

## Bread From Air

**A** PRODIGAL world is beginning to discover that it cannot indefinitely continue to despoil the stores of Nature without taking thought for the morrow," writes Mr. L. G. Chiozza Money, M.P., in the Daily News. "Forest, mine and prairie have been ravaged until in respect of many different commodities world scarcity has made itself felt at a very early period in the age of machinery. Fifty years of wanton waste are beginning to tell; fifty years more would mean world famine."

"Of the problems of reparation which have arisen, none is more important than the nitrogen problem. Without nitrogen man is impossible. With the preservation and rapid multiplication of men the call for nitrogenous foods has led to the rapid exhaustion of soils and manure beds. The soils of the old world demand payment in nitrogen before they yield a crop. America has got rid of the available nitrogen in great tracts of her lately virgin soil. The world's guano beds are practically exhausted. The nitrate deposits will be in the same condition within the lifetime of many now living. This while the world's mouths to be fed are always increasing in number."

"Fortunately for mankind, science is proving equal to the occasion. The daily loaf, endangered by the arts of business, is to be preserved for us by the arts of the laboratory."

"Several scientific processes claim our attention in this connection. First let us note that Prof. Ostwald and Dr. Brauer, two of the brilliant chemists whom Germany produces so prolifically, have made it possible to produce nitric acid from the ammoniacal liquor of gas and coke works. It is impossible here to detail the technical process, but it consists essentially in the decomposition of ammonia vapour by platinum. It is a beautiful method, which depends upon the exposure of the ammonia to the platinum for one-fifth-hundredth part of a second of time. If the exposure were longer than this, unoxidized nitrogen would be created, and, of course, lost. The ammonia vapour has to pass like a gale of wind, so that decomposition goes far enough to produce nitric acid and not free nitrogen. The area of the decomposer used is but that of a teacup, but it produces 2000 lb. of nitric acid in a day. The production of nitric acid from ammonia has been known as a laboratory experiment for sixty years, but the Ostwald-Brauer process is economical and gives cheap nitric acid."

"Not this alone is the scientist proving himself master of the situation. Even more fascinating are the methods employed for utilizing the nitrogen of the air."

"Air is a mechanical mixture of oxygen and nitrogen, twenty-three pounds of the former and seventy-seven pounds of the latter making one hundred pounds of air. We have, then, but to manure the soil with air and the thing is done. The farmer can do it quite easily—after the scientist has shown him the way. Before the scientist finds out the way, however, your 'practical man' will make certain caustic references to 'dreamers,' 'faddists,' and 'cranks' if you talk of turning air into quarter loaves."

"In Norway, at this moment, with the aid of French and German capital, the power of great waterfalls is being used to produce nitrogenous manure from air at prices low enough for commerce."

"The process used in Norway is that of Birkland and Eyde, which employs the electric furnace. The air is led into the furnace and submitted to an electric discharge with a diameter of about seventy inches. Sweeping this terrific flame on both sides, the air is momentarily heated to a point at which the nitrogen is oxidized. Immediately the gas coming from the furnace is cooled down to avoid loss of nitrogen, and led over limestone sprinkled with water, with the result that calcium nitrate, or lime salt, is obtained. It is a scientific triumph which looks prosaic enough when the stuff leaves the factory in wooden barrels."

"In another direction also science is operating in order to utilize the boundless stores of atmospheric nitrogen, 75,000,000 tons of which are suspended over every acre of land."

"About twenty years ago Hellriegel showed that leguminous plants (known from ancient times to fertilize the soil in which they grow, and always therefore grown in rotation before corn) obtain their nitrogen from the air, and that bacteria, living in nodules or tubercles on the roots of the plants, are the media by which the nitrogen is obtained."

"This line of investigation was continued, until a culture of the root organism was obtained by Beyerinck, and named the *Bacillus Radiciola*. Prof. Nobbe, of Germany, failed in an endeavor to prepare the infective culture on a large scale, but in 1901 the United States Department of Agriculture took up the work, and by 1903-1904 the State Department was sending out tens of thousands of packages of prepared microbes, at first dried on cotton wool, but now issued in liquid form. In 1905 the reports showed that 74 per cent. of the trials were successful."

"In the same year our own Board of Agriculture took up the matter. They got samples from America and Germany, distributed them, and as a result reported that the matter was still in an 'experimental stage.' And there, unfortunately, they dropped it. Fortunately Prof. Bottomley, the Botanical Professor of King's College, London, has continued the work which our Board of Agriculture did so badly and laid down so quickly. During 1906 and 1907 a thousand packages were distributed here for testing purposes and so far most of the results have been successful."

"It should be clearly understood that the bacteria culture is not a manure. What it does is to add to the soil organisms which breed and multiply on the roots of a leguminous crop and enable it to grow in a soil which contains little or no nitrogen. After the leguminous crop, of course, the succeeding crops benefit. After the doctored clover the wheat flourishes. The poorer the soil the more marked the effect. With the aid of the culture peas have been grown luxuriantly even in cinders."

"The scientist appeals to the government to take up the tools of science. The United States Agricultural Department is distributing bacterial culture free, and cannot cope with the demands for it. Our own department, after tinkering with a few imported and, in some cases, dead cultures, is doing nothing. It is little money that is needed, but poverty is the excuse pleaded. I understand, by the department. Prof. Bottomley tells us that waste land can be reclaimed and made fertile for sixpence an acre, and, as he puts it, 'can we afford to neglect such possibilities of national wealth?'"

### THE TURMOIL IN PERSIA

"The first thought which comes into the mind on reading the daily reports of the political chaos in Persia is a profound thankfulness for the existence of the Anglo-Russian Convention," says the Spectator. "To appreciate the value of the Convention at this moment we must picture what would be happening without it."

"The fact that the British public is not moved fearfully by what is happening in Persia need not harden our hearts to the tragedy. A brilliant and likeable people is in rapid decline, and no one can foresee what the end will be. The forty millions which once populated Persia have dwindled to six or seven millions, and neither the character of the people nor the forcible efforts of the people towards self-government, which is scarcely understood as such, gives a glimmer of hope that either of these influences will end the oppression of the satraps under whom the country has withered."

### The Coup d'Etat

"Last week we recorded the furious coup d'etat by which the Shah brought the Mejliss and the Nationalists to their knees in Teheran. The Parliament building was bombarded, and afterwards methodically reduced to ruin by wreckers; many leaders of the popular party were shot down or arrested, and afterwards tortured and executed; and the systematic destruction of the Parliament house and the private houses of the Nationalists, one house being bombed and pillaged by command every day. For the moment the policy of the 'whiff of grape-shot,' magnified a thousandfold, has been successful. The Shah has produced



ANY marvellous feats have been performed by travelers in the northern regions of America. Explorers have suffered hardships and performed great deeds of daring and endurance, in trying to solve the mysteries of the North. Most of these daring adventurers have been white men, and it was not until last year that any white woman braved the perils of the north and made a considerable journey through the trackless wilderness. Last winter two women crossed from Hudson Bay to Winnipeg, a distance of some seven hundred miles. Mrs. Ray and her three children, accompanied by a corps of guides and half a dozen dog teams, crossed from York Factory to Lake Winnipeg. A much greater performance was that of Mrs. Beech, who, accompanied only by her husband and son, with two dog teams, crossed from Fort Churchill to Winnipeg. Fort Churchill is farther north, the distance to Winnipeg greater, and there was no corps of trained guides to insure the party's safety. This ninety day trip made by the Beech family must ever be memorable in the annals of Canadian travel."

This performance, by the first white family to travel by dog train from Fort Churchill to Winnipeg through eleven hundred miles of wilderness, is made all the more remarkable when the ages of two members are considered. Mrs. Beech is fifty-five years of age, and her husband is sixty. For a couple so far advanced in years to attempt so great a journey was certainly a hazardous experiment. The Hudson Bay officials believed that the successful accomplishment of the enterprise was exceedingly doubtful, and could provide them with guides only as far as the Nelson River."

The Beech family left their home on the east side of the Churchill river on December 10, 1907. It took them seven days to accomplish the journey along the coast from the mouth of the Churchill to the mouth of the Nelson. When they arrived at the latter river they found it free of ice, and as no boats were available they were forced to wait until ice had formed. The Nelson river is a wonderful river, draining as it does almost the whole of

a solitude in certain quarters of Teheran, and temporarily, at all events, calls it peace."

The people, never famous for physical courage, are cowed. But it would be a great mistake to suppose that the Shah has really the means of enforcing his ruthless will if the popular party should take heart again. His triumph in the capital is, after all, only local. Teheran is not Persia, and the voice of the provinces has scarcely been heard yet. If the Persian people are not heroic in revolution, neither is the palace party. All are of the same blood, and cruelty and ruthlessness do not necessarily mean either heroism or resolution. The conflicting motives which underlie the turmoil are of the same value in Persia as in countries where the people are made of different stuff, and it is as necessary to understand the political issue there as it was in Cromwell's England or Robespierre's France."

### The Civil List

"Last December the Mejliss fell foul of the Shah on the question of his Civil List, which is fixed at the high figure of £100,000 a year but which he assumed was his pocket money, and need not be spent in any degree on meeting the usual charges on the Royal purse. He arrested the heads of the government, and the life of the prime minister would not have been safe but for the ready and humane action of the British Legation. The parliament almost in a manner of the old English House of Commons, standing on its rights and flouting the Sovereign, sent what was practically an ultimatum to the Shah, and the Shah yielded and swore fresh fidelity to the constitution. That oath saved him time, and he fostered his resources meanwhile against the second trial of strength."

### Self-Government

"The quarrel about the civil list was only a pretext for the first trial. The issue was far deeper than that; it was, and is, the aspiration of a people, however ill suited for it, to self-government. The fame of the Russian Duma had spread over the border, and history shows that waves of political ambition (take the extraordinary wave of democracy which spread over Europe in 1848, for instance) are not confined to one country. They are communicable, even contagious, and may travel round the whole world before their force is expended."

"The experience of last December had the unhappy effect of making the Mejliss overestimate its power, and even arrogate to itself rights which did not belong to it under the most fanciful interpretation of the constitution. What we have called the second trial of strength between the Shah and his people began on May 28."

### CONSUMPTION OF HORSE FLESH IN VIENNA

Owing to the steady increase in the consumption of horseflesh in Vienna, the municipal authorities have erected new slaughter houses for horses. They comprise a fine block of brick buildings, covering an area of 3,300 square yards. Land and buildings together have cost over \$200,000. There is stabling for 200 horses. The principal building is the great slaughter hall, more than 300 feet in length and 50 feet in width, and equipped with the most modern machinery. There are stalls for killing fifty-nine animals, each fitted with hoisting apparatus. There is also a large lift, with a capacity of 2000 pounds, for conveying the meat to the cooling house. Last year 20,225 horses were slaughtered in Vienna for food. Most of it is converted into sausages of various brands and flavors."

## From Fort Churchill to Winnipeg

the vast district between Hudson Bay and the Rocky Mountains. Its current is strong and the volume of water passing down is enormous. At its mouth it is fourteen miles wide.

During this wait at the Nelson river, which lasted twenty-three days, the Beech family were located in a rough shanty on the bank of the river, which they shared with five Indian families. They had only such provisions as they brought with them and the food for the dogs had become exhausted. During the whole of this tedious three weeks the dogs had not a bite to eat. When at last the river froze and a crossing was effected, the dogs were scarcely able to draw the loads over the ice. After the crossing, an Indian chanced along with scant provisions and relieved the situation for a few days. He and Mr. Beech started off on a hunting trip which lasted nine days, but not a deer, rabbit or game of any kind was sighted. Eventually, however, the party managed to reach York Factory. Here they fared a little better, but it was not possible to obtain a candle, a can of condensed milk or a bit of butter. All supplies at Fort Churchill and York Factory are controlled by the Hudson's Bay company, and it is not the policy of that great company to encourage the invasion of its territory by independent persons."

In an interview Mr. Beech gave the following details:

"We had good weather all the way, but found many waters open. The Steele and Hill rivers and part of Kenee lake were open and forced tedious detours. We went almost into God's lake, where we met Rev. Mr. Stevens, the Methodist missionary. One of the finest missionaries on the road is Mr. Ferris at York Factory, who was of invaluable assistance to myself and Mrs. Beech, and had it not been for him we would never have got out of the country in safety."

"The four dogs that brought Mrs. Beech out are four of the finest dogs in the country, and three of them started travelling on September 23, from Repulse Bay, 200 miles on the other side of Fort Fullerton. They are the first dogs to come to Winnipeg from the

## About Worry

**I**T seems a pity that so much good life should be wasted in meeting trouble instead of enjoying all the enjoyable things, like breathing and looking round and liking one's fellows. One questions whether this conviction of the hostility of life is well grounded, and whether the attitude of worry, of preparing for the worst is really necessary. If one could only accept the reverses as a sort of poison, kerosene emulsion, or Bordeaux mixture, administered to the plant to destroy the devouring worm and make the blossoms more perfect, one would perhaps meet them with less wearing anxiety and a more pliant attitude. Life is too beautiful and, so far as we are assured, too rare an occurrence to spend it all, tensely drawn up, facing out sorrows and our deprivations. And, as Epictetus said, "It is a shame for the soul to give out before the body."

Great men, the saints, and the geniuses somehow always escape worry. They fling the private burdens on the shoulders of Destiny with an inward conviction of Destiny's ultimately beneficent intent; and perhaps, too, they are born with an innate realization of how small a dot a life is in a soul's career. One thing is certain, that the great interests and the nobler pursuits are the surest relief from fretting, care and nerve-wracking anxieties."

After all, such is our weakness, and our impuissance in all the major matters of life that the very beginning of wisdom is the flinging aside of the burden and living the moment through for what it is worth in itself, leaving the future to a more capable hand. Planning occasionally helps us to seize an opportunity, but worry never does anything but eat up vitality and power. Some training in faith is required to take tomorrow's dinner on trust, and yet how slight a turn in the screw can change a destiny, and how little our own hand has to do with the turning."

A depressed and industrious gardener, grubbing for a bed of killing worms amongst some clove-pink roots, was startled by a low voice close to his elbow: "Any work I can get to do?" And out of his depression and faint-heartedness, from a consciousness where there seemed to be no work for anybody to do or room in the world for anyone to live he answered, harshly: "No, nothing at all." And, glancing up, he saw a strange, muscular twirl around the mouth of the beggar who turned off; and, noting it, he became aware of a tattered, sick-looking boy, with the look of endurance at last ebb, and the helpless child-nature near to the birth again. So the gardener jumped up and called the boy back and listened again to the old story of work unexpectably shut down in a distant manufacturing town, of a week's tramp accompanied by every possible deprivation—worst of all, the deprivation of the poet's mind that can turn a degradation into paradise—a mission cut free for three nights while a job was hunted, the time up and neither job nor money forthcoming. "When did you eat last?" the gardener asked, staring. "Day before yesterday." And self-pity won the day, and the mouth twitched

again, and tears made muddy streaks down the boy's brown cheeks. The gardener had his own worries; not matters of dinners, exactly, but things as vital; and as he sat, later talking to and watching the friendless creature, clean and clothed and rested, fed and encouraged, it suddenly came over him that the whole change wrought in the face of the lad's universe, came not from his powers of persuasion, nor yet his abilities, nor the gardener's sympathies and good intentions, but merely from an uncontrolled muscle round the boy's mouth—a muscle that twitched when he could no longer speak."

Then there flashed into his mind the analogous incident of David Copperfield's presentation of himself to his aunt, Betsy Trotwood—surely, surely a chapter taken out of real life! David was gifted with a vocabulary and a fluency rare in a masculine creature of ten years, and a readiness of affectionate address strangely antiquated to the mind, of an up-to-date little boy who would scorn indeed to address an elderly female relative, of whose intentions he was unassured, so glibly as "dear aunt." But it just chanced that "dear aunt" was in the habit of turning to Mr. Dick for advice, and the obvious being ever uppermost in his mind, he responded promptly to her question, "What shall we do with him?" by "Give him a bath." And, later, when the question was reiterated, by, "Measure him for a suit of clothes." So David, too, found his destiny delivered into safe hands not through his precocious eloquence, nor through the natural charity of his aunt's emotion, but by a weak-minded old gentleman's habitual preoccupation with the immediate and the obvious."

Perhaps, with our destiny ever dancing on so fine a thread, there is something in letting life take care of itself, living out the moment for all it is worth, doing our best at the immediate juncture, and flinging the burden of the distant tomorrows upon more capable shoulders."

He would be a temerarious thinker, at any rate, who would want to deny the uses of adversity, and a dullard who cannot see that the spirit grows most swiftly when the blows of fate fall fastest."

"What, my pretty fellow, so comfortable? near asleep?" Fate would seem to say before he takes the most pointed dagger to "stab our spirit broad awake."

And in every life when one falls as each one must who makes a glorious ending, the miry slough whither the scum and filth of limitation perpetually pour, it is well to remember that the pilgrimage is long and varied, and that Help has a way of wandering on the edges of such sloughs.—Harper's Weekly.

### THE BUSINESS MORALS OF JAPAN

The important inquiry with regard to Japan in a large way is as to the direction in which the nation is now moving," writes Prof. Ladd in the Century Magazine. "And in answer to this inquiry I am able to give a most unequivocal and quite satisfactory answer. Never before in the history of the country, and at the present time in the history of no other country, do we find the same intelligent, deliberate, and widely-prevalent purpose to do away with the nation's reproach and to rise in the scale of national business morality. In saying this I speak what I know to be true."

"I have seldom listened to more grateful words than those which were spoken at a banquet given on the evening of February 11, 1907, in the city of Osaka by the Ashai Shimbun (a daily paper) to some one hundred and fifty guests. After an exchange of compliments between the representative of the hosts and the chief guest, an elderly gentleman, one of the leading physicians of the city, rose and spoke as follows: He had been much impressed by what had been said that afternoon as to the necessity of morality for a true national prosperity. 'But this is what our great Oriental teacher, Confucius, taught us centuries ago. Now, in these modern times, comes a teacher of morals from the Western World, and tells us the same thing. Why do the ancient Oriental teacher and the modern Western teacher say the same thing—that nations must be righteous, if they would have and keep a true prosperity? They say this because it is true. And it is time for us, here in Osaka, whose reputation for business morals has hitherto been so low, to recognize this truth and to govern our conduct accordingly.'"

"Then followed a younger man, the Vice-Mayor of the city, and he, after confirming the truth of what the previous speaker had said, added this: 'There are enough of us, leading citizens of Osaka, about this table to change the moral conditions of the whole city of Osaka, if only we will to have it so.'"

"It is barely possible that our own moral development as a nation may be tending downward along some such lines of argument as the following: The great merchant, banker, manufacturer, railroad magnate, is the truly great man; to be great in this way is the most desirable success; to attain this success certain virtues are indispensable; therefore, these are the supremely noble and desirable of the virtues. After which comes, it may be, the practical conclusion: To be esteemed a virtuous, while at the same time actually to become a successful business man, it is necessary somehow to combine getting rich with a character, truthful, honest, and prudent enough at least to keep out of gaol!"

### WITH THE VALUE



money and enable Plain good seed to be sown, and get for it, while on what he will get situation and opportunity of a good much money to other case, yet inherent potential Houdan."

I breed Houdan natural layers a poultry family. The Houdan from the very start will be laying and right through the Once started ing. The coldest Houdan egg-prod heavily feathered, as Rocks or V. Leghorns, and comb or gill to well, are non-setter layers known."

As a fancier's breed excels them, and still preserve The value of a for the sole and ing market eggs superior breeding care for the breed very valuable, with blood foundation profit. One pair is worth more number of ordinary that the potential a Houdan's actual ternally visible.—er."

### KILLED

A few years ago young chickens that were sure of killing lard and kerosene to the young chick that the preparator. A few days sulphur in lard for to apply it directly to the hens under young chicks. I both the lice and casual light gr. heads of the young lice in check and hens' wings will fest the bodies of heavy application the young chicks

To treat cases in Commercial P. feathers from ad. cept at the tip e has been mixed