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HEALING NEWSLETTER

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Let's Set the Record Straight

(Part 4)

A Survey of the U.S. Peer Reviewed Medical Literature Regarding the Developmental Gerson Diet Therapy

by Gar Hildenbrand

In the years following WWII, German-American physician Max Gerson proposed an empirically developed set of general dietary and medical measures to be used in the management of cancer patients. Similar measures had been approved by the majority of authors as a curative treatment for cutaneous tuberculosis. Additional applications are found in the literature for pulmonary-, gastrointestinal-, and bone tuberculosis. A variation of the combined regime was used effectively by Gerson in heart and kidney insufficiency. Many clinicians reported rapid healing of a variety of dissimilar skin conditions including eczema, lichen planus, lupus erythematosus, psoriasis, and pruritus. Also noted were benefits in bronchitis and bronchiectasia. With several significant modifications Gerson applied his therapeutic nutritional regimen to cancer, publishing results in U.S. and German peer reviewed journals. After a 1946 patient demonstration before a Committee of the U.S. Senate which received much media attention, Gerson was attacked editorially in the pages of the Journal of the American Medical Association. Reasons for the attack are unclear. Morris Fishbein, longterm editor of the JAMA, intentionally lied.

With this special issue of the *Healing Newsletter* we furnish our readers with the entire text of "Basic (Vitamin) Feeding in Tuberculosis" by *Mayer* and *Kugelmass* as it originally appeared in the *Journal of the American Medical Association (JAMA)*. Our reasons for doing this are many.

In the first place, seeing is believing. As you read, you will discover that healing was shown in lung X-rays of 40% of a group of far advanced pulmonary tuberculosis patients who had failed to improve under the best of the accepted therapies for at least two to three years.

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GERSON INSTITUTE
PO Box 430
Bonita, CA 91908-0430
(619) 585-7600
Charlotte Gerson, Pres.

These regressions were achieved after only six months of *Herrmannsdorfer's* modification of Gerson's diet therapy. It cannot be overemphasized that while there is an overall structural similarity between *Gerson's* original diet therapy and the variation evolved by Herrmannsdorfer (both employ salt restriction, calorie restriction, and the use of fresh, raw fruits and vegetables), there are several marked differences, some of which are well highlighted by *Eller* and *Rein* in the *New York State Journal of Medicine* 32(22): 1296-1300, November 15, 1932, "The Value of an Equilibrated Salt Diet in the Treatment of Various Dermatoses".

The greatest dietary differences lie in Gerson's assertive restriction of protein and fat. Patients in Mayer's trial were allowed cream, eggs, and 500 to 600 grams of meat weekly, amounts set by *Bommer* and Herrmannsdorfer who used the diet primarily in the treatment of skin tuberculosis. Gerson was adamant that much more severe protein-fat restriction was necessary over a considerable period of time in order to achieve total healing in far advanced lung tuberculosis. The amounts of raw food constituents differed substantially as well.

Mayer's patients received 100 grams of raw vegetables and ¾ of a pound of raw fruits per day. Gerson's diet therapy involved frequent manipulation of metabolism through alternating raw food days and apple- potato days, and his patients received quarts of raw fruit and vegetable juices in addition to much raw food with meals. Also, it is not clear that Mayer's patients were detoxified with Gerson's caffeine/chamomile enemas. It is surprising that Mayer, who went to the trouble of recruiting dietician *Frau Jungklaus* from Gerson's Bielefeld Clinic in Germany, would have elected to use a weaker (perhaps safer) variation of the originator's therapy. However, this seems to have been the pattern with all of the U.S. clinical trials. In spite of this, the results were surprising, positive, and encouraging and caused each of the U.S. investigators to recommend further study.

Mayer's lung tuberculosis trial is significant also in that it was reviewed and published by *JAMA* editor *Morris Fishbein* who later lied about Gerson's tuberculosis therapy in damning editorials that appear to have been politically motivated efforts to crush Gerson's work in cancer. Critics may resent the suggestion that appearances point to an attempt by radiology, surgery, and pharmacology to prevent the inclusion of internal medicine (or anything new for that matter) in cancer management. But that's what it looks like.

We also provide this article to counter false claims being made today by the *American Cancer Society (ACS)* against Gerson's work in cancer. ACS maintains Gerson's name on its list of unproven treatments, yet ACS is unaware of the peer reviewed literature of Gerson and those who have verified his work. In its printed anti-Gerson statements, ACS attempts to create the impression that its hostile attitude is the result of medical fact. However, it lists no clinical trials in its references. Instead it lists unpublished correspondence, books from private publishers, and only two articles from the peer reviewed literature, the editorials of Morris Fishbein.

In 1946, as editor of the *JAMA* Dr. Morris Fishbein was one of the most powerful men in U.S. medicine. Ironically, he was not a practicing physician, never had been, and never would be.

In that same year, Dr. Max Gerson was definitely on the rise in cancer medicine. A 1936 immigrant from Germany, the well published physician was generally recognized as having introduced a sodium restricted dietary therapy curative of tuberculosis and for having methodically studied the course of the disease under the influence of the salt poor, vitamin rich diet which he had developed. In a late 1945 issue of the *Review of Gastroenterology*, Gerson published a report with case histories which strongly indicated that the general condition of cancer patients might be improved with a similar regimen. Indeed, word of Gerson's successes, which was carried primarily by grateful patients and families, had led to a June 1946 patient demonstration before a *Subcommittee of the U.S. Senate* which received nationwide network news coverage.

In November of 1946, Fishbein published in the *JAMA* an emotionally excessive, angry diatribe in the form of an editorial in a transparent attempt to destroy Gerson's reputation. The first principle of Fishbein's harangue was fallacious: he argued that "The good results in many types of tuberculosis reported by Gerson were apparently not susceptible of duplication by most other observers". This is simply not the case.

I have searched and read the world's medical literature regarding Gerson's management. During its development, Gerson's therapy was the subject of many enthusiastic reports from Germany, Norway, Italy, Spain, Russia, Czechoslovakia, the United States — and some angry controversy from Germany. Most writers who were negative to Gerson were associated with each other and referenced each other in their articles in an attempt to create the impression that they were greater in number. They argued that while the Gerson diet definitely cured lupus vulgaris (the great *Sauerbruch* had proved this) it simply could not cure lung tuberculosis.

A few of Gerson's more bitter opponents swore that even the results reported by Sauerbruch could not be duplicated. These pseudo-experts might be compared to today's *Victor Herbert* and *Jim Lowell* of the *American Council Against Health Fraud*, self appointed crusaders for the status quo in medicine who are unashamed to lie and make incredible statements in public and in the media. These authors had never been involved in the treatment of patients with Gerson's therapy, and their reports consisted largely of the restatement of each other's random conjecture and second hand observations.

On the other hand, many solid clinical reports from reputable researchers and institutions indicated that even far advanced pulmonary tuberculosis patients could benefit from Gerson's treatment. In the U.S. literature alone, positive results of clinical trials involving far advanced pulmonary tuberculosis patients were reported in 1929 by *Banyai* of Wisconsin (*American Review of Tuberculosis*), *Mayer of New York* (*Journal of the American Medical Association*), and

Emerson of Nebraska (*Nebraska State Medical Journal*). None of these researchers used the Gerson diet therapy for lung tuberculosis as outlined in Gerson's 1934 monograph "Diattherapie der Lungentuberkulose", but relied instead on the much less complicated and much less effective variation created by Herrmannsdorfer.

Diet has gained prominence of late as ***the*** best means of disease prevention. No one in medicine is able to say why. Perhaps the comments of Dr. Emerson of Nebraska, made in 1929, can help us to understand today why diet can protect those of us at risk for not only cancer and heart disease but also infectious diseases: "The theory of this dietetic management has nothing to do with increased nourishment per se. but is based entirely on an altered metabolism which in some manner undetermined increases the resistence of the patient..."

Reading the following article, and bearing in mind that the dietary in use is probably only slightly as effective as the complicated management of Gerson, one cannot help but feel confident about the powerful influence of nutrition to maintain and restore health.

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BASIC (VITAMIN) FEEDING IN TUBERCULOSIS

PRELIMINARY REPORT

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EDGAR MAYER, M.D.
NORTHWOODS SANATORIUM, SARANAC LAKE, N.Y.
AND
I. NEWTON KUGELMASS, M.D., PH.D.
FIFTH AVENUE HOSPITAL, NEW YORK

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Advanced tuberculosis is again being approached from the standpoint of nutritional therapy. Recent studies from Sauerbruch's surgical clinic in Munich urge the curative value of a base-forming dietary low in sodium chloride, protein and carbohydrate, and rich in fats and vitamins. This regimen, devised empirically by Gerson, is particularly worthy of critical consideration, coming as it does from a clinic which made distinctive contribution to thoracic surgery in tuberculosis. Sauerbruch, Baer and Herrmannsdorfer[1] maintain that inoperable bilateral cases of pulmonary tuberculosis may now be treated with thoracoplasty if the patients are first prepared by this dietary, thereby frequently clearing up the less diseased lung.

One of us (E.M.) has been privileged under the auspices of Mr. August Heckscher to visit Sauerbruch and Gerson's[2] clinic and to observe the dietary methods applied to their tuberculous patients in pavilion Y at the Munich clinic and at Bielefeld, Germany. Definite healing was observed in advanced cases of lupus vulgaris[3] of the face and mucous membranes that had previously been resistant to all other accepted forms of treatment. These results seemed far more striking to us than those claimed for the other forms of tuberculosis, which included tuberculosis of the bones and joints, lymph nodes, lungs, peritoneum and genitourinary tract, both with and without sinuses.

This visit and observation of cases stimulated sufficient interest on our part to lead us to subject a group of patients at Saranac Lake (NY) to the diet under the supervision of Frau Jungklaus of Bielefeld, who as dietitian had been previously administering it in the German clinics. Thirty patients with *far advanced* pulmonary tuberculosis were selected who had previously undergone *all* of the accepted therapy for *two or three years* but had *failed to respond*. Each patient was given a complete study, including physical examination, roentgenograms of the lungs and intestine, and blood and urine studies before and after the six month period of investigation. The patients were carefully supervised to prevent their partaking of any other food.

THE DIETARY

The nutritional requirements in advanced tuberculosis depend on the metabolic changes involved. The metabolic rate increases more in proportion to the toxemia than to the fever. The caloric requirement should cover that metabolism as well as the atrophy already induced by the disease. But excessive caloric intake burdens the pulmonary mechanism with additional oxygen-carbon dioxide exchange, thereby preventing func-

tional rest. Accordingly the optimum caloric intake should be about 50 calories per kilogram.

The protein requirement is normally 0.75 Gm. per kilogram of body weight and in the wasting stages of tuberculosis should theoretically be increased. But such an increase would accelerate metabolism 37 per cent and hence prevent the desired pulmonary rest. McCann and Barr found that on a 3,500 calorie diet a daily intake of 100 Gm. of protein will maintain a tuberculous patient in positive nitrogen equilibrium. Many of the calories in this dietary are furnished by vitamin-bearing fats.

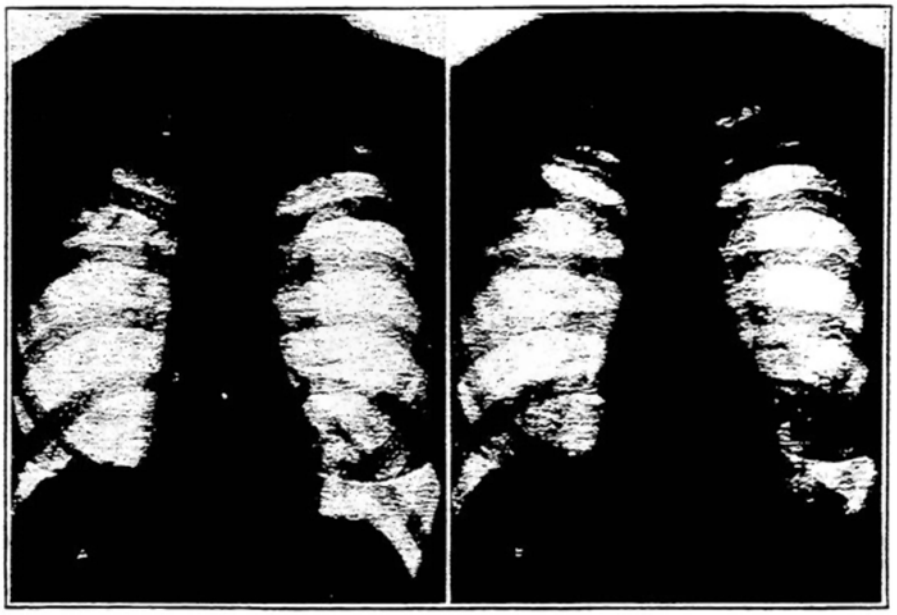

Fig. 1.—Appearance of lungs in case 10: *A*, before diet; *B*, after diet.

Obviously, fulfilling the caloric requirement is only a part of the nutritional function. The wasting in tuberculosis involves a parallel demineralization, for with the loss of tissue there is a corresponding loss of its inorganic constituents, calcium, magnesium, potassium, phosphorus and sulphur. These are supplanted by the dietary rich in base-forming salts. And since tuberculous processes involve excessive tissue hydration, sodium chloride is excluded. The German clinicians advancing this dietary have been confused about its acid-forming or base-forming value.[4] An analysis of the diet reveals definitely its base-forming nature. Attempts to increase the mineral intake have favored the addition of a mixture of inorganic compounds, 70 per cent of which contain calcium phosphate and lactate, with the formula presented in table 1. More critical analysis of this mixture reveals the fact that a number of the constituents are absorbed to such a slight extent in the alimentary tract that their effect on the acid-base equilibrium must be very slight. For example, the first constituent, potassium aluminum sulphate, is absorbed only in minute quantities, as is also the bismuth subnitrate and the strontium lactate. Therefore the evaluation of the acid-base effect as determined solely by chemical analysis cannot be carried over as such and applied to the body metabolism.

In this study both the diet and the mineral mixture have been used in the same manner as suggested by the original exponents of the regimen in Germany, but full cognizance is taken of the factors discussed as to their limited absorption.

Attention is also called to the fact that this has been considered a low protein diet. As the average American diet is considered to contain 100 Gm. of protein, an intake of 92 could not well be regarded as particularly low.

One of the outstanding features of the dietary as presented in table 2, however, is its rich source of vitamins A to G. We now know that all nutritional requirements once met depend on the vitamin intake for their absorption and utilization in the body. Much of the dietary consists of raw food, and that which is cooked is abundant in vitamins. The vitamin provision in the food offered constitutes a specific advance in this form of dietary treatment of tuberculosis.

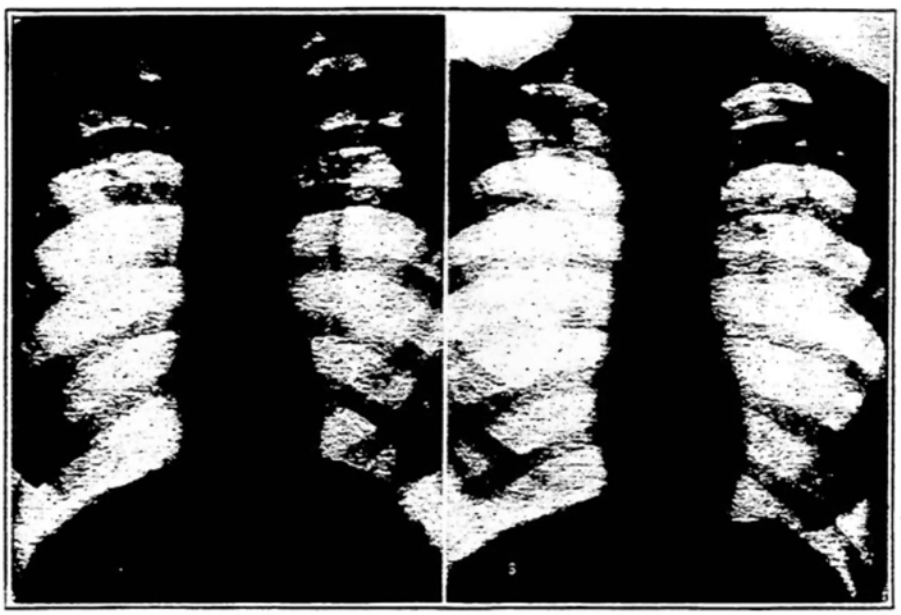

Fig. 2.—Appearance of lungs in case 16: *A*, before the administration of the diet; *B*, after the diet.

The application of these dietary features to tuberculosis has been appreciated in accordance with recent advances in experimental nutrition, concerning especially

vitamins and their function. The past ten years revealed the effectiveness of ultraviolet energy in the healing of intestinal tuberculosis, the mechanism of which is related to vitamin D, the body product of ultraviolet irradiation.[5] Furthermore, the accelerating effect of this vitamin on the calcium absorption in the intestinal tract and its subsequent assimilation have clarified the understanding of the healing mechanism. McConkey[6] and Smith[7] observed the healing of intestinal tuberculous ulcers following the simple administration of cod liver oil and tomato juice-rich sources of vitamins A, B, C and D. In fact, Smith produced such ulcers in infected animals on diets deprived of these vitamins.

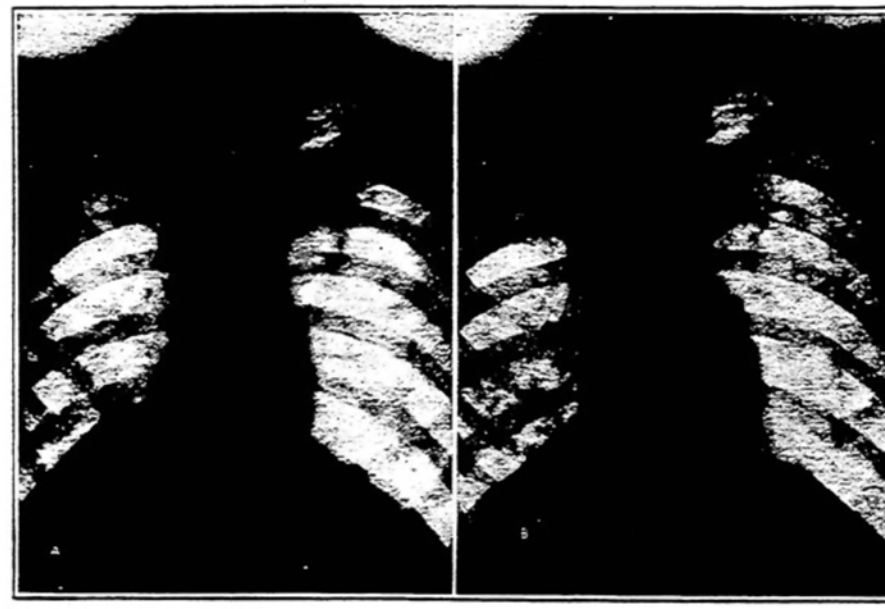

Fig. 3.—Involvement of lungs in case 17: *A*, before the diet was given; *B*, after the diet.

CLINICAL RESULTS

Two thirds of the patients were maintained on this dietary for six months, the others having been excluded for various reason. A summary of twenty cases is presented in table 3.[8] Two of the pulmonary cases showed complications of intestinal and laryngeal tuberculosis. In two a phrenicotomy or pneumothorax was done, which interfered with an accurate evaluation of the dietary factor alone.

The group studied showed a substantial gain in weight which it had been impossible to attain by previous procedures. Many of the alimentary disturbances, which had presisted on other diets, cleared up rapidly with this regimen. The diet was well tolerated except in two instances. It was effective in diminishing fatigue and induced a sense of well being. The slight elevations of temperature disappeared in a few cases.

Physical and roentgen examinations of the chest showed in about one third of the cases definite clearing with an occasional contraction of a cavity. The other patients did not show any marked changes. The quantity of sputum diminished considerably in about half the cases, but in none did it become negative for tubercle bacilli. A few of the patients showed marked diminution of cough. Hemorrhages occurred in some during the experiment as well as before. Chest pains disappeared in a few who constantly complained of this symptom before. Two cases of intestinal tuberculosis which had resisted other therapeutic procedures cleared up clinically and the roentgen filling defects of the colon disappeared; one remained unchanged.

TABLE 1.—*Analysis of Mixture of Inorganic Compounds (According to Herrmannsdorfer)*

Chemical Compound	Formula	Milliequivalent		Excess	
		Base	Acid	Base	Acid
Potassium aluminum sulphate	$AlK(SO_4)_2$	11.61	11.61	.....	.....
Calcium phosphate	$CaHPO_4$	302.07	453.10	.....	151.03
Sodium silicate	Na_2SiO_3	14.09	14.09	.....	.....
Magnesium sulphate	$MgSO_4$	24.34	24.34	.....	.....
Sodium sulphate	Na_2SO_4	31.03	31.03	.....	.....
Bismuth subnitrate	$4BiONO_3BiO(OH)$	4.788	18.08	22.868	(Nitrate calculated as base)
Calcium lactate	$Ca(CH_3CHOH\ COO)_2$	324.44	.....	324.44	(Lactic acid not computed
Strontium lactate	$Sr\ (CH_3CHOH\ COO)_2$	7.35	.....	7.35	
Albumin	$C_{72}H_{112}N_8SO_{22}$				
Sodium acid sulphate	$NaHSO_4$	12.49	24.98	.....	12.49
Sodium bromide	$NaBr$	77.73	77.73	.....	.....
		828.018	636.88	354.658	163.52
		+191.138		+191.138	

RESULTS OF CHEMICAL STUDY

Comparative studies of acid and base forming diets were made in two groups of twenty-three and twenty-five young albino rats weighing between 30 and 35 Gm. Litters of the same stock and age were maintained on natural foods -acid and base predominating in composition, in sunlight and in darkness during all the seasons. These experiments, conducted with the assistance of Miss Emma L. Samuel, have been in progress in the department of pediatric research of the Fifth Avenue Hospital for more than two years.[9]

1. Blood Analyses.-The dietaries had a marked effect on the animals, as indicated in table 4. The acid-forming diet depressed the serum phosphorus, alkali reserve, total base and pH, with a compensatory

rise in the chloride, sugar and cholesterol. The base-forming diet produced the converse changes with some depression in the serum calcium. The albumin-globulin ratios, fat percentage and iodine numbers of the fat were all normal. The hematologic data were also normal in both groups of animals.

2. Histologic Examination of Bones - The animals fed on acid-forming diets developed rickets manifested by thoracic deformities, costochondral junction enlargements and long bones, which were small, soft and brittle. Histologically, the bones showed considerable osteoid tissue with little lime deposition, wide and irregular metaphyses and swollen cartilage cells. The rats fed on base-forming diets showed no thoracic deformities but the epiphyses were somewhat enlarged and the extremities were large and firm. Histologically, the bones showed some semblance to rickets: a moderate amount of osteoid tissue with some lime deposition in the metaphyses and cartilage. These observations are in accord with preliminary work of Shelling in Park's laboratory.

3. Analysis of Bones - The animals on the base-forming diet showed the greater percentage of ash and heavier bones, while those on the acid- forming diet showed the smaller percentage of ash and lighter bones; the animals that had been exposed to light showed a higher ash content than those in darkness.

4. Metabolism - the rats on base-forming diets showed a more marked average gain in weight than those on the acid-forming diets (fig. 5). The weight contrast was striking for the summer, less so for the spring and none for the winter (fig. 6). Other metabolic properties which characterized each group of animals are summarized in table 5. The bones of the animals on the basic diet were large, well formed, round and thick, while those on the acid diet were small, thin and brittle.

Similar studies were made on the blood of patients in the Northwood Sanatorium, maintained on the dietary. The base-forming diet produced a shift in the acid-base equilibrium toward the basic side of high norm, comparable to that

TABLE 2.—*Sample Diet for Tuberculous Patient for One Day* *

3,500 calories: 70 Kg.; 1 Gm. per kilogram of body weight: basic, 40 cc. Milliequivalents: protein, 11%, 92 Gm.; carbohydrate, 44%, 378 Gm.; fat, 45 %, 174 Gm.; calcium, 1.87 Gm.; sodium, 1.51 Gm.; phosphorus, 2.20 Gm.; chloride, 2.49 Gm.; iron, 0.041 Gm.

Food	Measure	Weight, Ounces	Protein	Carbohydrate	Fat	Calories	Calcium	Sodium	Phosphorus	Chloride	Iron	Acid	Base
7 a. m.													
Oatmeal	4 T	1⅔	S	33	4	205	0.03	0.03	0.20	0.03	0.002	5	..
Sugar	1 T	½	..	15	..	62	....	....	....	....	.....	..	..
Cream	2 T	1	1	1	12	115	0.03	0.01	0.02	0.02	0.0006	..	..
8 a. m.													
Br. tomatoes	1	3½	1	4	..	24	0.01	0.01	0.03	0.03	0.0004	..	6
Bread (stale)	1 sl	1	3	16	..	78	(0.002)	(0.12)	(0.05)	(0.18)	(0.0005)	2	..
Butter (sweet)	2 pats	⅔	..	..	17	159	0.003	....	0.003	....	0.00004	..	..
Cheese (cream)	1" cube	½	4	..	5	65	0.14	0.09	0.10	0.13	0.0002	1	..
Honey	1 T	½	..	21	..	101	0.001	0.0002	0.003	0.004	0.0001	..	..
Milk	1 c	S	S	12	10	170	0.30	0.12	0.20	0.25	0.006	..	6
			25	105	48	992							
11 a. m.													
Lemon juice	½ c	4	..	10	..	40	0.03	0.01	0.01	0.0004	.....	..	5
Sugar	2 T	1	..	25	..	103	....	....	....	....	.....	..	..
Egg yolk	1	⅔	3	..	7	73	0.03	0.02	0.10	0.02	0.003	5	..
Butter	1 pat	⅓	..	..	9	77	0.003	....	0.003	....	0.00004	..	..
Crackers	2	½	2	11	1	64	0.003	(0.08)	0.02	(0.14)	0.0002	1	..
			5	46	17	350							
1 p. m.													
Vegetable soup	1 C	8	1	3	..	15	....	....	....	....	.....	..	..
Potato	1	5	4	31	..	146	0.02	0.03	0.09	0.06	0.002	..	11
Peas	Serv	3½	2	9	..	47	0.03	0.01	0.13	0.02	0.002	..	1
Carrots	Serv	3½	2	9	..	47	0.06	0.10	0.05	0.04	0.0006	..	11
Lettuce	Serv	1½	1	2	..	13	0.02	0.01	0.02	0.04	0.0003	..	4
Mayonnaise	1 T	½	..	..	11	100	....	....	....	....	.....	..	..
Bread	1 sl	1	3	16	..	78	(0.002)	(0.12)	(0.05)	(0.18)	(0.0005)	2	..
Butter	2 pats	⅔	..	..	17	159	0.003	....	0.003	....	0.00004	..	..
Milk	1 C	S	S	12	10	170	0.30	0.12	0.20	0.25	0.006	..	6
			21	82	66	775							
4 p. m.													
Cocoa	1 C	S	9	21	10	270	0.30	0.12	0.20	0.25	0.006	..	6
Bread	1 sl	1	3	16	..	78	(0.002)	(0.12)	(0.05)	(0.18)	(0.0005)	2	..
Butter	1 pat	⅓	..	..	9	77	0.003	....	0.003	....	0.00004	..	..
			12	40	25	425							
6 p. m.													
Rice	2 T	1	2	21	..	108	0.003	0.01	0.03	0.02	0.0003	2	..
Lettuce	Serv	1½	1	2	..	13	0.02	0.01	0.02	0.04	0.003	..	4
Cheese	1" cube	½	4	..	5	65	0.14	0.09	0.10	0.13	0.0002	1	..
Bread	1 sl	1	3	16	..	78	(0.002)	(0.12)	(0.05)	(0.18)	(0.0005)	2	..
Butter	1 pat	⅓	..	..	9	77	0.003	....	0.003	....	0.00004	..	..
Milk	1 C	S	S	12	10	170	0.30	0.12	0.20	0.25	0.006	..	6
			15	54	24	521							
8 p. m.													
Oatmeal	4 T	1⅔	S	33	4	205	0.03	0.03	0.20	0.03	0.002	5	..
Sugar	1 T	½	..	15	..	62	....	....	....	....	.....	..	..
Cream	2 T	1	1	1	12	115	0.03	0.01	0.02	0.02	0.0006	..	..
Almonds		½	2	2	6	70	0.02	0.002	0.05	0.004	0.0004	..	1
			11	51	22	272							

* This diet represents the food intake of a patient for one day. Naturally it must be varied, but all other daily diets are made to approximate this one in total calories, distribution of protein, carbohydrates and fats, mineral constituents, base quality and vitamins. Meat is allowed to about 500 Gm. weekly. When patients partook of additional milk and fruit, the rest of the diet was adjusted so that the essential factors remained undisturbed. Cod liver oil, 1 tablespoonful with meals, was generally taken. The inorganic mineral mixture was taken in 1 teaspoonful doses after eating. A complete list of foods advised and forbidden is given by Bommer and by Herrmannsdorfer (footnotes 3 and 4).

TABLE 3.—*Clinical Observations Before and After Basic Feeding in Twenty Cases of Advanced Tuberculosis Observed Six Months**

Case	Name	Age	Temperature		Weight, Pounds		Sputum, Cc.		Results of Pulmonary Roentgen Examination	Results of Physical Examination	Comment	Weight, Gain or Loss
			Before	After	Before	After	Before	After				
1	S. S.	29	100	98.6	110	126	70	10	R. Infiltration throughout with multiple cavity formation	R. Definite improvement: cavities in lower half disappeared	Cough disappeared: fatigue lost: "indigestion" lost; chest pains ceased	+16
									L. Infiltration upper lobe	L. Slight improvement		
5	E. B.	24	99.2	98.6	95¾	109	50	20	R. Apex infiltration L. Pneumothorax 20%; fluid at base: cavity at first rib	R. Unchanged L. Pneumothorax discontinued in first month: definite improvement: cavity smaller	Intestinal tuberculosis with diarrhea symptoms cleared: first weight gain in 3 years: fatigue lost	+13¼
6	H. C.	24	98.6	98.6	106¼	103½	150	50	R. Infiltration throughout: two large cavities	R. Phrenicotomy in second month: lower cavity smaller	Violent coughing spells disappeared: strength gained: phrenicotomy played a part	−½
									L. Infiltration upper half	L. Infiltration decreased		
7	A. R.	22	98.6	99.2	109	123½	30	20	R. Infiltration upper half	R. Slight improvement	Persistent weight loss checked: gained strength greatly: pneumothorax perhaps played a part	+14½
									L. Pneumothorax 60%: had been begun six months previously	L. No change		
8	E. S.	24	99 Occasional 99.8	98.6 Occasional 99	135½	160	40	5	R. Infiltration upper half	R. Clearing definite	Cough gone: hyperacidity cleared up	+4½
									L. Infiltration upper half	L. Clearing definite		
10	M. C.	32	98.6	98.6	106½	112¾	30	10	R. Infiltration upper half: double cavity formation	R. Improved: cavities smaller	Cough decreased: fatigue cleared: vomiting stopped	+4¼
									L. Infiltration upper half: cavity formation	L. Improved: cavity almost disappeared		
12	H. W.	28	98.8	99.6	83	90	140	70	R. Healed lesion upper third	R. No change	(Died in 3 months of tuberculous pneumonia)	+5
									L. Infiltration throughout: phrenicotomy three months previously	L. No change		
13	S. G.	28	99	99.4	110	106	30	?	R. Infiltration upper two thirds: cavity second rib	R. No change	Advanced laryngeal involvement: diet not tolerated: died four weeks after start of trial: dysphagia, disseminated tuberculosis	−4
									L. Infiltration upper half	L. No change		
15	M. G.	24	98.6	98.6	122	123½	20	20	R. Infiltration upper half	R. Slightly improved	.....	+1½
									L. Infiltration throughout	L. No change		
16	L. K.	21	99	98.6	98	98½	5	25	R. Infiltration upper half with small cavity	R. Improved: cavity almost gone	Intestinal tuberculosis treated previously by mercury vapor quartz light with diarrhea cleared up	+½
									L. Infiltration upper half with cavity	L. Improved		
17	J. L.	21	99.2	99.2	118½	115	15	15	R. Infiltration throughout	R. No change	Diet not well tolerated: objected to lack of salt	−3½
									L. Infiltration upper half	L. No change		
18	N. J.	30	99.5	98.6	121½	120	35	35	R. Infiltration upper half	R. Slightly improved	Hemorrhages necessitated pneumothorax: weight gain 8 pounds prior to hemoptysis	−1½
									L. Infiltration throughout with cavity	L. Pneumothorax after 3 months of diet		
20	C. L.	33	99	98.6	155	177	140	35	R. Infiltration upper third	R. No change	Admitted for treatment after previous appendectomy and thoracoplasty to increase weight	+22
									L. Thoracoplasty before admission: complete collapse of lung	L. No change		
21	I. G.	28	99.4	98.6	105¾	121	15	5	R. Infiltration upper half	R. Slightly improved	Much improved appetite and digestion	+15¼
									L. Infiltration upper half	L. Definite improvement		
22	M. R.	23	....	....	110	115	35	20	R. Infiltration upper half	R. Definitely improved	First weight gain in 3 years: lost a persistent marked weakness	+5
									L. Infiltration upper two thirds with multiple cavity formation	L. Definitely improved: cavities smaller		
23	M. B.	28	99	99.8	91	95	35	70	R. Infiltration throughout with cavity formation	R. No change	Great gain in strength	+4
									L. Infiltration upper two thirds with cavity formation	L. No change		
24	D. E.	25	98.6	98.6	113½	117½	25	15	R. Infiltration throughout with multilocular cavity formation	R. Slight clearing	Lost a persistent nausea and gastric distress	+4
									L. Infiltration upper half	L. Definitely improved		
25	D. G.	28	98.6	99.6	106½	112½	70	35	R. Infiltration upper half	R. No change	Diarrhea and intestinal tuberculosis improved (mercury vapor quartz light previously)	+6
									L. Infiltration throughout with cavity formation	L. No change		
26	M. N.	25	99.6	98.6	120½	129¾	35	20	R. Infiltration upper half	R. Definite improvement	Greatly improved appetite	+9¼
									L. Infiltration upper half with large cavity	L. Cavity smaller; clearing		
27	H. G.	32	99	99.4	121	121	105	90	R. Infiltration upper third	R. No change	No change even with phrenicotomy	0
									L. Infiltration throughout: phrenicotomy in first month	L. No change		

* Patients 2, 3, 4, 9, 14 and 19 (omitted from summary) discontinued the diet after one or two months.

TABLE 4.—*The Chemical Composition of the Blood of Rats on Acid and Basic Diets*

Diet	Inorganic: Carbon Dioxide	Inorganic: p_H	Inorganic: Chloride	Inorganic: Phosphorus	Inorganic: Calcium	Inorganic: Total Base	Organic: Sugar	Organic: Cholesterol	Organic: Protein	Organic: Fat Iodine Number	Organic: n_D	Clotting Time	Hemoglobin	Red Blood Cells
Neutral	48	7.27	280	6.1	9.0	148	135	140	6.5	58	1.347	2.5	115	9.5
Base, sunlight	56	7.48	261	7.5	9.8	154	175	110	6.7	62	1.347	2.0	110	8.8
darkness	51	7.38	282	6.3	8.2	143	160	130	6.6	..	1.342	3.0	....	....
Acid, sunlight	48	7.28	305	5.7	11.8	137	150	150	6.9	51	1.345	3.0	105	10.9
darkness	44	7.23	317	6.0	11.3	134	144	142	7.1	..	1.344	2.0	....	....
Base-acid	51	7.33	353	3.8	10.0	142	140	120	6.7	55	1.347	3.5	110	10.2
Acid-base	49	7.38	320	4.6	9.7	150	145	137	6.7	63	1.345	2.5	102	8.6

shown by the rats. The total base and alkali reserve were definitely higher, while the chloride and cholesterol were low and the pH and refractive indexes were within normal range (table 6).

COMMENT

We realize that a preliminary study of the value of a dietary in such a limited number of cases of far advanced pulmonary tuberculosis does not warrant a dogmatic statement. No acutely progressive, highly febrile cases were included. They constituted a group distinct from those of the German clinic, where more favorable results were observed. The difficulties of clinically controlling such a study are apparent, the only means being the selection of patients who failed to respond to accepted therapeutic measures for two or three years.

The favorable results in about one third of the patients studied for a period of six months of careful supervision may perhaps be attributed to the effect of the dietary. But critical clinicians may justly maintain that contributory factors other than diet were operative in the end-result. The psychic element, the enforced rest, the occasional tendency of the disease to subside spontaneously, the wholesome food, its scrupulous preparation and careful cooking, and the individual service are factors that must be considered in a final analysis.

A study of the dietary shows that the nutritional requirements particularly effective in tuberculosis are the inorganic and the vitamin factors. Chemically there is a preponderance of alkali-forming over acid-forming salts. But the German clinicians attribute the value of the dietary to its acid-forming nature metabolically. We have no scientific evidence for such a contention. The addition of

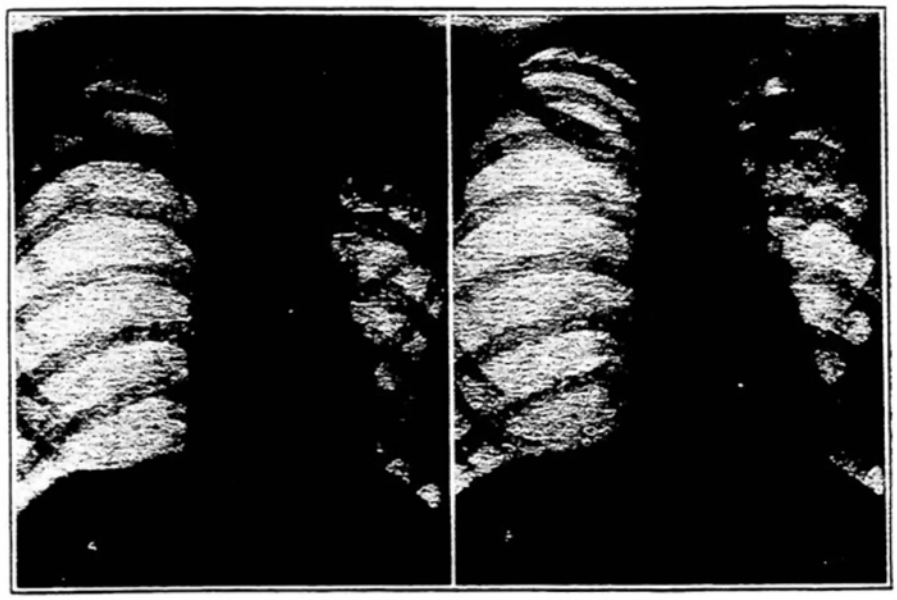

Fig. 4.—Condition of lungs in case 22: *A*, before diet; *B*, after diet.

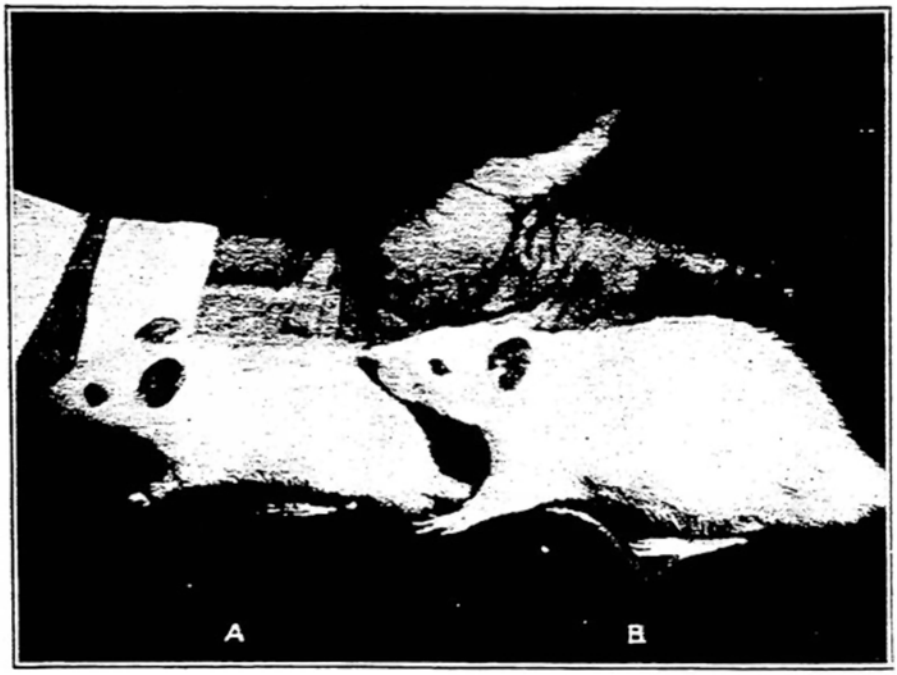

Fig. 5.—Comparative size of typical rats of the same age and litter fed *A* acid-forming and *B* base-forming diets.

the mixture of inorganic mineral compounds consisting of base-forming salts certainly does not substantiate their opinion of an acid-forming mechanism in the body.

TABLE 5.—*The Metabolic Results in the Groups of Rats on Acid and Base Forming Diets*

	Acid (23 Rats)	Basic (25 Rats)
Weight: Summer	Average gain 7 Gm. a week (first 14 weeks)	Average gain 17 Gm. a week (first 14 weeks)
Winter	Average gain 8 Gm. a week (first 14 weeks)	Average gain 8 Gm. a week (first 14 weeks)
Spring	Average gain 11 Gm. a week (first 14 weeks)	Average gain 18 Gm. a week (first 14 weeks)
Skeleton	Bones small, brittle, rachitic (histologic)	Bones large, firm, nonrachitic (histologic)
Musculature	Flabby, rat posture poor	Tonicity good; posture characteristic
Fur	Shaggy, matty; growth patchy	Silky, soft; growth uniform
Activity	Mild	Vigorous; irritable
Appetite	Fair	Good
Stools	Small, hard	Large, soft
Infections	Rats susceptible early	Susceptible later
Reproduction	Delayed (26th week in spring group)	Normal (15th week)

The experimental studies on the effect of acid and base forming dietaries in rats, in progress for two years, reveal distinct differences. The animals maintained on a base-forming dietary throve to a maximum degree, grew rapidly, gained weight readily, and were more active than those on the acid-forming diet, all other nutritional requirements having been equal. And blood studies of the acid-base equilibrium revealed shifts toward either the acid or the basic side, depending on the dietary given. Studies made on the blood of the patients before and after the dietary showed a similar shift toward the basic side of the acid-base mechanism.

We believe that the inorganic constituents, whether acid-forming or base-forming, are not as important as the vitamin content of the dietary. In fact, vitamin intake depends on base-forming foods which contain them in greatest amounts; e.g., milk, vegetables and fruits, the so-called protective foods. Both inorganic constituents and vitamins regulate cellular metabolism, and the absorption and utilization of minerals depend on the simultaneous presence of vitamins in the alimentary tract.[9]

We have not determined to what extent the effects obtained are to be attributed to the diminished sodium chloride intake or to the mineral mixture. The importance of these factors has been especially stressed by the German authors. The sodium chloride intake was kept at a minimum without quantitative regulation, merely by avoiding the addition of salt in the preparation or the use of the food. It has been stated that a neutral salt such as sodium chloride can prevent the lability of cellular metabolism so desirable in healing. It must yet be shown that the sodium and the chlorine ions weaken any chemical action of cells and that a reduction of the sodium chloride content by means of a salt-poor diet can enable the cells to counteract the tuberculous process.[8]

CONCLUSIONS

1. In a preliminary experiment, twenty patients between the ages of 22 and 33 years with far advanced pulmonary tuberculosis, who had failed to respond after two or three years of routine treatment, were maintained for six months on a special dietary regimen.

2. The average dietary consisted of 3,500 calories, base-forming, low in sodium chloride and in animal protein and carbohydrate, but rich in fats and in vitamins.

3. Eight patients gained substantially in weight; ten patients showed considerable diminution in the quantity of sputum but without loss of tubercle bacilli; four patients showed a loss of a slight constant fever, while two developed fever.

4. Eight patients showed definite clearing in the lungs by physical and roentgen examination; two patients with intestinal tuberculosis lost the symptoms of this complication; one did not respond.

5. A diminution in fatigue, pains in the chest and alimentary disturbances was conspicuous.

6. The acid-base equilibrium of the patients studied before and after the dietary shifted toward the basic side. This result is in accord with similar studies made on rats maintained on acid-forming and base-forming diets, respectively.

TABLE 6.—*The Average Chemical Content of the Blood of Seventeen Tuberculous Patients on the Dietary*

Time	p_H	Carbon Dioxide	Total Base (Milli-equivalent)	Chloride	Cholesterol	n_D
Before	7.48	46	198	340	150	1.344
After	7.45	35	182	280	130	1.344

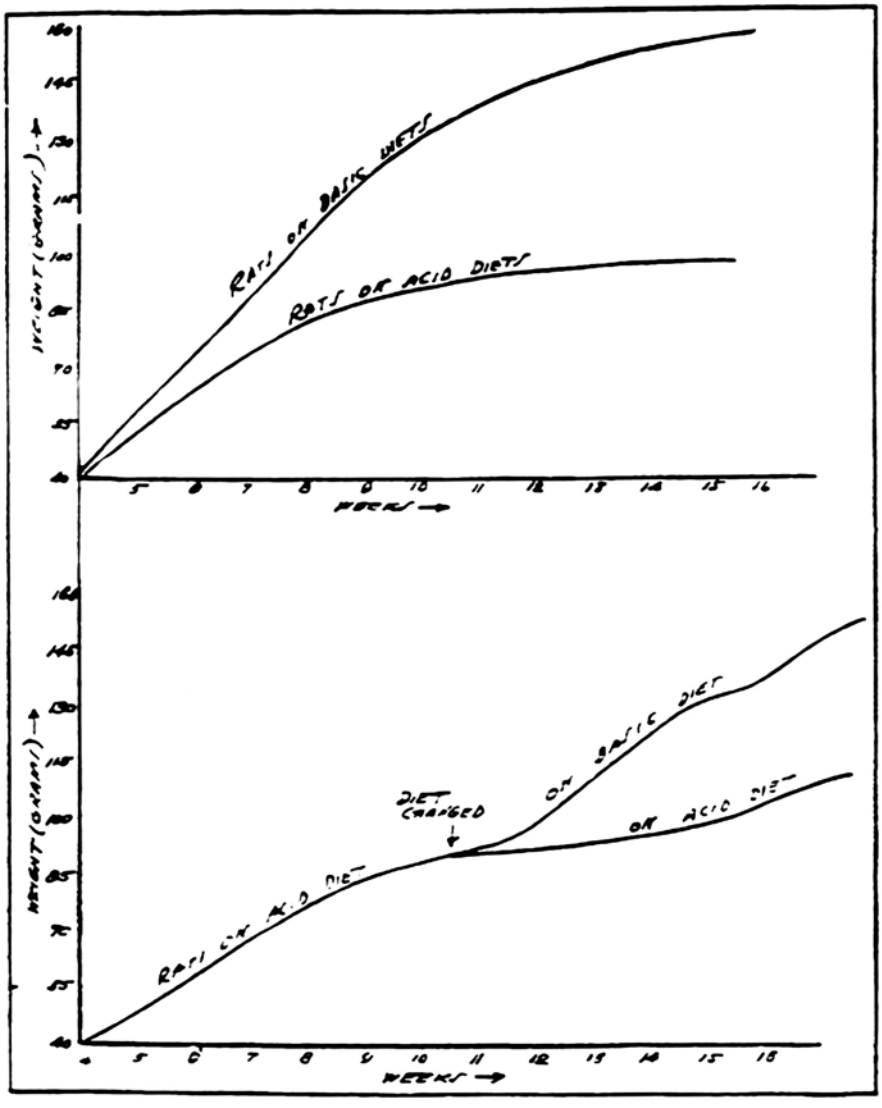

Fig. 6.—Group 1 (upper curves): Average weight curves of rats on acid and base forming diets. Group 2: Average weight curves during summer of rats, one litter of which was shifted to the base-forming diet.

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