somewhat satisfactory in relieving the painful symptoms of peripheral vascular disease.

The final criteria for the use of fever therapy may be changed because of the introduction of certain drugs which appear prominent in the experimental treatment of some diseases for which fever therapy has been efficacious. Preliminary results would seem to indicate that the combination of fever therapy with chemotherapy (sulfonamide) may be the procedure of choice in the treatment of certain chemotherapy-resistant infections[29].

COLD THERAPY

In contrast to fever therapy the use of cold as a means of treatment is being investigated. From the available literature[30] the chief virtues of cold therapy (cryotherapy) in cancer are the reduction of pain due to extensive growths and the possibility that the process may be arrested. For a localized lesion, ice water between 36 to 48 F is circulated through tubing at the site of the disease for periods ranging from 4 to 48 hr. A later development was the principle of hibernation during which time the patient is kept in an air conditioned space with an environmental temperature between 50 to 60 F for five days. The body temperature is reduced below the critical level of 95 F. Most of the vital processes of life are at very low ebb and this period simulates the hibernation of wild animals. Although the relief of pain is reported, this form of treatment is still in the experimental stage.

It has been demonstrated that the cooling of limbs and other parts with ice-water or ice, cracked or pulverized, down to near the freezing point (5 C or 40 F) is harmless. Freezing must be avoided. There is a temporary retardation or suspension of life, with resumption of cellular activity as the temperature returns to normal. A human limb can remain bloodless and anesthetic below a tourniquet for at least 8 hr and perhaps up to 48 hr without injury, while the rest of the body remains warm. Where amputation is indicated it can thus be done without pain, loss of blood or strength and also without shock. There is no apparent interference with the subsequent healing of the stump. Refrigeration anesthesia is of importance not only in amputation but also in the control of hemorrhage, pain, infection and shock during the transportation of patients with traumatized limbs. A portable electric refrigerative apparatus is in use at the New York City Hospital[31]. There is a growing feeling that cooling the body is of great importance in the treatment of shock. Extensive research is in progress to determine what degree of heat or cold is most efficacious in obviating or treating secondary shock[32].

HIGH TEMPERATURE HAZARDS

Diseases due to heat are now classified as heat exhaustion, heat cramps, and heat strokes[33]. Heat exhaustion is due to circulatory failure; heat cramps to excessive loss of body chlorides and heat stroke to an inadequacy of the heat dissipating mechanism which results in heat retention. If the hyperthermia becomes excessive, the liver and the central nervous

[29]Temperature Factors in Cancer and Embryonal Cell Growth, by L. W. Smith and Temple Fay (*Journal of the American Medical Association*, 113:653, 1939).

[30]Combined Artificial Fever-Chemotherapy, by H. W. Kendell, D. L. Rose and W. M. Simpson (*Journal of the American Medical Association*, 116:357, 1941).

[31]Experiments on Pelvic and Abdominal Refrigeration with Special Reference to Traumatic and Military Surgery, by F. M. Allen (*American Journal of Surgery*, 55:451, 1942).

[32]Cooling in Shock—Editorial (*Journal of the American Medical Association*, 121:432, 1943).

[33]Heat Disease: Clinical and Laboratory Studies, by M. W. Heilman and E. S. Montgomery (*Journal of Industrial Disease and Toxicology*, 18:651, 1936).

system may be seriously injured and this damage may prove fatal. The hazards of high temperature are not understood. It is difficult to say whether short exposures at high temperatures are more harmful than longer exposures at lower temperatures. A new concept is evident from the observation of an increase in leucocytes (white cells) of the blood in workers subjected to high temperatures. These leucocytes are defensive factors which are increased when infection invades the body. A rise in temperature and leucocyte count indicates a mobilization of the body defenses. Since a recent study[34] showed that both temperature and cell count were increased, the question arises as to whether long exposures to very high temperatures might not cause exhaustion of these defense mechanisms.

ALLERGIC DISORDERS

Although there is some division of opinion over the ultimate cause of allergy, the prevailing belief is that it is due to an inherited or acquired hypersensitiveness to pollen or other foreign proteins in certain individuals who react abnormally to the offending substance. The reaction may be induced by inhalation, eating, or absorption (through the skin) of the allergens. Some of the clinical manifestations are hay fever, asthma, eczema, and contact dermatitis.

Symptoms of Hay Fever and Asthma

The respiratory tract is the usual site of allergic manifestations, *e.g.* hay fever and asthma. In hay fever, the nose and eyes are red and itchy, and there is considerable discharge. Nasal obstruction is the most common and distressing symptom. The severity of the symptoms varies widely from day to day depending chiefly on the amount of pollen in the air.

Seasonal asthma comes in attacks. The most popular theory concerning the mechanism of action is that the offending substance irritates the nerve endings in mucous membranes of the respiratory tract, causing spasmodic contraction of the small bronchioles of the lungs, which interferes with breathing, particularly with expiration. Non-seasonal allergic disturbances are sometimes attributed to house or street dusts, fungi, odors, animal dander, irritating gases, and heat or cold, particularly sudden temperature changes. It is often stated in the literature that heat regulation in asthmatic individuals is likely unstable, with a tendency toward the subnormal. Many allergic cases who are apparently well, develop their attacks when cold weather appears, or upon changing from warm to cool outdoor air.

Air Conditioning Apparatus

In recent years considerable effort has been directed toward the elimination of the principal cause of allergy from the air of enclosures by filtration or other air conditioning processes capable of removing pollens, in the hope of providing relief to individuals who fail to respond to medical treatment (desensitization or immunization).

Paper or cloth filters, mounted in inexpensive window or floor units, prove quite satisfactory, but since dust and smoke frequently cause asthmatic attacks, it is necessary that an air filter, to be of full value in the treatment of asthma, must remove all dusts and pollens regardless of size or amount. An electrostatic cleaner has proved extremely efficient

[34]A.S.H.V.E. Research Report No. 1106—Air Conditioning in Industry, by W. L. Fleisher, A. E. Stacey, Jr., F. C. Houghten and M. B. Ferderber (A.S.H.V.E. Transactions, Vol. 45, 1939, p. 59).