HERALD OF health

June 1980

INDIAN FARMING

IN SEARCH OF ANSWERS

Francis A. Sopar

The mother of a five-year-old girl complained: "Lisa's questions are very bright and searching. The trouble is that she can't understand any of the answers."

This seems to be quite a prevalent failing these days, and not only with little children either. Obviously, there are many trials and difficulties in our world—problems that need solving. On the other hand, we have advantages and comforts unknown to former generations. All too often this latter fact is forgotten in the protests and dissent becoming so prevalent today.

Dissatisfaction with our society and our environment is not a bad thing in itself if it prompts us to seek betterment. However, the best kind of dissatisfaction is that which leads to self-improvement.

Much is being said by youth about growing up—the ability to take over. True maturity implies one's ability to walk by himself without the need of being ashamed of what he says or does.

Our world demands youth who are making progress toward maturity. Such progress can be gauged by self-responsibility and common sense in making personal decisions. Such development requires effort and adaptation.

Maturity comes through experience, the learning process. A person should react to his environment differently today from the way he did yesterday.

A false impression in the minds of youth is that restraints and discipline are to be avoided, that they imply weakness or insufficiency. Actually, the opposite is true. Maturity is not something one can slide into or enter with ease. It must be entered legitimately, sustained with constant and deliberate purpose.

True maturity is a mark of character. Though we speak of character development, we must remember that it is a steady, steep climb. As one author has described it, "Every impluse acted upon, every resolution carried out, every fine emotion that gets us somewhere, is weaving itself into the pattern of our character. This is not the product of lectures or sermons, but of well-directed individual effort."

This involves self-discipline and often such discipline includes doing things we would rather not do and staying away from things we at times might want to do.

There is something about life, especially for youth, that centres on the immediate. But if life is lived only for the present, it is futile. Present demands need to be met, but one hallmark of man's position above the beast is his ability to plan for the future and to govern the present in the light of its effect on the future.

So, we ask many questions—youth ask many questions. We desire answers, immediate answers. Impatience comes naturally; we resent a time lapse beween pressing a button and getting a response. But we must accept the fact that the answers may to a great extent lie within ourselves. They may involve not only blessings to bring joy and satisfaction but also burdens to bear. Both burdens and blessings are part of normal life and adjustment, part of the answers to our questions.

***

HERALD OF
health

Vol. 57 • No. 6 • June 1980

ARTICLES

FEATURES

PICTURE CREDITS: Cover transparency by J. M. Fowler; 5—Insight; 9, 11, 25—V. S. Powar; 15—International Communication Agency, Avinash Pasricha.

Correspondence: Address all editorial correspondence to Editor, Herald of Health, Post Box 35, Poona 411 001. Address correspondence regarding subscription orders, rates, complaints of delay or non-receipt of magazines to National Home and Health Service, Post Bag 129, Poona 411 001. Readers in Sri Lanka and Bangladesh may send their queries to the relevant address: Oriental Watchman Book Depot, 8 Devale Road, Nugegoda, Sri Lanka; Bangladesh Section, Post Box 80, Dacca 2.

THINK ON THIS: "It is an inevitable law that a man cannot be happy if he does not live for something higher than his own happiness. He cannot live in or for himself. Every desire he has links him with others.—Bulwer.

Gravitational Waves

A research team at the University of Massachusetts, USA has announced the first experimental evidence directly supporting the existence of gravitational waves. Such waves, long hypothesized but never directly observed, are in some ways similar to radio waves, but are based on the forces of gravity rather than those of electricity and magnetism. The existence of gravity waves is one of the longstanding but heretofore untested predictions of Einstein's general theory of relativity. The new experimental data came as the result of a four-year programme of monitoring the radio emissions from a pulsar located some 15,000 light years away from the earth, in a distant portion of our galaxy. This pulsar, discovered in 1974 by the same research group, is known to be orbiting another massive object—perhaps another pulsar or perhaps a black hole—because its repetitive "beeps" of emission speed up and slow down over a regular pattern lasting a little less than eight hours.

* * *

Portable X-ray

A concept fostered by North American Space Administration scientists for studying X-ray sources in space has led to an X-ray instrument that can be held in the hand which produces an instant image with a small source of radio-active material. Powered by a single pensized battery, it exhibits high potential for screening and other uses in medicine, dentistry, and areas of industry. Most obvious promise is for emergency and other field use where a quick fluoroscopic examination is desirable.

DID YOU KNOW?

VIEWPOINT

PHARMACOLOGY OF OPIATES

Opiates are the most effective pain killers known today. How they reduce pain is not known. Both tolerance and physical dependence develop on opiates. Because they produce a euphoria (high), they are readily abused.

As pain killers, it is believed they diminish awareness of pain and the emotional response to it. Morphine, for example, appears to act on the cortical arousal system by disrupting the electrical activity of the brain. This tends to also cause drowsiness or "the nods."

The second action may be on the limbic system which is responsible for emotional responses. Opiates also depress the respiratory system so breathing becomes shallow and slow. This can result in death if respiration ceases and nobody is available to give first aid. At the same time, opiates stimulate the brain centre in control of nausea and vomiting, so these are frequent side effects. Opiates also slow digestion and movement of food through the system so they can be used to treat diarrhoea, as in the case of the drug paragoric. In short, under the influence of opiates, pain messages still come into the brain, but responses to pain are diminished.

The speed with which these effects occur depends on how opium is taken and in what strength. Addicted natives may eat or drink opium in tea. Prepared opium can also be smoked alone or with tobacco. In this form it causes a dreamy stupor, sleep or unconsciousness. When an opium smoker tries to stop smoking opium, his withdrawal is not as severe as in a person using heroin. He may experience irritability, and inability to concentrate.

When opiates are taken in refined form, (heroin or morphine) the effects are faster and more severe, especially if the drug is injected. Of course, the danger of overdosing and death is also greater, since the drug reaches the brain in seconds.

In the U. S., opium smoking is rare. Those who abuse narcotics usually prefer the stronger derivatives. Use of the injection route also increases the danger of "needle diseases," like hepatitis and tetanus.

Addiction to opium develops not only because the abuser particularly wants the euphoria, but because he wishes to avoid withdrawal. The intensity of the symptoms is related to the daily dose. Some may describe it as a "case of 24-hour flu," with vomiting and diarrhoea, while others experience muscle twitching, insomnia, cramps, hot and cold flashes, and watery eyes and nose. This withdrawal is not nearly as severe or life threatening as withdrawal from barbiturates often taken as sleeping pills. The myth of the heroin withdrawal being the worst possible still persists. However, it is seldom life-threatening.

SCHOOL-STRESS: A NEW DISEASE

More and more West German schoolchildren are being sent on a course for school-stress, a health insurance agency reports. The youngsters, aged between seven and 12, are suffering from nervousness and disturbed sleep due to fears over their school work.

Family doctors are prescribing six-week rest and recuperation cures in sanatoria that now handle between 6,000 and 7,000 children each year.

Most parents try for places during the school holidays, so their children will not miss lessons and get into an even worse mental state. Not all these patients are school-stress sufferers, but the number who are is growing rapidly, reports the Federal Institute for Employees, in West Berlin.

A spokesman said: "Children go back to school after a cure with new strength that enables them to catch up on missed work. The alternative to taking a cure, for many children, is the risk of nervous disorders."

—Home and Health

From meat to greens

By Marvin Moore

How to switch to a vegetarian diet

How can a person switch to a vegetarian diet?

Two kinds of vegetarian diets are safe. One is called the lacto-ovo-vegetarian diet. The lacto-ovo-vegetarian does not eat meat, but he does use milk (lacto) and eggs (ovo). Since all milk products and eggs are from animal sources, the lacto-ovo-vegetarian is not a complete vegetarian. The total vegetarian eats only plant foods.

Some people have tried exotic-vegetarian diets, restricting themselves, perhaps, to just one or two kinds of foods. We occasionally hear of the devotees of certain mystic religions who do this. Such diets are very dangerous. They may cause serious nutritional disease, even death.

Your reason for wanting to switch to a vegetarian diet will help determine whether you choose to be a total vegetarian or to use milk and eggs too. Some people object, for philosophical or religious reasons, to killing animals for food. For such persons, a diet that includes milk and eggs is quite satisfactory.

Most people, however, switch to a vegetarian diet for health reasons. Two factors about meat make it less than ideal as food: cholesterol and disease. Cholesterol is a substance that builds up in the arteries and veins and may help cause heart attacks and strokes. Meat is high in cholesterol. Animals are as plagued with disease as man, and many people fear that eating an animal's flesh will expose them to the animal's diseases. This fear is probably more justified than most meat eaters realize.

If health is your reason for wanting to change, then the total vegetarian diet is your ideal choice, since milk and eggs are quite high in cholesterol and may be diseased. However, if you use eggs only in cooking, and if you drink skim milk, you will greatly reduce your cholesterol intake over that of a person who uses meat regularly. If the milk is pasteurized and you cook the eggs, the danger of disease will be minimal. Unless you have a serious health problem, I would suggest you try the milk-and-eggs diet first and progress to the total vegetarian diet after you have adjusted to that. Among vegetarians, you will be in good company using milk and eggs. Very few leave them off entirely.

Learn what your body needs

Living on a vegetarian diet does not require learning a bookful of nutritional facts. Although you will need to be better informed about nutrition than the average person, you won't have to be a scientist. To switch to the milk-and-eggs vegetarian diet, just review what you learned in your high school health class. I've

listed the body's basic nutritional needs in the box that is included in this article together with several common sources from which they may be supplied.

Please notice one thing in that long list of foods in the box: Fruits and vegetables, nuts and grains, and protein foods show up over and over again. Variety is your key to a successful vegetarian diet. Eat at least two servings a day from each of these three major food groups, varying your choice from one day to the next, and you can be sure of an adequate diet. If your fruit for breakfast is orange juice and a banana, try prunes or water-melon for supper. If your choice is corn for lunch one day, make it green beans the next.

A word about protein. Protein is a substance just like salt or water. The difference is that we can see salt and water. Protein comes mixed in with the food we eat, and it doesn't seem quite so real. But the scientist can separate the protein from a cupful of beans in his laboratory, pile it up on the scales, and weigh it.

Like every other substance, protein is made of molecules. The molecules of protein are called amino acids. There are 20 common amino acids in food, and they make proteins by linking together like beads on a string. A writer puts the 26 letters in our alphabet together to make an infinite number of words; likewise the body combines the 20 amino acids into hundreds of different proteins, each with its own special function.

Fortunately, your body can make all but eight of the 20 kinds of amino acid molecules (all but ten in children). If you've ever heard the term, "essential amino acids," that's what it means: the eight kinds of amino acid molecules that you must get in your food because your body cannot make them.

But don't worry about which ones you must have in your diet and what foods contain them. Any animal product, including milk and eggs, has all of them. And here's a helpful hint to guarantee getting all of them from strictly vegetable sources: Mix any legume (including beans, peanuts, peas) with any grain, and you will get all eight of the essential amino acids. If you like peanut butter on your toast for breakfast (whole-grain bread is best), you've got a complete protein. Rice with your beans at lunch works the same way. Keep in mind that the protein must be complete in each meal. Rice for lunch, and beans for supper won't work very well.

Some people worry about getting enough protein. Around 1880 a German scientist named Karl Von Voit studied the food intake of 1,000 working men and found that their average protein consumption per day was 118 grammes. For many years, this was accepted as the recommended daily allowance for humans. A vegetarian eating milk and eggs could reach this amount if he ate heartily. It might be difficult for a total vegetarian to eat this much protein in a day.

However, the most recent recommendation cuts Von Voit's recommendations by more than half: 54 grammes per day for a working man and 46 for a woman. Most people can get along on considerably less. Some authorities believe the average person needs no more than 25 grammes per day. The chart on this page shows how a modest vegetarian menu for one day can provide more than the minimum recommendations.

Protein Adequacy of a Vegetarian Diet

Breakfast	**grammes**
2 slices toast	4
cooked cereal	4
glass of milk	9
peanut butter	2
fruits—2 kinds	2
	21

Lunch	**grammes**
1 slice bread	2
creamed peas	8
rice and beans	5
glass of milk	9
2 biscuits	2
	26

Dinner	**grammes**
Cream of potato soup	8
crackers	1
fresh fruit	1
glass of milk	9
	19

Total protein for the day: 66 grammes. Authorities recommend 54 for men, 46 for women, and these are generous amounts. Most people get along on considerably less.

How fast to switch

There are two ways to switch to a vegetarian diet: gradually or all at once. If you are a heavy meat eater, you may find that switching all at once leaves you feeling weak. This is because meat contains waste products that stimulate your nerves. Quitting meat is something like quitting coffee; you miss the zap. But this is only a temporary problem. In a few days you will feel as good as before, probably better.

One trap to avoid during this time is sugar. Some people, because they feel weak, gobble up chocolates, ice cream, biscuits—all kinds of sweets—as if they were being taken off the market. This can actually be harder on you than meat.

And there's rarely a compelling

reason for changing all at once. Unless your meat intake is quite limited to begin with, you will probably find it easier to start with one vegetarian dish per week in place of a meat dish that you are accustomed to eating. Next week make it Monday and Wednesday, and the following week Monday, Wednesday and Friday. Your body can adjust more easily this way to the new diet, and you can adjust more easily to the new flavours.

Advice for the cook

Several years ago a friend and his wife invited me home for dinner. They knew I was a vegetarian, and the poor wife was nearly beside herself trying to figure out what to prepare. She finally settled for the meat eater's favourite dish for vegetarians: macaroni and cheese.

I like macaroni and cheese, and I enjoyed dinner that evening. But I wouldn't care to eat macaroni and cheese two or three times a day! The real challenge in switching to a vegetarian diet isn't so much in eating. It's in the fixing. Housewives who make the change invariably report that they have to learn a whole new way of preparing food, particularly main dishes.

Today's cook is more fortunate than her counterpart 25 years ago. The food industry is more health-conscious, and a number of companies are now producing vegetable protein products that have almost the same texture and taste as meat.

These prepared meat analogs make the change from a meat to a vegetarian diet less of a jolt on your taste buds, and the housewife doesn't have to learn as much all at once in order to serve her family food that tastes good. But the best vegetarian dishes are those that the housewife puts together herself from raw materials: beans, grains, nuts, onions, and other seasonings. Good vegetarian cooking is an art that thousands of people have learned to enjoy.

The best way to learn is from someone who has been doing it for years. However, for many housewives, this is impossible. Second best, then, is to get several vegetarian cookbooks and learn for yourself. Most vegetarian cookbooks pass along "tricks of the trade" that the new vegetarian housewife will find very helpful.

What can the housewife do who wants to make the switch but knows her family would be horrified? Practise on one vegetarian recipe till it really tastes good. Never mind if you fail at several experiments. When you've found a recipe you think your family will rave about and you've worked it up to mouth-watering perfection, quietly put it on the table some evening. The questions the family asks may be easier to answer if you can arrange to be out of meat that evening, so you "did the best you could with what you had."

It will help, too, if you make the meal attractive with other things you know your family especially enjoys. And brighten up the surroundings with colours in the salad, serving special dishes instead of the novel ones, and a clean cloth on the table.

Remember that you can't force your preferences on your family. If they don't want to go vegetarian all the way, see if you can learn to prepare vegetarian dishes well enough so the family will go part way—sometimes serving their meat, sometimes your vegetarian dishes. Avoid putting secondclass vegetarian dishes on the table. And avoid arguments. The family will accept more vegetarianism than you think, sooner than you expect.

Vegetarian eating may be a challenge to the family, and especially to the housewife who has never tried it before. But it is not as hard as it sounds when you know how. In many ways, it's the healthiest way to live. And if you go at it right, it's lots of fun.

Good luck, and many happy meals of vegetarian eating!

Nutritional Needs and Common Food Sources

Protein: Milk, eggs, all breads and cereal foods, beans, nuts, potatoes, wheat germ and brewer's yeast.

Fat: Whole milk, eggs, nuts, oil and shortening used in cooking, butter.

Sugar: Most of us use too much, but for the record, all fruits (especially dried fruits), all breads and cereal foods (carbohydrates), milk, potatoes.

Vitamin A: Eggs, all green or yellow fruits and vegetables (vitamin A gives these foods their colour, so the darker the colour the more vitamin A they contain.)

Vitamin B: There are several B vitamins, and most are found in large amounts in whole-grain (unrefined) breads and cereal foods. Vitamin B_{12} is the one exception. Milk and eggs are the vegetarian's best source of that, and for the total vegetarian, brewers' yeast.

Vitamin C: Most fruits and vegetables, especially citrus. Potatoes have a surprising amount of vitamin C. Avoid overcooking. Vitamin C is easily destroyed in heat.

Vitamin D: The sun. Spend time out of doors each day and don't worry about the vitamin D. Dairies usually add vitamin D to their milk.

Minerals: Minerals are found in all fruits and vegetables.

Prepare Your Child for School

By Ernestine M. Schindler, R.N.

If you are the parent of a child too young for school, you are preparing him daily to enter school when he becomes of school age. Perhaps your little Bimbo is still a toddler, and you think you have plenty of time. Perhaps he is starting school this year, and you wonder whether he will adjust. Whatever his age, you are guiding him each day toward his life in the world on his own.

By daily teaching, here a little and there a little, you can help him learn many things. For instance:

1. To say good-bye happily.
2. To button and unbutton his clothing.
3. To use the toilet properly and wash his hands afterward.
4. To speak clearly.
5. To accept regular rest periods, obey simple rules, and finish what he begins if it is not too difficult.
6. To know how to take turns and to play with other children.
7. To say his name, address, and his father's name.
8. To go and come from school alone safely.

This list sounds simple, but it takes love, a great deal of patience from you, and time for him to be ready physically and mentally to master such skills.

No set of rules can guide you, for each child is like no other, each growing at a different speed, and each having a unique position in the family group.

Watch for signs of readiness in Bimbo to assume a skill. For example, when at two years he tries to put on his shoes, praise him and give him time to try. If at one year he reaches for his spoon, guide his hand. At every stage encourage him and show pleasure in his accomplishments. Sometimes you will help him to help himself. You will say, "Look Bimbo, you button the middle button on your jacket. I'll help with the other buttons."

Attempt to introduce some part of a new training phase before Bimbo gives up the old. Six-week-old Bimbo is fed orange juice from a spoon. When the doctor prescribed cereal, Bimbo had had some experience with a spoon. Similarly, he is offered water, fruit juice, and milk from a cup long before he is weaned. His experience with a cup makes weaning easy for him. Carry over this pattern into all his activities.

Saying good-bye to a parent is perhaps the most difficult skill. To do so happily, a small child must feel loved and know that his mother has not deserted him, that she will return. Most parents feel embarrassed when their youngsters cannot be left in any situation without raising a fuss, adding to the child's distress.

Begin some kind of mother-child separation at an early age, but keep in mind that at times Bimbo will be more willing to leave you than at other times. A year-old baby may be hesitant, even frightened, by unfamiliar faces, but from the ages of three

To a parent, saying good-bye is perhaps the most difficult skill.

and a half to four he will reach out to feel, to experience, the world outside his home. When he is five, he will want to remain at home, seemingly happy to return to home base for a time.

If Bimbo cannot face being left with a grand-parent, a baby-sitter, or a group of people, the happiest solution for you and him is to attend a nursery school together directed by a trained teacher.

In such a school you can remain while Bimbo becomes accustomed to new friends, new play situations, and new adults. Even with you near he may be so tired by the social stimulation that he cannot attend more than two or three days a week. With the help and wisdom of the teacher, he can learn to say goodbye. He may need you by his side again after an absence, an illness, or if your family situation is strained.

All parents should realize that childhood is a series of improvements, of calm behaviour, followed by ups and downs, yet the trend is ever forward.

Tendencies of age changes follow a rhythmic pattern. They are repeated again and again through the growing years. The personalities of twos, fives, tens, and sixteens are tagged "smooth and consolidated," but the two-and-a-halfs, the five-and-a-halfs to sixes, and the elevens are less happy.

In the general pattern of forward achievement, plus the age tendencies, environment influences readiness. Bimbo may revert to old patterns and habits, if faced with major adjustments such as a new brother or sister a family move, house guests, a relative living with the family, illness, or a new social situation.

Many peculiar forms of behaviour may become evident as Bimbo develops. Usually strange behaviour indicates that he is either ready for more independence or is unhappy. He becomes the neighbourhood bully because he feels insecure at home. He constantly climbs over the side of his playpen or bed because he wants to explore. He becomes destructive when he cannot read as well as his younger brother. If a seemingly happy child becomes unmanageable he is not being naughty. He is trying to say, "I'm not happy. My world is all mixed up."

If you believe that Bimbo is ready to enter school this year, if he can manage most of the skills in our list, send him. But observe his behaviour at home after he starts school. He will tell you by his actions whether school is too much for him by—

1. Becoming a crybaby, especially on school mornings.
2. Being unable to eat or being sick to his stomach on school mornings.
3. Refusing to go to school.

4. Being cross and unhappy at home after school.

Sometimes these evidences are only signs of extreme fatigue. You can help relieve the strain on Bimbo if you—

1. Try to be relaxed and ready to spend some time with him alone when he reaches home.
2. Offer him luncheon if he is not too weary to eat.
3. Have a warm bath ready.
4. Allow a time for quiet play alone in his room if he will not nap.

If these measures do not relieve Bimbo's fatigue, consult his teacher. Perhaps he can handle kindergarten only every other day at first. Remember that kindergarten is a situation to prepare a child for formal learning in the first grade. He needs this time for adjusting.

If Bimbo continues to show you and his teacher that he simply cannot take school yet, let him remain at home another year. You are not hurting him. He is not a dullard. He simply needs more time.

Removing a child from school is painful for parents. It takes courage to tell neighbours and friends. Some children enter kindergarten at age four and a half to five. School administrators, teachers, and psychologists well know that many boys are not ready to begin reading until they are close to seven and that many girls need to be into their sixth year or older. Why rush Bimbo when he is not grown up enough? His welfare is far more important than false pride. Rushing him only creates school problems and keeps him from having a happy learning experience. ***

NEW HOPE

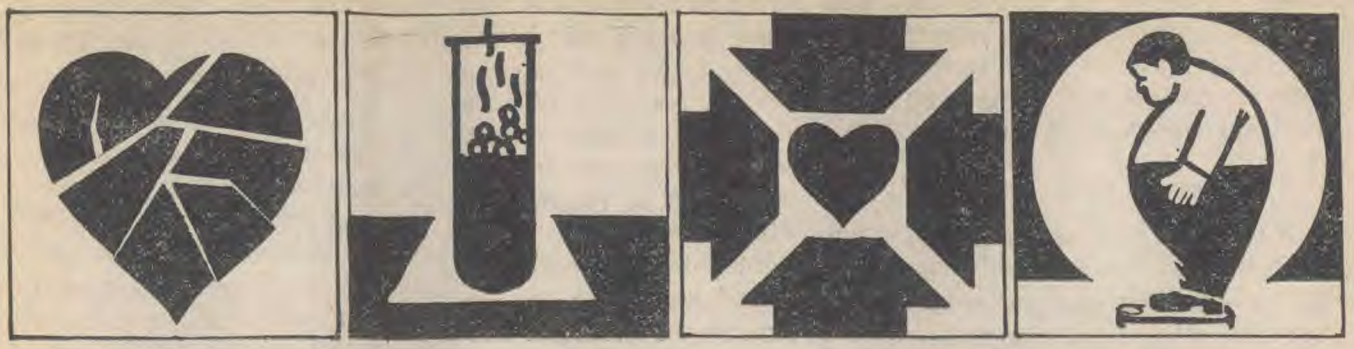
For victims of coronary heart disease, diabetes, high blood pressure and obesity

By C. E. Nelson, M.D.

The commonest cause of deaths from coronary heart attacks in people under the age of fifty is tobacco. The epidemic of heart attacks (52 per cent of all deaths) can be controlled if facts presented here are taken seriously. This is also true of high blood pressure, stroke, diabetes, and obesity—all important cripplers and killers. All are related to the high consumption of animal fats. WE NEED TO EAT TO LIVE, AND NOT LIVE TO EAT!

A very important advance in the care of patients with angina and coronary artery obstruction is in the field of surgery. X-rays can now be made of the coronary arteries that supply the heart muscle with blood. (By introducing a needle into the femoral artery in the thigh, a small plastic tube is passed through it up to the heart, where a contrast substance that casts a shadow on the X-ray is injected.) An accurate visualization of the coronary artery is made showing if there is obstruction by cholesterol deposits which may shut off most of the blood supply to the heart. Frequently there are three to five obstructed areas in the artery, with up to 85 per cent to 90 per cent of obstruction of the lumen.

Three of my close friends had this done recently because of chest pains. Since they had 85 per cent to 90 per cent obstruction of the vessels, the heart team would not let them leave the hospital until they were operated upon—actually emergency surgery. To overcome the obstruction, a large vein from the lower leg was removed and connected with the aorta where it leaves the heart. This vein was then brought down and openings made between the vein and coronary arteries below the obstructed areas, thus providing new blood supply to the heart. In most cases this surgery is successful, but sometimes there isn't room left in the coronary arteries to give complete relief. There is still hope for the patient if he is willing to go on a very rigid diet, avoiding saturated animal fats and doing graduated exercises. This will be described in more detail later.



People who have had coronary by-pass operations no doubt have deposits in other major arteries of the body, especially in the abdominal aorta that carries blood to the legs. Insufficient blood frequently causes cramp in the legs on exertion, called intermittent-claudiction. The carotid arteries, which furnish blood to the brain, may be involved and may cause minor or major strokes, as well as premature senility. Vascular surgeons frequently ream out some of these arteries in the neck to remove obstructions. In the case of the abdominal artery which may be almost obstructed, it is necessary to remove the obstructed part, which extends from below where the arteries of the kidneys come off and includes portions of the main artery branches that go to each leg, and plastic arteries are put in its place.

Unfortunately, the by-pass operation is not the last word in returning people to perfect health. At least 80,000 by-pass operations are done yearly. Stanford University reports that 40 of 350 patients operated on who had the typical chest pains known as angina had a recurrence of their chest pains within two to five years. It is urgent that patients who have had by-pass operations go on the therapeutic diet of 10 per cent fat, 10 per cent protein, and 80 per cent carbohydrates (fruits, vegetables, and grains) for a time, then change to a preventive diet.

It is possible that many with angina may avoid by-pass operations by this diet and gradually increasing exercise.

Until recently doctors prescribed diets high in fats and low in carbohydrates for diabetics. Now they find that if the patient is put on a low fat and high carbohydrate diet and a good exercise and mass reduction programme instituted, many can get along without anti-diabetic drugs. Those on insulin required only one-quarter as much, if at all. (This is not true of juvenile diabetes.) Diabetic women have higher incidence of still-born babies or babies with birth defects when on a high fat diet. Experiments were done giving healthy twenty-year-old young men a high animal fat diet for two weeks, then testing them with glucose tolerance tests. All gave a positive test for diabetes. They returned to normal when their diet was changed to high carbohydrates.

In one test, diabetics on a high fat diet required five times as much insulin as when they were on a low fat, high carbohydrate diet. Obesity predisposes to diabetes, heart disease, stroke, and cancer of the breast.

Smoking is an important contributor to cholesterol deposits. The carbon monoxide gas of the cigarette smoke causes an irritation and swelling of the lining of the arteries, opening the way for cholesterol deposits. One study demonstrated that those who have 5 per cent carbon monoxide hæmoglobin (C O H G) (which occurs frequently) have 29 times as much cholesterol deposits as those having 3 per cent COHG. Unfortunately, cigarettes with lowest tar content are often the highest in carbon monoxide. You can't win if you smoke!

Thousands of people are crippled each year by stroke and obstruction of the arteries of the brain and lower extremities. Stroke claims many lives each year. Most of these could be avoided if the programme recommended herein is followed.

Animal fats (meat, poultry, fish, milk, cream, cheese, egg yolk) are high cholesterol foods and cause deposits of cholesterol in the arteries, not only of the heart leading to heart attacks, but of the arteries to the brain, the abdominal aorta, and those to the legs. Glaucoma and heart disease is unknown in

countries where the diet is low in fat and protein. Obese people will lose mass on this 10 per cent fat, 10 per cent protein, 80 per cent carbohydrate diet.

Absorption of deposits

It has been observed in human beings that a change from a high fat to a low fat diet causes absorption of many of the cholesterol deposits. This has been shown by repeating angiograms (X-rays of the arteries) months after a change to a low fat diet. There is a noticeable decrease in the atherosclerotic plaques of cholesterol. Monkeys fed on 25 favourite foods of people in time developed coronary heart disease. After their diet was changed to low fat, their heart disease was reversed.

When monkeys were fed on high cholesterol diet for 17 months, their serum cholesterol rose to 700 mg. per cent. They showed extensive cholesterol deposits in their arteries. Then they were placed on a low fat diet containing only four per cent of the total intake. Some were given a diet with 40 per cent of corn oil and no cholesterol foods. Their serum cholesterol dropped to a normal level of 140 mg. per cent. After being fed on these diets for 40 months, there was a remarkable decrease in the cholesterol deposits in the arteries. There was more than 80 per cent increase in the diameter of the arteries as compared with the animals that were on the high cholesterol diet. Similar results were obtained by other investigators from 65 per cent to 25 of lumen.

Certain animals (hamsters) have very thin lining inside their cheeks. When they were given a large dose of cream or vegetable oil, the red blood cells became coated with grease, which interfered with the absorption of oxygen, as noted under the microscope. Soon the blood cells became sticky and plugged up the capillaries. Tests showed marked reduction in oxygen to the tissues as a result.

It is now believed this same process affects the circulation to the inner ear and is responsible for nerve deafness. A similar process is believed to cause glaucoma in the eyes, and possibly cataracts. In the same experiments in human beings, it was noticed by use of the ophthalmoscope that after a fatty meal, 30 per cent to 40 per cent of the vessels of the interior of the eye became plugged. This process could also take place in the heart muscle.

Limit on fats

An experiment was done on fourteen patients with severe heart disease who had angina chest pains when they would walk or exercise. These fourteen were seated in chairs without exercise. After drinking some cream, all fourteen developed anginal pains because the greased red cells couldn't carry enough oxygen. The test was repeated later, but the patients were given a drink that didn't contain cream or fat; none developed chest pain.

Edible fats are classified into two important groups: saturated fats and polyunsaturated fats. There is also a monosaturated fat, but it does not have the importance of the other two. Saturated fats are animal fats of all types, including meat, fish, poultry, milk, milk products, and eggs. Also included are coconut and coconut oil.

The vegetable oils are known as polyunsaturated, and instead of increasing cholesterol in the body, they have a tendency to

Temperatures can vary as much as twenty degrees between a city's business section and its residential suburbs. Throngs of people in the commercial district, along with heavy automative traffic and the solar energy reflected from buildings and sidewalks add to the buildup.

* * *

The difference in temperature between the warm surface and the cold depths of the tropical ocean could prove an important source of energy for countries in the South Pacific region. The heat is needed to convert a working fluid into a gas; the cold is needed to condense the gas back into a liquid so that the process may go on. The solar energy stored as heat in the upper layer of the ocean is renewable and does not depend on the whim of the weather.

* * *

Thousands of navigable rivers and streams in the Soviet Union serve as major trade arteries, carrying 150 million passengers and 500 million tonnes of freight each year. When the waterways freeze in the winter, many become highways, solid enough for use by heavy vehicles.

decrease it. However, these oils if taken in large quantities can act like animal fats (cream) in coating red blood cells and decreasing their oxygen-carrying power and tendency to clotting. Vegetable oils do not contain cholesterol.

A protective diet should not contain more than 300 mg. of cholesterol for a day. Those on a therapeutic or curative diet should have a diet with practically zero cholesterol until the desired results have been accomplished.

Those with either high triglycerides (a form of fat) or cholesterol should have their fat intake reduced to 10 per cent and eliminate sugar from their diet. If blood cholesterol is above 260 mg, there is four times a risk of heart attack than those whose test shows 200 mg or less. A drop of one per cent in serum cholesterol reduces heart attack risks by 2, 4 per cent. Triglycerides should be kept at 100 mg. or below. There are millions of people with high blood pressure; they should reduce their cholesterol to below 200 mg and their mass to what it was at the age of 16. It's a lean horse for a long race. Half of what you eat keeps you alive, and the other half keeps us doctors alive.

Use only vegetable fat. Omit refined cereals such as white flour, white bread, noodles, macaroni, white or polished rice, pastries, cookies, cake and crackers (unless whole wheat), as well as prepared sweetened breakfast foods.

The Masai tribe of Africa, who live on milk and fresh blood drawn from the veins in their cows' necks, have high cholesterol. They and the Eskimos, whose diet consists mostly of fat meat, do not have heart attacks, but autopsies on people who die of accidents, etc., show they have heavy cholesterol deposits in their arteries. The reason they don't have heart attacks is that they both do lots of walking and hard labour, which keep their coronary arteries open.

The main causes of deaths from heart attacks are high animal cholesterol foods: meat, milk products, cream, ice-cream, cheese (not non-fat cottage cheese), and eggs. Other factors causing heart disease are tobacco, alcohol, coffee, obesity, high blood pressure and stress, which is often caused by overwork, lots of coffee and lack of adequate exercise.

Diet recommendations

Following are practical dietary recommendations:

1. Use meat substitutes in place of meat, such as nutrine nuggets or those made of textured soya beans and gluten.

2. Use non-fat milk in place of whole milk. Sometimes low-fat milk.

3. Use non-fat cottage cheese in place of regular cheese.

4. Limit the use of eggs. Egg whites are allright.

5. Reduce visible or added fats over 60 per cent.

6. Use fresh fruit in place of high sugar desserts.

7. Use less sugar.

8. Eat only whole-grain breads. Avoid macaroni and cheese, cheese omelets, and pancakes or waffles with lots of butter or sweet syrup.

9. Get lots of exercise.

For mass reduction and for high cholesterol:

1. Reduce dietary cholesterol to less than 50 mg. per day.

2. Limit saturated fatty foods to five per cent or less.

3. For cooking and table use, use polyunsaturated vegetable oils and margarine.

A yearly blood test (Multiphasic or S.M.A.) which shows how much cholesterol, uric acid, blood sugar (glucose) are in the blood, as well as ten or more other important tests on one blood sample is advisable. See your doctor for regular examinations. Watch your blood pressure. Smokers should have chest X-rays every three months if cancer of the lungs is to be found in time to be operated on. It takes 18 months before a lung cancer will show on X-ray. A smoker's only safe plan is an X-ray every three months.

In changing your diet, remember you will get all the protein you need on a vegetarian diet, as well as all the vitamins, when citrus and other fruits are added. For desserts, use apples and other fruits such a prunes, dates, bananas, etc. Instead of 60 gms. of protein a day, it is known now that 50 gms. are better. Use fruit instead of sugar if desired to sweeten cereal. Protein is found in most vegetables, but higher in peas, beans, garbanzos (chick-peas), and lentils. The protein in legumes is of equal value to meat protein but has no cholesterol. It also contains, pound for pound, the same amount of protein as meat when used with cereals.

You will lengthen your life, increase your enjoyment, lessen your diseases if you also get enough exercise. Try to walk four to five kilometres a day, half in the morning, and half in the evening. Skipping with a rope for 15 minutes twice a day is

To page 22

The story of a successful Punjab farmer

By Pran Chopra

PRODUCING MORE

"And then I went to PAU." With these few words farmer Harnek Singh began a new chapter of his life story as he told it to me, standing at the edge of his rice farm in Raipur Bet.

I am familiar with this part of the Punjab **bet**, as riverine areas are known in the Punjabi language, especially if they are also sandy. Raipur used to be a very desolate pocket of a very backward part of the river Sutlej **bet**, a barrenness of heaps of sand which rolled all the way from the canal headworks at Ropar to the suburbs of the city of Ludhiana. In those days—I am talking of 20 years ago—tawny grass and a few stunted fields of grain were all that broke this dull brown and sandy gray monotony. An uncertain ribbon of a road ran through the **bet**, which was often obliterated by shifting dunes.

Early this year I motored again on that road on my way to a lecturing assignment with journalism students at the Punjab Agricultural University (Harnek Singh's "PAU"). And as I travelled on that road I could not believe my eyes. Along most of the road, which was now broader and much better, were healthy, endless fields of ripening wheat as far as I could see. This new monotony was broken only by powered tubewells with their gushing streams of water, by harvesters and tractors, by cold storages, poultry houses, the grain godowns of the Food Corporation. I was not a stranger to the fame of agricultural Punjab. But I was not prepared for a change like this.

Raipur Bet is a tiny village of only a score of families or so, two-thirds of them Harijans and other low castes and only four of them jats, the Punjabi peasants whose farming skills have made Punjab's agriculture the dynamic and thriving occupation it has become in the past decade. So Raipur does not have enough jat families to give it the thrust of Punjab's new agriculture. I therefore expected to see the old **bet** in it still. But I was mistaken.

Harnek Singh's career as a farmer is a miniature of one of the great agricultural sagas of our time—perhaps the greatest in terms of the numbers of people involved and their dramatic experiences. The saga began a hundred years ago and is still unfolding itself in the lives of millions of people like him.

In the 1860's and 1870's, the British administration of India began the adventure of colonizing the vast, empty, desert lands of the Indus river system which were

OOD THE MODERN WAY

later to become India's wheat granary. They dug hundreds of miles of canals in what is now Pakistan until they created one of history's largest irrigation networks.

To populate this wilderness in the succeeding decades they called over a couple of million people or more from the crowded districts of what is now India's Punjab Province, and especially from the districts of Ludhiana, Jullunder, Amritsar and Hoshiarpur.

But after the 1947 riots, Punjab was divided into its Pakistani two-thirds of West Punjab and the Indian one-third of East Punjab. Since religion became the dividing knife and most of those who had migrated to West Punjab in the earlier decades were non-Muslims, they all had to trek back—and in barbarous conditions of arson, looting and riots in history's most massive and certainly bloodiest exodus.

Finest farming stock

But their homecoming became for East Punjab an invaluable input for agriculture, to which it gave an unprecedented push. These refugees became India's finest farming stock. Skilful they had always been, even before they migrated west. The opportunities they experienced in West Punjab had made them bolder and more venturesome. Now their plight made them desperate to get the maximum out of the tiny plots they got as compensation for the vast farms they had left behind. Their success exceeded all expectations.

Harnek Singh's family performed the journey both ways. His grandfather was given a fine block of land in Lyallpur district, his father went there later. Harnek Singh was born there in 1923. Recalling the reverse migration of 1947, he said, "Where we are sitting now"— we were

sitting in the front yard of his tiny but neat brick-built house, its kitchen a generous source of tea and biscuits in the gathering dusk—"the sand heaps were one and a half stories high. We had to truck out the sand before we could move in."

But in the past few years technology and the flow of communication have been doing for Harnek Singh what better land and the flow of canal waters did for his father and grandfather. The technology comes to him from the Punjab Agricultural University, which Harnek Singh calls "PAU" with a touch of affection because half the faculty of this university had graduated from the Agricultural College at Lyallpur, though more than half of them also have doctorates from various universities in many

---

HEALTH WISE

Programming man's future

Allan R. Magie, Ph.D.,M.P.H.

Headlines of "test tube babies" have recently captured man's imagination. While these babies do not really develop in test tubes it does give us an idea of the rapid advances being made in the field of human genetics.

The basic theory of such genetic engineering, as this new field of medical research is called, was recently demonstrated in bacteria. These tiny creatures have fairly simple genetic material which, it was found, could be taken apart and then rejoined in new arrangements. The bacteria then produced offspring which could make new materials or look different than their "parents." The gene pattern was changed in these bacteria. Genes are the primary units of inheritance, each gene being responsible for some aspect of the organisms structure or function.

Now that man has discovered the secret for manipulating gene patterns, how can it be used to meet the requirements of science?

There are a number of ways in which genetic engineering might be used to better life for man:

(1) Developing plants which have been taught to take nitrogen from the atmosphere (four-fifths of the air we breathe is nitrogen) and to utilize it in constructing protein molecules. This would eliminate the need for expensive nitrogen fertilizers, most of which is currently produced from crude oil.

(2) Correcting the mistakes in the genetic "blue prints" of children born with a hereditary disease. There are more than 1500 diseases caused by such defects, including Down's syndrome (mongolism), hæmophilia (bleeder's disease), leukemia (blood-cancer), and early blindness.

(3) Creating bacterial "factories" that would be capable of producing in large amounts at a low cost, substances essential to modern medicine. Already this technique is being used in producing the hormone insulin, used to treat diabetes.

(4) Producing vaccines that would be effective in preventing hepatitis, influenza and other virus infections. The same methods might also be used against some of the major diseases that afflict mankind, particularly in developing countries, such as sleeping sickness, malaria, schistosomiasis (liver fluke), tuberculosis, and the dread leprosy.

(5) Developing entirely new treatments for heart disease and several types of mental disease.

(6) Discovering how cancer begins and how to prevent it.

Such ideas were once thought to be too imaginary to be considered very seriously in this century. But, step by step, man has arrived at the threshold of being able to eliminate some of the obstacles to a healthy future for mankind.

countries especially the United States.

Harnek Singh's faith in PAU may owe something to the Lyallpur connection. But its source must be more ubiquitous, because I have found it everywhere among the farmers of Punjab. That source is the close interaction in Punjab between the university and the farmer through an extensive system of two-way communication.

Change and communication

Communication means change in Punjab. The past 10 years have seen the fulfilment of a promise which was foreseen 15 years ago when PAU entered into a five-year collaboration with the University of Ohio in the United States, under the peculiarly American scheme of land grant colleges. PAU is as strong in scientific research and in on-campus training and education as an agricultural university should be. But it is strongest, and uniquely so, in extending the results of research to the farmer's field, in on-farm education and training through mass communication and face-to-face propagation, and in learning from the field what only the farmer can teach the educator.

This uniqueness was contributed by the Ohio collaboration, which added a strong emphasis on extension to the research and education which had been the university's previous main concerns. The contribution has paid off brilliantly because of the matching uniqueness of the Punjabi farmer, his responsiveness to change and opportunity, his willingness to adopt a new idea and his ability to adapt it to his own conditions.

One of the university's bridges with the farmer is its own communication centre, a more developed institution than most universities have. Though far from complete, it already conducts all of the university's mass communication programmes—over the radio, on cinema and television and through print.

The centre prepares replies to questions, running into the scores every week, which All India Radio and Doordarshan receive from farmers on specific farming problems. It provides the expertise for all farm programmes on these two media, and gives to them and the press an extensively publicized weekly bulletin on what farmers should be doing during the week.

The centre publishes a priced magazine, which does not accept an advertisement before testing the claims made for the product, and already sells 15,000 copies. Two of the centre's other periodicals, also priced, are six-monthly guides on farming operations, published in advance of the two main farming seasons. Apart from these, the centre sells about 40,000 copies of other priced publications.

Punjab Agricultural University's extension work also includes two mass events. Before the kharif and rabi seasons begin, the university organizes two **kisan melas** or **farmers' festivals** on the campus and its experimental farms, where attendances run up to 15,000 or so, and two or three times that number when a new seed variety is to be released. The police have to be called in to keep order in the long, winding and sometimes impatient queues which form up overnight.

Between seasons too, parties of 200 to 300 farmers spend a few days each on the campus. Some 50,000 farmers visit the university annually—quite an exposure rate for a farming population of say 10 million out of Punjab's total population of less than 14 million. This is apart from the 2,500 graduates who pass through the university every year, and a similar number who take short crash courses on the campus or by correspondence.

At the other end, the university interacts very closely with the agriculture department of the state government, the agency responsible for supplying and distributing all the material inputs such as seeds, chemicals and water resources. The university quite rightly feels that its research will never bear fruit unless it carries conviction with the department. Whenever research yields a new technique or a new seed variety, it is jointly tested by the university and the department, working side by side and simultaneously, on three fields selected by each in relevant districts from among farmers who have a taste for experimentation.

New techniques

All the new techniques approved for each of the two main seasons are brought before a "workshop" held on the campus, well in advance of each season. The university's scientists and researchers talk to all the extension hierarchies of the university and the department and to selected farmers drawn from all districts. The participants then fan out to the villages to hold much larger training camps for other farmers; from there the message is taken over for further mulling and chewing by **charcha mandals** or discussion groups which are springing up in many villages.

Most of this traffic of communication is downward. More heartening as a sign of change in Punjab, however, is the upward traffic I saw in some villages, including some in the relatively isolated Raipur Bet. I was travelling with some of the university's technical staff to see the work being done to remedy vital plant nutrient deficiencies in the soil, and I found that news of the arrival of the soil experts spread rapidly in the village wherever we went. Immediately farmers came to them with their troubles, sometimes with samples of the diseased crop in hand. The university's experts prescribed cures for them like country doctors on their morning rounds.

Regular consultations

Others, more venturesome or in need of more complex consultation, travelled all the way to the campus. Among those who did so a couple of years ago was Harnek Singh of Raipur Bet. That is when "I went to PAU."

Harnek Singh's father was allotted 68 acres of land when he sought resettlement as a refugee farmer from West Pakistan. This was a small farm by the standards of what he had left behind —in terms of productivity it was small even by the standards of East Punjab. Most of it was sandy and unirrigated in the highland; the rest was waterlogged in the lowland plain. He cultivated the split patches as best he could with the help of one son, while Harnek Singh ran a small factory for bicycle parts in Ludhiana.

In the late 1960's the old man's strength began to run out, and also Harnek Singh's patience with his factory ("factories are run with government quotas, and I could not get one"). So he shut down the factory, sent off one son to England where he drives a postal van, and with his wife, one son and daughter-in-law (now a school teacher but also brightly informed about farm economics) he moved over to Raipur Bet to start ploughing the sand, quite literally, on what his father allotted to him as his share in the family's land.

"I got 21 very poor acres in the upland where my father used to grow a stunted wheat crop, and 7 poorer acres in the swamp lowland which were not being cultivated at all." This is how it went until a few years ago. One meagre wheat harvest in the year, and that too mostly on subsistence cultivation, was all that Harnek Singh got from his own 28 acres, plus another 9 which he manages for a brother who lives elsewhere.

Then Harnek Singh began to ring changes, and that is how his acquaintance with PAU began. He heard of the university's extension facilities through other farmers who had availed of them, went to the campus for advice, and with its help switched over from wheat to the more profitable groundnut, which is also more suitable for his kind of porous land. Not satisfied with this, he began another shift, to the still more profitable potato ("two crops a year; 100 per cent net profit from the first crop, 75 per cent from the second"); with the assistance of his wife and daughter-in-law he added poultry as a sideline.

Both poultry and potato are problemprone, easy preys to diseases and pests. But this only expanded his contact with the university. On the one hand, he began to use its advisory services even more. At the time I met him last September he was happy to display the latest benefit he had extracted from the contact. On the other hand, he became more active in organizing local farm forums and farm volunteer groups.

Problems

Like other farmers in the **bet**, Harnek Singh had also started paying some attention to the marsh and had tried local varieties of rice in it with some marginal success. But he was no more content with that kind of rice than with the wheat he used to grow on the rest of his land. So last year he went a step further and despite all the costly inputs required, he put the land under high-yielding rice.

The results were disastrous. The crop was a total failure, because these inferior lands—"not only these but 50 per cent of the total agricultural land in Punjab" according to Dr. Pran Takkar, a senior soil scientist at the agricultural university—are deficient in zinc. This is a deficiency that is lethal for rice and maize, especially for the high-yielding varieties. (Wheat tolerates such soil to some extent, which is why zinc deficiencies did not show up on lowland plain soils until farmers began switching over to rice cultivation).

As Harnek Singh tells it, "Next year I decided to do what other rice farmers were doing. I too applied big doses of zinc sulfate, both in the soil and by spraying from above. But my crop began to die just the same. The disease appeared as bad as the year before. So I went to PAU once more, holding in my hand samples of yellowing and dying paddy from my farm. The expert's immediate answer was

'try zinc sulfate.' When I said I had applied the recommended doses, he asked me to bring my supplies for a test."

Speedy growth

At this point Harnek Singh discovered a problem connected with speedy growth which many others in Punjab had discovered before him, much to the surprise of conservative socioeconomists: that far from being reluctant to apply the techniques of modern farming, the supposedly inert farmers are adopting the inputs of the new farming faster than the rest of the economy can supply them. Whether it is high-yielding varieties of seeds, or fertilizers or insecticides or other chemicals, or high-wage imported labour, the cry all over Punjab is the same—"shortage"! Even unskilled farm hands are in short supply; though "anywhere up to 400,000" (an estimate by the Department of Economics at PAU) are imported annually from Uttar Pradesh, Bihar, Rajasthan and Orissa, wages in the busy season can go up to Rs. 20 a day for the daily wage worker.

The persistent shortage is a fertile breeding ground for black market and fakes. A good example is harvesting combines. At the biggest depot I saw for such machines, I was told that seven-or eight-year-old machines are being resold at the original price because the demand far exceeds the supply. The demand has increased because even in remote Raipur Bet it is now known how quickly mechanization earns back its price. Harnek Singh's daughter-in-law looking at some Bihari Muslim labourers who were sitting nearby, taking their tea break from her father-in-law's farm, said wistfully: "We could buy a tractor if we had the right kind of land. A good one costs Rs. 75,000. Or Rs. 100,000 if it is bought on instalments or with a bank loan. But it earns back its price in a year." People have made a thriving business out of renting out machines.

But Harnek Singh had run into the more nasty by-product of shortages: fakes. "I took a bag of my zinc sulfate to PAU. They tested it. They found it to be zero." But fortunately for him, the university helped him to act

To page 22

Reweighing the balance of nature

After years of telling us how delicate the balance of nature is. scientists themselves are being warned that their respect for that balance has not been sufficient, either. Researchers at Cornell University in the United States have found that the laboratory tests used to predict what effect disposing of chemicals—both toxic and seemingly non-toxic—has on the environment have been inadequate. Scientists, it seems, have failed to take into account significant differences between what happens in nature and what happens in a lab. The result: We may have been seriously underestimating from partially degraded, or altered, chemical compounds.

Most organic chemicals—including the toxic types produced by many industrial processes—can be broken down into harmless inorganic forms only by micro-organisms found in soil and water. According to Professor Martin Alexander, a Cornell soil microbiologist, some chemicals break down faster in nature than in the lab—but others decompose much more slowly than artificial tests indicate. In some cases, a particular chemical will stop decomposing entirely at the point where only low concentrations remain; the popular herbicide called "2, 4-D" is one example. Other chemicals may resist microbial on slaughts for months or years, remaining intact, and dangerous all that time. In still other cases, chemicals that have under gone "cometabolism"— partial decomposition—may be more persistent, than they were previously. And some compounds that are quite innocent when discharged into the environment become dangerous when micro-organisms that attack them set up a chain of chemical reactions that change their nature. For example, amines—compounds containing nitrogen—may eventually become carcinogenic. Since plants may then absorb them from the soil, they can become a hazard to animal and perhaps human life.

Alarmed by finding that these conditions often escape the notice of laboratory environmentalists, the Cornell team is looking for substitutes for such hidden-danger chemicals. But replacement is clearly a long way off. In the meantime, the best we can do is look upon proclamations that the environment is being protected, with an informed—and skeptical —eye. ***

spotlight on science

Dental implants

A look at the new way of fixing those decaying teeth, showing that the old—the natural way—is still the best.

By William Carl, D.D.S.

When a shark wears out his teeth, he grows new ones. Humans are not that fortunate. We get a set of twenty teeth—ten uppers and ten lowers—usually by the age of two. Starting about the age of six, we gradually lose these teeth, and they are replaced by twenty new ones, plus an additional twelve teeth. This gives us sixteen uppers and sixteen lowers. By the time we are twelve or thirteen, twenty-eight of these have erupted.

The last four, the third molars, or wisdom teeth, are usually trouble-makers. They might never erupt. Often they come in crooked—if they decide to come in at all. Many times they are impacted, lying flat or at an angle, and only a lonely little cusp peeks through the gum, causing a lot of aggravation around the age of twenty.

Our second set of teeth doesn't always last for the duration of our lives. Many of us get a third set: dentures. Chances are that at one time or another you've read or heard about dental implants. And if you are a denture wearer, especially one who has all kinds of problems with your dentures, you've probably wondered whether or not you should have implants placed in your jaws to rid you once and for all of your denture troubles.

It's not that easy and it'll be a long time yet—if ever—before implanted teeth make dentures obsolete. Implants are simply not yet ready for everyday use.

Much research has been done in the past ten years in implantology. A handful of dentists seems to have had a fair degree of success with implants, but they select their patients very carefully and caution against overenthusiasm.

A dental implant is a foreign body of noncorrosive metal that is surgically embedded into the jawbone. The purpose of it is either to replace missing teeth or to serve as support for dental prostheses: crowns, bridges, partial dentures, or full dentures.

Two types of implants

Most dental implants in use at this time are one of two types: intraosseous or subperiosteal.

An intraosseous (intra=in, osseous=bone) implant makes use of a piece of metal introduced into a hole or a slot in the jawbone. The metal going into the bone may have a thread on one end and a smooth tapered stub on the other. It is literally screwed into the bone like a bolt into metal or wood. Another type of intraosseous implant looks like a flat blade with holes through the side. Again, the other end has a tapered stub. To get this implant into the jawbone, a narrow channel has to be cut for the blade to fit snugly into. If all goes well, bone will eventually grow through the holes in the blade and anchor it firmly to the jaw.

The tapered stub on the one end of the implant sticks through the gum into the mouth. In a way, the stub is like a tooth: a crown, bridge, or a denture may later be anchored to it.

Subperiosteal (sub=below, periosteal=layer of fibrous tissue around bone) implants are not inserted into the jawbone. They are made of a metal grid that fits the contour of the bone. The tissue covering the jawbone is opened, the implant is slipped between it and the bone, and then the gum tissue is sutured together over it. As with the intraosseous implant, little stubs resembling teeth are left sticking out into the mouth for the attachment of crowns, bridges, and dentures. Most dental implants today are made of Vitallium—a metal that doesn't corrode in the mouth.

These procedures sound simple, but they aren't. Implant dentistry is a tricky business that's still plagued by many failures. One of the problems is rejection of the implant by the patient's own tissue. The implant eventually becomes loose, the bone around it melts away, and the gum tissue becomes infected. As a result, the implant has to be taken out.

Implants are not for everyone without natural teeth or a flat ridge. Patients have to be carefully selected, and implant dentistry is not every dentist's thing.

First of all, the dentist has to know what he's doing. He must be a good surgeon, a good periodontist, a good prosthodontist, and a good diagnostician. He must know his limitations and what he can expect from jawbones and from an implant. In addition, he must be able to project how the prosthesis that later attaches to the implant will function.

Problems with implants

Patients who had or have chronic gum disease when they had or have their own teeth are poor candidates for implants. Loss of bone around natural teeth is a problem with periodontal disease. It's an even bigger problem with a foreign body implanted in the bone. Like natural teeth, implants are subject to periodontal disease. Gum tissue doesn't really grow into the metal of the implant. The most one can hope for is a tight cuff around the neck of the stub sticking into the mouth.

The type of ridge that's left on the jawbone determines what kind of implant may be used. If the ridge is thin like a knife edge, then it's not good for an implant; the walls of bone are not strong enough, and the metal will break through. Try screwing a bolt into a narrow strip of metal: the sides give way.

If the ridges are flat only a subperiosteal implant can be considered, because the bone isn't thick enough to support the other type. The remaining bone must be solid and firm, and the gum tissue over it must be healthy.

Besides all these mechanical considerations, patients must be healthy. People who are diabetics or have kidney problems or heart disease are poor candidates for dental transplants. These conditions may affect bone and healing.

The implant itself is not the replacement for lost teeth. It is merely a frame to build on. In other words, the implant is the anchor for a superstructure. The superstructure may be crowns, bridges, partial dentures, or full dentures. If the superstructure is poorly or incorrectly done the implant doesn't last long. All the principles of good restorative and prosthetic dentistry apply. Even with the most favourable conditions, overenthusiasm is not indicated with any form of implant.

Good care of your teeth by your dentist—and by you—is still the best safeguard against becoming a dissatisfied dental-implant patient some day. ***

Don't let tension kill you!

A little tension is inevitable in life and even beneficial if you keep it under control. But when tension takes over, it can result in a variety of physical and mental illnesses that keep hospital beds filled. G. S. Stevenson, a well known medical consultant, offers the following suggestions for coping with tension when it appears to be getting out of hand:

1. Talk it out. Share the burden and relieve the strain. Talk may also help clarify the problem and bring a solution to light.

2. Escape for a while. A change of scenery is often just the right medicine when worry and anxiety begin building up beyond control.

3. Work it off. Chop some wood. Take a brisk walk. Hard physical work gives your mind a rest.

4. Give in, occasionally. Sometimes it's easier to yield, even when you know you're right.

5. Do something for others. Often it will take the steam out of your own worries.

6. Take one thing at a time. Tension is intrinsic in the effort to do several things simultaneously.

7. Don't try to be a superman. Aiming for the unattainable is a sure road to failure—and ulcers.

8. Give the other guy a break. Competition is important, but so is cooperation.

9. Don't withdraw. That usually just compounds the problem.

10. Schedule your recreation, especially if you tend to drive yourself. Set a routine for relaxation and follow it.

NEW HOPE

From page 13

good exercise if you can't get out and walk in the fresh air. Avoid tobacco. Keep your mass down. Get sufficient rest.

Dr. Denis Burkett, a famous English scientist who spent 30 years in research in India and Africa, stated that heart attacks, stroke, high blood pressure, gallstones, hiatus hernia, cancer of colon and rectum, diverticulosis, hæmorrhoids, constipation, colitis and varicose veins rarely occurred among villagers. He said it was due to diet, not genes.

Dr. Burkett advised unprocessed bran, two to three tablespoonfuls a day, mixed with other foods, either wheat or rice bran, for colitis, diverticulitis, even some forms of diarrhoea. High protein diets remove minerals (calcium, phosphorus, iron, zinc, etc.) from the body and demineralize the bones (osteoporosis). Eskimos who have high protein diets have marked bone deficiency.

Pigs fed high cholesterol food for only three days before being slaughtered already showed changes in their arteries. Obesity tends to high blood pressure, heart attacks, cholesterol deposits and diabetes.

Blood tests, in addition to cholesterol should include total lipids and newer tests for lipoproteins,—high density lipoproteins, (HLD, friendly) and low density lipoproteins, (LDL unfriendly) which is an oily-like substance that irritates lining of arteries and transports cholesterol to deposit in the tissues, arteries (atherosclerosis), also into fat, muscles, tendons, and as xanthoma deposits around the eyelids. ***

PRODUCING MORE FOOD

From page 19

in time. It guided him to stores known for genuine products. "I again applied the recommended doses, and within four days my crop revived. On the eigntn day I sprayed again as I was told, and my crop became as though it had never been ill." He still could not conceal either his happiness or his surprise as he looked at his seven-acre spread of healthy high-yielding rice below where we stood.

He was still worried about next year. "I have reported the local merchants who gave me the fake; and they can make difficulties when we want to buy our supplies again. I don't know. They may take it out on us on other supplies as well." That is one of the reasons why he is now very active in organizing farm forums. He feels the farmers will then be able to look after themselves better.

PAU is deeply concerned. According to Dr. Takkar, Punjab annually needs Rs. 120-150 million worth of zinc sulfate. Though the gain in total crop production can be worth Rs. 1,000 million—one of the many examples of the cost effectiveness of the university's research and extension work—better organized and surpervised manufacturing is needed than exists at present. Dr. Takkar fears that more people are in for Harnek Singh's fate as the fame of this chemical spreads among farmers.

I am no judge of these forebodings. They may well be right. Or they may not be. But my visits to the university have wholly convinced me of three things:

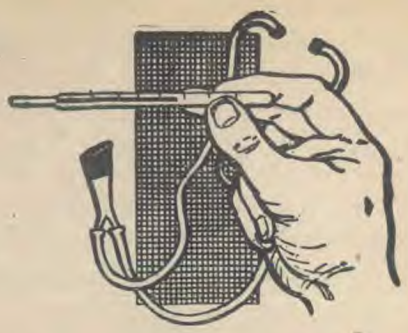
☐ Punjab has discovered an alchemy of interaction between research in the laboratory and practise on the farm which has far from exhausted its potential. There is vast scope for further growth even within the limits of the present research strategy, because there are many areas even in Punjab which have yet to be conquered by the new agriculture, and the areas outside Punjab are truly vast.

☐ In Punjab, at any rate, the tools exist for such a conquest. A responsive farming population exists which is ready to try whatever it hears will work. And the resources exist—tangible money resources, and the less tangible but equally precious resource of a two-way communication system between scientist and farmer, the interaction between knowledge and practise.

☐ I am convinced that what Punjab has done, a great deal of the rest of India can also do once the alchemy of human interaction is put to work. The most advanced district in Punjab, Ludhiana, is less well endowed by nature than many others are; in fact, its soil quality is much below the Punjab average. Similarly, Punjab and Haryana are less well endowed in terms of soil and water conditions than much of the Gangetic plain further to the east including the eastern Uttar Pradesh and Bihar, areas which people sometimes write off. Therefore the example of the better districts of Punjab can spread to the whole of northern India. The means are available; the people are ready. ***

—Courtesy, Span

The Doctor Advises



TROUBLE STAYING AWAKE

My husband has trouble staying awake. I know some elderly people sleep a lot even during the day but my husband is not elderly. He falls asleep in church and sometimes at work. We are worried, for a few days ago he fell asleep while driving the car and ran into the back of another car. How can we get to the bottom of this problem?

Many people nod while sitting quietly in church, and we hear of many car accidents that result from a driver's going to sleep. It appears from the tone of your letter, however, that your husband's problem is more serious than the usual instance of nodding.

Is he taking any kind of medicine? If so, have your doctor check the possibility of disease of the thyroid. A deficiency of the thyroid hormone often allows a person to become lethargic.

If such investigations provide no clue, then have your doctor refer your husband to a neurologist—a physician who is a specialist in diseases of the nervous system. A certain part of the brain normally functions to keep a person awake (during waking hours). Disease of this part of the brain may make it difficult for the person to stay awake. Or it may be that your husband has narcolepsy—a symptom for which the cause is not known and in which the person falls asleep unexpectedly. If so, there are certain drugs which can help to relieve the symptom.

BLACK TOENAILS

My big toenails go black and drop off. Can you say what is wrong?

The circulation of blood in the feet has in some way been impaired. The shoes may be too tight. The commonest fault is that the tread (width) across the front part of the feet is too narrow. It is very often that the shape of the shoes do not necessarily conform to the shape of the foot. And very rarely does one have one's feet measured for shoes, whereas one would never buy a suit or coat without such measurement. Yet we depend upon our feet for more than we think. Socks can be too tight, too. The ploy is to have the right size shoe, proper fitting socks, a nice soft insole, and if you have trouble with your feet, a nice soft spongy type of sole. If leather is used (and this is infinitely preferable to the plastic material so commonly used today) then there can be a stick-on rubber sole to ensure longer life.

BOILS

Are boils a type of septicæmia? If not, can they turn into this if you have many of them at one time?

Boils, also called furuncle, are not a type of septicæmia. They are abscesses located inside the skin and are caused by bacteria that have gained entrance and are multiplying there. A specialized membrane (called pyogenic membrane) forms around the abscess and prevents the bacteria from getting into the tiny blood vessels and being carried to all parts of the body. Normally, there are no bacteria in the blood.

Septicæmia on the other hand, is infection of the blood itself; bacteria are living and multiplying there and thus are carried to the body. This is a very serious condition, because overwhelming infection can occur in any organ or tissue. So boils are not a type of septicæmia. If they are properly cared for, so that the protective membrane is not broken, they will not release bacteria into the blood. But if they are squeezed or pressed so that the membrane is broken, septicæmia may result.

The presence of many boils at the same time is usually an indication of poor resistance—often due to excessive sugar intake. Elimination for a while of all refined sugar, large use of fruits and vegetables, plenty of water, sunlight on the involved area, thorough cleanliness, and balanced exercise and rest will build you up and will help prevent boils and speed up their healing.

A LIGHT FOR LOUIS

By Helena Welch

The story of the inventor of the Braille system that has helped millions of blind people.

"Is the candle burning, Father?" Louis asked.

"Yes, Louis, I have just now lighted it," Louis's father answered. "It is beside your bed."

Louis had always liked to watch a burning candle, the sun shining through a window, or the flames in the fireplace. In fact, the little boy found joy in everything he saw. But now only darkness surrounded Louis no matter how many candles his father lighted. Louis was blind, and would be for the rest of his life.

Louis Braille was born in a little village called Coupvray in France in 1809. He went blind when he was only three years old. His parents were very sad when the doctors told them there was nothing they could do for Louis.

But Louis was happy. He played with his kitten and his toys. Even though he could not see, he could touch. And now he found joy in touching things that he formerly had been able to see.

When Louis was old enough, he started to school. Now came the only time when he was unhappy.

When the other children read aloud, Louis ducked his head and tears rolled down his cheeks. He wanted more than anything else to be able to read, but there was no way that he could. In the village school the teacher had no means to teach him.

Louis learned quickly. He remembered everything he heard. He listened very carefully when the children or the teacher read. Then he would repeat the entire lesson out loud.

One day after Louis's tenth birthday the teacher called him to his desk. "Louis, you have finished this school," he said. "I cannot teach you anything more."

Louis was not happy to be leaving the school. He would miss it and his classmates, and he knew he could not go to the higher school where the older boys went. For this school did not teach blind students at all.

Even though he could not go to school, Louis continued to learn everything he could. He listened to people talk, and he helped his father in his business. "Some day I will learn to read," he promised himself.

Many people were impressed with Louis's ability to work even though he could not see. Many thought he should be sent to a special school for the blind, but in the early 1800s such schools were often not available.

Then a family friend learned of a school for the blind in Paris and brought the news to Louis's father.

Immediately his father shared the wonderful news with Louis. "I have learned of a school in Paris where they teach blind children," his father told him. "Would you like to go there?"

Louis took his father by the hand. "Do they teach reading?" he asked.

"I'm sure they do," his father said.

"Then I want to go!" Louis said.

Louis missed his family and his home, but he liked the school. And he liked especially the reading classes he attended. He had to work very hard, and it took a very long time to read a book. Sometimes his hands grew tired and his fingers ached from fingering the letters on the heavy pages and interpreting them by feeling. But he did not mind. He was happy to be reading.

After much practise Louis learned to read very fast. Soon he had read all the books available at the school. He wanted more to read, but his teacher could not get them for him. When Louis was a boy, books for the blind were very expensive. They were very difficult to print and very heavy and hard to handle.

"Books should be easier to print," Louis declared, and even though everyone agreed with him, no one knew of any easier way to print them.

Louis was determined as well as courageous. Just as he had promised himself he could learn to read, he again promised himself that one day he would find a better way of printing books for the blind.

He studied all the methods of printing and finally chose the one by Barbier as being the best. Then he set about trying to improve it. One day he came across a paper with a coded message of dots punched on it.

Here was the inspiration Louis needed! For weeks he worked; and at last, using only two straight vertical lines of three dots each, he created an entire

alphabet. Each letter consisted of a different number of dots located in different places. When the alphabet was finished, it was small enough and simple enough so that many books could be printed with much less paper. Also, Louis's was much easier and faster to learn.

Soon the Braille system, as Louis's alphabet was called, became known throughout the world. Many books, and magazines too, were printed as a result; and a new, wonderful life began for the blind.

Today, more than a hundred and fifty years later, the Braille alphabet is still used. There are many libraries throughout the world established for the blind. Also many books and magazines are mailed directly to the homes of these people. Everyone who is blind, from very young to very old, can learn to read by the Braille system.

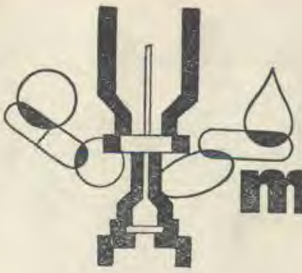
Perhaps a member of your family is blind, or you may have a blind friend. When you choose a special truth-filled book or magazine for him or her, think of the little boy named Louis Braille, who liked to watch a burning candle. And remember how his determination and hard work helped to light candles for a whole world of blind people.

***

Subscription rates: 1 year, Rs. 18.50; 2 years, Rs. 36.20; 3 years, Rs. 54:00 Sri Lanka rates in Sri Lanka currency: 1 year Rs. 35; 2 years Rs. 69; 3 years Rs. 102. Bangladesh: Indian rate in Indian currency.
Published and printed by V. Raju for the owners, Oriental Watchman Publishing House, Box 35, Poona 411 001.

Flowers to Colour

These morning-glory blossoms may be light blue with green leaves. Add other colours to the rest of the picture.



medicine today

Smoking increases risk of heart attack in women

Cigarette smoking alone accounted for approximately three quarters of all heart attacks in a group of otherwise healthy women under the age of 50 and not taking birth-control pills, according to researchers at the Drug Epidemiology Unit of Boston University School of Medicine (BUSM).

Heavy smokers—those smoking 35 or more cigarettes a day—had about 20 times the risk of heart attack as women who had never smoked, the Boston University research team reported. The risk was related to the number of cigarettes smoked, diminishing to 14 times that of non-smokers for those who smoked 25 to 34 cigarettes a day, and dropping to about 4 times for those smoking less than 25 cigarettes a day.

While the women in the BUSM study survived their heart attacks, other research has shown that sudden death in women from coronary heart disease is also strongly related to cigarette smoking.

The study team found the risk for ex-smokers suggesting that the risk from smoking drops off sharply as soon as a woman stops smoking. Because of this finding, the researchers suggest that "cigarette smoking may exert a precipitating effect" on heart attack.

—Life and Health

New Analgesic Introduced

A new strong analgesic (Temgesic) has been introduced in England by Reckitt & Colman. The product is in injectable form, mainly for hospital use, and is said to have several advantages over morphine and other drugs commonly used for severe pain. It has been approved for the treatment of post-operative pain, for coronary infraction, and in the terminal care of cancer.

Temgesic (buphrenorphine) is a partial agonist in which high agonist potency is combined with antagonist properties minimizing many of the undesirable effects associated with narcotic analgesics. Its analgesic properties are said to be at least comparable to those of morphine with double the period of activity (i. e. upto eight hours).

—The Eastern Pharmacist

Laser spells hope for thousands of childless couples

Carbon dioxide lasers are being used at the maternity clinics of university hospitals in Lubeck and Mainz in West Germany, to help childless couples. The laser is used to open up blocked Fallopian tubes, clearing the way from the ovaries to the uterus.

The sensitive tube tissue is only 4mm thick, and conventional surgery is both costly and by no means sure to succeed. The specially designed carbon dioxide laser is a much faster worker and immediately puts paid, by means of radiation, to any bleeding during the operation.

Laser surgeons are confident they can deal with blockages or growths affecting the Fallopian tubes, but they have so far limited to laboratory animals experiments in surgery in the immediate vicinity of the womb. The laser is fast and simple to use, they say, but must be beamed with absolute accuracy.

—German Features

An artificial pancreas

An artificial pancreas may soon end diabetics' dependence on insulin jabs. It is a miniature pump developed by research scientists and a leading electrical engineering company in Munich, Federal Republic of Germany.

The pump is fixed to the patient's arm and automatically injects the required amount of insulin into the nearest vein. It is regulated by a pocket-sized portable electronic device, so insulin intake can be increased at meals, say, or during sporting activity.

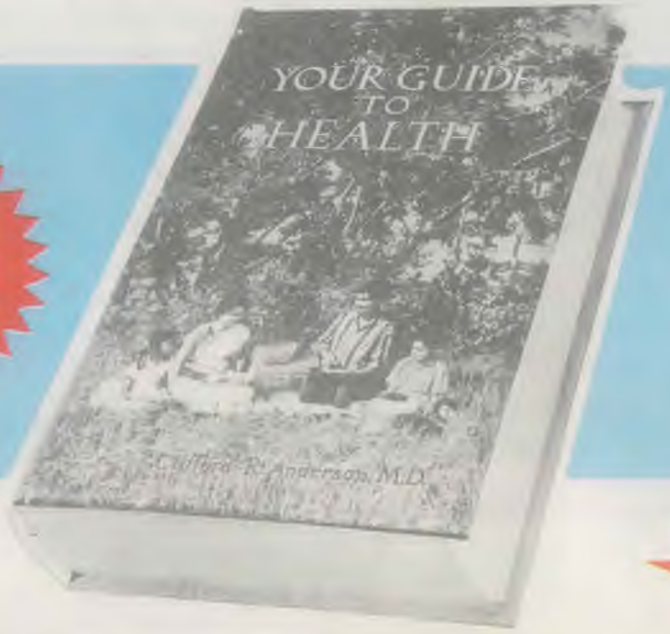
Ten volunteers have used the device and doctors are satisfied with the results, but technical improvements must be made before it is mass produced and marketed. After about five weeks' use either the electronics played up or inflammation of the patients' veins occurred.

—German Features

This is the book you have always wanted. . . .

Written especially for our readers by Clifford R. Anderson, M.D., internationally known speaker and producer of the popular Radio Sri Lanka broadcast "Your Radio Doctor."

YOUR GUIDE TO HEALTH has over 700 pages containing up-to-date information you need in your home for the benefit of your family.



YOUR GUIDE TO HEALTH

Cut out this coupon and mail today.

IMPORTANT FEATURES:

•Family problems •Mental Health •Bringing up baby •Common sicknesses and remedies •First aid •Medications •Home treatments •Large readable type •Full colour and black and white illustrations •Ready reference index •Cloth binding with plastic jacket.

Only Rs. 55.00 plus Rs. 3.75 postage and registration

Manager: (Check appropriate box)
National Home & Health Service,
Post Bag 129, Poona 411 001.

Dear Sir:

I am sending a money order/cheque for Rs. 58.75 to pay for the book and postage. ☐

I would like to know more about YOUR GUIDE TO HEALTH ☐

Name .....

Address .....

.....

Registered No. PNC—27