limejuice were issued daily to each man. Non-commissioned officers were instructed to keep a

supply of cold water at hand, and if any man showed signs of "heat-stroke" to apply the cold douche at once.

Symptoms.—The usual type was as follows:

A man was carried in with flushed face, hot, dry, burning skin; if conscious, complaining of intense pain in the head; generally unconscious, pulse feeble, breathing shallow and laboured; at times comatose, with stertorous breathing, in others violent convulsions relapsing into coma. The initial temperature generally varied from 104° to 107° ; you could not depend on the strict accuracy of the clinical thermometer, owing to the high temperature of the external air, but the bodily temperature was always very high.

The cases occurring in patients in hospital presented similar symptoms, but were generally more insidious.

Several cases exhibited a kind of premonitory stage, the patient being admitted to hospital with slight febrile disturbance, and after a day or two developed the disease in its full intensity.

In cases of enteric fever in which it occurred, it was either speedily fatal or seriously complicated the disease, the symptoms being high temperature, hot, dry, and burning skin, flushed face, and great prostration, which, if yielding to treatment, left the patient very weak and less fit to cope with the original disease.

In severe cases, in which the patient became comatose early, he usually died in a few hours without rallying. One or two cases rallied and then relapsed into coma. Case 6 was the longest case that terminated fatally. If the attack yielded to treatment the patient was left very prostrate, feverish, furred tongue, headache, etc., which passed off generally in a few days, and left him convalescent but weak and debilitated.

Most of the cases which recovered were considerably debilitated, and required change of climate; I am unaware if they suffered from brain mischief later on.

Treatment must be immediate and thorough. The patient should be stripped and laid in the coolest place possible—in the shade outside is best—and cold water dashed on the head and spine; this should be maintained; a large enema administered and the lower bowel well emptied. If the patient regains consciousness, he may then be placed on his bed (if the temperature remains high) in a wet pack, and ice kept to his head. Five grains of calomel may then be administered, and diaphoretics given frequently. To promote free action of the skin and maintain the action of the bowels is very needful. If a relapse threatens, douching should be at once resorted to. If there are no signs of rallying, use sinapisms to the heart, frequent douching, ice to head and spine, friction of the limbs; if the pulse is failing, brandy at frequent intervals in small doses and brandy enemata. If respiration is failing, artificial respiration should be employed and well kept up. On no account give up every attempt until life is quite extinct. On no account bleed the patient. The after treatment is to maintain free action of the skin and bowels—tonics and change of air to a temperate climate.

The essence of treatment is to reduce the bodily temperature as speedily as possible, and the surest way to do this is the application of cold water and ice; this should be maintained, and the least relapse dealt vigorously with in the same way. Immediate action of the bowels by enemata is very necessary, and an emetic is beneficial in suitable cases.

The close of the month of June saw a considerable decrease in the number of cases of "heat-stroke." July, although very hot, was not so unbearable as the previous month; during the month of July there were five cases of "heat-stroke," two died out of hospital, and of the three that were admitted all recovered. In June it was arranged that all men under 20 years of age, and all men of weakly constitution, should be sent down river, and proceed to Cyprus for change of air; this had a very beneficial result and reduced the sick list considerably. At the end of July, the average strength of the garrison was 1,784; the number of sick in hospital was seventy-four. Only seventeen cases of enteric fever, and not one case of "heat stroke." This brings me to the end of the three worst months of the year. May being characterised by a serious epidemic of enteric fever, which gave rise to forty-seven deaths in that month alone. June following with its outbreak of "heat-stroke," enteric fever still prevailing, but gradually lessening, and of a less fatal character; July succeeded, at the end of which month, "heat-stroke" had disappeared, and enteric fever was immensely lessened. The whole period was a most trying and depressing one to both officers and men. If troops remain in Assouan during the coming summer, every possible precaution should be taken to ensure protection against the intense heat which is prevalent here. The huts should be high and have double roofs with free circulation of air between them; large verandahs around them, and ample cubic space to each man, and free ventilation through the huts. An ample supply of ice is a necessity and by no means a luxury, and for medicinal purposes is absolutely requisite.