

devised to strengthen the body ravaged by cancer or to counteract the devastation caused by radiation or surgery. Therapeutics most often attached to one or another biochemical theory fashioned to make the whole seem plausible: cancer was said to be a "deficiency disease" or a "disease of excess"; cancers were alternately a product of local irritation, allergies, "chronic auto-intoxication," "asphyxial acidosis," or "local oxygen deficiency." Cancer was said to be a consequence of too little or too much of just about anything you might think of.¹³⁴

Some of the more popular theories contradicted one another. Alfred Neumann recommended coffee while barring milk; Erwin Liek barred coffee and recommended milk. Ferdinand Blumenthal found that a restricted diet promoted tumor growth, while Wilhelm Caspari found the opposite to be true. Liek and others stressed raw vegetables, but Caspari "banned" spinach and tomatoes, cautioning against raw food as "purposeless and dangerous."¹³⁵ Fischer-Wasels limited carbohydrates, but Hans Auler allowed an abundance of bread, macaroni, corn, malt, and sugar, not to mention large quantities of raw meat and fat—especially butterfat.¹³⁶ Experimentation seemed to cloud the issue as often as it clarified, the problem being that laboratory results could vary precipitously according to the kinds of animals used or the conditions under which an agent was administered (for how long, in what combinations, etc.). Experiments also sometimes killed the patients, as one series of cold-water immersion studies found.* The "will to believe" must often have been strong, though the inherent difficulty of designing experiments to resolve such questions should not be underestimated.

* The *Monatsschrift für Krebsforschung* in 1942 reported on "whole body cooling" experiments by H. Eltrom of Copenhagen; Eltrom had placed eleven patients with late-stage cancers (*Malignomen*), all of whom had had undergone extensive radiotherapy, in very cold water for several hours. Six of the eleven died from cardiac arrest in the course of the experiment or shortly thereafter. One had been placed in water of 26.4° C for twenty-six hours, while also under the influence of narcotics. Germans reviewing the research concluded that while the treatment did help to reduce pain, "one could achieve better results with less dangerous methods"; see O. Kaum, "Referate," *Monatsschrift für Krebsforschung* 10 (1942): 223.

Vitamin therapies were among the more controversial. Vitamins had been discovered prior to the First World War, largely in consequence of exploring nutritional deficiency diseases like scurvy and pellagra in the British military. Germans were slow to accept the value of vitamins (Max Rubner's influential *Kalorienlehre*, popular around the time of the First World War, stressed only the human body's need to maintain a certain level of calories and ignored the value of fresh fruits and vegetables),¹³⁷ but by the 1930s the role of vitamins was widely appreciated. Vitamins were known to be unsaturated fats produced in the liver; fat- and water-soluble forms had been distinguished (A versus B, for example); and the primary vitamins A, B, C, D, and E were known to exist in different chemical subtypes (B₁–B₄, etc.). Vitamin C was known to protect against scurvy, vitamin D (from sunlight) against rickets,¹³⁸ and B₁ against beriberi. Sterility had been shown to be caused by a shortage of vitamin E (in 1927), and pellagra by a shortage of vitamin B₂ (in 1925). Fruit and vegetables were known to be good sources of vitamins,¹³⁹ but it was also becoming clear that vitamins were destroyed in the course of food processing and storage.¹⁴⁰ It was even known how much of a given vitamin was needed to reverse a specific ailment (only 0.01 mg of vitamin D per day to cure rickets, for instance).¹⁴¹ Excitement over vitamins came to border on hype, as the first issue of the new Swiss journal *Zeitschrift für Vitaminforschung* (1932–) forecast a "future of medicine" lying "largely in dietetics."¹⁴²

Cancer was an obvious candidate for vitamin cures: a host of other puzzling diseases had succumbed to dietary therapeutics—why not *Krebs*? Public health and medical journals of the 1930s are full of vitamin cancer therapies.¹⁴³ Hopes for a quick diet cure were dealt a blow, however, when it turned out that vitamin-rich foods seemed to promote tumor growth as often as they inhibited it. Wilhelm Caspari of Frankfurt's Institute for Experimental Therapy in 1933 reported that vitamin B and, to a lesser extent, vitamin A actually promoted tumor growth; the situation with vitamin C was not yet clear, while D seemed to have no effect one way or the other.¹⁴⁴ Caspari warned against giving cancer patients too much vitamin B or potassium; patients were cautioned against eating