stances, and in relation to victims of the same constitution ; and by repeating these experiments with various kinds of serpents, and taking the average effect of each∣ kind as a re­sult, we might in a measure ascertain the different charac­ters of these animal poisons, of which we have as yet but a meagre knowledge.

The effect of a serpent’s bite usually manifests itself without delay. A sharp pain is felt in the part pierced by the fangs, although the puncture is extremely minute, and scarcely a drop of blood may flow ; swelling follows, and inflammation soon declares itself. The progressive effects upon other parts of the system are exhibited by a general feebleness ; walking becomes painful, and respiration labori­ous and constrained ; the patient suffers from ardent thirst, followed by nausea, vomiting, glimmering of the sight, and other symptoms, which, combined with acute bodily pains, often deprive the victim of his senses. Livid spots some­times surround the wound, the dread precursors of that fa­tal gangrene which, spreading more extensively, ere long puts a period to existence. “ His strength is poured out like water, and all his bones are out of joint; his heart is like wax, it is melted in the midst of his bowels. His strength is dried up like a potsherd, and his tongue cleaveth to his jaws, and he is brought unto the dust of death.” Then, instead of the bloom of youth, the power of man­hood, or the pride of beauty, we behold but a bloated corpse, the sad repulsive remnant of humanity. It may be remark­ed, however, that the poison of these subtle reptiles seems to deprive us of life under a considerable variety of aspects. A lethargic torpor without pain is said to follow the bite of the asp; and hence, we presume, its preference by that luxu­rious queen for whom Antony “ lost the world.” The fact, though doubted by medical observers, seems in a great mea­sure confirmed by the examples adduced by Captain Gowdie, as recorded by Dr Russel.@@1 Lucan of old has distin­guished the poisonous serpents that infested the march of the Roman army over the deserts of Libya, by the various symptoms which they produced ; but his dreadful cata­logue should perhaps be regarded rather as a piece of poe­tical embellishment than as an historical relation. Yet it seems now believed, that however the symptoms may vary, the nature and action of the poison is the same in all, and is in most cases to be counteracted by the same means. The virulence of the bite even of individuals of the same species probably varies according to the season of the year, just as their manners and external aspect also vary, as so beautifully described by Virgil.

Postquam exhausta palus, terræque ardore dehiscunt ;

Exi lit in siccum, et flammantia lumina torquens Sevit agris, asperque siti, atque exterritus æstui.

Ne mihi tum molles sub dio carpere somnos.

Neu dorso nemoris libeat jacuisse per herbas :

Cùm positis novus exuviis nitidusque juventu,

Volvitur, aut catulos tectis aut ova relinquens.

Arduas ad Solem, et linguis micat ore trisulcis.@@3

The excessive rapidity with which death was frequently produced by the bite of venomous serpents:, induced Dr Mead to conclude that its fatal influence affected the ner­vous rather than the circulating system. But the experi­ments of Fontana go far to demonstrate that the venom of the viper is perfectly innocent when applied to the nerves only; but that it acts immediately upon the blood, and through the medium of that fluid destroys the irritability of the muscular fibre, and so produces death. A different idea has been more recently proposed ; that the poison of serpents acts upon the blood by attracting the oxygen which it contains, and which is believed to be essential to its vital functions. The human heart, and in general the heart of all animals with warm blood, has two ventricles or cavities ; and the blood, before it is returned to the right

ventricle, has to perform two circles, a lesser between the heart and the lungs, and a greater between the heart and the rest of the body. While the blood passes through the hmgs, it undergoes a very remarkable change of colour, and of other properties. A certain portion of atmospheric air is attracted and absorbed, while the remainder carries off by expiration whatever ingredient of the blood is either un­necessary or injurious. The atmosphere we respire is a compound fluid, of which one portion is oxygen or pure air, and another and much larger is noxious or azotic air ; and it is the former ingredient only which is attracted by the blood in its passage through the lungs, and contributes to the maintenance of animal life. From this combination, the heat of animals, and the brilliant colour of the blood, are supposed to be derived.

The preceding observations will enable the reader to comprehend more clearly the theory of the action of poi­sons proposed by Mr Boag. He adduces the following ar­guments in its support: 1. Man and other warm-blooded animals, exposed to an atmosphere deprived of oxygen, quickly expire. The poison of a serpent, when introduced into the blood, also causes death ; but carried into circula­tion by a wound, and in very small quantity, its operation is comparatively slow and gradual. 2. The appearances on dissection are very similar in both cases, the blood be­coming of a darker hue, and coagulating about the heart and larger vessels. The destruction of the fibrous irrita­bility, and tendency to rapid putrefaction, are also remark­able in each. 3. Although Dr Mead mingled the venom of a viper with healthy blood *out* of the body without per­ceiving it produce any change in its appearance, this is pre­sumed to arise from his having mixed a very small portion of poison with a large portion of blood ; but if two or three drops of venom be mixed with forty or fifty drops of blood, it im­mediately loses its vermilion colour, becomes black, and in­capable of coagulation. 4. It is, moreover, a remarkable cir­cumstance, that the poison of serpents has most power over those animals in which the blood is the warmest and the action of the heart the most lively, while it is but a tardy and altogether uncertain instrument of death to the majo­rity of cold-blooded creatures. Of this the reason is, as Mr Boag supposes, that cold-blooded animals do not re­quire a large quantity of oxygen to preserve their lives; a fact otherwise sufficiently obvious from the conformation of their heart and respiratory organs. Fontana’s experi­ments with a view to the prevention of the fatal effects of poison, may be here stated in a few words. He applied lunar caustic, which is a preparation of silver in nitric acid, and found on so doing, that not only was the venom there­by rendered innocuous, but the corroding power of the caustic greatly diminished. He next wounded a variety of animals by means of envenomed teeth, and scarifying the wounds, he washed them in a solution of lunar caustic and water, and by this means saved the lives of the greater number, although they belonged to species which he knew to be easily killed, while the death of others was greatly re­tarded. These experiments, it may be added, neither pro­ceeded upon nor led to any theory.

Now the application of the following admitted facts is presumed by Mr Boag to explain the efficacy of Fontana’s treatment, and to illustrate the accuracy of his own views. I. Oxygen enters into the composition of all acids, and is the principle, as its name imports, on which their acidity depends. 2. Metals are united with oxygen under various circumstances, but chiefly in two ways ; the first is by burn­ing them in an open fire, or, to speak more philosophically, by the contact of heat and air, when they are converted into metallic oxides ; the second is by the decomposition of acids, when they form compound salts. 3. Oxygen is at-

@@@• In his work on the *Serpents of the Coast of Coromandel.*

*@@@’ Geor.* lib. iii. 1. 432.