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"THE SCIENCE OF KEEPING YOUNG"
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ONE: YOUTH AND THE SALTS OF THE EARTH

§ I—AGE POSTPONED

The erroneous, pernicious, but widespread conviction that "time" makes us old, and that age is automatically fixed by the number of years behind us, constitutes a deadly assault upon the human family.

"Time" does not make us old. Time has nothing to do with age. Time is an hour-glass—a measuring device—not a force. Time can influence disease or health no more than a yardstick can influence the speed of a race horse—no more than a stop-watch could control the flight of Paavo Nurmi. Time had nothing to do with the ability of the Helsingfors phantom to run faster than mortal man ever ran before.

Age is the result of changes brought about in our own tissues through our own habits of life. Within the limits of variation we can hasten those changes or check them as we will.

The expression "Time dealt lightly with Cornaro" is figurative and misleading. In itself it contains the refutation of the very idea it proposes. Cornaro was "old" at forty yet "very young" at a hundred. Not "time" but the man himself controlled the rapidity of the tissue changes that were hurrying him to the grave before he discovered the secret of youth. The most famous centenarian of history not only succeeded in slowing-up the mechanism of death, but actually reversed its wheels and turned the course of his own life backward.

The physiological laws controlling this phenomenon are the same today as they were yesterday, and as they will be tomorrow. Nature is not capricious. That she abhors freaks is demonstrated by the rarity with which she produces them.

The influence of "time" on flesh is mythical. Yet under the obsession engendered by this cruel superstition men and women adopt a fatalistic attitude toward what they call time. They adjust

themselves to its "inevitable ravages" through heroic resignation or supine indifference to what they foolishly believe cannot be helped. Hence they speed up the tissue changes that result in feebleness and hurry all the faster the onslaught of decay, disease and death.

Appalling are the consequences of accepting without challenge the poisonous suggestion that because man's hair is gray at the temples his liver, heart and arteries are correspondingly gray, and time is graying him all over. This is false. Of course man can't restore the color of his hair or put it back when he has lost it, or replace the teeth with which Nature blessed him during the dentition period of his growth.

But he can, even at forty-five, throw off the unnatural load under which he compels Nature prematurely to groan. He can remove the handicap and start all over.

Nature cannot resurrect the suicide, and there is a final step beyond which any thought of recovery comes too late.

But for the vast majority—for the millions who are living desperately, who are aging before their time, and who do not realize the significance of the fact that some are old at thirty while others are young at sixty—there is within reach an overwhelming abundance of all the factors needed to keep at a distance age and all that age implies.

As a rule the human family makes no conscious effort to invoke the aid of these enemies of decay, but, on the contrary, goes out of its way to ignore their existence and reject their help.

And they are so simple, so eager to serve, so truly wonderful in their operations, so easy to comprehend, that man's unfamiliarity with their story—the story of the salts of the earth—must ever remain an enigma too baffling to solve, too mysterious to explain.

These squandered and neglected riches must be restored to the human race. To the end that the work of restoration may begin for the individual now and at once, even though the masses move tardily, sluggishly, wilfully along the easy way leading to preventable illness and untimely death, the author devotes this task.

What "The Science of Eating" began, this work, he fondly hopes, will finish. The demonstrations assembled by it are so picturesque, so graphic, and, by their very nature, so eloquent that he is confident his treatment of them, however clumsy and unskilful, has encountered little risk of blurring their clarity or

marring their beauty. Through a plate of smoked glass one may still see the sun.

Merely to exhibit these demonstrations so that they may disclose their own wonders in their own way, is to present specific and conclusive evidence against the conspiracy of ignorance, superstition and habit responsible for obscuring the truth and must eventually force the gates now holding back inexhaustible floods of vitality, releasing their torrents upon this overfed but undernourished and devitalized world.

Just how the salts of the earth are waiting to bring back to humanity the despised and rejected treasures of health, endurance, stamina, resistance to disease, normal growth to the young and happy maternity to the prospective mother, is the heart of the information which we have labored to set forth in the belief that it is the secret for which our women and children hunger.

Experimental animals, of which the writer has five hundred, including an offshoot representing the fifteenth generation, under observation in his laboratories, confirm in detail the promise—one might even say the prophecy—that the seeming miracles which have showered benedictions upon them, can be duplicated, multiplied and perpetuated for the benefit of mankind precisely as they have been made manifest among the furry creatures that have given up their lives to the principles here expounded.

We can at will control the growth of any animal. We can take two brothers and bring one to robust maturity, dwarfing, stunting and runting the other. We can so increase the resistance of one as to immunize it against the ordinary dangers of unsanitary environment while lowering the resistance of its brother in an ideal environment to a point that makes it a ready victim of the slightest disturbance.

With the great variety of foods purchased in any store in America we can lift up or let down the life line of bird or beast. We can elevate an animal to the peak of normalcy, let it drop, pick it up again, depress it anew, and keep it swinging like a pendulum between the two extremes of life and death, provided we do not go too far, for then recovery becomes impossible.

By manipulating its food we can bring an end to reproduction or control the size and vitality of its offspring. With a large group of foods commonly consumed by the human family we can induce such forms of morbidity and mortality as must make the observer

shudder. In one cage a mother brings forth her litter triumphantly and so disports herself thereafter as if to furnish proof that normal maternity is a tonic. In a neighboring cage another mother bears her offspring dead, or dies herself in the effort, or casts a litter so feeble that they perish within two or three days of sheer inability to survive.

In a third cage the mother fed with an abundance of denatured foods consumed directly from the packages in which they are purchased, with no interference of any kind whatsoever from our own hands, undergoes an experience so perverted and so abhorrent to nature that she turns cannibal and devours her young. That same mother brought back to normal on an adequate diet is made over and brings forth another healthy and happy litter which she not only guards with jealous care, but which in time reproduce their kind as if their ancestors had never known a cruel history.

"Shocking!" one may say. Not at all. It must be remembered that drugs, poisons and chemicals are nowhere involved in these proceedings; that we merely feed to these unhappy laboratory animals the very foods that our human mothers buy from the stores to feed to their own children without asking questions as to what may or may not happen to their human offspring, or to themselves, under the continued influence of a diet artificially disordered and disarranged.

If the Society for the Prevention of Cruelty to Animals is concerned with these laboratory tragedies it follows that a society of still larger scope, motivated by still higher principles, must organize itself to deal with the far more harassing, far more terrible consequences effected by the same cause, controlled by the same laws, and differentiated from the other by but a single factor. The one deals with animals, the other with human beings.

Surely if the evils resented by lovers of animals are to be tolerated, condoned and justified when their victims, through ignorance, sloth or commercial greed, are selected from the human race, it must be admitted that a fog of hopeless degeneration has settled down upon mankind. This the writer does not believe, cannot believe.

Nevertheless the physical infirmities, through which laboratory animals are experimentally joggled, run parallel with the commonest of ailments suffered everywhere among men, women and children.

We find the distress characteristic of gestation. We reproduce all the hazards of childbirth and the exhaustion incidental to lactation. We induce the wholly unnecessary "upsets" continuously, almost systematically, experienced by young children. We duplicate no exact counterpart of the striking prevalence of pallor among humans, but we do develop the same soft, flabby, water-logged tissues padded with layers of "chicken fat" giving rise among men and women to that form of painful self-consciousness which dumpy rotundity rarely fails to provoke.

We have no difficulty in bringing about among our victims all the nerve squalls and brain storms more or less charitably characterized when manifested by *homo sapiens* as the vagaries of "temperament."

We multiply at will the indescribable depressions begotten by the retention of fatigue poisons in auto-intoxication, and we parallel the "gone stale" condition of athletes at the training table.

Certainly the nameless miseries constantly increasing under the shadows of diabetes, Bright's disease, heart disease, cancer and hypertension are so analogous to the distempers experimentally induced among our laboratory animals as to render absurd, irrational and abortive any effort to explain away or to conceal the obvious relationship between cause and effect, regardless of whether its manifestations occur among animals or among human beings.

"If all this is true then you yourself shall live a century."

Such a conclusion does not follow. The writer knows he will not live a century. He has been unduly fortunate at the age of forty-six in having survived the last twenty-six years of his life against physical handicaps which would have removed him from earth in his youth had he disregarded the principles set forth in this work.

Physicians intimately familiar with his case are forced to interpret the fact that he is alive and able to tap a considerable reservoir of energy as an impressive and conclusive vindication of the soundness of his philosophy of nutrition. He cannot guess at the potential duration of his own life, which, because of the defective mechanism to which it clings, should be a short one. But he knows through his experiments with *normal* animals that the average span of their lives can be doubled or cut in two, and that the physiological laws under which these phenomena are con-

trolled are identical with those governing the life processes of the human race.

Blind indeed is he who cannot perceive the magnitude of the waste heaps of the world. All waste is detestable. It symbolizes tragedy—the deliberate defeat of the purpose for which any object is made, or to which any object is dedicated. Melancholy in the extreme is the contemplation of the fate even of things inanimate when they are not permitted to function in accord with the design, energy and skill that brought them into existence.

A polluted well, an abandoned house, a wantonly burned library are examples of waste differing only in degree from the polluted rivers, the sacked villages, and the wickedly contrived illiteracy of subject nations. But how appalling the needless waste of human health, and the waste of food factors upon which human health depends!

Squandered energy, squandered strength, squandered comfort, squandered happiness littering the highways of life are the direct and immediate consequences chargeable to humanity's highly organized and systematic waste of the salts of the earth which Mother Nature, responding to a law imposed upon it by a Law higher than itself, elaborates so bountifully and so benevolently for the needs of man.

Sickening is the extent of these waste heaps; outrageous and indefensible are the enormities and monstrosities that grow upon them. Their significance constitutes the theme of this work, which proceeds forthwith to describe the nature and functions of the salts of earth out of which the human body is wrought, and without which it hastens to decay.

Following hard upon these preliminaries will be found, wholly unrelated to each other but intimately related to the principles here expounded, a series of graphic episodes demonstrating what might have been, what is and what can be, as determined by the uses and abuses which man makes of the riches lying at his feet.

§ 2—NEGLECTED FOOD CALCIUM

When you think of food the thought usually focusses on some particular kind of food—lamb chops, jelly roll, string beans, ice

cream, for instance. All natural food contains calcium. There is no food of bird, reptile, beast or man that does not contain calcium. No bird, reptile or beast removes the calcium from its food; man does.

If he realized the price paid for his folly he would never fail to think of calcium when he thinks of food. Pure calcium is a light yellowish metal with a brilliant lustre. It is not as hard as iron nor as soft as lead. It is about as hard as gold. In moist air it oxidizes quickly. If we were speaking of iron we would say it "rusts" quickly. At a red heat calcium burns with a vivid flame forming quicklime. When water is added to the quicklime it becomes slaked lime.

Like potassium and phosphorus it is never found in nature in its pure state, but always in compounds widely distributed. Gypsum is simply calcium sulphate. The old-fashioned calcium light of the theatre was produced by focussing a stream of oxygen and a stream of hydrogen while burning upon a lump of calcium. In these forms most people are quite familiar with calcium, but they do not appreciate the fact that it has uses within their own bodies, any interference with which results in disease.

The food manufacturer who deliberately removes calcium from his prepared or patented product commits an offense against all nature, but in particular against the individual who buys and eats the denatured offering. Pure milk is the best offset against calcium deficiency but should not be consumed with meat. Milk itself is meat in liquid form. It is much more than meat, containing many elements not found in meat at all.

In the human body calcium is found in the bones, tissues, blood, as well as in every other part of the organism. One of its most easily studied functions can be observed through its effect upon the coagulation of the blood and the contractility of the muscles of the heart. A solution of "blood ash" containing calcium, potassium and sodium will keep a heart beating for a long time after it has been removed from the body of a slaughtered animal.

If the sodium and potassium are removed from the solution the calcium will cause a condition of tonic contraction of the heart muscles. If the calcium is removed the sodium and potassium will cause the heart muscles to relax. When all are present together in normal proportions the muscles relax and contract in rhythmical order.

Calcium is capable of correcting the disturbances of the inorganic equilibrium in the animal body, whatever the deviations from the normal may be. Any abnormal deviation produced by sodium, potassium or magnesium in the direction of increased or decreased irritability can be corrected by calcium, which promptly re-establishes the normal.

When people fast, calcium goes out through the intestinal wall and is lost, demonstrating the necessity of a constantly renewed supply in the maintenance of health and life. The bones and teeth make good the loss of calcium from the soft tissues and blood when no food is taken at all. They also surrender their calcium when decalcified foods are consumed. Pure milk supplies calcium in abundance, but again the caution against the ingestion of meat and milk at the same meal must be sounded. Milk provides a natural calcium-phosphorus balance. Meat does not.

The injurious results that follow a diet robbed of its calcium through refining processes can be observed very quickly in the case of full-grown animals, but even more quickly in the case of animals that are still growing. A very large percentage of the calcium appropriated by the growing animal goes to its bones and teeth. An abundance of calcium for the needs of the growing bones, and in a form in which it can be utilized, is demanded if Nature is to be served.

In its mother's womb the unborn babe derives its calcium from the food consumed by the mother provided the calcium has not been removed from that food. When it is removed, as is always the case with a diet consisting largely of white bread, polished rice, modern cornmeal and refined cereals, the mother's bones and teeth are called upon to make good the deficiency. This deficiency exacts an appalling toll from the future health of the mother.

It is not only entirely preventable, but in the light of modern knowledge it is vicious and indefensible. Unrefined foods make such deficiencies impossible. White bread and biscuits, crackers, cakes and patented breakfast foods made from white flour and all other forms of denatured cereals attack the mother and the child by robbing them of their calcium.

This robbery is not confined to calcium, for when the calcium goes the other minerals go with it. Vitality and health accompany the lot and thus new burdens, new miseries, new inefficiencies

are dragged from ignorance and greed and flung into the lap of the human race to breed their infirmities.

If food calcium were permitted by food manufacturers to remain where Nature put it—in the food—there is much evidence to support the conviction that tuberculosis would disappear from the face of the earth. Calcium compounds—the organic lime of unrefined foodstuffs—are the building materials used by the body to plug up the tuberculous gap through which health and life are so miserably drained away.

Through the calcium furnished by natural foods man, woman and child construct their defense against tuberculosis. No disease is more common, yet the human race could turn its tuberculous tears to laughter if its tuberculous victims would only heed the calcium facts.

At any autopsy in any morgue the surgeon in charge will tell you that the scars in the lungs and glands of the body, undergoing post-mortem, are the healed wounds, the calcified lesions of tuberculosis. Food calcium had walled off the diseased area and sealed it up. The victim never knew the truth. His tuberculosis had been arrested before there was any suspicion that it was present. Mere accident—good luck—provided sufficient calcium to calcify the lesion. The result was a “cure”—an arrested disease.

Refined, decalcified food would have resulted in death. Animal experiments prove this. Why, then, allow our children to depend on accident—good luck—when by design we can control the calcium that Nature provides? Unrefined food will “cure” tuberculosis that hasn’t gone too far and prevent tuberculosis that hasn’t yet started.

§ 3—RESISTANCE TO DISEASE

Let us by repetition stress the significance of this:

Post-mortems reveal that hundreds of thousands of human beings have suffered from tuberculosis during life without ever having suspected the truth. Physicians report their continued surprise at the number of instances of “cured” tuberculosis, the evidence of which is revealed during operations or autopsies.

The calcified lesions of a once active tuberculosis completely walled off from the rest of the body are common, showing how

Nature, when given an opportunity to arrest the progress of the disease, performs her wonderful work without even exciting the faintest suspicion of the truth. There is no combination of unrefined foods, if consumed as Nature gives them to us before the manufacturer removes their calcium and other mineral salts, which will not protect child or adult against tuberculosis.

All unrefined food is good food and in the average variety within the reach of the average human such food is adequate to all the needs of the body. Any combination of natural foods which one can think of will place at the disposal of Nature all the raw materials required by her in "curing" a tuberculosis that hasn't gone too far, or in protecting the body against a tuberculosis that hasn't yet got a start.

Food calcium, found only in unrefined food, endows the body with resistance against infection. The loss of such calcium through food refinement results in the loss of such resistance. Whole grain breads and breakfast foods are "fads" only to the ignorant. Milk, rich in calcium, were it better known for its true worth, would become a real fad wherever human beings of ordinary intelligence are earnestly seeking to live their lives fully and normally.

When the surgeon's knife cuts through a healed wound of tuberculosis the effect is exactly like that which follows an attempt to cut sand. With food calcium Nature builds a wall of stone against the invading tubercle bacilli provided she can get the calcium with which to do her building.

Sifted, bolted and refined foodstuffs do not help nature for the reason that they are robbed of their building materials. They have parted with their calcium—without which nature is powerless against tuberculosis—and in this decalcified condition are quite as deadly, though not so swift, as bullets.

Nature can't take from food elements that have been removed from it. Contemplating the calcified lesions of a "cured" tuberculosis we perceive the folly of turning "a deaf ear to the beautiful rhythms playing everywhere about us, reminding us constantly that in creating earth for man, God, in His wisdom, neglected nothing, left nothing to chance, provided for every human need, heeding not alone the requirements of the new-born infant at its mother's breast, but also the requirements of the adult."

The infant is powerless to outrage nature, but the adult, blind to the dispensations of his Creator's love, capriciously ignores them and proceeds to disorder, change, "improve," refine and destroy the means whereby health might be attained and conserved.

Calcium does not stand alone, but, with the other mineral salts found in natural food, mourns over the human scrap-heap and longs to be permitted to do the work assigned it from the beginning by Mother Nature. Whole grain breads and breakfast foods are not broken staffs of life. Milk is a perfect staff.

Not only is calcium, Nature's defense against tuberculosis and many other diseases, found in all unrefined food and in every bone of the human body, but it is also found in the blood serum, in the red corpuscles, in the pancreatic fluid, in the gastric juice, in the saliva, in all the tissues and glands, and in the milk of every mother of every species, including homo sapiens.

Calcium is foremost among the alkaline bases demanded by the life and health of the body and furnished by natural food. Food from which the calcium has been removed is automatically rendered deficient in potassium and magnesium. The food manufacturer can't reject the calcium without losing all the mineral salts that accompany it. Consequently when food is consumed after it has been deprived of these alkaline salts, free acids are allowed to develop in the body.

In the presence of calcium and its alkaline companions these free acids are neutralized before they can do harm to the tissues. It is because they are thus neutralized that they subsequently appear in the urine as discarded waste products in the form of sulphates and phosphates. When not neutralized they remain in the body to attack the tissues from which they abstract or pull out not only the calcium, but the other alkalines so essential to vitality.

The tissue-tone is lost and the condition known as "run down" develops. A nation that eats the quantity of refined breadstuffs and breakfast foods consumed in America and at the same time disregards the enormity of its daily calcium losses may be very wise in recognizing the folly of other nations in other matters but is tragically blind to its own. Persisting in its destructive habits its only hope lies in pure milk.

If you would like to know what happens when the calcium is removed from your food take a clod of meat, chop and immerse it in distilled water for a few hours. The soluble calcium will be

leached out of the meat into the water. It will take along the soluble potassium and magnesium. The meat will lose its color and its flavor.

You are now ready to cook it, after which you will find it without flavor. If fed to dogs, cats or other meat-eating animals they will eat a little for a few days, gradually eat less, and if fed on nothing else will actually die more quickly than if not fed at all.

The reason for this is not difficult to explain. Phosphoric and sulphuric acids are being generated in the body constantly through the digestion of the phosphorus and sulphur-containing proteins found in meat, eggs, fish, cheese, beans, peas, etc. These acids, when neutralized, become harmless at once. When not neutralized they attack the body.

The animals fed on the decalcified and dealkalinized meat, in addition to being deprived of substances indispensable to the maintenance of health and life, are further handicapped by the necessity of throwing off the waste products imposed upon them through such useless and unnatural food. On the other hand the animal starved outright is not called upon to dissipate its vitality faster than the laws of starvation demand.

The sifting and bolting of wheat, corn, rice, rye and oats rob our grain foods, just as the soaking robs the meat, depriving them not only of calcium, potassium and magnesium, but of all the other mineral salts, in the absence of which we can have no defense against disease. Milk contains all these substances, save iron alone, which is readily supplied by whole wheat bread and fresh vegetables.

The outstanding phenomenon of the laws of nutrition which we are endeavoring to emphasize is that the calcium and other food minerals of unrefined food are so essential to the life and health of the body deprived of them that disease must and does follow the deprivation.

The commercial defenders of refined foods contend that all human food contains more mineral salts than necessary, and that therefore the sifting, bolting and polishing by which they are made more "attractive" does them little harm.

This assertion is not now true; it never has been true. That it never will be true has been conclusively proved in scores of experiments in our own laboratories which demonstrate that where refined foods are consumed the calcium and other mineral salts of

the tissues are actually carried out of the body faster than they are taken in.

This is notably the case in tuberculosis and other wasting diseases, in which the calcium content of the feces tremendously exceeds the calcium content of the food consumed. Nature does provide a reserve of calcium from which in emergencies the body, for a short time, finds all the elements it requires, but if the diet consists of refined food over a considerable period, the limit in the case of humans being approximately 250 days, the calcium and other mineral losses completely exhaust Nature's reserve so that food-deficiency diseases inevitably follow.

Neuritis, "rheumatism," asthma, anemia, acidosis, bronchitis, pneumonia and tuberculosis are not only favored but actually invited in all food experiments designed to show the folly of robbing our breadstuffs and cereals of their calcium and other mineral content.

§ 4—SAPPING TISSUE-TONE

It ought not to be necessary to repeat to children or to their parents that calcium assists the digestive ferments to perform their full duty, provided absurd methods of home cooking have not removed the calcium and that the food factory has allowed it to remain where Nature put it.

Calcium does assist the digestive ferments. When food is robbed of its calcium normal digestion does not progress. This influence of calcium on ferments is not confined to the inside of a human being. We see it also at work in the laboratory and in the food factory.

Rennet, for instance, is a ferment. It is used to make curd for milk. Without curd we would have no cheese. To keep the rennet working as it should work the cheese-maker knows that the calcium of the milk must be kept perfectly soluble. To secure this solubility he frequently adds hydrochloric acid to the milk. He knows that if the calcium is thrown out of solution before the rennet can complete its function he will never get cheese.

Many substances will throw the calcium out of solution. Oxalic acid, for instance, or cooking at the boiling point. Calcium will

even revive a run-down culture in the laboratory, yet despite its importance to health and life, and above all to growth, we go on shunning it as if it were the Witch of Salem.

Breakfast food manufacturers never tell us why they take the calcium out of their patented products. A decalcified race is a soft race. Happily we cannot remove the calcium from our milk.

If you are in a state that can be justly described as "healthy" you will find that should you cut your finger the calcium in your blood will cause a coagulation at the surface of the wound. If it were not for this interference of the calcium you would bleed to death. All sorts of "bleeders" are walking about. Even when they have a tooth pulled they just go on bleeding.

There are many disorders marked by the blood's loss of its normal calcium content in which wounds either refuse to heal or heal very slowly. One of the commonest symptoms of anemia, acidosis, nervous prostration, scurvy, beri-beri, neuritis, etc., is the stubborn refusal of the most trivial scratch to heal promptly. Surgeons realize the importance of this coagulating, healing function of calcium and frequently before operating they attempt to introduce it into the blood of their patients through the use of calcium lactate.

Calcium lactate, though it has been known at times to prevent hemorrhage on the operating table, is a precarious substitute for the numerous complex calcium compounds with which Nature tries to fill up every larder and pantry, and with which she would succeed in filling them were it not for the fact that the food "improvers" and "refiners" are so busily engaged in the other direction.

No prepared food now on sale in America confesses that it has been robbed of its calcium salts, yet the men, women and children who eat it are faced by the fact that precisely as they diminish the normal supply of food calcium they correspondingly lower their vitality and reduce their resistance to disease. Whole wheat foods are for simply sane people. They are all the more potent when consumed with an abundance of pure milk.

Those who knew Dr. James R. Mitchell while lecturer of chemistry at Fort Worth University Medical College will never forget his indignation when he discovered through a study of the school children of Louisville that 86 per cent. of them were suffer-

ing from defective teeth, notwithstanding the fact that they lived among the richest riches of the "limestone" state.

Kentucky is sometimes called the "calcium cup of America," yet with millions of tons of this bone- and tooth-building substance within reach, the children of this calcium kingdom were able to find so little of it in their refined and manipulated food that 86 per cent. of all those of school age in the calcium capital itself were manifestly the victims of calcium starvation.

Dr. Mitchell thundered against the evil thus disclosed, pointing out how dentists prescribe tooth washes and tooth pastes; how they advocate oral hygiene; how they fill cavities and fit bridges; how they pull out old teeth and put in new ones, while all the time the primary cause of tooth destruction sneers at the world, disregarded and ignored.

When decalcified foods attack the body there is evidence to support the belief that calcium is withdrawn from the understructure of the teeth. The thin enamel made thinner by fluorine starvation (from white bread and refined breakfast foods) eventually cracks, opening an entrance to bacteria which promptly begin the work of true decay. Tooth destruction commonly begins before birth through the refined foods consumed by the mother. Whole grain foods and pure milk prevent it. It's a case of health versus food refinement.

Not only singular, curious and interesting, but actually astonishing is the fact that sweets and fruit acids have no effect on the enamel of normal teeth. The sound teeth of humans fed from childhood on whole grain foods, including whole wheat bread, whole rye bread or whole barley bread, or the old-fashioned oatmeal cakes of Scotland, can be immersed in a solution of sugar or fruit acids for days, weeks and months. In these solutions they will suffer no erosion, thinning or loss of their protective enamel shell.

Many dentists of the advanced school are now convinced that sugar does not act directly on the teeth at all, but indirectly, and though dental work is terribly necessary in this age of defective teeth, the dental profession merely treats the symptoms and not the cause of tooth destruction when its operators plug cavities and fit bridges.

Refined starches and demineralized sugars possess a remarkable affinity for calcium. Druggists know how energetically calcium combines with sugar. Upon this knowledge they base their

manufacture of what is known as "syrup of lime." A thousand parts of water will take up approximately one part of calcium. If sugar is added the water will take up thirty-five times as much calcium.

The human body, unless otherwise fortified by an abundance of unrefined food such as milk and whole grains, must be prepared when indulging in refined sugars and refined starches to surrender calcium from its own tissues, depriving the growing bone structure of its building material, eating into the teeth and handicapping all the normal functions of metabolism and natural immunity against disease. Whole wheat bread and unrefined breakfast foods with plenty of pure milk will prevent these evils.

"Chicken bone" is prepared by the manufacturers of poultry food from the bones of cattle, sheep and hogs gathered from butcher shops. Poultrymen and egg men know that if hens are not fed a plentiful supply of calcium in the form of "chicken bone" they will begin promptly to lay decalcified eggs, and then cease to lay eggs of any kind.

The dog fed on meat without bone will suffer tooth decay. His skin will be tettered, his hair will fall out, his disposition will be as irascible as that of many humans.

The circus lioness fed with meat alone brings forth cubs with cleft palates. Meat does not provide the calcium necessary to bone formation. Caged mice fed with distilled water and the only kind of corn meal (degerminated and decalcified) now on sale in the grocery stores of America will develop "nerves," just as men and women robbed of their calcium also develop "nerves."

As the calcium-robbed diet is continued the mice are stricken with twitchings and paroxysms, passing gradually through all the symptoms of pellagra, beri-beri, acidosis and general prostration. Children will suffer and prospective mothers decline while they continue to glut themselves with an excess of refined, denatured, decalcified sugars, starches, breadstuffs and breakfast foods.

Pallor and anemia among women together with childhood morbidity are traceable in large measure to the excessive consumption of calcium-robbed breads, cakes, cereals and meats. It can't be repeated too often that when calcium is taken from prepared foods it doesn't go alone; out goes the iron, potassium, manganese, fluorides, and other indispensables to life and health. Fortunately milk brings them in again.

In the laboratory where pneumonia germs are being studied a little sprinkle of calcium will revive a culture that has ceased to grow. When a baby is deprived of its calcium its bones are softened. Under the X-ray one can actually see (when the calcium is restored to its diet) the remaking of new bone. Pictures of the wrist show the retipping of the ends of the bones as if they were billiard cues. Ask Dr. Alfred F. Hess.

In the adult, when the muscle is deprived of its calcium, it quivers and twitches. The nerves react in similar fashion. Many foods are so decalcified by the manufacturing process that scarcely a trace of the precious substance is found in them as they are brought to the table. The nation's bread, bun, biscuit, cruller, cracker, cake, pudding, pie, waffle and wafer supply is notoriously decalcified.

The medical profession does not know and makes no pretense of knowing the extent to which the removal of the calcium from so much of the nation's food has affected or continues to affect that large army of adults afflicted at the age of forty with heart disease, hardening of the arteries, Bright's disease, diabetes, cancer, etc.

The vitamin-mongers have coined millions from the anxieties of those who perfectly well know that "they don't feel right." The sale of vitamin pills, nostrums, sauces, and what not has attained enormous proportions. Vitamins, even if there are any, without the calcium natural to unrefined foods can neither prevent decay nor death. If the calcium of foods is undisturbed all the other necessary minerals, plus the vitamins, are certain to be present. Yeast is not a storehouse of vitamins. It is a valuable mineral and amino-acid food and has a very definite rôle to play in the field of public health.

§ 5—8,000,000 TUBERCULOUS CHILDREN

In Berlin, April, 1913, at the Sixth International Conference on Physio-therapy some calcium information was given to the world which no body of scientists or individual scientist has ever challenged or ever thought of challenging.

Many children who were then fifteen years of age are now parents with children of their own. Twelve years have passed, but the simple facts haven't gone very much farther than New York City, which is a long way from Berlin. Look at them.

"Natural immunity to disease is very closely allied to nutrition. As soon as a slight disturbance of nutrition occurs the child loses this natural immunity. An infection of the mouth with thrush is not possible in a normal-born and breast-fed child. The bottle-fed child is at a great disadvantage as compared with the breast-fed child. One-sided nutrition with carbohydrates (starches, white breadstuffs, denatured breakfast foods, refined cereals) injures the immunity of children.

"Tuberculous children nourished with such carbohydrate foods succumb more easily than when nourished on natural foods. The water content of the body is inversely proportionate to the natural immunity. Water-logged tissues lose their immunity. Refined foods increase unnecessarily the quantity of water in the tissues and promote a rapid rise in body weight.

"Children fed on such diet become water-logged, fat, and show slight resisting power against infection. The lack of absorbable calcium in the diet favors the water-logging." Grasp the meaning of these words for the sake of health and life, and give just a little more of your attention to the wonders of pure milk.

We have seen how and why absorbable calcium salts (organic lime, which is no more like inorganic lime than a water-lily is like a pond) are used by the animal body to wall off and heal up an active tuberculosis. With organic calcium and its accompanying salts (iron, potassium, phosphorus, etc.), furnished only through food and never through medicine, man, woman, child and infant build their resistance against disease.

That Sixth International Conference on Physio-therapy, at Berlin, April, 1913, could have done almost as much to save the world as was done a year later to destroy it. Twelve years have passed; Germany, and especially Austria, are now experiencing as never before on so large a scale, the appalling ravages of mal-nutrition. They now know that "Water-logged tissues do indeed lose their immunity; that lack of absorbable calcium in the diet does indeed favor the water-logging; that children fed on such diet do indeed become water-logged and show slight resisting power against infection."

What was said in Berlin in April, 1913, for the good of the world was not heeded, and tuberculous children, eight million in the United States, nourished with decalcified starches, white bread-stuffs, denatured breakfast foods and refined cereals go on succumbing to the disease. Their water-logged tissues have lost immunity.

We are now able to understand why calcium acid phosphate, which does not resemble the absorbable calcium and phosphorus of natural food, cannot, when added as baking powder to decalcified white flour, restore its other deficiencies.

The calcium acid phosphate with which self-rising decalcified flour is dosed would not produce the hurry-up effect so tragically delightful to the hurry-up housewife were it not for the chemical action of the soda that must ever be present if the baking powder explosions are to explode. The self-rising flour manufacturers say very little concerning the inorganic minerals put into their fancy packages and nothing at all of the organic minerals taken out in the refining and bleaching of the decalcified white flour which constitutes the broken staff of life in high-speed America.

What they put in bears absolutely no resemblance to what has been taken out. Subtracting the natural and adding the artificial not only does not add to the body's resisting power against infection, but actually takes from it.

The U. S. Public Health Service Report No. 333, recording the government experiments conducted by Voetlein, Sullivan and Myers, confirms this by showing that the properties of food upon which health, growth and life itself depend are easily destroyed by the commercial-chemical compounds employed in dosing self-rising flour.

This may sound new, and extremely novel, but it is very old.

The new confirmation makes the old truth no more true than it has ever been. It does show us how prone we are to ignore old truths and how little we take advantage of the repeated discoveries of the laboratory which, for the most part, as far as nutrition is concerned, are filed away in the archives of science instead of being flung into the faces of the readers of the newspapers whose advertising policies keep them all too quiet upon such business-disturbing subjects.

While tons of patent medicines are being consumed by the American people for the reason that they know there is something

radically wrong with their inwards, other tons of organic calcium salts and colloids elaborated by old Mother Nature are withdrawn from the human dietary and cast like pearls to swine.

No wonder the National Cereal Products Laboratories at Washington, D. C., under the direction of Dr. Benjamin R. Jacobs, for many years connected with the U. S. Bureau of Chemistry, have sounded a warning against the alarming increase in the use of self-rising flour, of which in the south alone from 8,000,000 to 10,000,000 barrels are used annually, representing an actual loss of 40,000,000 pounds of the most precious organic mineral food known to man.

A barrel of flour weighs approximately 200 pounds. Ten million barrels weigh 2,000,000,000 pounds. Nearly 2 per cent. of the unrefined grain consists of natural mineral salts and colloids. Here you have a loss of nearly 40,000,000 pounds of the most efficacious though non-patented medicine in nature.

We have been speaking only of the loss sustained in the consumption of self-rising flours which are dosed with inorganic explosive minerals that have no miraculous function to perform in human nutrition. If we were to include the total loss sustained in the milling of all our white flour, to say nothing of the degenerating of our corn meal and the polishing of our rice, the heap of squandered vitality would rise mountain-high. We shall attempt to show something of the size of this mountain.

Of almost incredible magnitude is the heap of calcium, with its associated natural mineral salts and colloids, removed annually from our refined white flour. A bushel of wheat weighs approximately sixty pounds. We eat every year 750,000,000 bushels, or 45,000,000,000 pounds. Approximately 2 per cent. of this total consists of the literally wonder-working mineral elements elaborated so marvelously, so delicately and with such photographic sensitiveness to external influences, by Mother Nature, who knows what she is about in her task of "coaxing a vital verdure from verdant earth."

Earth, plants and the seeds of plants give us fresh and vibrant life. Our wheat crop alone with its 2 per cent. of mineral salts yields 900,000,000 pounds of the very substances upon which the Sixth International Conference on Physiotherapy, at Berlin, April, 1913, demonstrated our dependence if we are to maintain resisting power against infection.

Nine hundred million pounds! Sifted out through grits, gauze and silk bolting cloth! Abandoned! Rejected! Wasted! Lost to the needs of the human family! Of course we reach out blindly and grasp, in our thoughtless, reckless, ignorant orgy of pandering to the false and artificial taste standards that have us in their grip, for the nearest thing within reach so that we may repair, as we foolishly think we can, the dreadful damage self-inflicted.

Vitamin tablets, vitamin nostrums, boxes of pills, bottles of compounds, packages of powders, salts and elixirs of life suddenly appear with glittering labels and still more glittering claims. Millions of dollars are spent, but we cannot and do not buy back the rejected keystone of the arch of life.

If we really want to we can take advantage of the information that has come out of the National Cereal Products Laboratories at Washington, D. C., where Dr. Benjamin R. Jacobs has analyzed thirty-seven different brands of self-rising flour (refined and decalcified). At least we now know that many of them consist of low grade, even the lowest grades and most inferior sub-grades of chemically treated starch, with a protein content dropping as low as 6 per cent. and a residue of added sodium running amazingly high.

The analysis reveals that these demineralized starchy compounds are dosed with calcium acid phosphate and sodium bicarbonate in proportions bearing no relationship between the amount of acid-reacting leavening and the amount of alkaline neutralizer employed.

The report tells us how these self-rising flours remain on the shelves of the grocers until the chemicals in them have deteriorated, and how they are then shipped back to the factory for an extra dose of calcium acid phosphate and soda.

We know how the Referee Board of Consulting Scientific Experts, through U. S. Department of Agriculture Bulletin 103, issued a formal warning against the excessive use of these chemical baking powders, which in their inorganic phosphorus and calcium content are wholly unlike the organic phosphorus and calcium bodies found naturally in wheat in the form of calcium colloids, phytin and phospho-lipins.

The self-rising flours differ from refined white flour, bleached or unbleached, only in that they contain added chemicals. Both

have lost the same natural properties, including not only the precious calcium content of the grain, but its iron, potassium and other stabilizers of health.

§ 6—FOUR THOUSAND LABORERS

Four thousand laborers trying to build two hundred and thirty-two miles of railway connecting Bolivia with Brazil were surrounded by calcium, but couldn't get any of it. Their employers, the owners and officials of the Madeira-Mamore Railway Company, before going into the hands of a receiver, buried the four thousand calcium-starved pick-and-shovel men in Candelaria Graveyard, three kilometers south of Porto-Velho, midway between that town and Santo Antonio—the Matto-Grosso district explored by Theodore Roosevelt.

The laborers, fed on white flour imported from New York, ate enormous quantities of hard white crackers and tapioca, both of which are practically pure starch products somewhat similar to farina, cream of wheat, corn flakes, Post toasties, puffed rice and other decalcified denatured cereals.

On top of this they put away coffee, sugar, lard and xarque. Xarque is dried beef, for which they had an occasional substitute of dried codfish, smoked ham or bacon. The cheapest food in camp consisted of "sinkers," a heavy doughnut fried in lard. From all these foods the calcium had been removed, and with it the life went out of the tissues of the workers.

Before death, when the calcium starvation was coming on, they complained of shortness of breath, fluttering of the heart, tremor of the nerves. They all developed "swollen ankles." The company physicians were unable to do them any good. Medicines had no effect upon them. They lacked calcium and all that goes with calcium in unrefined foods. They couldn't get it, so they died and bankrupted the railroad. Two engineers survived. Whole wheat bread and pure milk would have saved them all.

When the appalling history of the Madeira-Mamore poison squad holocaust was written by those engineers, all reference to the deaths by white bread starvation among the laborers, after a conference of the railroad officials, was blotted out. The officials

thought the public might misinterpret the facts at the expense of the country through which the railroad had been projected, and it was decided as a good business policy that no mention should be made of the tragedy in the various articles written for electrical, engineering, and scientific publications.

When P. H. Ashmead, chief engineer of construction, himself a victim of white bread acidosis, reported on the number of deaths in camp, exception was taken to his figures and his list of four thousand victims was arbitrarily cut in two so that in the records of the tragedy only two thousand names appeared.

Ashmead, one of the best known consulting engineers of New York, on the day he discovered the first symptoms of his approaching breakdown, determined to take passage for England on the next vessel out. Terrified by what he saw going on about him he had good reason to fear that he, too, was entering the shadows of death.

Fortunately for the world at large, he kept an account of all that had occurred, and how, after he discovered that he himself was breaking down, he found a comparatively quick return to health and usefulness by saturating himself with the juice of a high-power calcium food. Why he did what he did, and what happened thereafter, though completely detailed in the Science of Eating, are reported here in order to drive home another calcium truth.

When Chief Engineer Ashmead discovered in his own case symptoms similar to those exhibited by the dying laborers of the Madeira-Mamore Railroad Company he promptly abandoned his work and sailed for England. On the ship he found plenty of oranges. Throughout the entire journey he ate little else, and after landing in England he continued to saturate himself with orange juice, freshly expressed from the fruit, not purchased from a vendor of sweetened and colored water containing a little orange juice, an abundance of citric acid and a lot of artificial flavor and H_2O from the spigot.

Within sixty days his heart symptoms had disappeared and, excepting a depressing sense of lassitude for the following six months, he was apparently none the worse off for his experience.

Oranges, especially the Florida variety, are base-forming, calcium- and potassium-crammed fruits, the value of which consists in their feeble fruit acids and their precious alkaline mineral salts.

The salts are united with the tartaric, citric and mallic acids that produce the agreeable fruit flavors. The acids, which are extremely "weak," are quickly burned up (oxidized) in the body and the alkaline carbonates are thus made ready for use.

In all food deficiency disorders in which the tissues react to the poison of the acid fluids in which they are bathed the alkalinity of food calcium and potassium is worth a hundred dollars an ounce. Ashmead got quickly and in a readily assimilable form, through his orange juice, much of the alkaline salts that had been stolen from his refined bread and meat diet. The others didn't get them. They died. Ashmead lived.

H. F. Dose, one of the Madeira-Mamore engineers who devoted three years to the completion of the work started by Engineer P. H. Ashmead, made numerous observations covering his experience and kept in close touch with the twenty physicians of the railway company. Three of the physicians were stricken with the four thousand pick-and-shovel men and died.

How came it that all these human beings were so quickly decalcified? Why wasn't the disease spread out over years, as it is in America? Why were its fatal results bunched in a lump so gross and gruesome that it could be seen without field glasses?

Here's the reason: The laborers received \$2.40 a day. The Commissary Department charged them a dollar a day for their food. With the balance they could buy a half-pound tin of glucosed jam, or a No. 2 tin of canned sauerkraut, or a thirteen-ounce tin of canned sausage. Any one of these tins cost them a dollar. The three together cost them three dollars.

These foods did not offset their regular diet, which, as we have seen, consisted of white bread, white crackers, "sinters," and tapioca, having the same denatured food value as farina, cream of the wheat, corn flakes, degerminated corn meal and polished rice. The extras of lard, coffee, and xarque (dried beef) only hastened the decalcification.

All these foods are decalcified. The tissues of men who live upon them exclusively can't escape decalcification quickly. Decalcification means death. That's why Ashmead craved orange juice—for the calcium it enabled him to lap up.

Americans eat many offsetting foods; not enough to repair the great damage, but enough to postpone the breakdown which the pick-and-shovel men suffered so quickly.

If only three of the physicians of the Madeira-Mamre Railway Company died when there were twenty of them, and if a number of the officers escaped, why were there so many deaths among the pick-and-shovel men? Why are four thousand men buried in Candalaria Graveyard? These are pertinent questions.

Unrefined oatmeal and condensed milk were served at the officers' quarters. The pick-and-shovel men didn't get any. The officers also, and this means the physicians too, had plenty of dried fruits, nuts, and potatoes, with fresh meat obtained by slaughtering an occasional beef steer imported on the hoof.

Chief Engineer Ashmead ate largely of the white bread, "mashed potatoes" and fresh meat. Potatoes steamed in their jackets would have helped him, but "mashed potatoes" did not help, because the potatoes had been peeled and boiled, and in the boiling not only the calcium but the potassium went out in the water, and the water was thrown away and the starch served.

The fresh meat he ate would have killed even a dog in time, unless the dog had been able to get a plentiful supply of bone. Ashmead did not eat bone, and for this reason fared no better than a dog would have fared under similar circumstances. Not "fresh" meat, but any other kind of meat, lacks the alkaline, base-forming substances essential to the normal alkalinity of the blood and tissues.

Some of the doctors ate the way Ashmead ate. Ashmead got out of camp. The doctors stayed there. Ashmead would have died hadn't he got that orange juice. The three physicians who ate as he ate didn't get any orange juice. That's why they died. Those who escaped had enough to help them avoid the grave.

In food deficiency diseases such as decalcification, which may mean scurvy, beri-beri, anemia, neuritis, acidosis, etc., the tissues are bathed in irritating acid fluids. The alkaline mineral salts of fresh fruit juices, vegetables and greens invariably prove of great benefit in neutralizing these irritating acids. The orange, grapefruit, grape and lemon are exceedingly helpful in such disorders.

The peculiarly pleasing fruity odor of ripe fruits is due to the presence of ethereal bodies which completely elude chemical investigation. No chemist knows just what they are or how they are produced by Mother Nature.

Artificial fruit flavors made in the laboratory from coal-tar, ethers, esters and aldehydes are not substitutes for real fruit. Not

only have they no nutritive or medicinal value, but in many instances they are actually dangerous, their use merely serving to make palatable such forms of foodless foods as could not otherwise be swallowed—corn-starch, for instance.

It wasn't the flavor of the orange that Engineer Ashmead hungered for. What he wanted was the medicine of the orange, its alkaline earthy salts, its calcium and potassium. There was no calcium in the Madeira-Mamore poison squad diet. There is no calcium in the orangeade and other so-called fruit-flavor soda waters which your prohibition friends are perfectly willing your children shall swill till doomsday.

Wherever you have refined food and artificial food you begin at once to deal with tuberculosis. It is significant that tuberculosis swept through the Madeira-Mamore camp. We shall learn something from that fact.

Engineers Ashmead and Dose, from whom the writer obtained in person the Madeira-Mamore facts which have come over from the "Science of Eating" into these calcium nuggets, informed him that quite as many of the pick-and-shovel men died of tuberculosis as of the disease the doctors called beri-beri, which was the name given to the decalcification of the blood and tissues of the four thousand laborers whose bodies now lie in Candaleria Graveyard.

All engineering enterprises, all army expeditions, all exploring adventures in which, through accident or ignorance, the base-forming elements of food are not properly provided for, meet with the same fate. How can we forget that in a modified but none the less serious form our American school children, particularly the children of the poorer classes, are robbed of the elements of a base-forming diet?

We steal the calcium, we steal the potassium, we steal the other mineral salts from their dressed beef, pork, lamb, ham, white bread, soda crackers, wafers, biscuits, doughnuts, buns, rolls, pie crust, lard, lard compounds, cake, corn flakes, corn-meal, farina, tapioca, cream of wheat, polished rice and corn-starch.

What we steal from them we don't put back and never will until we return to whole wheat, greens of every kind, fresh vegetables aplenty including cold slaw, ripe fruits, particularly oranges, beans, peas, properly cooked potatoes, and the other root foods such as carrots, parsley, turnips, beets, egg yolk, good milk and a strict minimum of meat.

Americans who partake generously of refined, processed, patented, prepared foods do not heed the fact that there should be, and where natural food is concerned there is, a nice balance between the acid-forming and base-forming substances in the mineral content of all food. They disregard the fact that from the patented foods the base-forming substances have been processed out, leaving an excess of acid-forming substances.

They do not seem to be interested in these phenomena, or that after a diet of refined food a mild, chronic acidosis is set up, which actually withdraws calcium salts from the muscles, nerves, cartilages and bones. In a severe acidosis, due to a continuous bombardment of refined foods, the limbs begin to swell. This swelling is due to the loss of calcium salts and the increased vascularity that follows.

Americans are constantly consuming patent medicines in the hope of curing irritability, weakness of the muscles, neuralgic pains, yet the loss of calcium salts from natural food always causes irritability, weakness of the muscles and neuralgic pains. The continued loss of calcium salts causes effusion into the joints. The mildest of these symptoms is a red light, a danger signal, a warning, a call for fresh vegetables, orange juice, egg yolk, whole wheat bread, whole grain breakfast foods, pure, sweet milk and cabbages.

This does not mean that one should cram with such foods. It is a mistake to overload with any kind of food. It does mean that one should get back to nature, not with the crazy enthusiasm of a fanatic or a fool, but quietly, sanely, and without worry.

Reliance upon refined foods is frequently justified by shallow thinkers on the ground that they obtain plenty of "offsetting" foods which completely repair the damage that would otherwise be caused. They cannot obtain "offsetting" foods in adequate quantities, regardless of their theories, for the very good reason that their stomachs aren't big enough to hold the load that would be required.

In the meantime a condition of mild acidosis is invited into their homes. If their own food habits are imposed upon their children this acidosis progresses sufficiently to interfere with their growth, robbing them through lowered vitality of their natural defense against disease. Moreover, it imposes a tremendous

handicap upon pregnancy and lactation. It predisposes to tuberculosis, pneumonia, appendicitis, measles, constipation and cancer.

In the greatest white bread eating country in the world, the United States, 100,000 persons are killed by cancer every year. In Chicago alone 2,663 died of the disease within a year, while the deaths from tuberculosis in the same city numbered 1,957. Dr. J. E. Rush of the American Society for the Control of Cancer informs us that more persons are dying in the United States each year from this disease than America lost through gunshot in the World War.

The origin of cancer is shrouded in mystery. No one can say confidently that he knows exactly what causes it. Nevertheless, it is curiously preceded by a long history of white bread and meat. The persistent significance of this phenomenon is gradually receiving attention in medical circles.

§ 7—KAISER'S SAILORS AGAIN

Of more significance than the Madeira-Mamore poison squad experience was the experience of the kaiser's sailors aboard the converted cruiser *Kronprinz Wilhelm*. This crew lived for 255 days in 1914-1915 by raiding French and British merchantmen. During all this time the raider never put into port, obtaining from her victims fuel and food sufficient for her career.

Before bombing the enemy ships which her great speed enabled her to overhaul, she confiscated their frozen beef supplies, their white flour, lard, cheese, ham, bacon, sugar, tea, coffee, rice, sweet biscuits, potatoes, etc. For 255 days her crew lived on these typically decalcified American foods. They were not interested in the fact that acidosis, even of the mildest type, is the forerunner of tuberculosis and other diseases that follow in the wake of lowered vitality.

They were too busy sinking ships to bother with the fact that acidosis is the most relentless calcium destroyer that ever runs amuck among the wreckers of human tissue. They had never heard of Scandola, who has demonstrated that nothing promotes the elimination and loss of calcium with such rapidity as the use of decalcified white breadstuffs, sugar and meat.

They weren't interested in the work of Drennan, showing that the loss of calcium may cause a fatty infiltration and fatty degeneration of the liver cells. It was enough that they got hold of the decalcified food that they thought would keep them alive. Just what happened and how it happened is related in detail in "The Science of Eating" published by George H. Doran Company. We can touch upon it here only in brief.

When the sailors aboard the converted cruiser *Kronprinz Wilhelm* were playing hide-and-seek with French and British merchantmen during the stirring days of 1914-1915, they knew very well that they could escape death in two ways. Their speed would enable them to avoid the battleships of the British, and their own raiding ability would enable them to avoid starvation.

It was enough that they were able to take from fourteen enemy vessels all the decalcified, frozen meat, white flour, lard, cheese, ham, bacon, sugar, rice, sweet biscuits, potatoes, tea and coffee for which they could make room. They had so much to do to others on the high seas there was no time to worry over what such food might or might not do to themselves before the completion of their task.

Consequently they gave no heed to the fact that where decalcified food is consumed the calcium supply of the blood is diminished, and that when this happens the blood will not coagulate on demand during life, and even after death a post mortem will reveal hemorrhages in the long bones. It never occurred to them that while they were ravaging the enemies' ships from without they themselves were being ravaged from within.

Their foods were not only decalcified; they were also deficient in the other mineral salts that accompany calcium. They just went on raiding and eating and ravaging and being ravaged. What happened to them and how it happened, and what it all means to the readers of this narrative, is about to be explained. The medical profession, as well as the mothers of children, are invited to heed.

The *Kronprinz Wilhelm* raiders might have considered that in the ordinary meat-containing diet loaded with white bread and denatured breakfast foods, man, to some extent, offsets the acidosis that follows such demineralized food when he consumes milk, egg yolks, celery, lettuce, spinach, carrots, cabbages, parsnips, beets,

cauliflower, string beans, oranges, melons, berries, and other fruits and vegetables.

They might have considered all this, but they didn't. That their raided diet had been robbed of its calcium and other mineral salts for purely commercial reasons meant no more to them than it now means to the Americans who aren't interested. The 500 men aboard the *Kronprinz Wilhelm* couldn't get any part of these offsetting foods because they had been reserved for their officers' use.

None of the officers collapsed though all were anemic, but by the two hundred and fifty-fifth day the crew, full of roasts and steaks, mashed potatoes, fried potatoes, biscuits, white bread and sweets, were a crew no longer. A hundred and ten of them were paralyzed. That's why all America was startled at the sudden apparition, in the early morning of April 11, 1915, lying at anchor in the James River, off Newport News.

The *Kronprinz Wilhelm* had abandoned her raiding career on that famous Sunday morning. She didn't know that some day she would carry American troops to France. She did know that a hundred and ten of her five hundred men were prostrated, and that the others were on the verge. She didn't know that she had been decalcified by America's white bread, meat and mashed potato diet. She didn't know anything except that she had been undone and that her once proud bearing had suddenly developed shrunk shanks.

§ 8—WHITE-WONDER-LOAF

An Associated Press dispatch dated November 6, 1922, reporting the discovery of a method of extracting the vitamins and mineral salts from the germ and bran of whole wheat, so that they might be used by the American public in its effort to take the curse off white bread, succeeded at least in explaining the cause of the collapse of the *Kronprinz Wilhelm* crew.

For ten years America had known, without heeding, the facts brought to public attention through the most famous poison squad experience of history. Scientists representing Yale Medical School, Harvard Medical School, Johns Hopkins Biological Laboratories, Mellon Institute of Industrial Research and George S.

Ward, the baker, reported in a very astonishing, yes, in a very spectacular way, that any loaf of white bread made from patent flour or any other form of denatured or demineralized flour, would kill animals within a few months.

The *Kronprinz Wilhelm* episode proved very much more than this, but no scientist connected with any of the universities that have figured so prominently in the "great discovery" would open their mouths as to what it all meant. The millers of patent flour, bleached and unbleached, and the bakers of white bread, howled down all the facts and everybody who attempted to recognize them.

Alas, what could they do now? Could they howl down Harvard, Yale, Johns Hopkins, and the rest? Their own George S. Ward, a baker of white bread, had proved that white bread was grossly defective; admitted the facts; and at least, as far as Boston was concerned, had attempted to give the people, in addition to his whole wheat loaf, a loaf of white bread in which extracts of whole wheat were introduced with enormous quantities of whole milk solids, in an effort to cure the deficiencies of white bread. It required courage of a high order for a white bread baker to do that and though we could not sympathize with George S. Ward's program we honored him for it.

It is indeed odd, not to say startling, that the new loaf of white bread labelled Vitovim, and advertised in Boston, November, 1922, by the old Ward Baking Company, contained a generous dose of added calcium phosphate, calcium carbonate and calcium sulphate.

The loaf was made of unbleached white flour, plus 5 per cent. of an extract of whole wheat germ and bran, and 10 per cent. of whole milk solids estimated on a dry basis.

As the milk was introduced in the form of powder it became possible to incorporate in the loaf very much more of this precious ingredient than could have been absorbed had it been introduced in the liquid form. Ten pounds of dry milk solids represent the equivalent of eighty pounds of whole milk in the fluid state.

These additions, including two and a half pounds of added mineral salts to the hundred, were advertised in the newspapers as representing a formula worked out by professors connected with Yale, Harvard, Johns Hopkins and the Mellon Institute.

The advertisements, although paid for by one of the largest white flour baking corporations in the world, demonstrated that

the defects of white flour bread could be cured by the improved loaf. This was the first instance in the history of the baking industry in which the denatured character of refined white flour was specifically admitted and inferentially condemned by a white bread baker addressing the consumer through paid advertising.

It was established and publicly proclaimed through an extensive campaign that white rats, white mice and pigeons died quickly on a white flour diet, whereas with the additions described above they thrived through numerous generations.

Calcium played an important part in the philosophy of the new white bread, which at that time (1922) had not yet advanced upon New York City. Yet calcium was not the secret of the new loaf's goodness. That secret was more profound than any calcium secret has ever been or ever will be.

At any rate the writer endeavored to convince George S. Ward of the difficulties such a loaf would encounter in its effort to win popular approval. We were then associated with the old New York *Globe*, and through our relations with the general public could not escape the conviction that such bread, however meritorious, would not be able to make its way through the world and must eventually disappoint the high hopes of its sponsor.

In the first place, to obtain sufficient wheat germ (with the other ingredients employed) to cure the defects of white flour as now milled, the world would have to produce six times more wheat than its present average. What was to become of the unused by-products left over after the extraction of the germ? Who was to pay for this enormous waste?

The project wasn't economically sound, and the writer incurred the wrath of George S. Ward by saying so publicly. In fact, although as his guest we had visited the germ extraction plant at Youngstown, Ohio, and could enthusiastically approve the purity and wholesomeness of all the raw materials entering the loaf, our attitude toward the finished product was so obviously unsympathetic that the Ward Baking Company, as then organized, made vigorous efforts to discipline us when the new loaf was finally brought to the metropolis.

Numerous full-page advertisements of the new bread were distributed among all the metropolitan newspapers, including the old New York *Globe*. The day before the release of each piece of

copy the *Globe's* order would be cancelled and the advertisements would appear in all the papers except the *Globe*.

When the *Globe's* advertising manager sought an explanation of this significant phenomenon he was frankly informed that the *Globe* would publish the advertisements like all the other papers as soon as McCann saw fit to change his attitude toward the loaf. William Shillaber, Jr., one of the owners of the *Globe*, applied all the pressure he could command in an effort to force us to see the issue through the eyes of "good business."

The change of attitude vehemently, even frantically urged, could not be brought about in good faith. In consequence it was never brought about at all and the *Globe*, gazing enviously upon the flood of profitable advertising pouring out upon its rivals, had to be content to go without its share of the riches thus lavishly squandered. To his honor be it said that H. J. Wright, the *Globe's* editor, supported the writer unwaveringly in his stand.

Nearly \$2,000,000 were spent in a futile effort to make the people eat this fortified white loaf.

The old Ward Baking Company sold out and retired from the field. The new Ward Baking Company, under the management of William B. Ward, immediately discontinued the production of the novelty bread and withdrew it from the market. The writer's advice to George S. Ward, had it been followed, would have saved the old Ward Baking Company several millions of dollars. That money if it had been spent in advertising the truth concerning genuine whole wheat bread made of wheat freshly ground would have worked a miracle in the bread industry.

We say this for the reason, as we shall see a little later, that certain extraordinary facts have fully vindicated the eagerness of the public to eat genuine whole wheat bread made as it should be made wherever the truth, accompanied by obvious sincerity in presenting it, is adequately disclosed.

It was through no accident that the Medical Research Committee of the Lister Institute reported its astonishment at the discovery that white breadstuffs, including all the refined and demineralized breakfast foods and highly-milled grains comprise not only 55 per cent. of everybody's diet, but that in the case of most of the sick children of civilization white breadstuffs run up to 80 per cent. of the diet.

Whole wheat bread with milk and vegetables will support life at

its best. The novelty loaf which resulted in such a fiasco represented a really heroic and in many respects a praiseworthy effort to make white bread safe for human consumption wherever the public, through ignorance or caprice, fails to take advantage of the riches of genuine whole wheat bread and pure milk.

Not Yale University, nor Harvard, nor Johns Hopkins, nor Columbia, nor the Mellon Institute, nor any baking company had anything to do back there in April, 1915, with the spectacular recovery of health which broke in upon the stricken crew of the *Kronprinz Wilhelm* with a suddenness literally startling when compared with the subtlety of the attack under which their vigor had been broken down.

Scientific men then knew that any loaf of white bread baked in America would kill white rats, black rats, white mice, black mice, guinea pigs, or any other kind of pigs, pigeons, chickens, monkeys and men. The plain people neither knew nor cared. They were quite content to mull along as if any routine established through accident, habit or environment must be worthy of perpetuation.

They could see for themselves that millions of dollars were being spent to advertise the virtues of white flour under numerous forms. How could they be expected to look behind these advertisements when the upper crust of the nation's educational system displayed not even a blister to indicate that anything might be wrong within, below, beyond or behind?

About all the plain people could see was that the white flour millers and the white bread bakers, and the refined breakfast food manufacturers were advertising their denatured wares on all the street car cards, bill boards and electric signs of the country. They knew that the columns of the newspapers and magazines were filled with fine phrases and pretty pictures symbolizing the fetching qualities of one form of food which they were accustomed to eat three times a day.

The well-massaged and equally well-manipulated public, some of whose most outspoken citizens were learnedly proclaiming their lost faith in God, had plenty of faith in the beautiful art work and the sparkling rhetoric through which this and that rat-killing bread found public favor.

Nevertheless some "queer" things had happened aboard the *Kronprinz Wilhelm*. The stricken sailors were dosed up with soup made at low temperature, more than 75 degrees below the boiling

point, of wheat bran, cabbage, carrots, parsnips, spinach, onions, turnips, and potato skins. No; not potatoes, but potato skins, to which were gradually added whole wheat bread and egg yolks, orange juice and milk.

On a diet of denatured food stretched over a period of 255 days the German crew had surrendered 110 stricken men to a mysterious infirmity which defied all treatment. The date was April 11, 1915. During the next five days ten more sailors collapsed. April 16 the "queer" treatment began. Ten days later, April 26, forty-seven cases were discharged from the ship's hospital—on their feet. The others followed almost at once. We have experienced this phenomenon on scores of occasions with white rats, never before with men. The same physiological laws control both. The response of the sailors was the response of outraged Nature to the withdrawal of the offending factor.

Let us summarize the most sensational feeding experiment of history. We know that there were one hundred and ten stricken sailors aboard the *Kronprinz Wilhelm*, April 11, 1915; that two new cases were reported April 12; one new case April 13; four new cases April 14; three new cases April 15. We know that April 16 began the work of saturating the tissues of the men with soluble alkalines of vegetable origin, in order to neutralize as quickly as possible the acidity or acidosis into which their white bread and meat diet, over an experience lasting 255 days, had gradually pushed them.

April 17, 1915, no new cases were reported. Dr. E. Perrenon, "Chief Surgeon, S.S. *Kronprinz Wilhelm*," was elated. April 18 no new cases were reported. Many of the more recent cases manifested marked improvement. In eighteen cases the swelling in the ankles had subsided. Pain resulting from pressure over the nerves was not so acute. April 19 four men were so much improved they were permitted to go on deck.

April 20 fourteen men were able to leave the ship's hospital and return to their own bunks. Between April 21 and April 24 twenty-seven additional cases were similarly improved. One of the completely paralyzed could stand on his feet without help.

Let it be remembered that the cure consisted of no patented bread. It did consist of soup made of wheat bran, cabbage, carrots, parsnips, spinach, onions, turnips and potato skins, without the potatoes, plus orange juice, milk, whole wheat bread and egg

yolks. Any loaf of honest whole wheat bread in America will always perform its full share in the working of such wonders.

But what have all these *Kronprinz Wilhelm* facts to do with calcium? The question is a proper one, and it is fitting that Dr. E. Perrenon, chief surgeon of the *Kronprinz Wilhelm*, should impart the answer.

The crew, you will remember, left Hoboken, August 3, 1914. You will also recall that they had all the white bread, fresh beef, sugar wafers, tea biscuits, sweet crackers, mashed potatoes, canned vegetables, tea and coffee they could consume.

In January, 1915, five months after the raiding cruise began, two of the sailors flopped over with all the symptoms of a general breakdown. February 23 and 25 there were two more. March 4, 16 and 25 there were three more. In April the men dropped like ten-pins and continued to go down until their prolonged mineral fast was broken by the strangest prescription ever written.

This is Dr. Perrenon's answer to your question: "We had many cases of pneumonia, pleurisy and rheumatism. The men lost all resistance long before the epidemic broke out. When we had superficial wounds, cuts to deal with, they usually refused to heal. We had much hemorrhage. Among the accidents aboard, including fractures, the broken bones were slow to mend. Nature was not doing her duty."

We already know that in the absence of calcium the blood does not coagulate on demand; bleeding is profuse; the bones are broken down; in the young animal the bones refuse to grow. Calcium wasn't present in the diet of the *Kronprinz Wilhelm* crew. That's why they collapsed. When the calcium was restored in natural food their health was restored, for the reason that the calcium couldn't be put back without bringing everything else they needed with it.

When Congressman Walter M. Chandler reported the *Kronprinz Wilhelm* episode to Surgeon-General Blue of the U. S. Public Health Service, he said: "Apart from all considerations of public policy or official recognition of unofficial but well-corroborated facts, there is an element in this *Kronprinz Wilhelm* situation which demands the recognition of this government and the profound attention of its experts."

The magnitude and significance of the affair were obvious. Its general bearing on the physical welfare of millions of growing

children who rely with betrayed confidence in the white bread and decalcified breakfast foods of America was clear. The nation's experts were really on the peak of a newer and wider outlook upon the sadly neglected field of food research.

The year 1915 was crammed with nutritional dynamite. The experts did nothing. George S. Ward wasn't interested. When he did get interested he financed the experiments at Harvard University, the Mellon Institute of Technology, and retained various professors of Yale, Johns Hopkins and Columbia to determine what's wrong with white bread, how soon white bread will kill rats, and why it kills them.

These universities neither lacked incentive nor inspiration to find out for themselves years before George S. Ward manifested a readiness to pay the bill. Before the *Kronprinz Wilhelm* inspiration there had been many others. The universities were silent. At last, with the aid of an Associated Press despatch, they spoke with a loud voice. The big result is that honest whole wheat bread became more important to America's diet than commercial professionals have ever heretofore dared to admit.

As far back as 1907, fifteen years before the appearance on the market of the new alkalized bread which had so deeply impressed Harvard, Yale, Columbia, Johns Hopkins, the Mellon Institute and the Associated Press, Drs. H. C. Sherman and J. Edwin Sinclair were reporting from the Havemeyer Laboratories, Columbia University, that certain foods contain an excess of acid-forming substances, and that other foods contain an excess of base-forming, or alkaline substances.

With Dr. Gettler, Dr. Sherman had demonstrated that the foods which the *Kronprinz Wilhelm* sailors subsequently consumed were every one of the kind that contains an excess of acid-formers. Sherman, Sinclair and Gettler are really entitled to the credit for the recovery of the *Kronprinz Wilhelm* crew.

It was their research that suggested as a cure to the writer the opposite of that which had caused the disease. Hence the alkaline vegetable soup, the alkaline potato-skin liquor, the alkaline egg yolks, the alkaline whole milk and orange juice, and the germ and extractives of wheat bran and whole wheat bread.

The men were forbidden acid-forming fats, egg albumen, cheese, meat, white flour and sugar. None of this looked much like science, but it did look a deal like common sense. If one thing

stood out above anything else, it was the conspicuous fact that in the dietary of the German seamen the alkaline bases had been distinctly absent for 255 days. Obviously to get them back was no fool's mission. That the Germans responded almost instantly ought never to be forgotten.

§ 9—WE MUST HAVE IRON

From calcium the step is a short one to "iron and manganese." The public for years has been consuming "beef, iron and wine" by the hogshead. Thousands of puncheons of "iron and manganese" have been ingested by way of the tonic route. Iron pills and pellets, exasperated iron and nauseated iron, have made fortunes for patent medicine-mongers who are even more astute and accomplished in human psychology than the professional politician.

Iron and manganese are so essential to growth and health that without them this planet would be indeed a sterile promontory. Life would be inconceivable. On the assumption that the average person is easily confused with respect to disease, its cause and cure, and on the further assumption that there is more superstition than anything else on earth, the patent medicine and patent breakfast food barons have organized a new school of opera bouffe science based on iron, iron, iron and more iron.

The phenomenon would be serio-comic if it were not too serious to be comic, and too comic to be serious, yet under it all is the food-iron of the world, and no other kind of iron. Happily this food-iron is abundant and within the reach of everybody. Unhappily, everybody doesn't know how to acquire a share of it.

For this reason we shall try to explode the superstitions and confusions to the end that we may learn what we all ought to know about the iron element of our bodies.

Neither the inorganic iron salts found in minute traces in certain drinking waters, nor the inorganic medicinal iron preparations sold by drug stores to pale people, can replace in any way the complex, organic iron compounds of greens, egg yolk, whole grains or vegetables. Not one man in a million has ever seen chemically pure iron. Such iron can be produced only in the

laboratory. It is not at all like the thing people ordinarily recognize as iron.

It will surprise most folk to learn that chemically pure iron is nearly as white as silver and much softer than ordinary bar iron. Vegetable or animal life is not possible in the absence of iron. Yet notwithstanding that the iron needed by the human body is food iron, not drug store iron, which is no more like food iron than pot-metal is like the mechanism of a fine watch, the prepared food manufacturers assume the right to remove it from their products.

But let us hurry into our subject. Socin fed two groups of mice; one with refined food from which the iron had been removed, plus drug-store iron in the form of iron chloride. The other group received the same ironless diet, plus the addition of natural food iron in the form of egg yolk.

Before the thirty-third day of the experiment all the mice on the drug-store iron diet were dead. On the other hand, the egg-yolk iron manifested its potency from the very start. The mice that got it did not become anemic, nor did they die. The writer has made a biscuit of whole wheat flour, whole eggs and sugar that will sustain the life of albinos generation after generation. It contains iron.

What Socin did to mice when he fed them ironless food, plus a little drug-store iron, Lelensky did to dogs. Although it required thirty-three days to kill the mice on a refined white flour diet, it didn't take so long to overcome the dogs. Lelensky wanted to know what effect an ironless diet would have upon the hemoglobin content of the blood.

Polished rice, like white flour, has lost all its iron in the milling process. In one dog fed on polished rice the percentage of hemoglobin dropped in nine days from 18.5 to 13.1. In another it fell from 14.8 to 11.3 in six days. The anemia became more pronounced as the polished rice diet was continued, and on the eighteenth day the dogs were dead of iron starvation.

On the subject of iron the physiologists don't need to do any more guessing; they now know. They have demonstrated time after time that the iron demanded by the body for its needs of oxidation, secretion, reproduction and growth must be obtained from food iron, not from iron pills or pellets. They know that from our patent cereals, our white flour, our store cornmeal, our polished rice, our refined foods, the food iron is removed.

They know that much of our vegetable iron is lost through ignorant methods of home cookery. They won't let advertisers mention their names publicly as to what they know and how they come to know it, yet they know very well that whole wheat bread contains all the iron it ought to contain, and in a form which works wonders, even though it won't cure cancer nor replace false teeth with real ones.

Because fruits and vegetables contain much water and very little protein or fat, certain well-known but strangely muddled dietitians regard all fruits and all vegetables with contempt. This contempt grows out of forgetfulness that fruits and vegetables are important sources of food iron.

For the reason that the iron compounds of meat from which the blood has been drained have a distinctly lower value than the iron compounds of eggs, whole wheat, vegetables and fruits, the famous Van Norden stresses the folly of relying upon meat as a source of iron for young children. White flour bread doesn't contain any iron because the wheat has been robbed. Milk doesn't contain any iron because the young animal stores up in its liver, before birth, all the iron it needs until weaning time.

On this account Van Norden, though recommending the use of meat in the diet of the grown-up, advocates no meat at all for the child. He says: "As far as our children are concerned we would do better by following the diet of the most fanatical vegetarians than by feeding the little ones as though they were just naturally meat-eating animals, according to the bad custom which prevails. If we limit the child's supply of fruit and vegetable iron we cause a certain sluggishness of blood formation and an entire lack of reserve iron such as is normally found in the liver, spleen and bone marrow of healthy, well-nourished individuals."

Professor Henry C. Sherman, of Columbia University, shows that the iron estimated in milligrams in one hundred grams of whole wheat is 5.2. Alas, how is the child to get this iron from white bread, milk or meat? Whole wheat bread and milk supplement each other *perfectly!*

Because Professor Henry C. Sherman is so well known and so well thought of in scientific circles, and because, connected with Columbia University, he comes so near home, our white flour millers, brokers and bakers ought to forget for a little while the ridicule which their caustic wit inspires at the expense of honest

whole wheat and remember that Professor Sherman has reported the results of an experimental dietary study conducted in New York City.

In that study it was found that a free use of fresh vegetables, whole wheat bread, and the cheaper sorts of fruits, with milk, but without meat, resulted in a gain of 30 per cent. in the iron content of the diet. It was also discovered that the protein value, the fuel value and the cost remained practically the same as in the ordinary conventional diet obtained under the same market conditions.

How is it that an intelligent community professing to think seriously concerning the physical welfare of children can ignore such facts? We now know that herbivorous animals get more iron in their diet than meat-eating animals, and that they not only live longer, but, according to Sherman, are also less liable to anemia while they live.

This phenomenon is not difficult to explain. The grass- and grain-eating animals get all the iron of their diet for the very good reason that when left to themselves they don't eat refined grains or denatured grasses. On the other hand, the human animal not only loses the greater part of the iron he ought to have through his inordinate addiction to white bread and denatured breakfast foods, but he also throws away a lot of it in the water in which his vegetables are cooked.

The light of the sun shines into the human body through windows of iron. Most people are regarded by cynics as ungrateful. Lacking gratitude for their benefactors in the flesh, how can they be inspired by this noble emotion where mere iron is concerned? Of course they are ungrateful to iron, for the reason that they are indifferent to it. They don't know that the chemical processes which transform earthy substance into living tissues are the same in plant and animal, with one striking difference in which iron is deeply involved.

They give no heed to the fact that plants can take non-living matter from earth and organize it into their own wonderfully complex structures. They don't know that animals cannot do this. Animals must depend upon plants to do it for them. Plants gather in their energy from the sun through a wonder-worker found in their green parts called chlorophyl.

Chlorophyl requires exposure to the sun's rays if it is to do

any part of its work. What this green coloring matter is to the plant hemoglobin in the red coloring matter of the blood is to animals and human beings. Without iron there wouldn't be any hemoglobin and, as far as a living human race is concerned, the sun would shine in vain.

Man gets his iron second-hand from plants, provided the plants haven't been robbed. The defenders of white bread know the extent of the robbery. They know that the iron is gone from white bread, and that it's for this reason that on a diet of white bread animals die. When they laugh at whole wheat bread eaters they don't mention iron. They just laugh. Iron doesn't impress a defective or a moron. Laughter does.

§ 10—DENATURED MILK AND EGGS

If the iron is taken from a prepared, refined or patented food you can have some justifiable suspicion of the fact. The loss of natural coloration keeps step with the bled-white exhaustion. White flour, cream of wheat, farina and ordinary store rice are white because they have parted with their iron and the other minerals associated with iron in the natural, unrefined grain before man debases it artificially.

It is true that these exhausted breadstuffs can be given an attractive complexion, but the gift does not restore the iron. Cream of wheat can be parched over a coal fire or a gas fire on a revolving pan and come out of the parching with lovely brown tints resembling the riches of whole wheat. Exhausted corn grits go into the hopper pure white and come out of the roaster with a caramelized, dextrinized, dusky hue, looking like a million dollars' worth of health and are advertised accordingly.

If you would really know how these foods have been debased, feed them to rats as they have been fed at Harvard, Johns Hopkins, Yale, Columbia, the Mellon Institute, and the McCann Laboratories. Yet people go on buying fancy packages of sophisticated fodder as if they would prove what has been charged against them by the medical examiners who rejected so many of their sons during the last draft on the ground that they were physically and mentally defective.

In the face of the facts which we are about to describe for the hundredth time, it would indeed seem that the skulls of those who persist in their defined food addictions are filled with a sort of mental mush which no prodigy of stirring can illuminate. They are quite as anemic and colorless as their foods are depraved. The history of the moron begins with the debasing of the food of his progenitors.

Eggs with very pale or colorless yolks may lack their normal content of iron, and also many other substances. Fortunately, the denatured food of the hen discloses itself through the yolk of the egg, which, had it been hatched instead of broken for the skillet, would have brought forth a feeble-bodied, and, if we knew the truth about the mentality of poultry, a feeble-minded chick. Unfortunately, the denatured food of the cow doesn't show itself so vividly through her milk, though such milk is just as undesirable as such an egg.

Science now knows through the laboratory work of J. S. Hughes, J. V. Fitch, H. W. Cave, L. F. Payne, F. E. Fox, and others, reported at the Symposium on Vitamins, Division of Biological Chemistry, American Chemical Society, at Havemeyer Hall, Columbia University, September 7, 8 and 9, 1921, that denatured cattle feed causes the milch cow to produce milk actually dangerous to children and calves, and that the same kind of feed fetches eggs from the poultry yard which do not hatch.

In the case of such milk there is no superficial test that will warn the parent against its continued use, even though calves fed on it at first become blind, then at the end of a few weeks throw fits, and later die. Every community should organize to give adequate supervision to the character of its milk supply. New York has done just that!

We see how denatured foods not only directly affect growing animals and growing children, but how, before birth and during the nursing period, such denatured foods affect them indirectly. When God allows Nature to gather iron for us in our foods, we should not permit man to act as if, in his superior wisdom, he would assure God that he might have done much better, had the work of creation been shifted by the Creator to the creature.

Early in 1921, at the St. Louis session of the American Chemical Society, announcements were made by Hughes, Fitch, and Cave concerning experiments which had been begun with milch cows

fed on grains robbed of their bran and germ, and corresponding in type to the polished rice, corn flakes, farina, hominy, and white bread consumed by men, women, and children. The object of the experiment was to determine not only the effects of such ironless and otherwise demineralized foods upon the cows directly, but indirectly upon the quality of their milk and upon the health of their calves.

The milk of these cows, when fed to their own calves, November, 1920, resulted in startling disclosures which America's white bread and denatured breakfast food eaters have heeded in about the way a butterfly regards the funeral of a great man.

America has too many tuberculous cows, nourished largely on processed by-product foods. America's children consume this milk ad lib. Would the butterfly be so kind as to observe the cows for a minute? Never mind the children.

For some time prior to the birth of the calves the cows had been fed on commercial feed. When born the calves seemed to be "quite normal" for the first three weeks. They actually "appeared" to grow. The cows themselves, up to the time the calves were born, appeared "quite well," after which they began to "fail rapidly," just as is the case so often among human mothers. You can't take away from a butterfly's diet the iron and other minerals without which cow, calf, woman, and child pay the price unless you want the butterfly to perish.

There are two kinds of iron, food iron and drug-store iron, just as there were two kinds of calves in the experiments that showed the scientists of the American Chemical Society why mothers ought not to be fed on denatured and demineralized refinements if their offspring are not to be cursed before birth.

One group of calves was fed on milk from cows properly nourished with whole, natural grain foods. The other group was fed the way so many humans are fed—on refined, denatured, ironless, commercial stuff. Both the cows and the calves of the first group thrived. They remained well and happy. The calves grew. The cows continued in health.

The cows of the second group did not thrive, and their calves, after seven weeks of "doing badly," DIED! In their official report to the Biological Division, American Chemical Society, Hughes, Fitch and Cave declared: "This shows that a mother

can produce a normal offspring and a large supply of milk (such as it is) and yet the milk will not support the offspring."

In the last four years 1,500,000 children under ten years of age have died in the United States. The census director at Washington notifies Uncle Sam without excitement that every year we can be sure that 175,000 infants under one year of age will perish under the Stars and Stripes. This sacrifice of infant life indicates that nearly 200,000 American girls annually enter the shadows of motherhood unfit to bring their babies into the world.

The facts are as true as they are brutal, but because they are brutal we think of them in connection with cows and calves and do not heed their application to our own women and children.

Any food iron fact that applies to cows applies also to humans, and in the same way and for the same reason to chickens. The experiments which we have been discussing revealed the fact that hens can be made to produce a large number of eggs, even when fed denatured foods—foods that have been monkeyed with, deironated, decalcified, demineralized.

But—either none of the eggs will hatch, or, depending entirely upon whether the hens *AND* the roosters get a small or a large quantity of whole food, unprocessed, containing the green chlorophyll, which is the same to plants as the red hemoglobin is to animals, the hatchability of the eggs shrinks and continues to shrink from the low figure of 60, where it should be 100, all the way down to 20 per cent.

In the tests of the cream and butter of the abused cows the so-called "fat soluble A" was absent. In the tests of the egg yolks of the abused hens the same deficiency was noted. This should show our professional dietitians and high power advertisers the danger of prescribing patented foods of which they know NOTHING.

For many years we have been bitterly criticizing commercial feeds, human and dairy, reporting scores of disasters obviously traceable to malnutrition. In one dairy herd we found that when the cow feed was fed to the horses that did the work around the farm, the horses broke down and did not recover until they were put back on whole grain horse feed. The denatured cow feed in a few months was able to burrow into their tissues to reduce the iron content of their blood; to lower their resistance to disease;

to put them just where our tuberculous cows and anemic mothers are ever found.

During the winter of 1924 and 1925 New York's poultry receivers were thrown into a panic through a federal embargo against millions of pounds of chickens shipped out of the South and Southwest. The weather was not unusually cold, yet as carload after carload arrived the shipping crates were found to be mere sepulchres of dead fowls. Those that survived transportation were stricken within a few hours.

The situation became so grave that the demand for poultry was practically killed. The farmers lost millions of dollars. All the fowl were "incubator birds." Unusually high grain prices during the preceding six months had influenced the farmer to skimp on their feed. The birds lost resistance. When disease attacked they had no defense.

The egg, next to milk, is man's best form of animal food. The grain that, as a single food, comes nearest to meeting the requirements of the egg-producing hen is wheat—not refined, whole! On account of its high price wheat is used sparingly. Whole corn is ordinarily used. The epidemic birds had little corn and no wheat at all. Had they been egg-laying hens any nation dependent upon them for the perpetuation of the species could have looked instant for the disestablishment of all its poultry pens.

Had the dead birds lived long enough to reach the slaughterhouses they would have been dressed for human food. Alas, what kind?

Birds in nature instinctively select foods that are good for them. Controlled by man's cupidity they perish. Man himself has no food instincts, yet he is controlled by the same physiological laws that bore down upon those dead birds with resistless pressure. What man lacks in instinct he must make up in knowledge.

We have seen how the milk of cows that have been fed on denatured food, and how the eggs of hens similarly abused are deficient in those mysterious properties, qualities, attributes, accidents, or whatever you, as scientist or theologian, may see fit to call them, although despite the names by which they are known, they are none the less indispensable to growth, health and normal existence.

No knave has adulterated this deficient milk or egg. The milk has not been skimmed, watered, preserved. The egg has not been

"improved" by that form of human trickery which turns over all the bacteria-laden "leakers" to the commercial baker. As far as appearances go the milk is natural and so is the egg, but in truth they are not natural at all.

Depraved food, robbed of its iron and all that goes with iron, operates directly upon the cow and reaches her milk. Such milk, we now know, does not support the life of calves, yet we attempt to feed our human babies and our growing children upon it. In the same way the same depraved food operates through the hen and reaches the egg. The egg does not hatch, yet looking for a prolific source of "vitamins" our dietitians tell us to go to the egg yolk.

These facts should demonstrate to all professionals the folly of prescribing foods of which they know NOTHING. Let us admit that to demand laws covering these matters would be away ahead of the time, even though it be well known to scientific men that the colorless egg yolk and the milk of cows fed solely for profit are having a contest with human health and life in which unhappily the latter cannot win.

So now we know that, if we take the iron, the "vitamins," or anything else necessary to health out of the food of a cow or a hen, these animals will at first produce milk and eggs at the expense of their own tissues, after which, having robbed their own bodies of the very substances previously stolen from their food, they will produce milk and eggs lacking essentials that their bodies can no longer supply.

For these reasons Dr. J. S. Hughes reported to the Biological Division of the American Chemical Society at Havemeyer Hall, Columbia University, September, 1921, that of the 600,000,000 eggs set annually in the United States not over half produce chicks. "A hen," he said, "that does not lay many eggs may actually lay a better egg than a hen that lays very many. After a hen has laid a number of eggs usually the eggs don't hatch, just as the cow that goes on producing milk after her own tissues are exhausted yields a product deficient in the essential materials that are deficient in her food."

Dr. Hughes was emphasizing what he called the importance of "vitamins," the "water soluble vitamin" in particular. He knew well that vitamins without iron, calcium, potassium, and the other

mineral salts essential to growth and life are of themselves utterly useless, inert, dead.

Assuming that his hearers required no explanation of this fact he went on to say: "It is very easy to stop egg production by cutting the 'water soluble vitamin' out of the hen's diet." Of course what happens to hens and cows happens also to human mothers and their children. What a pity such facts are comprehended with such difficulty by the very people who know all about all the isms and ologies in the world!

§ 11—PRECARIOUS VITAMINS

Is there any reason to believe that iron is essential to health, growth and life, and that the so-called "vitamins" actually fail the enthusiasts who, ignoring iron altogether, stress the tremendous importance of the very thing that fails them? Not only is there reason to believe precisely this, but in the experiments thus far conducted with mineral salts on the one hand and vitamins on the other the results have given many a shock to the vitamin popularizers.

Let us not forget what refined food, fed to cows before the birth of their calves, will do to the calves. After the calves are born we know they appear for several weeks, together with their mothers, to be "quite all right." Then they begin to develop a disorder of the nervous system, followed by paralysis, various forms of infection, and death. Before the end they suffer violent convulsions. Yeast vitamins are given without result. The convulsions continue and the calves die.

BUT when calcium salts are administered instead of the vitamins, the fits subside in violence and disappear entirely. Not only do the calcium salts cure the fits of the calves that have them, but they prevent fits when administered to calves about to succumb.

What do these facts signify, if not that extreme caution should be substituted by scientific men for the unscientific extravagance of speech which has been helpful to nobody but the patent medicine and patent food-mongers whose advertising departments so well know how to make use of half-truths.

You want to know the names of the authorities who disclosed

the fact that undernourished calves born of cows fed on refined food throw fits and die, and that yeast vitamins don't help them at all under such conditions, although the administration of calcium salts cures the fits when they occur, or prevent them when about to occur.

The facts were reported at Havemeyer Hall, Columbia University, to the Biological Section of the American Chemical Society, September, 1921, by Drs. Hughes and Dutcher. Speaking of the calves which had developed neuritic symptoms in which the head went back and the animals went wobbly before falling down with convulsions, Dr. Dutcher declared: "None of the calves with fits responded to the yeast vitamins. We did relieve the fits with calcium treatment. Those calves that had calcium added to their milk were prevented from having the fits. When the calcium was left out the fits came on sooner."

A hundred other experiments have revealed this: No matter how many different types of the so-called vitamins are fed to guinea pigs, rats, mice, pigeons, calves or babies, they will merely *relieve minor symptoms for a short time*. The suffering creatures subjected to a diet in which the iron and other mineral salts have been removed can never be brought back on vitamins, but they can be brought back, and have been brought back a hundred times, by restoring to the refined diet the very minerals that have been removed.

Honest whole wheat bread contains all the vitamins it ought to contain, plus mineral salts natural to the wheat, not additions of artificial origin.

But haven't we jumped the track entirely? Weren't we talking about iron, and haven't we gone right back to calcium? We have indeed for the very good reason that in nutrition, resistance to disease, growth, stamina, life itself, we can't keep iron separated from calcium, or calcium from potassium, or potassium from manganese. They go together. It's the combination, not the isolated element, that counts.

We have seen how the so-called vitamin, when extracted from any food, is a useless thing, an inert thing. Vitamins by themselves, if there are any, are no good at all. When all the mineral salts are left alone in unrefined food the vitamins, such as they are, are just where they ought to be if they are anywhere at all.

Take out the calcium, and your iron is handicapped. Take out

the iron, and your calcium is handicapped. If you gave a young animal a bushel of vitamins it would have neither blood nor bones unless you gave it iron and calcium. We don't know what an animal would look like without blood or bones. There never were any such animals. Vitamins are neither good nor bad for them any more than canary birds are good or bad for the Rock of Gibraltar. But without iron and calcium nothing can continue to live.

Here's another "but." BUT iron and calcium without all the other mineral salts working with them, through them, on them, under them, would be just as useless as vitamins. If you want more of the truth of this you can refer to the research reported August, 1922, in Bulletin 240 by the Connecticut Agricultural Experiment Station, or go to the library and read "The Science of Eating."

Dr. E. M. Bailey, in charge of the analytical laboratory of the Connecticut Agricultural Experiment Station, working with Helen C. Cannon and H. C. Fisher, has fed all the "vitamins" now on the market to rats. They used brewer's yeast, Cerevisine tablets and granules, Fleischmann's Yeast, Mastin's Vitamon, Magic Yeast, Medic Yeast, Merck's yeast tablets and powder, Phospho Vitamine, Phytamin, Vegex, Vitaco, Vita-zest, Yeastamin, Yeast Foam tablets, Yeast-tone Metagen, Ironized yeast, Yeastonic, Harris yeast vitamin tablets and powder, Nuxated yeast vitamin, etc.

Without mineral salts not one of these vitamins has any more value than a knot hole in a keg of nails. Some of them are absolutely worthless under any and all circumstances. The stuff called "Nuxated Brand Genuine Yeast Vitamin Tablets," administered as a source of "water soluble B" vitamin, was found not only to have no such therapeutic value, but in two cases it started the rats to the rat cemetery, whither they continued their journey until the nuxated stuff was discontinued and ordinary brewer's yeast substituted, whereupon the rats recovered.

Mastin's Vitamon was found to be just as useless as the Nuxated variety, although the sale of these preparations results in fortune for the fellows who employed them to collect cash from the crowd.

Even with the help of the Osborne and Mendel inorganic salt mixture the rats declined. Yet we continue to read vitamin advertisements in tablets and foods, as if they were based on truth and honesty. The whole wheat bread that contains everything includ-

ing mineral salts and vitamins, isn't advertised at all. Who has ever advertised the whole truth concerning milk?

Notwithstanding the ignorance of science with respect to the mineral content of natural food, as revealed by the confession of scientists that they have been in the habit of confusing natural food with refined food in many of their experiments, it is now proposed to manufacture artificial foodstuffs by chemical processes dependent on sunlight.

While Professors Henry Fairchild Osborn and Edwin Grant Conklin were advertising their monkey ancestry at the Cambridge convention of the American Association for the Advancement of Science, December, 1922, Professor S. E. Sheppard was advertising the Eastman Kodak Company at the same convention by demonstrating that, inasmuch as men have descended from monkeys or some monkey-like creature, there is a very good chance that food and fuel will eventually be manufactured chemically, thus freeing mankind from dependence on plants and animals.

Professor Sheppard spoke of photo-synthesis or sunlight chemistry, but he did not reveal how he is to put iron or potassium, magnesium or sulphur, calcium or sodium, iodine or phosphorus into artificial or chemical bread. He did not mention that millions of pale children owe their pallor to white breadstuffs and breakfast foods from which the natural iron has been removed.

He did not complain of the removal of that indispensable iron. Possibly he didn't think it necessary. Possibly the chemical food of the future will not require any iron. Possibly the chemical men of the future will be bled white, with white livers, as spineless as the jellyfish that a great man tenderly refused to step on when Mayor Hylan was at Palm Beach. Laymen don't need to understand such talk. What they want is their iron in natural food.

That Cambridge convention, in addition to the monkey resolutions of Osborn and Conklin, was full of animated dissertations respecting bugs, worms, beetles and infested cattle feed. According to Professor R. W. Doane, of Leland Stanford University, cattle fed largely on insects and beetles conveyed to them in the form of infested meal are none the worse off than gluttons who eat maggots in cheese or weevils in webby pancakes.

A ton of densely populated stuff was ground up and fed to a herd of twenty Holstein cows. Twenty others were fed on meal

free from infestation. The professor reports that the meal lost none of its food value through being eaten by beetles and bugs. The cows got quite as much nutrition through eating the beetles and bugs after the beetles and bugs had eaten the meal as the other cows were able to obtain by eating meal that had never been eaten by beetles and bugs at all.

Four other cows were fed on meal worse than this, meal that would have frightened Malthus out of his kilties, meal to which were added several extra quarts of beetles swept up from the floor of the warehouse. These overpopulated cows gave more milk than the plainly fed cows who got nothing to eat but decent, clean and wholesome food. This proves that beetles are good for cows; that beetles contain plenty of iron and vitamins.

The Dairymen's League should forthwith build a beetle factory, and the housewives of the country should launch the Lonely League of Weevil Eaters to the end that the crawling and creeping things ordinarily sifted from infected cereals may be given their proper dignity and put to proper uses. Wormy figs are all right! Wormy cherries and wormy chestnuts are wonderful! It used to be milk-fed chickens, but henceforth it will be beetle-fed butter! Science says so.

There is iron in the "ash" of foods, but no vitamins. There are ten ways of capturing the iron, and more than a thousand ways of NOT capturing a vitamin. The professors at the Cambridge convention of the American Association for the Advancement of Science, December 27, 1922, complained that the world can't keep pace with science because laymen don't understand what the scientists are talking about.

That word "ash" is a case in point. There is no "ash" in any food consumed by man or animal. We get no "ash" until we burn the food in an incinerator just as we burn coal in a stove, or wood over a pair of fire-dogs. "Ash" is what is left after combustion. This "ash" contains iron, but not in the form in which iron was found before the fire that produced the "ash." The fire had demolished, rearranged, broken down, destroyed the organic structure that existed before combustion.

"Ash" is merely a heap of ruins mutely assuring the passer-by that something noble has been destroyed. There is no "ash" in food. It is for this reason that the pharmacist finds himself stumped and baffled when he attempts to put back into a human

body an assortment of minerals that will do the work of the organic compounds sifted, bolted, leached and refined out of natural food.

When you learn that the "ash" of food contains no vitamins, which have presumably gone off in smoke, but that the same "ash" does contain iron, you must remember that the iron thus discovered is not at all like the iron in a living plant or the iron natural to a loaf of whole wheat bread. When the chemist speaks of the mineral salts found in "ash" he doesn't profess to know anything at all of the form in which those same mineral salts are found in the living cell of plant and animal.

The iron of foodstuffs (meaning unrefined foodstuffs, for there is no iron in the denatured, refined and patented pabulum so extensively advertised), is so photo-sensitive that any effort to get it out results in the formation of an oxide and in the complete loss of the medicinal properties which make it so indispensable to health and so essential to the prevention of anemia.

When a liquid food containing natural iron is sprayed over hot rolls or through hot air in order to reduce it to a dry powder it loses much of its food value. When such food is fed to animals they sicken and die, unless saved by other foods; when fed to growing children they do not thrive.

Experiments have demonstrated that much of the dry milk powder from which most of our so-called "ice cream" is manufactured, and which is now so largely used by bakers in an effort to give a "taste" to their tasteless white flour bread, is notoriously lacking in food value. Nevertheless, since it has become popular to advertise vitamins in bread, milk, pills, pastes and powders, many of these commercially dried milk products sold through the wholesale bakers' and confectioners' supply houses, are dignified by the claim, even though they are known to contain neither iron nor vitamins, that they are the source of both in the falsely advertised stuff. Yes, there are good milk powders, really wonderful foods, but they are confused with the bad.

All the scientific conventions held in America have put the news of their proceedings upon the Associated Press wires. Not one of them has ever come out with a denunciation of the criminal and commercial misuse for advertising purposes of alleged discoveries falsely pictured to an uncritical and gullible populace as "the discoveries of science."

§ 12—YEAST CRAVES MINERAL FOOD

As the tissues of the new-born animal contain six times as much iron as the milk on which it lives, we either have to face two facts squarely (and profit by them) or ignore them with stupid contempt (and pay the price). The first fact is that the child comes into the world with its own supply of iron—a supply which it cannot obtain from its mother's milk, for the reason, as we have already seen, that milk is notoriously deficient in iron. The second fact is that the child before birth obtains this store of iron from its mother.

Of course we ought to begin asking questions at once. Where does the mother get her iron? How can she get it from food which, through refining processes, has lost it? Does indifference to refined food robbed of its iron impose a heavy penalty on the prospective mother? How can the mother give to the nursling what she hasn't got? How can she expect to get from demineralized food what she ought to have?

If the physiologist knows anything, he knows this: The ability of the hemoglobin of the blood to take up the oxygen essential to life depends upon the iron it contains. In dogs fed on white bread the hemoglobin drops in a few days from the physiological average of 137.5 p.m. to 103.2. A few days later it drops to 93.7 p.m. With the decrease of hemoglobin the blood becomes more watery.

A diet of white bread and milk will make any school child anemic. A diet of whole wheat bread and milk will give not only to the child, but to its mother, the iron needed. Fresh vegetables will make the combination fool-proof, provided, in the meantime, that the mother doesn't get side-tracked through reading the crazy vitamin advertisements.

People talk flippantly about livers, kidneys, hearts and lungs. Great jokes owe much of their laugh-making power to brains, or the lack of them. Nobody ever speaks of the spleen, yet without the spleen in a healthy condition it is practically impossible to get iron into the body, and without iron the spleen can't be kept in a healthy condition.

When animals are experimentally nourished on food from which the iron has been removed a destruction of body substance begins to take place at once. The first alarming fact to be noted is that

the body begins to lose its iron. In dogs from which the spleen has been removed this loss of iron is much more rapid than is the case with normal animals. This fact would indicate that one of the functions of the spleen is to seize upon the iron set free in the destruction of the body tissues and work it up for further use.

One could hardly expect the spleen to do its full duty when deprived of the materials with which it works. We know very well what happens to the thyroid gland when deprived of its iodine, a fact which we shall soon consider here. With or without brains it shouldn't be difficult to realize that without natural food containing the iron it ought to contain, the spleen is handicapped.

Heart, lungs, liver and kidneys have had so much attention as to be quite commonplace. Brains get attention that doesn't belong to them, for the reason that most people manage to get along without brains. The spleen insists upon being noticed. Those who do not notice it and its needs discover that after all it's not such a bad thing to have just enough brains to enable one to notice one's spleen, and the unrefined iron-containing foods that give it a chance.

Dr. T. B. Wagner has prepared from corn, or rather from that part of corn which the refined cornmeal and denatured corn flakes manufacturers won't permit human beings to eat, a grayish-white powder which, if added to the nation's white flour buns, biscuits, rolls, rings, twists, crackers, crullers and white flour bread-stuffs, might take a little of the curse off them.

Experiments conducted, not on rabbits, guinea pigs, rats, dogs or pigeons, but upon living human babies at the Metropolitan Hospital, New York City, have established the value of the grayish-white powder which Dr. Wagner describes as "the salts of the corn."

In the hospital experiment the salts of the corn were described as "Vitamin," yet they actually contain 0.3 per cent. iron. Note this fact, and observe the tendency of the so-called vitamin enthusiasts to ascribe all their enthusiasm to a mysterious thing that has never been captured, while ignoring a score of well known factors that shriek for recognition and attention.

Next to the iron the grayish-white powder contains 5.6 per cent. silicon compounds, 10 per cent. calcium compounds, expressed as calcium oxide, 15 per cent. phosphorus compounds, 10 per cent.

moisture, the remainder being described as a double calcium and magnesium salt of inosite pentaphosphoric acid.

Just why the grayish-white powder, which does not now find its way into our refined breadstuffs, should owe its potency to a mysterious "vitamin" that nobody ever captured, weighed or measured, while the mineral salts, which are actually present in enormous quantities, and the functions of which in nutrition are quite definitely understood, are robbed of their glory, no one will ever know.

Yeast, which is one of the great "vitamin" reservoirs, is so loaded up with mineral salts that most people will be surprised to learn that it is not at all a mysterious little "enzyme" which goes around growing in laboratories for the benefit of starved rats. Out of a hundred pounds of yeast analyzed after drying, seven pounds are discovered to be pure mineral matter—the best in the world!

Yeast is a plant, a fungus, a member of the vegetable kingdom. It grows—very slowly in the dough that goes into white bread, but very rapidly in the presence of the right kind of nutrition. Mineral salts quicken its growth enormously. Give the yeast plant a chance, and it will do just what might be expected of it if we weren't so absurdly devoted to vitamins. It will sop up iron with great greediness, if allowed to. This means the iron must be present. It will sop up lime, magnesium, phosphorus, potassium, silicon, and sulphur with the hunger of a glutton if these salts are within reach. These are the real reasons behind the value of yeast; yet one never hears of them.

When yeast grows in whole grain beer it gets all the mineral food it needs and grows with such lusty vigor that chemists look on and say: "There is the most robust, strong, husky, lusty thing that grows." If the yeast is put into a solution of white flour and water instead of into beer wort it becomes anemic, loses resistance, gets "sick," and has to be revived. That's why some bakers are now feeding their yeast with mineral salts so it won't starve to death on its diet of white bread.

When "vitamins" are fed the feeder forgets that he is also feeding mineral salts, albuminoids, peptones and other substances. "Vitamin staggers" produces blindness, consequently the very visible mineral salts become invisible; the invisible "vitamins" look like the end of the world, and the wonder-working amino-acids are ignored altogether.

In 1918 George H. Doran Company, publishers, copyrighted the book then known as "This Famishing World," but now published under the name of "The Science of Eating." On page 140 appears the following statement: "The failure of vitamins when consumed without the assistance of the other food elements necessary to normal nutrition to perform the miracle of sustaining normal life and health requires little demonstration. However high their calories, or however abundant the vitamins, unless the other food elements, so wantonly destroyed by food refiners, are present the body cannot make use of them."

Since the publication of this "stuff" a hundred books have been published on vitamins; a thousand monographs have followed. Everybody writes about vitamins. They are so easy to write about that it has been discovered that the best way to acquire a Ph.D. degree, without labor, is via the vitamin thesis route.

The whimsical element in all this is found in the fact that all these books and all these monographs agree in all particulars with the "old stuff" published in 1918. Even more whimsical is the fact that not one of these vitamin books or vitamin papers mentions the subject of iron, calcium, potassium, phosphorus, or any of the other mineral salts without which there can be neither vegetable nor animal life on the face of this planet.

Nevertheless, it is the iron, calcium, and other mineral salts that man continues to remove from his diet while striving to create a fetich with a prayer: "Oh, Spirit of Confusion, vouchsafe to us in our sad hour of distress, that whatever essential we take out, we may at least put vitamins in."

The American Chemical Society, some of whose members have done much to emphasize the necessity of iron in the food of the people, is not as a body so deeply interested in iron as it might be. Commercial pursuits claim the larger share of its energies. Honey contains the tissue salts of the blossom from which it is derived. Its mineral content differentiates it from all other sweets.

Honey is a gift of God. The commercial chemist isn't interested because nobody will pay him a fee for tinkering with it commercially. Hundreds of millions of pounds of honey are wasted annually in the United States. Despite all this the American Chemical Society now urges the canneries that put corn, some of it horse corn, into tins for human food to start the work of

converting their corn-stalks into syrup to compete with sulphured molasses.

The American Chemical Society says that every canner of corn has sufficient corn-stalks available for the manufacture of from 30,000 to 80,000 gallons of this corn-stalk syrup every year. It's going to be a chemical age in addition to being a commercial one. Our children are going to be forced to eat refined foods, and more refined foods. Perhaps they might if they could only get enough pure milk to offset the overload.

If, in the face of all this refinement, they manage to get enough iron, calcium, potassium, phosphorus, and the other mineral solubles essential to health, strength, stamina and resistance, it will not be through the help of the American Chemical Society or the converted corn-stalks that promise so much by-product syrup from the waste heaps of the world. It will be through pure milk and honest whole wheat bread.

§ 13—SEEK NO IRON IN MILK

Despite the patent medicines, headache powders, nerve tonics, constipation cures, blood builders, and other self-administered doses taken daily, the victim of "food refinement" is taught by the advertisements that the deficiencies of white bread are made up by "a little egg," and that, although white bread contains no iron, "a teaspoonful of egg" more than offsets the deficiency and another "teaspoonful of gravy" completes the job.

The facts are that a one-pound loaf of whole wheat bread contains 70 grains of mineral matter, beginning with iron and ending with phosphorus. To get the same 70 grains of mineral matter one must eat two dozen eggs. An egg fresh enough to eat costs during this month of January, 1925, between 70 and 90 cents a dozen. So for \$1.50 we can get enough iron, phosphorus, potassium, magnesium, calcium, etc., to take the place of the quantity found in ten cents' worth of whole wheat bread.

These figures are not quite correct, of course, for the reason that a loaf of white bread, although it does not contain seventy grains of mineral salts and solubles arbitrarily labelled "vitamins," does contain eighteen grains, chiefly phosphorus.

In milling the whole wheat to white flour, at least four of the mineral substances are entirely lost, and many others reduced to a mere trace, so that a loaf of white bread actually contains fifty-two grains less than a whole wheat loaf. To supply these missing fifty-two grains exactly twenty-six ounces of eggs must be consumed. Twenty-six ounces are approximately two dozen, which is precisely what was said in the first place.

The iron deficiencies of a white bread and milk diet are easily demonstrated. It is not true, as Dr. Woods Hutchinson once said, that a teaspoonful of milk repairs all the damage chargeable to refined white bread. Not even Coué could make a teaspoonful of milk perform the miracle that would be required of it in order that Hutchinson's assertion might be made good.

A pint of milk weighs approximately 3,500 grains, of which but 24 grains consist of mineral salts, among which iron is notoriously lacking. Whole wheat bread, as we have seen, contains to the loaf 70 grains of mineral salts, including iron. White bread contains 52 grains less, and no iron at all. Thus, in order to offset the 52 missing grains considerably more than two pints of milk would have to be consumed, or just about three hundred times as much as the resourceful teaspoonful of Hutchinson's contains.

In these two pints of milk there would be, alas, no iron, so that milk never does, never did, and never can supply the iron deficiency of white bread. Because parents don't know this thousands of children are deprived of their birthright, and handicapped from the beginning of their growth to the end of their days.

Hutchinson intimated that if milk wouldn't do the trick, a mouthful of meat would suffice. The Madeira-Mamore poison squad had plenty of white bread, but no meat. The *Kronprinz Wilhelm* poison squad had plenty of white bread and all the meat it could consume. The results in both cases were identical. Neither the absence of meat nor its presence in any manner diminished or increased the nutritional poverty of the demineralized, refined, ironless white bread which wrecked both squads.

There is no iron in the blood of our federal and state departments of agriculture. By their very nature they are obliged to become anemic. Their function is not to interfere with business or the established order of things. We shouldn't have been greatly surprised, under such circumstances, when we learned, during the

first six months of 1915, two years before we entered the World War, that there were 11,000 applicants for enlistment in the U. S. Marine Corps, of whom but 365 were physically fit.

There should have been no murmur of consternation when the Surgeon-General of the Navy reported during 1916 that out of every hundred applicants for enlistment, seventy had to be rejected as physically unfit. Excitement wasn't justified at all when we learned that of 278,537 would-be soldiers the U. S. Army, between 1914 and 1917, rejected at the recruiting offices 205,281, or nearly seventy-four out of every hundred.

These red lights were danger signals, but nobody saw them, even when, at the recruiting depots, of those originally accepted for service and subsequently subjected to more rigid examination, another batch of 10,062 were rejected. All these rejects had been eating all their lives all the red meat and white bread, all the corn flakes, corn-starch, biscuits, pancakes, degerminated cornmeal, polished rice and patented breakfast foods they could consume.

The departments of agriculture had never interfered. They had watched the iron go out of the refined foods and out of the bodies of the would-be soldiers. The human rejects were piled up in disregarded waste heaps, whose votes would never be lost because they would never have sense enough to put the blame where it belongs.

The scientists attached to the New York State College of Agriculture at Cornell University who urge the owners of motor cars to put honey into their radiators to prevent freezing in cold weather, while parents are putting table syrups into their children in all kinds of weather, may not be conscious of the pity or the meanness of their recommendation. They are not all bad. Some of their colleagues, in April, 1917, issued a bulletin urging the people to consume, among other things, more fruits, peas, beans, succulent vegetables and whole wheat.

"Green vegetables," said the Cornell bulletin, "contain great quantities of iron, and iron enters into the composition of the cell nucleus, and of that part of the red corpuscle which carries oxygen. Iron is important for growth and for maintaining the blood in good condition. Children, young girls and women, expectant mothers especially, need a diet rich in iron."

Obviously good and bad alike may flow from universities despite

the extraordinary "faith" reposed in all such institutions by certain preachers who never took a course in any of them.

Cornell's iron contribution was good, and we shall try to forget the radiator-honey episode, if only for the reason that the Cornell bulletin published also this: "It is advisable to include in the daily dietary a certain amount of cellulose, frequently called indigestible plant fiber or roughage." The funny part of all this is that the Cornell Alumni have never heard that their Alma Mater urges the use of iron foods and whole wheat bread.

The skin of anemic women is white. The flesh of anemic women is flabby. The muscles of anemic women lack tone. When iron is withdrawn from their blood the roses vanish from their cheeks. That Djer Kiss stuff applied from the outside deceives neither God nor man. Iron deficiency as a disease baffles the medical profession, and there is no joy, energy, gladness, youth, vigor, health or life in a bottle of "beef, iron and wine" or in a rouge compact.

Tired and listless folk might well remember that polar explorers, without tired and listless beds in steam-heated rooms, but with indomitable courage, face the longest nights of the arctic winter when iron props their strength. The same tired and listless folk can easily determine for themselves that when the iron prop falls the polar explorer begins to pay tribute to misery, anemia, scurvy, mineral starvation and death.

We ought not to forget that experiment of Lelensky, who fed dogs with foods deprived of their natural iron. We know that dogs can live on any foods that will sustain a human being, yet one of Lelensky's dogs fed on an ironless diet suffered a drop in the percentage of the red coloring matter of its blood from 18.5 to 13.1 in nine days.

Mere figures are not important, but of great importance is this: The dog's anemia became more pronounced as the ironless diet was continued. If you eat white bread, overcook your vegetables, and then drain the water off and pour it into the sink instead of converting it into a sauce or a soup, you must expect to lose iron. Under such conditions milk will neither help you nor your child to replace this lost iron, for the simple reason that milk doesn't contain any iron.

§ 14—MYSTERY OF POTASSIUM

For the reason that potassium is so essential to the life of every animal and plant that there could be no life without it, Nature has flung it about with such prodigality that one may say it is among the most generously and widely distributed of all the tissue salts. Yet, notwithstanding its diffusion over the whole earth, the mineral potassium never occurs in a free state. It is always found in combination with organic and inorganic acids. It is never found pure.

There is no such thing as "pure potassium" outside the chemical laboratory or the flames of the sun, just as there is no such thing as pure starch or pure sugar anywhere in the world except in the chemist's hands. When separated artificially and thus recovered from any of its many combined states it is silvery-white in color, shines with a decided metallic lustre and becomes, like pure arsenic, an instrument of destruction and death.

There is only one metal, lithium, which is lighter in weight. Potassium is much softer than lead, which is ever so much heavier. In fact at ordinary temperature potassium is soft enough to be cut easily with a table knife, but at the freezing point of water it is quite hard and brittle, and breaks into crystals.

With the single exception of caesium and rubidium, potassium is the most electro-positive element in nature. Doubtless its electrolytical influence on the human body is deeply involved in the vital processes of life. Found in every healthy human tissue, we nevertheless tolerate a score of commercial processes that do their utmost to keep it out of the human dietary. Thus begins our potassium excursion.

Dr. Frank Crane says: "Vitamins are not foods, but they are elements that make food nourish us." What he meant to say was: "Vitamins are neither foods nor elements. Potassium is an element. Iron, too. Also calcium. Also all the other mineral salts of food."

Quoting C. Houston Goudiss, Dr. Crane, even though some people claim to have seen ghosts, admits nobody ever saw a vitamin, and says: "Men can starve while eating all the beef they want, or while consuming the correct amount of protein, carbohydrates, fats and mineral salts, which scientists formerly thought contained

all the elements necessary for the human body." Not Mr. Goudiss, not Dr. Crane, not any scientist in the world can prove any fragment of this assertion, which makes all the more wonderful the astounding ergo which flows from it.

"Vitamins are all the more important because they are mysterious." They are not at all mysterious. Their predecessors, the august calories that have died and gone to "Dr. Owen's Rest House," where all mortals departing this life are kept in a detention pen until they calm down, were hustled out of the domain of exalted pretense by potassium, which is about to hustle the vitamins off with as little ceremony.

Potassium with its fellows, the mineral salts, presents to the elusive vitamins quite as much intolerance as is manifested by the professor of mathematics who insists with no broadmindedness at all that "two and two equal four every day of the year, and have never, since the foundation of the world, equalled five and never will until the crack of doom." That sounds like dogmatism, but whatsoever it sounds like it is true. Equally true is the proposition that the whole wheat bread and pure milk contain not only all the potassium the body requires, but all the other indispensables in full measure.

Harvard, Yale, Johns Hopkins, Princeton and Fordham admit that nobody ever saw a vitamin. On the subject of potassium they are not so vague. They know that when kept in perfectly pure, dry air potassium undergoes no change, whereas in ordinary air it greedily unites with hydrogen and carbon, and puts on a film of potassium hydrate and carbonate.

They know that it possesses a truly insatiable thirst for water, and that when the two are brought together an extraordinary phenomenon occurs. Potassium undergoes a violent disturbance, sputtering and hissing in the basin in which it floats with such liberation of explosive energy that tremendous heat is elaborated. This heat is so ardent that it sets fire to the escaping hydrogen, which bursts at once into a beautiful lilac flame.

They know that chloride of potassium fertilizes the soil; that chlorate of potassium is used in sinking ships and blowing up bridges; that physicians prescribe nitrate of potassium for the sick; that carbonate of potassium saponifies fats and oils; that cyanide of potassium makes photography a joy. They know that Nature

abhors pure potassium and will not tolerate it, except under the most unnatural circumstances.

They know how important it is to the life of the individual who reads these words. They know that the professors who talk mysteriously about the necessity of adding vitamins to one's diet say not a word about the necessity of keeping the potassium in one's food, where it belongs, but on the contrary close their eyes while the food factory removes it and thus sets up, through the evil consequences that follow, additional proof of its profound importance to the health of the human tissues and the continuance of life.

Potassium is found most abundantly in the blood corpuscles, in the muscle protoplasm and in the fluid secreted by the glands of the body. Unlike sodium, which is recovered from the blood and other fluids in the form of a chloride, potassium is recovered chiefly as a phosphate. This means that in the cells it is combined not with chlorine but with phosphorus.

The cells are controlled by a power higher than themselves, and act in obedience to that power. They have no freedom. They are bound by a fixed law to select only what is essential to their normal life and purpose. This selective action is interfered with when they cannot find the substance to be selected.

But how can they be supposed to find what is partly or wholly removed in the food factory? When a cell becomes free through artificial interference, to act as it pleases, it goes crazy. Cancer cells are crazy cells. Potassium and the other mineral salts control what is called the normal osmotic pressure, which must be maintained between the contents of the cell and the body fluids in which it is bathed. Without potassium and its companions neither muscle nor nerve would respond to tranquillity or irritation, nor could the body fluids, including the blood, maintain the neutrality or slight alkalinity necessary to health.

Potassium and sodium antagonize and balance the calcium of the blood and tissues. The alternate contractions and relaxations of the heart depend upon this interplay of potassium, sodium and calcium. What food industry has a right to interfere with the presence of substances which Nature prepares so wonderfully for the normal food of man and animal?

Dr. J. Reynolds Green, Cambridge, not only knew the fact, but proved it, that in the life of the plant the mineral salts play

many parts and are necessary for the assimilation of the food of protoplasm. This is a big word and an important one, but not nearly as big or as important, as far as significance is concerned, as the thing itself.

Protoplasm is the vitalizing, growth-controlling, health-sustaining, life-maintaining material, not only of the plant cell, but of the animal cell. Some years ago it was the fashion among scientific experts to juggle with what they called "calories." If you didn't bow down and worship "calories" with the scientific authorities in the year of our Lord 1910 you were a scientific heretic, a poor, benighted dun, a relic of the dark ages encumbering an enlightened earth.

And now, although so few years have passed, it is no longer the fashion to mention "calories" in polite scientific society. The new scientific authorities regard you with contempt, as a sort of animated clod, if you challenge the new mysteries substituted for those now abandoned "calories." Having coined the word "vitamins," which only a few years ago (1921) they mutilated by cutting off the "e," they now spill as much one-sided enthusiasm into their lopsided erudition, on the subject of "vitamins," as they used to spill when "calories" were mentioned.

Not a word about potassium or any of the other mineral salts demonstrated by Pfeffer to be indispensable to the growth of plants, which, unlike animals, can utilize mineral food as it exists in the ground. What we are about to tell you concerning Pfeffer will be worth remembering.

Pfeffer, with ordinary tap water, made up a solution of potassium chloride, potassium acid phosphate, potassium nitrate, magnesium sulphate, calcium nitrate, and iron oxide. Into this solution he put buckwheat to grow. He then made other solutions from each of which he left out one or more of the mineral salts mentioned above. He did this for the purpose of finding out what would happen to the development of the buckwheat when deprived of this or that mineral salt.

Through these experiments he proved that the plant is affected injuriously and at once as soon as it fails to obtain any one of this group of minerals. The first thing he noted was that when sufficient potassium is present, as food for the plant, its sugars and starches are produced as they should be, and the plant itself

grows healthfully and normally, so that as it matures its flowers are formed, and subsequently its seeds.

Any deficiency of potassium results in the plant's inability to store up sugars and starches, and also in the withering of its leaves and tubers, and its inability to perpetuate itself through the production of seeds that will sprout and grow.

All chemical analyses show that potassium is present in the saliva, the blood serum, the red corpuscles, the pancreatic fluid, the bile, the gastric juice, etc., yet not a day passes but some prepared patented, popularized food is deprived of its potassium by the manufacturers who must make sure that after it leaves their hands it will "keep." It was the writer's interest in potassium that first caused him to reject white flour products from which the potassium has been removed and to adopt in his own diet whole wheat products containing an abundance of this precious mineral.

From the five glass jars in which Pfeffer attempted to grow buckwheat under conditions that included a lack of one mineral salt in one jar, and a corresponding lack of some other mineral salt in each of the others, there came not only the knowledge that a lack of potassium results in sterility, a withering of leaves and tubers, inability to grow or to reproduce its kind, but also the knowledge that a lack of iron and potassium makes it impossible for the plant's chlorophyll to develop.

Without chlorophyll there can be no normal vegetable life. Chlorophyll is the green coloring matter of the plant. It corresponds to hemoglobin, the coloring matter of the red corpuscles. Without hemoglobin there would be no rats, mice, cats, dogs, horses, cattle, sheep, hogs, elephants or children on this planet.

Pfeffer showed that sulphur and phosphorus are required for the building up of all proteins, meat fiber, egg albumen, wheat gluten, milk casein; that as proteins are immediately utilized in the construction of protoplasm there can be no life without sulphur and phosphorus. He showed that no plant can fulfill the functions of plant life without a group of mineral salts containing potassium, calcium, magnesium and iron; that no plant can grow without another group containing sodium, silicon, manganese, chlorine and iodine; that in another group fluorine performs important functions in all plant and animal life.

People who eat fruit ought to be thankful that the tree knows

how to obtain its potassium food, for without potassium there would be a fruit famine. Knowing the effect of food refinement upon health, why are so many of us indifferent to the destruction done in the food factory?

§ 15—PUZZLES THAT BAFFLE SCIENCE

Vitamin enthusiasts never speak of the importance of potassium to growth, health, strength, reproduction, longevity. They never speak of potassium at all. They are so obsessed by zeal in their effort to put the vitamin theory on its feet that they don't even speak of nitrogen, protein or protoplasm. They are potassium snobs. They lack no knowledge of the fact that man and beasts are completely surrounded by an ocean of nitrogen. The atmosphere is full of it. No living animal can escape this atmosphere and continue to live.

It is strange indeed that these vitamin enthusiasts should keep their minds off the knowledge that nitrogen is absolutely essential to life, growth and reproduction, although no living animal is capable of utilizing for food purposes any part of the great envelope of nitrogen in which it lives.

The vitamin enthusiasts know that nitrogen becomes available for the purposes of nutrition only in the form of protein. Protein is indeed a complex substance, consisting of at least eighteen amino-acids. One of these is known to contain sulphur. All of them are formed and combined for the purposes of life only in the presence of potassium, iron, manganese, phosphorus, and the other mineral salts without which all things would be silent, numb, inert, dead.

There is much evidence to support the conviction that the feeble inferences, vague deductions and positive opinions labelled "vitamins" have been given credit, all too erroneously, that properly belongs to the protein fractions so tragically bolted, sifted and lost from all refined, patented, denatured breads, breakfast foods, sugars and starches. These protein fractions, the amino-acids, are found in all their completeness; eighteen of them, in pure milk.

It isn't known how potassium is concerned with the production of proteins, the various combinations of which are numbered by

the thousand. The fact is they have never been counted. Had Tut-ankh-Amen put a scientist on the job of unravelling the various groups and combinations to which the eighteen amino acids lend themselves, and had the life of that scientist been preserved miraculously to the present day, he might have presented his first report at the opening of the tomb at Luxor.

Such a report would have read something like this: "I am beginning to get acquainted with this subject, and expect 5,000 years hence to be able to say something definite about it."

Hence, to speak of our ignorance of potassium in this connection is to speak of the ignorance of all mankind. We don't even understand the nature of the phosphorus-containing group found in phospho-proteins. We don't know the business of iron in the protein of egg yolk called vitellin. In the case of hemoglobin, one of the protein compounds of blood, we know that it acts as an oxygen carrier, and woe to him who loses it!

Why certain proteins go to bone, others to tendon, others to ligament, others to nails, others to hair, others to nerve cells, we don't know. We do know that we remove these proteins, and their accompanying salts and colloids, from refined food, and then set forth on a hysterical search for a set of mysterious things, dubbed "vitamins." Potassium may lead us back to the truth. If it doesn't something else will have to, unless we make up our minds to be altogether satisfied with decay and degeneration. If that prospect is not inviting we should cultivate more genuine whole grain foods and larger quantities of pure milk.

When proteins are consumed they are split up or decomposed by what is commonly called digestion. The decomposition that thus takes place is in no way connected with what is understood by putrefaction. To decompose the word "Washington" in a digestive sense would be to split it up into the letters of which it is composed.

When the proteins are decomposed the amino acids to which they owe their composition are set free, otherwise they would be of no value to the hungry animal. Combined as proteins they cannot be absorbed; hence the necessity of breaking proteins down into their component parts, so that the blood may pick them up and reunite them in the thousand and one combinations demanded by the thousand and one needs of nutrition.

Under many abnormal conditions met with in the intestines

decomposition does indeed give place to putrefaction. Thus are developed many powerful poisons, which, as they are absorbed, cause auto-intoxication, or self-poisoning. The absorption of protein poisons, such as indol, skatol, phenol, cresol, is demonstrated by finding evidence of them in the urine.

What has potassium to do with this? Let us see. Indol is absorbed, carried to the liver through the portal vein, oxidized to a substance called indoxyl, then combined with sulphuric acid and eventually, through the help of potassium, eliminated as a potassium salt, indican, the laughing devil. The amount of indican thrown off is an index of the extent of intestinal putrefaction. Why? Don't ask anybody. You will get no answer. Refined foods are the delight of putrefaction, because they help to bring it about. Moral: See that potassium is not removed from your food.

Take two ounces of desiccated liver. Add four ounces of water, a teaspoonful of concentrated sodium hydroxide. Filter. Acidify with hydrochloric acid until litmus paper turns red. Extract with ether in a separatory funnel. Evaporate ether extract at room temperature. The result will be an odor symbolic of indican, putrescin, cadavarin and Bright's disease. Ask your doctor what this means. He may not know that such a product can be extracted from any animal liver. The writer has extracted it.

Potassium can always be recovered from human gastric juice in the form of potassium chloride, from human bile in the form of potassium sulphate, from the red corpuscles in the form of potassium chloride and potassium sulphate, from the pancreatic fluid in the form of potassium chloride, from the serum of the blood in the form of potassium oxide.

This fact does not mean that the patent medicine manufacturer can prescribe these potassium salts to the self-dosers who, striving to recover lost health and vitality, swill the nostrums so notoriously on sale in every hamlet, village, town and city of America. All the chemist can do is to prove that potassium is engaged in life's processes by recovering it from the human tissues in the form of "ash" of one kind or another.

Doses of potassium oxide would not benefit the blood serum. Potassium in the blood does not exist in the form of potassium oxide. The chemist merely reduces the mineral to such form in his effort to recover it. An analysis of the débris of a destroyed

factory throws no light upon the kind of work that was done under its roof before it was burned to the ground.

The minerals of the body do their work under marvelously complex conditions which cannot be reproduced by the drug store. The food minerals are just as complex as the compounds into which they enter when consumed by the human body. Nature possesses the key to the mystery. The refined food manufacturer attempts to throw the key away and succeeds. Hence the necessity of protecting yourself against food refinement, the wickedness of which commercialism refuses to recognize.

Take a piece of clean platinum wire. Hold it over a blue Bunsen flame. The color of the flame will not be changed. Press the wire against your forehead or rub it against the palm of your hand. Put it back over the flame. At once you will note the beautiful yellow coloration of burning sodium and the even more beautiful lilac of potassium, showing both these minerals to be engaged in the elimination processes upon which health and life depend.

The naked eye has detected the sodium. A blue glass which filters out some of the interfering light rays makes it possible to see the potassium flame. In addition to potassium's influence upon the flexibility of the tissues it is seen to be engaged with sodium in carrying off the carbon waste which results from the combustion of food in the furnace of life.

There is much evidence to indicate that potassium dominates the nervous system and makes it possible for the heart to beat by influencing the relaxability of the heart muscles. There is little doubt that potassium interferes with the hardening processes that menace the whole arterial system in disease. There is no doubt that potassium is profoundly engaged in the phenomenon of keeping the tissues soft and pliable.

It has been noted that linen produced from flax grown on granite soil rich in potassium is remarkable for its suppleness and softness, whereas linen made from flax grown on calcareous soil is hard, brittle, and of little strength. Why do you let the miller take this precious mineral from your white bread and refined breakfast foods? from your table syrups and starches? Why do you remove so much of it in your own home-cooking by draining off your vegetable waters into the sink?

Dr. Frederick Gowland Hopkins, of the Department of Chem-

ical Physiology, University of Cambridge, experimenting with animals nourished on refined white flour bread and animals nourished on whole wheat bread, came to the following conclusion: "If but half the necessary amount of potassium be present, then no matter how abundant may be all the other soil and air constituents of the diet, their normal utilization is limited to one-half. The rate of growth and the ultimate development are consequently depressed.

"The absolute amount of potassium employed in growth is small compared with the carbon or nitrogen, but any deficiency in it limits growth as surely as a deficiency in the more important elements. The substances of unknown nature may need to be present in very small amount, but if the necessary minimum is not available the utilization of other constituents in tissues growth or repair is infallibly deficient.

"In the process of converting the wheat grain to fine white flour many elements are lost or destroyed. It follows that, no matter how much nourishment they might otherwise contain, our systems cannot make the best use of such nourishment, owing to the absence of those elements necessary to their assimilation."

This is the tragedy of washing, screening, sifting, bolting and bleaching our wheat, corn, barley, rye, rice, and our denatured breads and breakfast foods. They lose not only their potassium, but their iron, calcium, manganese, magnesium, and all the other mineral salts and colloids, ferments, enzymes and vitamins, upon which growth, health, life depend.