cannot be surprised that some of its vessels are left unplugged or imperfectly constricted by its muscular fibres: then, if we look at the frequency with which we can trace pathological processes in the placenta, we need not wonder that the muscular fibre which has been developed *pari passu* with the placenta should itself be imperfect and irregular, and incompetent to maintain that firm and regular contraction which is nature's safeguard against hæmorrhage. How far morbid states of the placenta contribute to bring about the result now under consideration, is a question not very easy to answer. No doubt in many instances where the placenta is diseased it separates more readily from the side than naturally; but is it ever so adherent that it breaks in separating, so that a portion may be left behind where the accoucheur has not intervened? Further, the history of the cases related favours the conclusion that, when the placenta is situated low down anteriorly, it does not so readily separate, and that the accoucheur has less power over it by external pressure; and that, from feeling the insertion of the cord and the bulk of the placenta, he may be deceived as to its entire detachment, and thus be led to use extractive force prematurely.

THE HOT SAND-BATH.

By DR. CONRADE.

SAND, like most minerals, is a bad conductor of heat—the more so from being composed of small incoherent particles. It possesses a high specific heat—that is to say, a large capacity of retaining heat, without allowing it to escape but slowly. Hence in hot climates the sand is apt to form the hot-bed for certain species of amphibious animals, which, not being able to produce sufficient heat within their own bodies for the development of the embryo, simply deposit their eggs in the sand and leave the sun to perform their parental duty. The use of hot sand for baths forms a part of popular medicine in southern countries in which the mineral is abundant. By embedding the whole body or some of its parts in hot sand, we expose them to the action of the heat stored up in that medium. If not exposed to contact with substances of a low temperature, the quantity of sand required for a bath may be expected to retain its heat nearly unchanged for more than an hour. In the hot sand-bath, the layers used for surrounding the body are generally covered by other sand of much higher degrees of temperature (120 to 130 deg. Fahr. or more). These not only steady the heat round the body, but increase it gradually, without inconvenience to the patient. Over all is laid a blanket, which prevents too rapid cooling by the influence of the outer temperature.

The known effects of high temperatures on the body consist chiefly of the relaxation of all tissues and the enlargement of the blood-vessels, which become more filled with blood without any increase in the pressure. The flow of the blood in the neighbouring structures is therefore directed to the heated parts, relieving the former ones of as much of their contents as the increased space in the enlarged vessels will allow. By-and-by the same relief is imparted to more distant regions, until a balance is obtained. At the same time the parts become more succulent, larger quantities of fluid than usual being secreted from the blood; hence perspirations break out more or less copiously, according to the amount of the heat applied, and to the individual disposition. On the other hand, the blood is forced to make up its loss of fluid which it has sustained on its way through the hot parts, and no sooner does it reach the adjacent regions than it deprives them of as much of their watery contents as it is allowed to do. It is obvious that the extent to which the described change in the distribution of the blood takes place, is entirely dependent upon, and proportionate to, the size of the surface upon which the application of heat has been made and the healthy condition of the blood-vessels. If the whole skin be subjected to the heat, the circulation is drawn to the surface and the inner organs get rid of certainly not a small quantity of blood during the bath, provided the elasticity of the interior blood-vessels be normal. This relief, however, can no longer take place when the heat gets easy access to the inner parts as well. The influence of the heat soon becomes universal, and disturbances in the respiration and in the action of the heart will unavoidably follow. The described effects may be properly divided into—A, those exercised on the heated parts; and B, those produced on the neighbouring parts.

A. The heated parts (1) become more filled with blood, and (2) have an increase in the secretion of liquid matter from the blood; consisting chiefly, but probably not entirely, of water.

B. In the adjacent parts (a), those nearer to the heart, the blood-ves-

sels are relieved; (b) in those remote from it, the fluidity of the blood is diminished.

To a certain extent it depends on the method of treatment adopted which of these results will be obtained in the first place. In case of high degrees of heat being resorted to, much perspiration will follow; while lower temperatures, applied for a longer time upon a large surface, are more apt to spread towards the inner parts, and thus the described effect upon the distribution of the blood and its consequences may be presumed to be the most prominent result. In taking sand as a vehicle for the application of heat, no other complications will arise; the respiration remains undisturbed, the heat not entering the lungs; the circulation, too, goes on as usual, the action of the heart not being interfered with. No congestion of any kind will intervene; no palpitations, no headache, etc., follow. The skin, not being excluded from contact with the air, perspires freely, does not become softened, and does not lose its former resistance to the influence of the weather, and is still protected from draught and cold. The patient, whilst undergoing his treatment, may enjoy in the meantime the comforts of rest and sleep.

The advantages of the use of hot sand consist simply in its allowing the application of heat entirely free from any of the complications which more or less accompany all other methods. Water excludes the air hermetically, prevents perspiration, and overcharges the kidneys during the stay in the bath. It cannot be supported as hot as sand can without feelings of uneasiness, and, besides, it has a weakening and softening influence upon the skin. Steam and hot air baths are not very fit for patients at all; they require already a certain strength to resist the influence which they exercise upon everybody at the beginning. They interfere too much with respiration and circulation to allow their continuance for the purpose of cure. Delicate persons and children are entirely unable to make use of them. They increase the general temperature of the body by two degrees and more, thus causing a sort of artificial fever. None of these inconveniences occur in the hot sand-bath, if applied with sufficient care and experience. Doubtless electric currents are developed, as is generally the case whenever a high temperature acts on solid substances; but, as to the part they take in the action, nothing whatever is known as yet: they may have some influence on the nerves or other organs, but it cannot be asserted that any remarkable result is to be ascribed to them.

From the foregoing, it will appear that the diseases in which the application of heat by the aid of sand can be tried with hope of success are of two classes: in the first class, to bring about a large perspiration is the chief object; in the second class, perspiration is better avoided, and the effect of the heat to be directed towards correcting the circulation and restoring the vital processes. Under the first head are comprised rheumatism and gout (in which Trousseau appears to have employed this treatment long since), exudations, and oedemata from previous disorders, which will probably all derive benefit from heat. Under the second head we will enumerate morbus Brightii (the acute stage of course excepted); cases of recent paresis, which may be improved if the lesion be not the result of some disorganisation on the part of the nerve, be it by removing some injurious swelling pressing upon the nerve, or by improving its vegetative condition. That of course the diagnosis must decide, and the case has to be treated according to it. The same remarks apply to recent cases of partial atrophy, of not too long duration. In cases of scanty catamenia, in irregularities in the flow, dysmenorrhœa, and similar complaints, if not due to coexisting anæmia, experience has shown in many instances that cases of that sort improve much better under the hot sand-bath than after any other treatment. Scrofula and rickets derive great benefit from carefully administered hot sand-baths. Torpid ulcers and badly healing wounds improve wonderfully sometimes after a few applications.

Perhaps in some kinds of chronic exanthemata the hot sand-bath might be of good service, although no experiments have been made on this topic as yet. It speaks very much in favour of the hot sand, that, whenever judiciously given, the patient likes it, and has recourse to it in many cases.

Further information on the subject will be found in the following: Dr. Schwabe, *Deutsche Klinik*, 1869, No. 33 (being a report of a medical man, himself a patient). Dr. Flemming, *ibid.*, 1868, Nos. 12, 14; 1870, Nos. 35-38. Dr. Sturm, *Zeitschrift für Medicin*, by Küchenmeister, 1867, p. 293 et seq.; and 1868, p. 241. Trousseau's *Clinique de l'Hôtel-Dieu*, ed. ii, vol. iii, pp. 380, 381. *Archives Générales de Médecine*, 1856, p. 307. Schmidt's *Jahrbücher der Medicin*, vol. 133, p. 62. Dr. Flemming of Dresden enters into a minute comparison of the different methods of utilising heat as a therapeutic agent.

Abereen Place, St. John's Wood.