

the following tentative conclusions:

(1) It is not the rise of temperature which is harmful, but the toxins which accompany the fever. (2) The elevated temperature is not due to increased oxidation, as shown by normal or lowered output of carbon dioxide. (3) The febrile phenomena are due to a general disorganization and perversion of normal metabolism by toxins, with conversion of energy ordinarily expended in secretion, growth, motion, etc., into heat. (4) There is less metabolism in fever than in health, but it is mostly destructive. (5) If the dose of toxin is sufficiently large or virulent, the lessening of metabolism may even lower the temperature. (6) The temperature in fever is often sub-normal. (7) The standard of fever should be an increase in the daily range of temperature in excess of 1.5° F. (8). The rise of temperature may be protective, many pathogenic organisms being unfavorably influenced by fever temperatures. (9) Normal body heat may be a friction remainder, a waste product turned to use, rather than a vital necessity. (10) The intoxication and not the temperature calls for treatment.

The Use of Adrenalin.

"The Action of and Indications for the Use of Suprarena¹ Extract," is the title of a paper appearing in the *Journal of the American Medical Association*, in which J. L. Miller discusses the physiologic action and therapeutic use of the active principle of the suprarenal gland, using the name "adrenalin" as a general term, as all the trade preparations have the same effect. Its action in general simulates that of electrical excitation of the sympathetic, and it is at present generally conceded that this action is a peripheral one, affect-

ing the neuromuscular function. The most important action is on the cardiovascular system; a 3 minim injection of 1-1,000 solution into a vein causes a brief rise of blood pressure of from 40 to 80 mm. of mercury. This increase is due partly to vaso-constrictor effect, partly to the direct accelerative action on the heart. In the various vessels the constriction is proportional to their sympathetic innervation. The coronary vessels are said not to be affected, according to Shafer, and the therapeutically important question as to the effect on the lesser circulation of the lungs is yet somewhat in dispute. Very large doses given by the mouth have no demonstrable effect on the cardiovascular system, and local application to the mucous membrane has usually no constitutional effects. Miller has observed, both experimentally and clinically, a marked rise of blood pressure after subcutaneous injection, though the general opinion has been to the contrary. Intramuscular injection is always followed by a rise, less prompt, but more lasting than that after intravenous injection, and it is only with these two methods that the phenomenon is constant. In cardiovascular conditions its greatest therapeutic field is in cases in which there is marked vasodilatation with good heart muscle. The latter is important. Such conditions occur in chloral poisoning, shock and heart failure in chloroform and ether anæsthesia. In chloral poisoning and in shock he advises continuous transfusion of 1-50,000 or 1-100,000 normal salt solution as preferable. In chloroform or ether heart failure a single injection of 10 minims of the 1-1,000 solution of adrenalin should suffice. In heart failure of acute infection the problem is different. Vaso-motor paresis probably plays an important