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HEALTH

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THE FIRST STEPS

"The Victorian watchword that prevention, in the man in the street's sense, is better than cure is still not obsolete. It is a great deal better to provide clean homes and food than to pre-immunise people against the possible consequences of dirty houses and food, leaving the environmental conditions alone. It is fortunate for the world that pre-immunisation against the typhoid group was not discovered in the days of *laissez faire*; had it been many more thousands would have died of typhoid than actually did." —Prof. Greenwood.

WHILE adequate provision for remedial and preventive personal health services is no doubt essential for protecting the individual and the community, the creation and maintenance of an environment conducive to healthful living must be considered to be of even great importance, because in the absence of such provision the services rendered by the doctor, nurse, and other members of the health organisation will largely fail to produce the desired results. Therefore, in the campaign for improved health, drugs, vaccines, and sera can in no way replace such essentials as a hygienic home, good food, fresh air, and a safe water supply.

Of these four essential requirements of human beings safe water supply is only provided for the few living in towns which have a protected water supply. The rest, i.e., the majority of people living in the seven hundred thousand villages scattered all over the country, have not been provided with this essential requirement. They have mostly to depend for their requirements on tanks, many of which are used for all purposes. And even these tanks get dried up in the hot season with the result that they have to shift for themselves. We recently

read reports in the press that drinking water is sold at six pies a cup in some areas in our presidency. The position is the same in many other places as well, though it is not as worse as this, and it is not an uncommon sight to see women wending their way a distance of some miles to get a pot of drinking water. The Congress Ministry, while in office in Madras, set apart a special fund for water supply. But the policy laid down by them in this regard has not been pursued as vigorously as it should have been done.

The position regarding fresh air to breathe is not also as satisfactory as it should be. The towns have become congested and the air smoke- and dirt-laden, that town people are not able to enjoy fresh air, the gift of nature. In the villages the position may be said to be different, as there is much open space all round to allow free scope for fresh air to enter. But the people have not been trained in the habit of healthful living to at the environment is kept filthy with the result that the air they breathe gets contaminated before it enters their nostrils, causing many germ diseases.

About good food, the less said the better. Even in ordinary times a large

Health]

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[June '46

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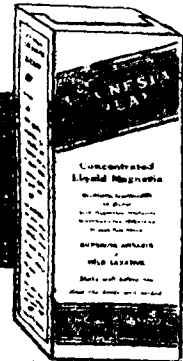
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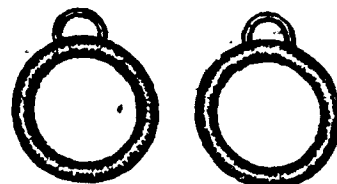
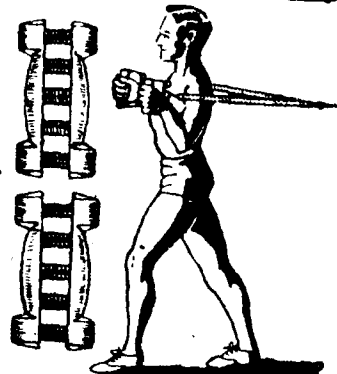
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number of people had to content themselves with a single meal though the number denied even this is not infinitesimal. With the food famine now prevalent, the position has become much worse. The quantity allowed is hardly sufficient to keep the body and soul together and the stuff that is now supplied in many rationed areas is very inferior in quality. Therefore good food, *i.e.*, a diet that is well-balanced, is denied to the people.

Last but not least is the hygienic home. This has become very rare. In the villages we see filth all round that the environment is very unhealthy. In towns we have some areas where the system of town-planning has been adopted. But in large parts of cities, we find many houses which are worse than slums. They have neither seen sunshine nor tasted fresh air. While it is possible to regulate the further growth of towns in accordance with the principles of sound town-planning,

something has to be done with regard to built-up houses which do not conform to modern standards of health. The Bhore Committee say that there are serious limitations to the improvements that can be effected in respect of these built-up houses. These, they say, have grown during a number of years and it might not be easy to demolish or rebuild them in all cases. Tradition, prejudice, ignorance, a conflict of interests between the community and private individuals, and the economic expenditure that is involved are, do doubt, factors to be reckoned with. But if environmental conditions are to be improved, something has to be done in regard to these areas. If complete demolition is not possible, alterations in structure to allow the free flow of fresh air and sunlight must be possible. In any scheme for the improvement of public health, we would appeal to the Health Minister to give serious attention to these problems first and foremost. Prevention is better than cure.

Ten Enemies to Health

Dr. D. N. DEBSARMA,

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1. Immaturity.—A premature child is likely to be sickly both mentally and physically in adult life. Ill health of the parents is often responsible for such weakness in their off springs. The hale beget the hale.

2. Ignorance.—In a great many instances a man gets ill, makes his life a burden to him and ultimately perishes immaturely only due to ignorance of health loss. Health education may considerably reduce his sickness and death-rate among such ignorant people.

3. Indigence.—A hungry man cannot keep his body and mind fit and cannot live an active and long life. Rise of his pecuniary status is absolutely necessary for his health and happiness.

4. Infections.—Disease germs have come to the world to punish the man. A man often falls a victim to these infectious micro-organisms and loses his health and may lose even his life. But these infections can be avoided to a great extent if the preventive measures against them are carefully adopted.

5. Impurity.—Impurity of both the body and the mind is incompatible with good

health. Physical cleanliness and mental purification by moral training are indispensable for health and happiness. The spirit must be spiritualised to attain health and vigour.

6. Impatience.—The mind is agitated and the body suffers from various disorders under the influence of this mental state. Self-command must be cultivated to get rid of this foe and thus to keep the brain cool and the body to sound. A namby-pamby man easily loses his path of life.

7. Incontinence.—This should be considered as a friend to human beings. The passions such as lust, anger, pride, etc., must be subdued by moral training and constant devotion to God, for these are the roots of many evils of life. Moderation in food and drink is also an essential factor for healthful living.

8. Inattention.—Carelessness to personal hygiene is usually followed by diseases and loss of animal spirits. Disregard of one's own life is also an indication of impairment of both mental and physical health.

9. Indolence.—Inactivity leads to ruin and activity leads to health and prosperity. Idle

brain is the devil's workshop and the idle body is the shelter of diseases. Regular exercise of both the body and the mind will rectify all this.

10. Intrusion.—Intruding thoughts which are usually connected with cares of life should

be avoided by any means, or these will mar the peace of mind and ruin the health. Persistence of these intruders in a man's mind is an indication of weakness of his nervous system. A sound body will make its mind strong enough to get rid of these troublesome thoughts.

White Cells of Blood

Dr. S. C. MAZUMDAR, B.M.S.,
Mymensingh Jail.

The human system has, like all powerful nations, scientifically trained, armed, strong force to fight against the enemies which enter our body. In our everyday life, we ingest and inhale plenty of bacteria which can cause virulent types of diseases but all these are immediately and instantly killed by the body soldiers which are always in field service and thus we are saved from many a malady. We get a disease only when the bacteria are plenty in number, virulent in type and our fighting forces are insufficient in number or weak in strength. Even during the course of a disease, they fight with all their might to effect an early recovery. They will never fly or hide themselves from the war field, their motto is 'Do or die'. Even in a fierce fighting there is no breakage of military discipline, they silently and tactfully march onward to kill the enemies.

In this small article, I shall deal with one section of soldiers of our body known as 'White cells of blood' or 'Leucocytes.' These are circular, colourless bodies and can only be seen with the help of microscope when the blood is suitably stained. Their average diameter is $1/2500$ of an inch. The number of these leucocytes varies from 5000-7000 per cubic milli-metre of blood. In new-born infants, the number is such higher but begins to decrease after the third week. The number of leucocytes increases whenever a man suffers from a disease and the greater the number is there is more probability of a prompt recovery. Hence, the idea of blood examination of a patient which is so frequently advised by a doctor is not only to see the number of R.B.C. or to detect the bacteria but also to see the number of the leucocytes engaged in fight so that substances which can increase the number of leucocytes can be given or injected if necessary. Among common diseases in India, pneumonia causes a high increase of leucocytes. The medical term of increase of number of leucocytes is 'Leucocytosis' whereas decrease in number is called 'Leucopenia'. Leucopenia indicates lack of power of resistance of the body whereas leucocytosis indicates the reverse.

Let me now, tell you in short, the ways in which the leucocytes fight against bacteria.

Whenever any bacteria enters inside our body, the leucocytes which are always circulating in the blood, come outside the blood vessel by piercing the wall of the same and assemble near the bacteria. They encircle the bacteria on all sides, produce some false process, bringing the bacteria inside their bodies and ultimately kill it. The leucocytes can also produce some poison-like substances which kill the bacteria. They can also liquefy the body of bacteria. The above methods are commonly termed as 'Phagocytosis.'

There are other methods also by which they protect our body; for example, they manufacture some substances which increase the general strength and power of the body. These substances are called anti-bodies.

Leucocytes play the role of sweepers and thus remove the dead bacteria and dead parts of the body so that further spread of infection cannot occur.

Apart from the role of fighting, they serve many other important functions of the body too.

The mother substance from which the leucocytes come in the blood stream are the red bone marrow (found inside the small bones of the body and also inside the long bones near their extremities) and in spleen.

Leucocytes are of four important varieties:—

(a) Neutrophils—They form about 60-70% of total leucocytes.

(b) Large mono-nuclears—They constitute about 2-4% of total leucocytes. They are the bravest soldiers.

(c) Lymphocytes—They form about 20-25% of total leucocytes.

(d) Eosinophils—They form only 1-2% of total leucocytes.

The average life period of a leucocyte is only a few hours and a soldier constantly engaged in the battle field cannot be expected to live for a longer period.

The burial ceremony of these great heroes of our body is never neglected but it is most pompously and gorgeously performed in one of the most important organs of the body namely, the spleen.

OUR TEETH

AND HOW TO TAKE CARE OF THEM

TEETH first make their appearance by about the seventh month of the child. By the time the child is two and a half years, they will number twenty which is the maximum. This set of teeth are called MILK TEETH. These milk teeth begin to fall out from the seventh year when the permanent set make their appearance behind the milk teeth. It is of utmost importance that special care should be taken of the teeth and they should be kept clean.

The permanent set number thirty two; but only twenty eight appear first. The last four appear after the age of eighteen usually. But there are instances when they have appeared as late as thirty years or even more. These are called WISDOM TEETH. The teeth are as important to man as any other organ in the body.

Uses of teeth.—Teeth play an important role in the proper digestion of the food we take. Their chief use is in their chewing the food well and prepare it so that the digestive juices can easily absorb the nutritive element of it easily. They are also useful in conversation wherein they help us to pronounce words properly. To safeguard one's health it is necessary to take care of his teeth first. Some Life Insurance Companies employ dentists to take care of the teeth of their policy holders; because they very well know that the money paid to the dentist is far less than that paid on sick and dead among their policy holders.

If an uncleaned tooth is scraped a nasty smelling substance is to be seen on the scraper. This contains millions of micro-organisms. The organisms mix with our food and enter our digestive tract and cause many kinds of illness. These may enter the ducts of salivary glands, lungs, nose and cause disease there. The breath of a man whose teeth are dirty is offensive and contains these organisms.

* Many physicians examine the teeth first because they know very well that dirty teeth are the cause of many a diseases.

Reasons for the decay of teeth.—The reason for the decay of the teeth are the particles of food left behind between two teeth. If one tooth decays, in course of time it spreads the disease to its adjacent tooth also. The particles of food left behind decompose and in it grow many micro-organisms. These set up inflammation and pus collects at the root of the tooth. This in its turn loosens the tooth. After some time the tooth falls off.

How to Find Out

1st Patient: Are you Medical or Surgical?
2nd Ditto: I don't know. How do you tell?
1st Patient: Well, did you come in ill, or did they make you feel ill when you got here.—*Middlesex Hospital Journal.*

V. Lakshminarayana Rao,
Asst. Medical Officer of Health, 72-III Road,
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Chewing the betel is considered to be a good habit, because some of the people who chew betel have good teeth. But it is a bad habit as the chunnam used with the betel irritates the gums and results in loosening of teeth.

How to take care of the teeth.—(1) The teeth should be cleaned after each time we take our food. If this is not possible at least twice a day, morning after we get up from our bed, and evening before we go to bed.

(2) All particles of food between the teeth should be removed. Metal sticks should not be used for removing.

(3) Both sides of the teeth should be well cleaned.

(4) The gums of the teeth should be cleaned well.

(5) For cleaning the teeth, mud, sand, etc., should not be used as these spoil the enamel on the teeth.

The following powder may be used:—

Precipitated chalk	4 ozs.
Powdered castile soap...	5 ozs.
Sugar	1 oz.
Powdered oris root	1 oz.

All these are mixed properly and used for cleaning teeth. Ordinary common salt can be used with much benefit.

After cleaning the teeth the brush should be covered with common salt till used for the next time. This prevents the brush becoming dirty, as by using a dirty brush we will be increasing the bad effects than deriving good effects.

Always hot water should be used for cleaning teeth as the cold water may contain many micro-organisms which give rise to various water borne diseases. It is a bad practice to wash our teeth in lakes, tanks, rivers, etc., as this helps to spread water-borne diseases.

We should get our teeth examined at regular intervals and also when they begin to give us some discomfort; as one tooth spoiled means the whole system of teeth is spoiled. This in turn upsets the health of the person. To be on the safer side, it is better to keep our teeth clean and healthy rather to get them treated when they are spoiled.

ON HONEY

K.A. SHAH. M.B. B.S.

(Continued from page 51 of May '46 issue of HEALTH).

Honey as food. But the question of most interest to me is the food value of honey. We read in the *Shatapath Brahman* (XI. 5-4-18, 'And they also say, 'He who is a Brahmin-charin should not eat honey, lest he should reach the end of food, for honey, doubtless is the utipost (supreme) essence of plants.' But *Shvetkeda Aranya*, when eating honey, whilst he was a student, said 'This honey, in truth, is the remainder (essential part) of the triple science (the Vedas), and he indeed who has such a remainder is an essence.' And, indeed, if a Brahmin-charin, knowing this, eats honey, it is just as if he were to utter either a Rik-verse, or Yajus-formula or a Saman tune; let him therefore eat freely of it.'"

We read in a modern bee-journal, "Do you know that 8000 doctors of different countries have recognised honey as an exceedingly healthy and valuable foodstuff... and that every person should eat daily two tablespoonfuls of honey for the sake of good health and energy?"

For all practical purposes honey is a concentrated solution of sugars and like all sugars it is a quick, energy-yielding food. It is superior to cane sugar in many respects. Firstly, it is sweeter; if cane sugar be taken as 100 per cent sweet, the sweetness of honey is rated to be about 123 (Willowman, 1928 Ref. 5). Says Hutchison, "No matter in what form sugar is consumed in the food, it can only be assimilated as a monosaccharide (glucose, levulose or galactose)... from a dietetic point of view we may speak of the disaccharides as undigested and the monosaccharides as predigested sugars." Honey, being a mixture of glucose and levulose, is thus a predigested food and is immediately available for assimilation. It has been claimed that it is absorbed into the blood even from the mouth. For this reason, honey is largely used by athletes in America, just before and after their work. Writes Dr. Beck, "For physical and mental fatigue and overwork there is no more excellent stimulant in the medical armamentarium than honey. A glass of hot water with several tablespoonfuls of honey is a quick acting energy builder, far superior to alcohol because it is without depressive action... The popular German honey-tea, which is plain hot water with honey is considered by the Germans a pleasing, wholesome and strengthening beverage." (5) Secondly, cane sugar irritates (particularly when concentrated) the gastric mucous membrane and retards digestion. "Invert sugar (the sugar of honey) produced no unpleasant symptoms, and disappeared rapidly from the stomach, while the cane sugar caused much distress, and remained for a long time." Thirdly, cane sugar is liable to fermentation whereas honey is not. For these and allied reasons honey is particularly recommended in infant feeding, for the aged, for dyspeptics and during severe illnesses

like typhoid fever. R. G. Flood (1925) wrote in the *Archives of Pediatrics*, "Honey owes its ease of absorption to the free available dextrose in the mixture, and its laxative action to the levulose fraction, which is absorbed slowly, so it eventually reaches the large intestine. These properties make honey a very valuable sugar in the treatment of constipated bottle-fed infants, and in our hands have profited these children a great deal." Schultz and Knott (1938) of Chicago University, studied the suitability of honey as the source of carbohydrate for ten healthy male infant. It was found that honey is easily digested, is well tolerated and does not cause diarrrhoea. It seems to facilitate weight gains.

But this is not all. We must remember that honey is not purely a solution of sugars. It also contains traces of proteins—as much as 1.29 per cent according to Hutchison*—and some of these occur in the form of amino-acids. Moreover, honey also contains traces of minerals like calcium, magnesium, iron, copper and manganese. Though the actual quantity of these minerals is small some of them like iron, copper and manganese are great of value to infants. This is especially true of iron which human as well as cow's milk contains in exceedingly small quantities. Honey complements this deficiency.

Paula Emrich of Switzerland (1932) found that of two groups of children the group receiving extra honey showed higher hemoglobin values in every case. Fraunfelder (1921), also from Switzerland, divided the inmates of a children's home in 3 groups. Group 1 was given an ordinary diet without any honey; group 2 was given an ordinary diet plus honey and group 3 was given an ordinary diet plus various tonics and no honey. The anemic children in group 2 after a few weeks surpassed the other groups in increase of hemoglobin and weight, as well as in quickness and completeness of cure from asthma, bronchitis, nervousness and certain other ailments. Rolleder (1934) in Germany, made a controlled feeding experiment with 29 pairs of boys in an orphanage, each member of any pair, being as alike physically as circumstances permitted. For six weeks one member of each pair was given one tablespoonful of honey every forenoon and afternoon, while the other boys were not given any. At the end of the experiment the honey-fed children showed a gain in hemoglobin content whereas the others showed an average loss. (6) In this connection, we must remember that dark honeys are better than light coloured ones; and there is a popular saying, "Dark honey for pale faces."

* This finding is at variance with that of other observers and probably errs on the liberal side.

Table II shows the food value of Honey.

Honey though acid in reaction is an alkali-ash-forming food because the acids in honey are organic acids like citric and malic. According to Dr. Paul Luttinger (1922) of Bronx Hospital, New York, who was "first to recommend honey for children 'The organic acids (of honey), which in some specimens go up as high as two per cent, and are rarely less than one per cent, act as mild stimulants to the digestion; and the increase of appetite seen in children fed on honey may be largely ascribed to this factor and possibly to the volatile oils."

It is worth while to remember that honey is a food which has an individuality of its own. It contains subtle essences which lend it flavour and colour and defies all analysis. The flavour depends mostly on the flowers from which nectar is collected and varies with the locality and the soil.

We may now take up the question, which to my mind, is of supreme importance, namely, that of the vitamin content in honey. In the "Text Book of Nutrition" by Nixon and Nixon published in 1938 the vitamin content of honey is shown to be nil. In Health Bulletin 23, published in 1941, we read, "It may contain a little vitamin C, but no other vitamins." In the ninth edition (1943) of their "Food, Health, Vitamins," the Plimmers write, "Honey has no anti-scorbutic value."

But this is not the whole truth. "The first worker in the field was Dutcher (1918), then of Minnesota and now of Pennsylvania State College, who studied nectar, honey and corn pollen and concluded that honey contained negligible quantities of vitamin B. In 1919, Miss Bachman of Wisconsin found no evidence of Vitamins in honey. In 1920, Faber, of Stanford Medical College, examined honey for vitamin C and found it lacking. In 1922 Luttinger of New York (P. K. M. 21. Medi-

TABLE II

Source and Reference	Protein gm/1000 gm.	Fat	Carbo-Hydrates gm/100 gm.	Calories.	Na	K	Ca	Mg	Fe	Cu	P	c
					mg. per 100 gm.							
English honey (22)	0.35	trace	76.4	(307)	10.9	52.8	5.28	0.21	0.38	0.03	16.8	17.9
American (23)	0.4	...	81.2	326	...	...	5.0	...	0.70	...	18.0	...
American, strained (35)	0.3	...	79.5	319	...	...	4.0	...	0.70	...	18.0	...
Indian honey (36)	0.38	...	71.08	284	...	...	...	...	...	...	...	...
Indian average (11)	0.58	...	68.54	276	...	...	...	...	...	...	...	...

A little while ago we remarked that honey is a food which can complement milk which is almost a perfect food. But in one respect it is even superior to milk. Milk affords an ideal medium for bacteria to grow and multiply and acts as a common carrier of some diseases. We need have no such fears in regard to honey. Sackett, Bacteriologist of Colorado Agricultural College, introduced into honey various pathogenic bacteria to determine whether they could live and thrive in such a medium. The following is a summary of his conclusions: "*B. typhosus* was no longer present in pure honey after 48 hours; *B. paratyphosus* A and B were dead after 24 hours; *B. fecalis alkaligenes* was killed inside of 5 hours; *B. proteus vulgaris* died after four days; *B. coli communis* died on the fifth day; ten hours' exposure in pure honey was sufficient to destroy *B. dysenteriae*." A. G. Lochhead of the Division of Bacteriology, Ottawa, says, "...through a happy combination of circumstances, namely acidity and high density, honey may be regarded as practically immune from bacterial action. The probability of honey acting as a carrier of typhoid fever, dysentery and allied diseases is very rare indeed."

cal B.—21) claimed to have found vitamins A, B and C in 82 per cent. of the honeys examined. In 1924 three German investigators, Scheunert, Scheblich, and Schawnebeck, examined three samples of honey and failed to detect the presence of vitamins. In 1926, Alan Callais, a well known French bee-keeping chemist, reported finding vitamin B in honey. The annual report of Bureau of Home Economics for 1927 states that two samples of honey examined were found deficient in vitamins A, B, C and D."

Kiefer and Munsell (1929) used white clover, buck-wheat and honey-comb honey in their experiments and concluded that these three samples did not contain any detectable amount of either vitamin A, B, C or D. Hoyle (1929) came to the same conclusion. Taylor and Nelson (1929), on the basis of their experiments concluded that honey cannot serve as a source of Vitamin E. Mathur (1930) found that honey contains no vitamins and even hastens the polyneuritis of pigeons. Trautmann and Kirchhoff (1932) concluded that the quantity of vitamins in honey is too small to be discovered by animal feeding experiments. Markuze (1935), employing bioassays reported that two samples of honey

showed the presence of vitamin B₂. Vitamins A, B₁, C and D were not found.

Recently, chemical determinations of vitamin C in honey have been made. Griebel (1938) reported 1.6-2.8 mg. ascorbic acid per gramme of mint honey and 0.07-0.22 mg. per gramme of some other samples. A biological assay of the mint honey showed that 1 gm. a day completely protected some guinea pigs from scurvy. Kask (1938) demonstrated the presence of ascorbic acid in Estonian honeys, the amount being from 0 to 20 mg. (average 4.888 mg.) per 100 gm. He also reported that the ascorbic acid content of honey decreases with age but that honey is a relatively stable medium for vitamin C. Werder and Antener (1938) determined the ascorbic acid content of nineteen samples of honey. The variation was from 1.1 to 14.6 mg. per 100 gm. Becker and Kardos (1939), employing microchemical methods, found from 31 to 89 mg. of ascorbic acid per 100 gm. of *Castanea sativa* honey.

riboflavin, ascorbic acid and nicotinic acid. Their findings are:—

Vitamin content of Minnesota Honeys.

Thiamine 5.5 mcg. per 100 gm.
Riboflavin 61.0 mcg. per 100 gm.
Pyridoxine 299.0 mcg. per 100 gm.
Pantothenic acid 106 mcg. per 100 gm.
Ascorbic acid 2.4 mg. per 100 gm.
Nicotinic acid 36.9 mcg. per 100 gm.

The greatest variability was in Nicotinic acid and vitamin C. Least variation was in pyridoxine; riboflavin and thiamine being next. There is a tremendous variation in the vitamin content of honeys from different sources and different regions. Thiamine varied from 2.1 to 9.1 mcg.; riboflavin from 35 to 40 mcg.; C from 0.5 mg. 6.5 mg.; pyridoxine from 233 to 480 mcg.; and nicotinic acid from 4 to 94 mcg. per 100 gm.

Unfortunately, we do not know anything about the vitamin content of Indian honey. We can, however, make a rough generalization

TABLE III. VITAMINS IN HONEY

Variety of Honey and Reference	Vit. C mg./100 gm.	Thiamine Mcg./100 gm.	Riboflavin Mcg./100 gm.	Nicotinic acid per 100 gm.	Pyridoxine acid Mcg. per 100 gm.	Pantothenic acid Mcg/100 gm.	Folic acid Mcg/100 gm.	Biotin mcg per 100 gm.
American (23)	1.4 mg.	3 to 9	35 to 80	...	...	...	...	...
Minnesota (34)	2.4 mg.	5.5	61.0	36.0 mg.*	36.0 mg. ²	105	...	...
American (38)	...	4.4	26	110 mcg.	10	55	3	0.666

On the basis of their animal tests they concluded that the reducing component of honey is not vitamin C. However, Griebel and Hess (1939), proved the identity of the strong reducing substance in thyme and mint honeys with ascorbic acid. They reported 31.2 mg. and 102.6 mg. of this vitamin per 100 gm. of the respective honeys. Buckwheat honeys contained from 7.36 to 18.8 mg. ascorbic acid per 100 gm. Later, in 1940 the same authors investigated ascorbic acid content of the nectar of the above mentioned plants. A comparison of these data with those obtained on the honeys indicate that there is a considerable loss of vitamin C, when the bees convert nectar into honey.

After thus extensively reviewing the work of their predecessors Haydak et al (1942) report their own work. They investigated various honeys for their contents of thiamine,

that honey contains no fat soluble vitamins, traces of all the members of the B group and a goodly amount of vitamin C. Here again, we have another proof of honey being an ideal complementary food to milk which latter is poor in vitamin C.

In view of these highly desirable qualities of honey, what a great pity it is that we should still recommend glucose in all serious illness! Our poor patients have to hunt for a tin of glucose from shop to shop and buy it in the black market or borrow it from friends or get it from their chemist after a good deal of cajoling and coaxing. From the point of view of cost pure honey perhaps is not cheaper than glucose but it is always available and if we are patriotic and sensible enough to encourage the use of honey it can certainly be produced much cheaper. Let us have the courage of our convictions.

* This is probably a misprint for mcg.; if not, honey is also a rich source of nicotine acid.

† The European Chestnut.

(To be continued.)

A Palatable Vitamin B Drink

Owing to shortages of foodstuffs containing vitamin B₁, imperfect combustion of carbohydrate is common in this country and preventable nervous diseases occur in the East and elsewhere," writes Mr. T. H. Sanderson—Watts in the *Lancet*. To make good this shortage the same writer suggests the following "palatable aerated drink": To a tumbler of warm water add a tea-spoonful of sugar and two tea-spoonfuls of dry yeast. Stir and leave in a warm place, or under a cosy, for one hour. Stir again and quaff."—*Good Health*.

Health, June '46]

[Page 63

IS THE HEAT GETTING YOU DOWN?

THE human body is remarkably like an air-cooled engine with a sensitive and efficient cooling system—the skin. The best way to keep cool, therefore, is to help this cooling system in performing its functions efficiently.

When the temperature of the air increases, the blood flows in large quantities in the small blood vessels (the capillaries) close to the body's surface, thus giving off heat easily. The pores of the skin open, perspiration pours out, evaporates, and cools the skin and body.

With the advent of the hot weather, here are a few points on How To Keep The Heat From Getting You Down.

Bathing:—It is a mistake to seek relief from heat by plunging into cold water. This may stop perspiration for a time, but it deprives the body of an essential protective mechanism against the effects of over-heating.

Clothing:—The best way to keep cool is to wear as few clothes as possible. These should be loosely cut, and made from porous, smooth, light-coloured fabrics. A cloth of a rough texture slows up the movement of air next to the skin which acts as an insulator. A dark-coloured fabric absorbs more heat than cloth of lighter colours. Just as black is the hottest colour to wear in summer, so also white is the coolest colour and should be preferred during the hot weather.

Diet:—In the hot weather, the body naturally requires less heat-producing food and, therefore, the consumption of carbohydrates (bread, potatoes, rice, etc.) and fats should be reduced. Preference should be given to proteins which are an energy food,

because bodily energy must be kept up to normal.

The summer diet should be composed of foods which contain a large proportion of water, such as fruits and salads. It is important to watch for loss of appetite—known in medical parlance as "anorexia." If this should happen, the appetite should be stimulated in order to maintain normal bodily energy and resistance.

Salt:—When the body perspires, it loses a certain amount of mineral salts as well as water. Salt is a very important element in the body, and is required for its efficient physiological functioning. If the salt content of the body is allowed to get too low, it brings about exhaustion and frequently heat-stroke. The salts ejected from the body through perspiration must, therefore, be replaced. Since the body may lose as much as 1½ ozs. of salt per day, this loss should be made good by an increased intake of salt. This can be taken either in food or in water.

Water:—The loss of water through perspiration is considerable. It may amount to as much as 3 quarts a day. This loss is to be made good, and the best way of doing so should be known.

Iced water looks cool, but it does not cool the body. On the other hand, it may be very dangerous, for it cools the internal organs and may produce stomach cramps. It contracts the blood capillaries under the surface of the skin, and thereby stops perspiration. The proper thing to do is to drink cool (not iced) water, or to eat fruits which are high in their water content.—*Efficiency News.*

VITAL CAPACITY

THE maximum volume of air that can be exhaled after a maximum inspiration is called the vital capacity and represents an estimate of the total air content of the lung. An approximate relationship exists between vital capacity and total height: The vital capacity expressed in cubic centimeters is approximately twenty-five times the height in centimeters for man, twenty times for women, twenty-nine times for athletes and fifteen times for children. The measurement is easily accomplished with an ordinary spirometer. The standing patient is instructed to exhale as much air as he can after he has made a maximum inspiration. The rate of expiration should not be too slow or too rapid. Care should be taken that all the air exhaled goes into the recorder. The nose should be closed and the exhalation should be by mouth. It is important that the test be correctly made, and it must be performed two

or three times after the patient is clearly instructed. Accuracy depends on the subject's co-operation and so is in part subjective.

Variations in the same person at different times are more significant than deviations from the standard. Vital capacity can be increased within limits with proper exercises. It is reduced in many diseases, especially those involving the cardiovascular and respiratory systems. It measures the elasticity of the lungs in heart failure and so gives an idea of the pulmonary vein engorgement.

The test is generally used to study the status and the evolution of a case of pulmonary tuberculosis or heart disease but adds little to the record of the symptoms and physical signs. Breath holding time is a simple bedside method of obtaining similar information.—*The Journal of the American Medical Association.*

Some Domestic Uses of D.D.T.

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Deputy Medical Officer of Health, Royal Borough of Kensington.

THE name D.D.T. has gained wide publicity since 1944, when information regarding this substance was first released to the public, and many noteworthy and even dramatic events are associated with its name. There is a danger at the present time that the general public will regard D.D.T. as a "cure all;" that it will be used improperly by the uninstructed and that less reputable firms will "cash in" on the publicity and produce preparations of doubtful composition and value—as they are already doing. All this will tend to bring discredit on a new and very valuable weapon in man's armoury of weapons against disease.

In discussing D.D.T. it is necessary to look briefly at its history. Dichloro-diphenyl-trichloro-ethane was first synthesised last century in Germany, but its properties were not then recognised. Re-discovered by two Swiss chemists in their search for an efficient moth proofing material, its powerful insecticidal qualities were quickly observed, and little time was lost before the new substance was given a major field trial. In 1940 the potato crop in Switzerland was threatened with destruction by the Colorado beetle. D.D.T. was used in a widespread attack on this pest with completely successful results, and the potato crop was saved.

In 1942, information was passed from Switzerland to both America and Britain, giving details of the new insecticide. By that time we had been deprived of our main supplies of natural insecticidal substances, pyrethrum and derris, by the Japanese advance, so the Swiss discovery was seized on with avidity and experiments pressed forward on both sides of the Atlantic. The results obtained more than fulfilled our hopes that an insecticide equal in value to those we had lost had been discovered. Large scale production was begun and soon D.D.T. was in use for many varied and important purposes on all the fighting fronts.

In the East, where malaria was the most deadly enemy, D.D.T. was used to destroy the larva of the mosquito in its breeding places in swamps and stagnant water. Sprayed on the surface of pools by hand sprayers or in some cases from aeroplanes, it made malaria control a possibility in a land which has as high an endemic incidence of the disease as any in the world. D.D.T. against the mosquito, and meposine, our synthetic substitute for quinine, enabled our troops to fight through that terrible land of Burma, and to go on fighting even during the monsoon. Used also in the form of an aerosol by the troops themselves in their fox holes and billets, against flying and disease-carrying insects, it made life bearable, where otherwise it would have been well nigh intolerable.

In Europe, probably the most dramatic

example of its use was in the outbreak of typhus in Naples during the winter of 1943-'44.

The stage was set on the continent for a devastating epidemic of typhus. All the factors necessary were there. Endemic centres of typhus exist in the Balkans, in Western Russia and Eastern Poland, and the two main elements required to bring about an epidemic, namely, mass movement of populations bringing non-immunes into an endemic centre, and starvation, were present to a degree seldom seen in the past. It looked as though the outbreak of Naples might well have been the spark that would set the whole magazine alight.

After the war of 1914-'18 there were more than three million deaths from typhus in Russia alone, and in 1943 it looked as though that number might be multiplied several times over in Europe as a whole.

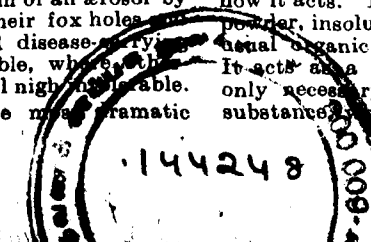
In Naples, louse borne typhus first made its appearance in December, 1943, in a city with an ill-nourished, louse infested population living in conditions of terrible overcrowding with all pretence of sanitation gone. With the appearance of the first cases the military authorities acted with vigour and the delousing of the population began at once. In pre-D.D.T. days this would have had to be done by means of human laundries with simultaneous steam disinfection of the clothing, a method which strictly limits the number of personnel who can be treated. However, D.D.T. was made available, and dusting of the population was carried out with this substance.

During January, 1,300,000 persons were treated, 72,000 actually being done in one day and from 305 cases, in the week ending 11th January, the number fell sharply to 155 the following week. So, for the first time in history an outbreak of typhus during the winter months was controlled.

These, then, are instances of how D.D.T. has helped in no small degree towards ultimate victory.

But now the war is over, and in all fields of scientific research we are turning once more to peace and its problems. Discoveries made and used for purposes of war are being turned to the service of man. How is D.D.T. to be employed? Perhaps after the tremendous events of the last year or two, it may seem mundane to consider such problems as bugs and houseflies, but nevertheless these things are important public health problems which we hope D.D.T. is going to help us to solve.

Let us look briefly at what D.D.T. is, and how it acts. The crude substance is a white powder, insoluble in water, but soluble in the usual organic solvents such as paraffin oil. It acts as a contact poison. That is, it is only necessary for an insect to touch the substance, which is then absorbed, probably



through nerve endings and has a powerful toxic action on the nervous system, producing first convulsions and then paralysis and death. Death is not produced rapidly, but takes one to four or more hours according to the type of insect; thus mosquitoes quickly succumb, but cockroaches may take several hours before they die. There are many other contact poisons in existence apart from D.D.T. but the latter has this advantage over all its predecessors, that it is stable, being difficult to destroy and goes on exerting its effect for a more or less prolonged period after it has been applied. To obtain the maximum of benefit, therefore, it should be applied in such a manner that a residual film of the substance will be left on the article or surface being disinfested, and as long as this lasts, it will spell death to any insect coming into contact with it.

It is never used in the "neat" form, but either as a powder containing 5-10 per cent. of the active substance in a neutral base such as kaolin, or as a liquid, either dissolved in an organic solvent, usually kerosene, or as an emulsion in water; or made up in "bomb" form with a gas such as freon, which will produce a fine mist containing the substance and which will remain suspended in the air for some time. In the latter form it is used only against flying insects and no residual toxic effect is obtained as no appreciable film is left.

Bug infestation of dwelling-houses is a very great social menace, and one which has spread considerably in dwelling-houses during the war years. Although the bug has never been incriminated as a carrier of disease, its bites are vicious and, especially in children, it can bring about much ill-health and skin irritation.

Much work was done in the past and much money spent in endeavours to find a method of freeing dwelling houses from this pest, but no certain method was evolved. In Kensington, for years it has been the rule to prevent infestation of new premises by old bug-infested furniture, by carrying out the removal for the tenants and exposing the furniture so removed to HCN gas *en route* in special vans maintained for the purpose. This method has given excellent results, but owing to the danger of the gas to man, it is not generally applicable to dwelling houses.

Up to the present in dealing with bug infestation of a house it has been possible to kill a majority of the live adults by spraying with suitable insecticides. But some may escape, tucked away in inaccessible nooks and crannies, and some eggs may similarly escape with the result that reinfestation occurs and all the time and money expended has been practically wasted. This is where the residual toxic effect of D.D.T. plays so great a part, for a room sprayed with D.D.T. solution will remain lethal to bugs for weeks or months. Therefore, not only is there a large initial kill of adult bugs, but new broods hatching out from eggs which have escaped, during their maiden voyage in search of human blood, come into contact with the residual film of D.D.T. left on walls or floor or bedstead and die as a result of such contact. Thus a room may be literally bug-proofed for

a period whilst the film lasts, and experiment has shown that results obtained in this way are far in advance of anything which we have had in the past.

When using D.D.T. for bug-infested premises, the present practice is to use a fairly coarse spray of 5 per cent. solution in kerosene. The walls, the edges of the floor and ceiling are sprayed, and the bedstead, so that a bug wishing to feed on a human must cross over a sprayed area.

Although much experimental work has been done, much remains and in Kensington at the present time we are trying to find out more exactly the strength of solutions which require to be applied; the length of time which they remain active and whether we can actually bug-proof a room for any prolonged period of time.

In spraying certain precautions must be observed, gloves and overalls should be worn and the hands completely washed after the work and before eating a meal. If a fine spray is being used indoors, a gauze mask should be worn over the nose and mouth.

Care must be taken not to contaminate foodstuffs with D.D.T. for although it is relatively non-toxic to man, yet it can produce both gastric and nervous symptoms if inhaled or ingested in any quantity. The danger of fire in a room when using kerosene is, of course, an obvious one, and requires obvious precautions.

The cockroach is a pest which gives rise to much trouble in such places as kitchens and canteens. It has an unpleasant appearance, an unpleasant smell and it also contaminates food. It is a potential menace in addition because certain disease-producing organisms such as *Bac. tuberculosis*, *B. Coli* and *entomaba histolytica* can pass unchanged through its alimentary canal and may thereby contaminate food which has been fouled by the insect. It is proverbially difficult to rid a kitchen of these insects, who commonly make their homes in hollow walls or chests, or spaces round steam pipes, emerging at night to seek food and water. D.D.T. has been used with considerable success against this pest. The most successful method of its use has been that of insufflating powder containing 10 per cent. D.D.T. into and around the breeding places, under floor boards, immovable furniture, sinks and so on. To be effective the dust must contact the insect so that it should be deposited in areas likely to be traversed. This dusting should be repeated fortnightly until no more insects are to be seen. Again, care must be taken not to contaminate foodstuffs.

Ants may be cleared from a room by the same means as cockroaches.

When dealing with flies we have to remember that they breed outside in putrefying material, in manure and such like places and the first steps to be taken should be in these breeding grounds. Frequent removal and proper disposal of manure, garbage and refuse are therefore of primary importance and D.D.T. spraying and dusting of the breeding grounds to kill the emerging adults can only take second place; reliance should not be placed on this latter line of defence alone. In rooms, however, D.D.T. spray applied to

leave a residual coating of the substance on wall surfaces will produce an almost complete absence of flies in a room for about 48 hours whilst the film is drying. After that, as flies breed outside the effects will be somewhat obscured by "new entrants," but the numbers will always be less than before for weeks or months. Flies are very susceptible to D.D.T. even in very low concentration but the effect is somewhat slow and a spray for use against flies should contain a knock-down agent such as pyrethrin in about 0.05 strength. For quick effect in a room, the aerosol bomb gives an excellent immediate result, but owing to the small quantity of material liberated, little or no residual effect is obtained.

Experiments have shown that D.D.T. compounded with oil-bound water paint or white-wash, retains its toxicity to insects. This opens up new possibilities for rendering rooms proof against bugs and flies. The residual toxicity of D.D.T. when applied in this form is less than when used as a spray, and as yet we are unable to say how long various preparations will remain toxic; but it is stimulating to consider the uses that this might be put to in such places as larders, kitchens, hospital wards and even in stables and byres. There is no doubt that cows in byres thus treated have shown a rise in milk production owing to the reduction of the torment which these animals ordinarily endure from stinging insects. At present, sprays are more effective than distempers and as permanent in their effect, but we are only at the beginning of a new chapter and much of interest may still emerge in this new field.

For use against moths it is important to remember that D.D.T. has no repellent effect, and to be effective the D.D.T. must come into contact with the moth larvae. Therefore, all the fabric to be protected must be impregnated with the solution so as to have a residual coat of D.D.T. crystals.

When we come to the uses of D.D.T. for personal hygiene we find that it is in the

5 per cent. powder form that it is most generally applicable. Dusted into the underclothes it will kill lice and prevent fleas from harbouring. Similarly it can be used against the crab louse. For head lice an emulsion containing 2 per cent. D.D.T. has been reported to give good results, but there is not much evidence at the present time and more work in this direction is required. For cat and dog fleas, lice and ticks, the powder dusted into the coat of the animal gives most excellent results—a solution should not be used as animals lick themselves and poisoning may result.

The Swiss have carried out many experiments on the agricultural use of D.D.T. and it has been shown in this country that it is possible to control the apple blossom weevil, which is such a serious pest in some localities. Caterpillars are destroyed by its use as are the cabbage butterfly, leek moth, onion fly, raspberry beetle and a number of other pests. The action on bees and other beneficial insects has given rise to serious misgivings and the advice given by the Swiss workers is to see that fully opened blossom is not dusted and that spraying be done in the evening or early morning before the bees are about.

Until further experimental work has been carried out under controlled conditions in the agricultural uses of this powerful insecticide it would be wise for the amateur enthusiast to hold his hand.

In this paper I have not attempted to go into technical details of the application of D.D.T. but rather to give a broad outline of the uses to which it is being put at the present time, and the direction in which experimental work is progressing.

The subject is a fascinating one and there is no doubt that we now have a much more powerful insecticide than we have ever had in the past, but, as in other technical work, knowledge, and meticulous attention to detail are required if proper results are to be attained.—Medical Officer.

Bed-Wetting

Can you give me any advice about bed-wetting in children of 3-5 years? These children are taken up at 10 p.m., when they are frequently dry, but are always wet before morning. Would dandelion coffee be helpful? I believe it stimulates the kidneys. If so, how much should they take it early in the day, so as to lead to drier nights?—Brent.

We should not advise giving dandelion coffee to children to cure bed-wetting. If there is some physical cause for it, such as over-acid urine, this is best combated by revising the diet, and feeding the children along Nature Cure lines, with plenty of clear vegetable broth to drink, so that the bloodstream and system generally is kept in a clean and healthy condition.

More often, however, bed-wetting is caused by some mental or emotional trouble. Any sense of insecurity, or of not being wanted or loved, or of being displaced in the mother's

affections by the arrival of a new baby, will produce bed-wetting. Again, if too high a standard of cleanliness is expected too early, and if the child is scolded for accidents, or for wetting the bed, control of the urine will become progressively more difficult for the child. The achievement of continence while asleep is a complex process, over which the child has no conscious control. Scoldings and exhortations do not help because they reach the child's subconscious mind only as fears and anxieties, and so make control impossible. The cure is to remove the child's anxieties, tell it not to worry about a wet bed, as it will soon outgrow it. Put a mackintosh and draw sheet on the bed and give the child a night light. Encourage it to get out of bed and attend to itself when necessary. Never show annoyance, but always accept a wet bed with cheerful matter-of-factness and let the child feel you are its friend in this matter.—Health for All.

Topics from Medical and Health Periodicals

Vitamins for combating anaemia.—Folic acid, one of the B group of vitamins, has been found to be effective in combating certain types of anaemia. Dr. Tom Spies and associates, of the University of Cincinnati School of Medicine, describe the effect of this remedy in the *Southern Medical Journal*. There are various types of anaemia, all characterized by deficiency in red blood cells or hemoglobin, the coloring substance of the blood. In some, known as macrocytic, the red cells are large, while in others, termed microcytic, they are small. Folic acid promptly cured cases of microcytic anaemia even when the red cells were below fifty per cent. of normal. It can be given either by injection or by mouth. Probably the patients will have to continue taking the vitamin the rest of their lives. —*Good Health*.

Vitamins and skin diseases.—Claims that vitamins are effective in treating skin diseases are not borne out by a research conducted at the Duke Hospital, Durham, N. C. Callaway and associates studied 354 patients suffering from seventy one varieties of skin disorders. They were found to have on the whole about the same amounts of vitamins A and C in the blood as do the people of the general population. Patients with common acne were observed to have exceptionally high vitamin values. Those with psoriasis had a good supply of vitamin A. A condition known as ichthyosis has been attributed to vitamin A deficiency, but those suffering from it had normal levels of this vitamin in the blood. The conclusion is drawn that there is no justification for the indiscriminate use of vitamins for the treatment of skin diseases (*Archives of Dermatology and Syphilology*, Vol. 51, p. 266.)

Analysis of colds in industry.—J. H. Kler, M.D., New Brunswick, N. J.—Colds are responsible for more than one-third of the total number of days lost in American industry. They cause a loss of 100 million working days each year. There is a definite pattern to the incidence of colds, with the highest peak in December (or December-January) and a lesser peak in October. July is the month of lowest incidence of colds. Sudden drops in temperature are followed by rises in the incidence and in the severity of colds. Both incidence and severity are much greater among office workers than among factory workers and greater among women than among men. A majority of the colds in women appeared at the time of the menstrual period. There is decreasing incidence of colds with increasing age. The severity of colds increases with age. There are fewer colds in air conditioned plants. The incidence of colds is highest in draughty places. More cold start on Monday than on any other day of the week. This is especially true of colds among men. Posture is an important factor in that the incidence and the severity of colds are lowest among those whose work necessitates

walking about most of the time. Early therapy seems to be of greatest value.—*Archives of Otolaryngology*.

Death knell for rats.—The new rat poison, 1080, promises to rank with DDT as a benefactor of humanity. It was discovered by the Office of Scientific Research and Development after two years of experimentation. The name was given to it because it was the one thousand and eightieth substance tested. It is a chemical called sodium fluoroacetate. It has a strong taste appeal for rats and other rodents, either in water or mixed with food. Infested buildings have been cleared in a short time. The Navy used it to destroy the rats of Pacific islands. The poison is also effective against ground squirrels, prairie dogs and gophers. Rats convey typhus, plague, rat-bite fever, tularemia, infectious jaundice, trichinosis, food infections, and perhaps other diseases. It is estimated that rat-borne infections killed nine million persons in World War I and possibly three times as many in the late war.—*Good Health*.

Movie shows not restful.—We have never regarded attendance at cinema shows as an ideal form of relaxation, especially for children. The constant flicker and noise of the machine, coupled with the usually exciting pictures, do not make for repose.

Now an American scientist of Chicago University gives in *Science* the results of a study of adult movie fans. According to a contemporary, "He found that sitting, in a theatre two or three hours raised the body temperature from one half to one degree." He concluded that attending movie picture shows which is looked upon as relaxation in the sense of escape from humdrum reality of existence, is by no means relaxation in the physiological sense. Muscle tension is increased during such performances.

What people call "the humdrum reality of existence," from which they are always trying to get away, may be far better for body and mind than a constant round of excitement. Congenial employment, good housing, a happy home life, with plenty of garden, space are more vital to a restful, contented and happy life than the supposed relaxations of the picture house.—*Good Health (Lond.)*

Duodenal ulcer.—Mr. H. M. Stanley Turner (*British Medical Journal*, October 20, 1945) maintains that there is a "duodenal diathesis," although every case does not necessarily present the stigmata in obvious form. For this reason he always warns "recovered" cases (i.e., when symptom-free with radiologically confirmed healing) of the possibility of relapse, of the importance of adhering to a "healed ulcer" regime and of the need for a periodic survey even in the absence of symptoms. He particularly emphasises the periodic survey.

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