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Hygienic Infant Feeding

W. HOWARD. JAMES, M.B., B.S.

NOW that we are approaching the summer season it is important that mothers should pay especial attention to the feeding of their infants. The mortality among artificially fed children in the summer season is serious due to the development of disease-producing germs, and to the composition of the artificial being so different to that of the mother's natural milk. The mother's milk as it comes from the breast is not only free from bacterial growths, but it has to a slight extent the power of destroying these injurious organisms. Cow's milk, however carefully the milking and the after care of the milk, always contains germinal matter. Fortunately the digestive juices of the child will, under normal conditions, destroy these organisms unless they are excessive in amount. Cow's milk again, it must be remembered, is prepared by nature for the development of the calf, a very different animal both in size and composition to the child being, and, consequently, it varies considerably from that of human milk. The calf grows more rapidly than the child, and requires more proteid and mineral matter; and again the calf, on account of having a relatively smaller surface from which heat is given off, requires a smaller amount of fat and

sugar. The plan is generally adopted in feeding children to dilute the cow's milk with water, and thus bring the proteid and mineral to approximately the same percentage as in human milk, and to add cream and sugar to increase the proportion of the heat-producing ingredients. But although the same ingredients are found in the cow's milk as in human milk they, with the exception of the sugar (milk sugar), have different chemical properties, consequently cow's milk can never, even with the greatest skill, be properly humanised. The proteins in milk consist of casein and albumin. The albumin is much more digestible than the casein, and is much more suitable for the delicate membranes of the child's alimentary canal. In cow's milk there are four parts of casein to one of albumin, but in human milk the proportion of the two is equal. Not only so, the casein itself is actually different in the two forms of milk. Cow's casein leaves behind a substance called paranuclein, which is to the child quite indigestible; human casein does not. Again, human casein is richer in sulphur than cow's milk. The acid of the stomach causes the casein of the cow's milk to be thrown down in large flocculi, curds, which are not readily digested; but with

the human milk the flocculi are very fine, and readily dissolve on the secretion of more acid. In regard to the important ingredient of milk fat, in the human milk there is more oleic acid, which has a lower melting point and is more digestible than the fat in cow's milk. Not only so, the fat in human milk is in much finer droplets, and is much more digestible and more easily assimilated than that of cow's milk. There are no less than 30,000 millions to 50,000 millions of fat globules in one cubic inch of milk, and yet the total weight of that huge number is less than nine grains. Again, human milk fat contains much less of the volatile fatty acids than is found in cow's milk. The mineral ingredients in milk are of great importance in the building up of muscles, bones, and blood. Phosphate of lime is wanted for the bones, phosphate of potash for the muscles and blood. These salts are of much greater value when they enter the body combined with organic matter than in the free mineral form. Human milk is particularly rich in organic combinations of these salts, thus lime water or other chemical preparations of salts cannot be proper substitutes for them. In human milk these salts are almost all in organic form, but in cow's milk less than half are thus combined. Human milk is similar to yolk of egg, and the embryo of young plants in its high proportion of organic phosphorus. The child again has a much greater development of brain and nervous tissue than the calf. Lecithin is a special proteid of brain tissue, consequently we find in the human milk double the percentage of the amount contained in cow's milk (3.05 per cent of the proteid in human and only 1.40 per cent in cow's milk is lecithin). We thus see that a truly "humanised" cow's milk is a chemical impossibility. Statistics undoubtedly prove the great superiority of the human milk in the bringing up of children. For instance, in Derby during 1900-3 Dr. Howard found the—

Death rate among breast fed babies	
was	69.8 per 1,000
Death rate among hand-fed babies	

was	197.5	..
The deaths from diarrhoea among breast-fed babies was	8.6	..
The deaths from diarrhoea among hand-fed babies was	51.7	..

In Brighton 1903-5 Dr. Newsholme found that of 121 infants who died from epidemic diarrhoea:—

The breast-fed amounted to	65	per cent
Those fed on cow's milk	36	..
—'Nutrition,' page 100, by Charles E. John, F.I.C., F.C.S.		

It cannot be too strongly emphasised that the rearing of children on their natural food, the human milk, is by far the best method, not only as far as the life of the child is concerned, but also in regard to its future health.

Infant Feeding with Cow's Milk

Unfortunately, however, many mothers find it impossible to breast-feed their children, and some modification of cow's milk is found necessary. The points that have to be remembered in connection with cow's milk are: (1) It contains rather too little fat; (2) too much casein; (3) too little albumin; (4) rather too little sugar; (5) twice as much mineral matter as in human milk; (6) that it forms large, coarse clots that disturb the infant stomach; (7) and contains dirt of various kinds, including numerous micro-organisms. These divergencies, except the last-named contamination, correspond to the differences in the requirements of the young infant and the young ox respectively.

Sterilisation or Pasteurisation

The first consideration is the destruction as far as possible of the deadly micro-organisms. Dr. John writes: "It is the lactic acid-forming bacteria which multiply most rapidly under ordinary circumstances; inconvenient though this may be in one respect,—since the ever increasing acidity soon curdles the milk,—it is really a fortunate phenomenon; for the organisms referred to, as well as the acid they form, are not toxic, whereas other species which might be far more injurious are to a considerable extent 'crowded out.' Putrefactive organisms and disease germs are thus prevented from multiply-

ing as fast as they would otherwise, but they are not killed, and should conditions arise more favourable to their growth and less so to the lactic bacteria,—such conditions being met with in the human body,—they may spring into activity. There may be no pathogenic (disease-producing) organisms present, but without a bacteriological research we can never be sure. Boiling milk (sterilisation) will destroy all micro-organisms in milk, but this interferes with the chemical composition of the milk, for at 162° F. lactalbumin (the chief whey proteid) is coagulated. Most healthy children, however, do well on boiled milk. Boiling destroys all micro-organisms, but not the spores from which they develop. Boiled milk will not necessarily keep indefinitely, even though corked securely in sterilised bottles. With a moderate temperature the undestroyed spore will develop into bacteria. A threefold heating at a temperature of 155° F., an interval of twenty-four to forty-eight hours between each operation, will destroy all micro-organisms and their spores, and this milk will keep indefinitely if placed in sterile bottles. This temperature does not alter the chemical composition of milk. For delicate children, milk should not be boiled. The threefold heating is in most cases too cumbersome, and entails too much labour for the mother under ordinary conditions. The Leed's pasteurisation temperature for milk is 157° F. for thirty minutes. If this milk is kept absolutely cold, preferably in a refrigerator, it is perfectly safe for all children. This temperature does not coagulate the important lactalbumin constituent of milk. Most disease-producing germs are destroyed at a temperature of 150° F.

Some infants thrive well on pure cow's milk. This is known as Budin's method. To be successful the milk must be sterilised at 212° F. for forty minutes, and should be given in small feeds, the exact amount being controlled by regular weighing of the infant. As a rule, the infant requires about one-eighth of its weight of milk daily. The milk, of course, is given

in divided quantities at the usual intervals. As the child gets older the intervals can be made longer, and the amount at each feed increased. The duration of sterilisation may also be shortened. In most cases, however, it is necessary to bring the composition of the cow's milk as near as possible to that of human milk. If ordinary cow's milk be diluted with equal parts of water, we get the following comparative results:—

	Cow's milk and water					
	Human milk		Cow's milk		equal parts	
Proteid	...	1.5	...	3.5	...	1.75
Fat	...	3.5	...	4.0	...	2.0
Sugar	...	6.5	...	4.5	...	2.25
Mineral matter		.2735

This makes the important proteid constituent about equal to that of human milk, but the fat and the sugar are deficient. These defects will be rectified by the addition of a medium-sized teaspoonful of milk sugar (pressed flat) and one teaspoonful of separated cream. White cane sugar will do, but the milk sugar is better. With weakly infants the increased casein and the decreased lactalbumin in this compound will cause it to disagree. The casein can be made more digestible by the addition of one grain of citrate of soda to every ounce of cow's milk. (Dr. F. J. Poynton in *Lancet* 1904, page 433.) This precipitates the excess of calcium salts, causing the casein to set into a less dense curd in the stomach. In the case of very young and weakly infants a further dilution may be found necessary. Equal parts of cow's milk, water, and lime water may be used, and the same quantities of cream and sugar added as above.

An ingenious method of overcoming the dense clotting due to the excessive casein has been proposed by Von Dungern. The milk is boiled and cooled to about 100° F. To this pure rennin is added. In two or three minutes clotting takes place. The milk is then thoroughly shaken until all the clots disappear. It is then ready for use. By this method the casein is not further clotted on reaching the stomach, and is therefore very easily digested.

As diluted milk contains only about two per cent of fat, it is well to allow the fresh milk to stand for four or five hours in a cool place, and use the upper third only for the infant.

The use of whey in the preparation of milk for the child is highly recommended by many eminent authorities. Whey has the advantage of containing only lactalbumin, the casein having been removed by curdling with rennet. For weakly infants, this has a great advantage. Lactalbumin, we have seen, is the important proteid in human milk. It does not form large clots like casein, and is much more digestible. Whey is best produced from fresh skim milk. Add a small piece of rennet or a few drops of rennet extract. Allow it to stand till the curds are formed. Break these up thoroughly, and strain through fine muslin. In order to prevent further action of the rennet, heat the sweet whey thus produced to 140° F. This destroys the rennet enzyme. The temperature, however, must not be raised above 150° F., as a temperature of 165° to 183° F. will coagulate the whey proteid lactalbumin. *Monti* for the first three months employs a mixture of equal parts of milk and whey, after that a mixture of two of milk to one of whey. *Hutchison* gives the following directions: "Let a quart of fresh milk stand in a covered jar in a cold place for four or five hours. Remove the upper ten ounces by skimming, and add to this twenty ounces of sterilised whey and one-half ounce of milk sugar. The mixture should contain four per cent of fat. A grain or two of bicarbonate of soda may be added to the mixtures to render them alkaline."

Whey has the advantage as a diluent of milk of containing albumin and a little fat, and of being antiscorbutic, but its preparation demands more time and trouble on the part of the mother than can usually be given to it.

Condensed Milk

Some, on account of not being able to procure cow's milk, are compelled to use condensed milk. Unfortunately, most of

the condensed milk used is prepared from sweetened whole milk, and when diluted to strength recommended makes a very poor food for infants. Dr. Louis Starr says: "Infants fed upon condensed milk (meaning the sweetened variety), though fat, are pale, lethargic, and flabby, and though large are far from strong; have little power to resist disease; cut their teeth late, and are very liable to drift into rickets before the end of the first year." Dr. Eric Pritchard is even more emphatic: "I have never yet seen an infant fed for six months uninterruptedly on condensed milk who did not present unmistakable symptoms of rickets." Many of the sweetened condensed milks are prepared from skimmed milk, and are very poor in fat. Infants, however, thrive when fed on the condensed, *unsweetened* whole milk. If one part of the unsweetened condensed milk is added to two parts of water, the resulting fluid fairly corresponds to a good sample of pure cow's milk. To dilute the sweetened condensed milk in this proportion would leave the fluid altogether too sweet. *Pearmain and Moor* write: "The following table shows the character of the liquid—it cannot be called milk—that is produced by following out the directions on the labels of half a dozen of the best brands of (*sweetened*) whole-cream milk:—

Sweetened Milk	Dilution recommended for household purposes	Fat in such product	Dilution recommended for infant's use	Fat in such product
A	1-3	2.6 per cent	1-5	1.8 per cent
B	1-5	1.6	1-14	0.7
C	1-5	1.6	1-14	0.6
D	1-6	1.4	1-15	0.7
E	1-5	2.1	1-14	0.8
F	1-5	1.7	1-14	0.7
G	1-5	1.7	1-14	0.7

When it is remembered that human milk contains on an average 3.5 per cent of fat, it will be seen how unsuitable the sweetened condensed milks are for children. They also are lacking in every other constituent of milk except the sugar, and that exists in injurious amounts.

The unsweetened condensed milks can be highly recommended. There are four good varieties on the market: "Ideal,"

"First Swiss," "Viking," and Hollandic. They have the disadvantage of not keeping well after the tins are opened. Small tins are thus advisable. These milks, however, are difficult to obtain.

Proprietary Foods for Infants

There are many proprietary foods on the market, and all claim to be the best food for infants, and perfect substitutes for human milk. The statements, however, are only made for the purpose of selling the article. Many of these foods contain unaltered starch, a greater proportion than the ordinary infant can well digest. All, or almost all, are especially deficient in fat and also in proteids. Most of the proprietary foods are prepared from desiccated milk, to which milk sugar, malted flour, etc., have been added.

The nearer these foods conform to the composition of dried human milk, the more suitable they are as infant's food. We will compare the percentage composition of some of the better known preparations with that of dried human milk:

Food	Water	Proteid	Fats	Carbo- hydrates	Mineral matter
	Per cent	Per cent	Per cent	Per cent	Per cent
Dried human milk	—	12.2	26.4	52.4	2.1
Allenbury's No. 1	5.7	9.7	14.0	66.85	3.75
Allenbury's No. 2	3.7	13.8	9.0	70.8	2.70
Glaxo	3.5	22.2	27.4	41.0	5.90
Mellin's Food	6.3	7.9	trace	82.0	3.80
Savory and Moore's Food	4.5	10.3	1.4	83.2	0.60
Benger's Food	8.3	10.2	1.2	79.5	0.80
Allenbury's Malted Food	6.5	9.2	1.0	82.8	0.50
Neave's Food	6.5	10.5	1.0	80.4	1.60
Frame Food Diet	5.0	13.4	1.2	79.4	1.0
Robinson's Groats	10.4	11.3	1.6	75.0	1.70

These figures are taken from "Food and the Principles of Dietetics," by Robert Hutchison.

It will be seen at a glance that all are deficient in fat when compared with dried human milk with the exception of Glaxo, and also all are deficient in proteid except Allenbury's No. 2 and Glaxo. Glaxo contains an excess of proteid. Many of the foods, such as Mellin's, Benger's Food,

Savory and Moore's are used with the addition of milk. These foods are farinaceous, and are prepared mostly from cereals (usually wheat), of which the starch has been partly or wholly transformed into dextrins or malt sugar. In Mellin's Food the starch is completely dextrinised.

The deficiency of most of these foods in proteid and fats should always be recognised in the feeding of infants, and that deficiency made up with separated cream and some albuminous food, such as Albumactin.

Fate of the Epicure

R. Hare

MANY a grave has been dug by the wine-glass, and many a tombstone has been modelled by the teeth. Many a life that might have been strong and enduring under self-control, has weakened and departed under the smile of voluptuousness.

Epicurus was a Grecian philosopher of the third century before Christ. He opened a school first at Mitylene, but finally settled at Athens. The doctrine he taught has been summed up in the aphorism: "Pleasure is the supreme good." While his own life was virtuous, his teaching was afterward made the excuse for vice on the part of his followers. His school at Athens was in the form of a garden. Over the entrance he placed the inscription, "Where you will find pleasure the highest good."

But the philosophy of Epicurus has failed, and humanity has often found pleasure to be a supreme evil instead of the "supreme good." As a rule, the path of pleasure leads to carelessness, sensuality, and a short life. Hardship, on the other hand, seems to be endowed with the factors of durability.

Sardanapalus, the last king of Nineveh, founded a city, "Anchialus," in Asia Minor. In the time of Alexander the reputed tomb of that Eastern voluptuary was in that city. Above it stood a marble statue of the city's founder. The figure stood in the attitude of clasping its hands,

and underneath, by order of Sardanapalus himself, there was chiselled the inscription:—

Stranger! eat, drink, gratify thy senses; for other human things are not worth this—"clap of the hands."

This prince is said to have surpassed all his predecessors in effeminacy, luxury, and vice. He spent his time among a company of women, dressed and painted like them. His pleasure was found in feasting, rioting, and indulging himself. The epitaph he ordered for his tomb was said by Aristotle to be "fit for a hog." When the hour of doom came this cowardly monarch gathered his treasures and his wives into an inner palace, locked the doors, set fire to the place, and all perished in the flames.

How often has history repeated the lesson of the ruin wrought through pampered appetite and pampered passions. The Chaldeans of Babylonia were a hardy people while under service to Assyria. While denied the dainties that appetite claimed for their masters, they grew strong; then they conquered, reigned, became voluptuous, and fell.

The Persians, before whom the Babylonian kingdom went down, were at first a hardy, abstemious people. The diet of the soldiers consisted largely of brown bread and water cresses, but on that they conquered the world. Then, in the ease of victory, in the leisure of triumph, amid the spoils of conquest they, in turn, became luxurious; their strength and prowess departed, and after 207 years of world-dominion they were conquered by the hardy soldiers of Macedonia.

Darius, the last king of Persia, went to meet Alexander in a golden and gem-set chariot. Beside him marched 15,000 relations and friends; while before went the "Immortal Band" of 10,000, with golden collars and robes glittering with precious stones. Three hundred and sixty concubines in queenly equipage followed. In the midst of all this luxury the once hardy Persians marched forth to renounce the sceptre of a world.

But the Grecians did not long retain

their power. They conquered the world, yet the mighty man who led them to victory was, in turn, conquered by the wine-cup. At a banquet tendered to Clitus, friend and companion of Alexander, on his appointment to an important position in the empire, words were exchanged in anger. Then Alexander, seizing a javelin, thrust it through the body of his friend. "By one act of drunken fury" every tie of friendship and life-long acquaintance was severed. "How wretched was the conqueror of nations! How weak was the master of the world!" Appetite was the real master after all.

Rome finally trampled on the independence of voluptuous Greece. But the real cause of her fall is thus stated by the historian:—

And who will say that these very sins were not the direct causes which made the descendants of Marathon and Salamis the victims and slaves of Rome. As it was by temperance, discipline, and combination that their fathers gained so high a point, it was by the opposite vices of sensuality, selfishness, and discord that they lost the fair inheritance bequeathed to them; and while the mountains and their beautiful sky and their monuments of art still remained, the *spirit of Greece* was dead and her glory faded.—*History of Greece*, page 213.

Byron has told the fall of Greece in these words:—

No foreign foe could quell
Thy soul, till from itself it fell!
Yes, self-abasement paved the way
To villain bonds and despot sway.

How often in individual experience the fate of the epicure has been demonstrated, and how widely that story is being told in modern history. The world is full of slaves—slaves to sensuality, to narcotics, to stimulants; in other words, "slaves to appetite!" Alcohol has its millions of victims, tobacco its millions more, while opium and morphine and gluttony are stealing away the mental and physical power of millions more. Manhood is surrendering in the awful struggle. What they call "pleasure" is being followed by devoted multitudes of humanity forgetful that the way which seems right unto a man is "the way of death."

Nero attended the Olympian games in Greece. He undertook to drive a chariot

drawn by ten horses, but he was thrown, and had to desist. Yet he was proclaimed victor in the race. He is said to have carried away 1,800 crowns, but they were given only because they dare not be withheld. But his life was too vile even for the voluptuous people of a decaying Rome. When the enemy was heard coming he fled from the banquet hall in terror. In his hiding place he was told

the sentence of scourging to death had been passed. Evil pleasure of every character had dominated his life, but with the terror of scourging before him, with the assistance of a slave he committed suicide.

But this monster in human form was one who deemed pleasure to be "the highest good." Why will men not learn that nature cannot be cheated in this way.

Hints and Suggestions for the Summer Holidays

A. B. OLSEN, M.D., D.P.H.

HOLIDAY is a good old Anglo-Saxon word, and is derived from two roots, *halig*, holy, and *daeg*, day. As we would naturally infer from this derivation the ancient and original holiday was in reality a holy day, or rest day, devoted to religious duties. There was a freedom from ordinary labour and work, but the modern idea of recreation, amusement, and diversion is a much later development.

Recreation Needful

Those who are engaged in constant labour, whether of a sedentary or active nature, benefit by an occasional change of scene and recreation. Long sustained work of any kind, whether it is manual labour, business activity, brain work, or merely the daily round of unceasing duties of the home life, becomes wearisome if not worrying after a time, and may lead to nervous and physical exhaustion unless there is a respite. Under such conditions one is no longer able to produce the best results in any kind of work. A holiday wisely spent is a blessing, and has a wonderfully refreshing effect upon both mind and body, and sends one back to work with renewed energies and fresh courage.

Rest or Change of Work

The holiday may be either a time of quiet relaxation and restfulness, or it may

be merely a change of work or activity. Those who are literally worn out and exhausted, who find themselves as tired and weary in the morning as at the close of the day; those whose nerves are constantly on the *qui vive* and in a sensitive, irritable condition, obviously require a rest holiday. They want freedom from excitement, and quietness as much as anything, and an extra amount of sleep. They need to relax and unbend and let-go. The soothing influence of an out-of-the-way quiet countryside or seaside where they can live out of doors in the fresh air surrounded by the beautiful things of nature, and a plain but nourishing and attractive diet, with fresh fruit, fresh vegetables and salads, wholemeal bread and cereals, together with milk, cream, butter, and eggs—these are the things which will soonest restore lost energies and refresh both mind and body.

The Strenuous Holiday

But there are those on the other hand who merely want a change of scene and activity, and a working holiday suits them better. Indeed, many people put in harder work of one kind or another on holiday making than at business. The explanation is that the holiday work is not only a change, but it is more congenial, and therefore they enjoy it and

benefit by it. An active holiday with a maximum amount of diversion such as cycling, walking, swimming, and more or less strenuous games of various kinds suits such people and does them good. They seem to thrive on activity while the other class would only suffer injury.

The Stay-at-Home Holiday

It is not always wise to take the first

holiday at home is often a blessing to the mother as well as the father, and this is particularly true where there is a garden to occupy one's time. A week or a fortnight at home with the family, digging in the garden, romping with the children, eating out of doors, and, as far as possible, living out of doors, is of itself a great and beneficial change to sedentary workers who have to spend long hours in darkened



Brighton Beach—One of Melbourne's Favourite Watering Places
N. J. Caire, Photo., Melb.

possible train at the beginning of the holiday and return by the last one. Many men would profit more by staying at home and getting acquainted with their wives and children. The strenuous toil and long hours of business or labour make them so weary when they return in the evening that they are scarcely fit for anything but bed, and in the morning they must needs start off early to work again. Where there are a number of children a

and ill-ventilated offices and shops. It is sometimes worth while to rent a tent, put it up in the garden, and sleep out of doors in the fresh air. The children will enjoy the tent, and the delight of having father at home each day will amply compensate for a visit to some other resort.

Seaside or Country

Those who are leaving home will have to decide whether they are going to some

quiet countryside village for their holiday, or to some seaside resort. Those living inland and the average town dwellers of our large cities will naturally prefer the bracing air of some seaside town or village, while others who live by the town or sea will prefer to seek the country. It is oftentimes possible to combine the delights of the seaside with the country. By means of cycling or walking tours one

benefit from the daily plunge, but the greatest care should be taken against drowning. Even good swimmers occasionally run grave or fatal risks at the seaside. Fortunately, by far the largest number of our seaside bathing resorts are remarkably safe as far as the sands are concerned, but none the less, danger is lurking about, and the holiday season rarely, if ever, passes without claiming a



A Giant Red Gum Tree Used as a Camp by a Bushman N. J. Caire, Photo., Melb.

can spend much of the time in the country and yet be lodging by the sea. The ozone of the sea air is a very pleasant tonic, and makes a fine change for the countryman.

Bathing and Boating

A word of caution is necessary for those who go to the seaside and expect to indulge in sea bathing or boating. Those accustomed to bathing in the sea will

considerable number of victims. One should never go bathing alone under any circumstances, but always take a companion, and better still, several companions. Always note the state of the tide, whether ebb or flow, and ascertain the character of the bathing sands. It is a wise precaution to keep near the shore, and it is a still wiser precaution to always have a boat and boatman near at hand to watch the bathers and be able to render prompt

assistance in cases of emergency. Even expert swimmers sometimes come to grief, and then usually through carelessness.

Boating and yachting, whether on the river, lake, or sea, is another risky recreation, and scarcely a week goes by in the summer time without recording fatal boating accidents. It would be a good thing if no boat was allowed to go out without

first aid in case of emergency. There are several methods, and it matters little which one is mastered. The object is obviously to assist the natural breathing process when the victim is unable to breathe through exhaustion. The first step in artificial respiration is to see that the tongue is drawn forward so that it will not impede the passage of air. The second step is to expand the lungs, thus



Australian Natives Spearing Fish in Deep Water on Lake Tyers, Vic. N. J. Caire. Photo., Melb.

being in charge of a competent sailor, or at least someone who thoroughly understands the management of a boat, whether row boat or sail boat. This would undoubtedly add to the expense of boating, but it would at the same time be the means of saving many valuable lives.

Artificial Breathing

Everybody should learn the art of artificial respiration, so as to be able to render

drawing in the air and afterwards to compress the lungs so that the air will pass out again. Artificial respiration should be performed steadily and deliberately at the rate of about fourteen or fifteen or sixteen times a minute, and it should be continued for several hours if necessary. Remember that a valuable life is at stake, and that patient perseverance after several hours of artificial breathing has been the means of restoring life. Do not make

the mistake of giving up too soon. Just imagine yourself in the condition of the supposed drowned person, and persevere with the movements until the faintest hope of restoration has passed. Other persons may render very material assistance by one going for the nearest doctor and one or two rubbing the extremities in order to restore warmth. The application of artificial heat is also helpful

or more. The necessities are in reality few, and may consist only of an extra shirt or two, an extra pair of hose, collars, handkerchiefs, comb and brush, one or two small choice books, and a light macintosh coat or cape if the jacket is not rainproof. It is possible to travel comfortably with an even smaller load. A good map of the district that is visited should be obtained before starting.



By permission of N. J. Caire, Photo., Melb.
A Romantic Touring District—Mt. Buller Road, N.Z.

and important. Just as soon as the victim is able to swallow, it is an excellent practice to give sips of hot water, but do not give brandy, whisky, or alcohol in any form.

Walking Tours

A very inexpensive and at the same time wholesome and pleasant holiday may take the form of a walking tour. With a knapsack on the back, a stick, and a jacket of rainproof cloth one is soon equipped for a walking tour of 100 miles

Cycling Tours

A cycling tour makes a delightful holiday for devotees of the wheel. With a cycle it is possible to cover a much wider stretch of country, and one can comfortably do anything from 300 to 500 miles in a fortnight without undue speed and with keen enjoyment. Of course the comfort of a cycling tour depends very largely upon the weather. A party of two is usually the ideal arrangement, but larger parties are also successful.



Studies in Child Culture

MRS. S. M. I. HENRY

“WHAT would you do in case a child will not answer, but sits or stands with closed lips, and utterly refuses to speak?”

First of all, try to find a reason for this strange behaviour. Some time when he is talkative, when you have been able to come into a good understanding with him on other matters, ask him about this peculiar freak, and get him to open his heart to you about it. You will probably obtain a clue from a frank talk which will help you to help him. If he proves stubborn, treat him as if he were ill; *for he is*. Put him to bed. Make some special applications to his chest, throat, and face, nurse him tenderly, don't ask him to speak, have it understood that he *cannot*; for that is true—he *cannot* if he *will* not. A few courses of such treatment will cure the most stubborn, leaving no sting of anger in the child's heart against you, and you nothing to regret. It may be that some peculiar form of nervousness is at the root of the trouble, so that he is actually unable to speak when under pressure of any sort.

“When several children living together acquire the habit of all talking at the same time, what method of training would you adopt to correct the habit?”

The first trouble is in leaving the children by themselves. Talk with them, and teach them how. To make a beginning in correcting the evil, I would have a talk with them, and enlist each to help in reducing this Babel to order. A con-

versation like the following would probably ensue:—

“Children, what do people talk for?”

“Because they want to say something.”

“But do they want to say something just for the sake of saying it? or is there some other reason?”

“They want to ask for something, or tell about something?”

“When anyone is telling you about something, or when you start to ask for something, what do you yourself want to do, first of all, or have those to whom you talk do?”

“Hear.”

“Yes; you would not talk much if no one would hear you. That is why people who are deaf are also dumb. They cannot hear their own voices, and so there is nothing to make them talk.

“Now I am interested in what you children all say, just as much in one as the other; so are you; but when all are talking together, no one is able to hear the words or get any new ideas. Now let us all begin to talk so as to be heard—just one at a time. When one has something to say, let us all listen and hear what it is.”

“But if Johnny wants to talk all the time, what shall the rest do?”

“Listen until he gets through. But he will not talk all the time, because ‘all the time’ is a great while; and besides, we can time ourselves by the clock, if you think best. Let each one have five min-



Bible in the World
The Queen of Holland with the Crown Princess

utes to tell what he has to say. I am sure we can depend on one another to help get this talking tangle straightened out. Let us not talk unless we really have something to say; and then when one has something to say, let us all listen, and see what we would like to answer back. That is conversation, which is one of the most beautiful gifts of God to us—one of the ways by which people find out those things which make them happy and cultivated."

Of course this made up formula could not live in any talk with children. Their replies would break in with startling and delightful variety. But in any home

where there is even average sympathy, the kind of understanding that should result would subdue the disorder of which you complain.

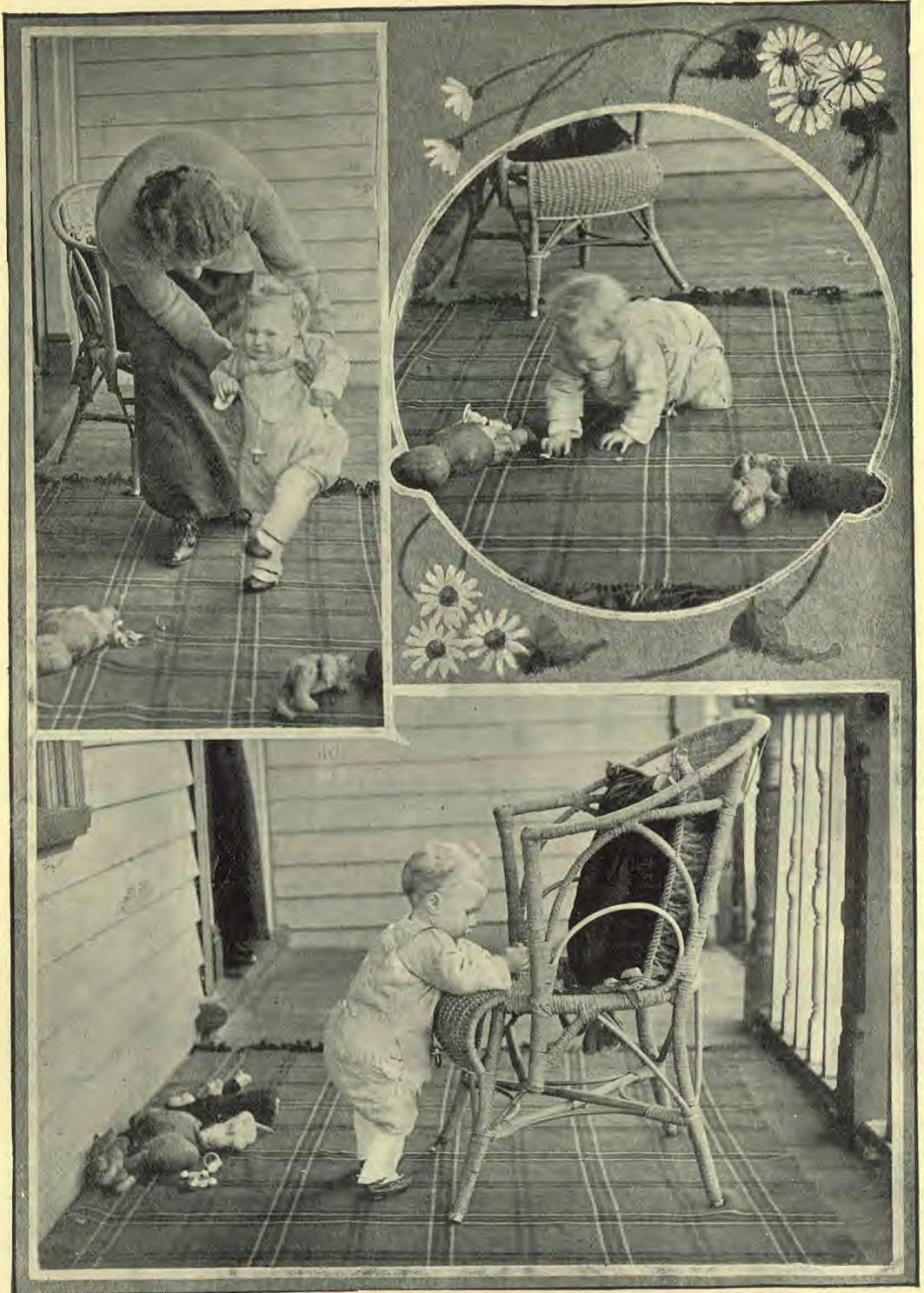
Teaching the Baby to Walk

IN recent years, doctors and others who are interested in child study have advised that babies be "let alone." They declare that much handling of the infant is not good for the health of its body or of its mind. Dancing the baby, tossing it in the air, and "riding it to Banbury Cross," kissing it and playing with it tire the child, and excite it injuriously. The little baby needs absolute quiet, and the less older persons disturb it and talk to it, the better.

That is all sound doctrine, but by and by the time comes when the child needs a little wise help if it is to develop properly. Left alone in the bed for the first few months, it will get all the exercise it needs by kicking and clawing the air, provided its limbs are not swathed in too many clothes or weighed down by heavy bedclothing; but when it has learned to use its muscles and gained some idea of space and direction, and when its bones have begun to harden, it is time to teach it the difficult art of walking. It cannot learn that in the bed, and will learn it slowly on the floor by itself.

First of all, teach the baby to creep. When it has acquired that accomplishment, begin the walking lessons. Hold the baby upright, with its feet resting squarely on the floor, and then carry it forward slowly while another person raises first one foot and then the other, and plants each ahead in its turn. Move the child's body so that its centre of gravity is transferred from one foot to the other alternately. In that way the child will learn very quickly to balance itself, and soon it can stand alone for a few seconds. By and by it will try to move forward of its own accord.

You can hasten the child's progress by



TEACHING THE BABY TO WALK

moving its legs in imitation of walking while it lies on its back in bed. Make these motions correctly and methodically, and make them as nearly as possible like the motions used in walking. With the average healthy child, these lessons, both active and passive, should begin about the ninth or tenth month, and the child should be able to walk a few steps alone soon after it is a year old.—*Selected.*

Training the Child's Appetite

PARENTS know that their child is not capable of wisely deciding what is best for him to wear or what his amusements shall be, but, when it comes to deciding the most important matter of all, what shall go into his stomach, they allow him free rein. Anything and everything he wants he gets, and not a firm word of denial is spoken.

Then mother takes care of him through the long night when he is sick, and everybody wonders what makes the baby have colic, and complains that they "couldn't get a wink of sleep." And grandmother says: "Why, every baby has colic. That is one of the things you have to put up with when there is a baby in the family."

A very little baby that has never had anything but milk has been unable to make comparisons in food, without which experience taste cannot be formed. This fact was amusingly illustrated when my baby was very young, and I had occasion to give him castor oil. My mother thought it a shame to give it to the child without some peppermint or something else to "take away the taste."

"Why," I laughed, "he has not formed any taste yet. What is castor oil to him? Just something strange to put into his mouth; I'll wager that he will not mind it a bit. Just watch his face."

And the little fellow actually smacked his lips, and looked up as if he wanted more of the horrid stuff! If we had nothing but such tasting things as castor oil to eat, that baby would soon have en-

joyed its taste, and called it good! And perhaps he might have gone to college declaring that he was accustomed to having castor oil for his breakfast and simply could not eat anything else.

A child's appetite is just what his parents make it. If the father and mother are wise, members of their family learn to eat "everything." If the mother caters to some preference, her son and daughter soon begin to think that they must have that article of food and no other. The children accustomed to eating whatever is set before them are welcomed everywhere; they are the joy of a hostess. But those brought up under the opposite conditions are the despair of everybody. They cannot eat this, and cannot abide that, and the other thing "makes them sick." Truth to tell, they make most people "sick," poor things!

When a child's stomach has been accustomed to a milk diet only, it will not take food of varying degrees of indigestibility without rebellion. Many a grandmother objects to such a statement, and will tell you immediately:—

"I brought up eight children, and every one of them had everything they wanted from the table from the time they came to it. Tea? Certainly; I gave them tea and coffee—all they wanted. And everything else besides, and they lived through it!"

Yes, thousands lived through such treatment, but it was in spite of, not because of, such ignorant methods. No one ever tells of the awful nights or the excruciating stomach-aches they caused.

There are few children that are underfed compared with the thousands that have so much to eat that it makes them poor to carry it around. Three times a day they have their stomachs filled "chuck full," and then we wonder why they do not get along better in school, and why they are so peevish all the time. "Some member of the family is sick all the time," one mother after another complains. And a person with a grain of common sense does not wonder a bit when he sees how their children eat.

The tendency is to overeat rather than not eat enough. The body requires only a certain amount for physical growth and development, and to enable it to perform its daily functions. If more food is taken than is required it is apt to clog the system, bring about organic disorders, and sap the nervous strength of the individual. Intellectual attainment is difficult or altogether impossible to one who has not the will power to deny himself too much food, or the rich and stimulating foods we are apt to find upon our tables to-day. It is a physical impossibility for the brain to work while the stomach and other digestive organs are being overtaxed. Keepers of very fine animals show their recognition of these principles in feeding them at regular intervals and in moderation, a practice that has proved conducive to their best health. If men can do such things for monkeys and bears, cannot women take as intelligent care of their children? Are not these children of ours of more value than the highest-priced animals?—*Bertha Bellows Streeter.*

Things Worth Knowing

Concerning Babies

BABIES when teething require sips of water frequently.

Babies should not be rocked or danced about, but be kept as still as possible.

The less infants are talked to or excited the better.

If you want them to be good, observe strict regularity in feeding.

Shade baby's eyes while awake or sleeping.

Try a lukewarm bath when baby is fretful, let him stay in it awhile.

Never permit yourself or anyone to kiss baby on the mouth.

Take care to keep the feet warm—they will not sleep long with cold feet.

Cold feet retard digestion and cause congestion and catarrh.

If constipated, insert a piece of soap covered with oil into rectum, at regular

hour daily. Use common soap, cut into little finger length, and keep it handy in oil, covered up.

Never cover so warmly as to induce perspiration; some babies require far less clothing than others.

The less teething powders or soothing syrups used, the better. They are very rarely necessary, and often decidedly harmful.

Concerning Children

Abundance of pure air and plain though nourishing food—without sweets, spices, or condiments—ensure good blood and strength.

Regular meals, without scraps or lollies between meal-times, ensure good appetite.

The less confectionery and lollies the less sickness and irritability.

Ripe fruits, honey, melsitos, or malt are the purest sweets.

Growing children require abundant sleep; school children especially.

Always keep the legs and feet warm, and the head cool.

Have bedrooms well ventilated; night air is purer than day air.

Nervous children often cover head with bedclothes—prevent this.

Children should never be hit or scolded in anger.

Observe their faults, yet speak not of them—encourage opposite virtues.

Children are inexperienced, so need to be kindly taught and patiently instructed.

Be careful what you promise children, then keep every promise.

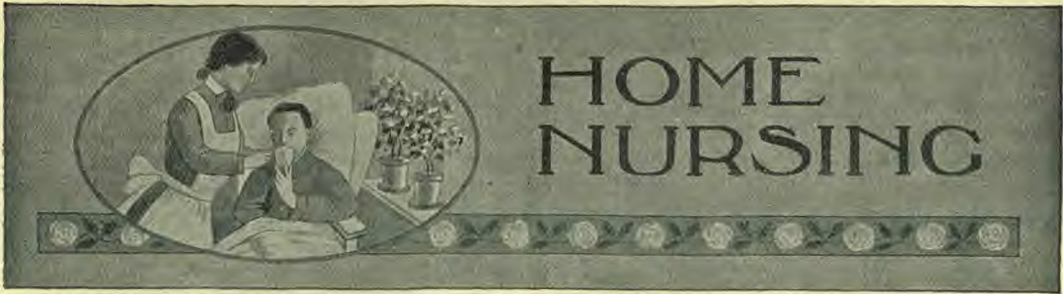
Be strictly truthful, and always keep your word if you want them to do the same.

Give every child a place of its own for toys and treasures, and insist on them being kept there. Allow time for play.

Teach every child to be thoughtful and useful according to its age and strength, even toddlers can do something to help mother.

Insist on kindness to dumb animals.

Make home the brightest and most attractive place in the world.—*Medico.*



Accidents and Emergencies in the Home and How to Deal With Them

Bandaging

MINNIE G. MORSE

AMONG the various kinds of accidents and emergencies with which the amateur surgeon may be called upon to deal, there is a very large proportion in which the affected part of the body needs to be supported, protected from the air, or covered with some sort of dressing; so that almost all those who attempt any sort of first aid work have occasion, at one time or another, to make use of whatever knowledge of the art of bandaging they may have acquired. It may seem a very simple matter to bandage a wound or support an injured arm, but an ill-fitting sling or an improperly applied bandage is about as comfortable as a shoe of the wrong size or shape, and may even do harm instead of good. A careless bandage over a wound, which allows displacement of the dressing below, may result in wound infection; a too loose or too confining first-aid sling for a broken arm may turn a simple fracture into a compound or impacted one; while a roller bandage applied too tightly may stop the circulation, and even cause death of the constricted part. A few practical directions as to the principles of bandaging and the application of simple bandages are not difficult to remember, and a little time given to personal practice of the art will be repaid many times over when an emergency arises.

Bandages are used principally to keep dressings and splints in place, to support injured parts of the body, to protect wounds from the air and from infection, and as temporary applications in stopping hemorrhage. They are usually made of unbleached cotton or of gauze, though flannel bandages are sometimes used when elasticity is desired, crinoline forms the foundation of the plaster-of-paris bandage, and rubber bandages are useful in cases of varicose veins, and to give support to weak knees and ankles. The most common forms, and those best suited to the use of the amateur, are the triangular and roller bandages.

The triangular bandage is very easy of application, and can be used for innumerable purposes. It is especially useful as a temporary dressing, and forms the most important part of the first aid dressing packet furnished to soldiers. A square yard of muslin folded diagonally makes two triangular bandages of the proper size for an adult's arm sling, while a large handkerchief or serviette, folded into the same shape, can be used as a bandage for the head, hand, foot, elbow, knee, and for many other purposes. Roller bandages can be made by tearing long strips from old sheets or new muslin, or by cutting strips from cheesecloth, and then rolling them, but they can be bought almost

everywhere ready for use. Those made from gauze have been sterilised by heat and sealed up in paper wrappers; they are especially valuable for use in any form of injury where the skin has been broken, and it is important to prevent the entrance of germs. Roller bandages can be bought in various widths and various lengths; a bandage one inch wide is generally used for the finger, one of two or two and a half inches for the extremities and for the head, and wider ones for the trunk.

part after it has been bandaged, and under such circumstances the bandage may need to be removed and reapplied. A reset limb should always be bandaged in the position in which it is to remain; if it is bandaged straight and then bent, the bandage will bind it too tightly, while if it is bandaged in a bent position and then straightened the bandage will not be tight enough.

The bandages which an amateur is oftenest called upon to apply are those of



FIG. 1—Triangular Bandage Used as Head Bandage and Arm Sling

FIG. 2—Triangular Bandage of Hand

Nothing but actual practice will teach one to put on a bandage that shall be neither too loose nor too tight. If put on too loosely, it will not stay in place, and may not exert the necessary degree of pressure, while if put on too tightly it interferes with the circulation, besides making the patient very uncomfortable. In bandaging a hand or foot, it is well to leave the fingers or toes uncovered, if possible, and if they become cold and blue it is a sure sign that the bandage has been put on too tightly. Constriction may also occur from the swelling of an injured

the head and the extremities. Of the head bandages, the simplest and the easiest to apply is the triangular bandage, as shown in Fig. 1, where a large handkerchief is folded diagonally to form the triangle. The long edge of the bandage is folded over, as if for a hem, and the centre of this hem is placed in the middle of the forehead, the central point of the bandage dropping over the back of the head toward the neck. The two ends are carried around the head to the back and tied; or, if long, they are crossed, brought forward and tied or pinned; after which

the point in the back is drawn down to fit closely to the head, turned up to the top of the head, and firmly pinned there.

Another form of head bandage which may be easily applied is the four-tailed cap. A strip of a very wide roller bandage may be used, especially for a child, but for an adult a piece of muslin, three-quarters of a yard long and not more than half as wide, will answer the purpose best. This strip should be cut lengthwise through the centre about one-third of its

turns of a roller bandage may be applied.

The triangular bandage is used to form the large arm sling shown in Fig. 1. It is the most effective sort of support for the lower arm, but should not be used for injuries of the upper arm or shoulder, as it is inclined to push the elbow upward. In applying this form of sling, one end of the unfolded triangle is placed over the uninjured shoulder, the length of the bandage hanging down in front of the patient with the point of the triangle



FIG. 3—Spiral Reverse Bandage of Forearm



FIG. 4—Figure-of-8 Bandage (complete) of Foot

length at each end, when it may be used to cover the top of the head, the front, or the back. The central part of the bandage is placed over the injury, the two front tails being carried to the back of the neck and tied, and the two back tails tied under the chin, unless the extreme back of the head is to be covered, when the front tails are tied under the chin and the rear ones over the forehead.

A narrow bandage for the head, the eye, the ear, or the face, may be made from a small triangular bandage folded into the shape of a cravat; or a few

turns of a roller bandage may be applied behind the elbow of the injured side. The elbow of the injured arm should be bent at a right angle across the chest, and the bandage drawn up in front of it in such a way as to support it in the proper position, the lower end being carried over the shoulder of the injured side, and the two ends tied or pinned at the back of the neck. The point behind the elbow is then to be brought forward and pinned, being fitted about the elbow in such a way as to form a snug support for it. A very good emergency substitute for this sort of a sling is to pin the sleeve or the

skirt of the coat to the front of the dress or coat with two large safety pins, one at the cuff and the other close to the elbow, which gives a very similar support to the injured member.

Narrow slings may be made from the triangular bandage folded into a cravat or from a fairly wide roller bandage.

The triangular bandage forms a very effective and easily applied first aid dressing for an injured hand, arm, or elbow. (Fig. 2.) In putting it on the hand, the bandage should be spread out, and the hand placed upon it, palm down, with the fingers toward the central point, which is then turned back over them to the wrist. The two ends are folded about the hand, crossed, and tied at the wrist. For the elbow or arm, the bandage should be folded into a wide cravat, the middle and widest portion being placed over the injury, and the ends crossed and tied.

For a permanent protection for injuries to the fingers, hands, or arm, or even for a first-aid bandage in cases where the injury is of considerable extent, the roller bandage is the most satisfactory one. If such bandages are made at home, they must be rolled very tightly; or it will not be easy to apply them firmly and evenly. One end of the strip should be folded over several times upon itself, until a small hard roll is formed; then, with the roll held firmly between the thumb and middle finger of the right hand, and the free end between the extended first and middle fingers of the left, the remainder of the strip should be rolled as tightly as possible.

In applying a roller bandage, the roll should be held in the right hand, with the unrolled portion upward, the free end in the left. The turns made should be of equal tightness, and the distance between them equal, otherwise the pressure upon one portion of the surface covered will be greater than upon another, and the bandage will be untidy, and probably not as comfortable as it might be. In bandaging a limb one should always begin at the lower end, and bandage upward; also, one should bandage from the inner side

outward. Wet material should never be used for bandaging, as it will shrink when it dries and bind the part too tightly.

The principal ways in which the roller bandage is applied are the simple circular and spiral turns, the spiral reverse, and the figure-of-8. The circular bandage is one applied about the neck like a collar, or about the wrist like a cuff, each turn of the bandage entirely covering the preceding one. The spiral consists of a series of turns in which each partially covers the preceding one, but advances higher up on the limb. This form of bandage is useful for the fingers and where only a small portion of a limb is to be covered, but, owing to the impossibility of making spiral turns lie smoothly where the part to be covered is larger at one end than at the other, in most locations the simple spiral has to be combined with the spiral reverse. (Fig. 3.) In bandaging the arm, after a few simple spiral turns above the wrist, the reverse may be employed, resulting in a smoothly fitting and tidy looking bandage. The reverses should be in the middle of the outer surface of the arm; at this point the bandage should be sharply turned over upon itself, underside out, the thumb of the left hand holding the lower part of the bandage in position, while the right hand doubles it over. Each reverse should be exactly above the one below it. Reverses should never be made over a sharp bone; when an arm bandage must be continued over the elbow, the figure-of-8 must be employed.

The figure-of-8 is a more elaborate bandage to apply than the reverse, but it is a much firmer one, and allows much less opportunity for the slipping of underlying dressings. It consists, as its name implies, of two sets of turns made in different directions, each turn overlapping the one below it by about two-thirds the width of the bandage. In applying a figure-of-8 to the hand and forearm, a couple of circular turns should first be made around the wrist to fasten the bandage, then the roller is carried diagonally across the back of the hand, from within

outward, and a circular turn made at the base of the fingers, leaving the thumb free. The roller should then be carried back to the wrist, in the opposite direction from that in which it was brought down, then across the inner side of the wrist, and back to the fingers in such a way as to exactly cross the upward turn. It then crosses the inner side of the fingers, passes inside of the thumb, and follows the former turn back to the wrist, overlapping it about two-thirds. This is repeated as many times as may be needed to cover the hand, after which a few circular and spiral turns are made about the wrist. The figure-of-8 of the forearm consists of a series of alternate upward and downward turns, crossing on the outer side of the arm, finished by two or three circular turns.

For an injury to the elbow, the proper bandage is the hinge-joint form of the figure-of-8. The elbow should be bent, and a couple of circular turns made directly over the point of the elbow. The third time around, on reaching the outer side of the arm the roller should be carried upward, making a turn whose lower edge, even with the point of the elbow, is in the centre of the previous circular turn. The next turn is downward, exactly meeting with its upper edge the lower edge of the turn just made. The following turn is directed upward, overlapping the upper two-thirds of the first upward turn; the next is downward in a similar manner. This is continued until four or five complete turns have been made, as may be required, when the bandage is cut, and the end turned neatly under and fastened with a safety pin.

The bandages of the lower extremity are almost exactly similar to those of the upper. Leg bandages may be applied in the same ways as those of the arm, and the hinge-joint figure-of-8 bandage of the knee is the counterpart of that of the elbow. The figure-of-8 bandage of the foot is called complete or incomplete, according as it does or does not cover the heel. For the complete bandage (Fig. 4), the roller is first fixed at the ankle, then carried diagonally across the foot in an outward direction to the base of the toes, where a circular turn is made. The roller is then carried backward across the foot to the heel crossing the latter in such a way that the lower edge of the bandage reaches exactly to the sole of the foot. The next turn brings the roller across the upper surface of the foot, crossing the turn just made; the bandage passes under the foot and proceeds to the heel as before, the procedure being repeated, each turn overlapping two-thirds of the preceding one, until the whole foot is covered, with the exception of the toes. When it is not necessary to cover the heel, the backward turns, instead of beginning at the level of the sole of the foot, are made around the ankle.

The terminal end of a roller bandage may be fastened in either of two ways; it may be turned in and fastened with a safety pin, as described above, or the end may be slit through the centre a sufficient distance to allow of the two tails thus formed to be crossed, carried in opposite directions, brought around and tied. Ordinary pins should not be used in bandages, as they are liable either to slip out of place or to cause discomfort to the patient.





NOTICE TO SUBSCRIBERS: All questions for this department must be addressed to the EDITOR, "LIFE & HEALTH," WARBURTON, VICTORIA, and not to Dr. W. H. James, who will treat correspondence only on usual conditions of private practice. Subscribers sending questions should invariably give their full name and address, not for publication, but in order that the Editor may reply by personal letter if he so desires. Because of this omission several questions have not been answered. To avoid disappointment subscribers will please refrain from requesting replies to questions by mail.

362. Pulmonary Tuberculosis

"Black Ridge" writes: "I have been unfit to follow any regular employment for four years. Doctors gave me no satisfaction until one day I had a hæmorrhage, and had to go to bed for a few days. On resuming work I had a second hæmorrhage, and became very short of wind. I have commenced to take a course of serum injections, and have improved sufficiently to do light work. My temperature ranges from 97° in the morning to 100.2° in the afternoon. On finding the temperature over 100°F., I go and rest, when it will drop to 99° within an hour. I notice in one of your journals you recommend lemons. The only medicine I am taking is Fellow's Syrup, which I have found has done me a deal of good. On discontinuing with it I find myself going back. I feel strong in myself, but with any excitement or hurry I become quite exhausted. I spit very little, only occasionally after meals and on getting up in the mornings, which is always burned. My age is forty-two years."

Ans.—This is a typical history of pulmonary tuberculosis (consumption). Apparently it is in the early and curable stage. Whenever hæmorrhage occurs, or the temperature rises, rest is absolutely necessary. The tuberculin injections are often of great service in the treatment of tubercular deposits in the glands of the body and in the lungs. They should be

given under the care of a medical man, who can regulate the dose and the frequency to suit the case. Lemon juice has frequently been recommended in LIFE AND HEALTH for dyspeptic symptoms, more especially where there is deficiency of acid and autointoxication. This state is generally revealed by a yellowish coating of the tongue, especially on the back part; heavy, sleepy, drowsy feelings; dull pain in the lower part of back, disagreeable taste on rising, and dark-coloured urine. Fellow's Syrup acts as a stimulant on account of the strychnine and phosphorus which it contains. It is frequently prescribed by medical men as such. Stimulants, it should be remembered, however, are not necessarily tonics, and generally the stimulation is followed by a corresponding depression. We would recommend open-air treatment night and day. Avoid all close and ill-ventilated rooms. Sleep on the verandah, or in a well-ventilated room with several windows and a fireplace. Open all the windows to fullest extent, but place the bed as far as possible away from draughts. Daily, the body should be sponged with cold water and rubbed thoroughly dry with a good, rough towel. Good, nourishing food is absolutely necessary, such as eggs, raw or lightly cooked, fresh milk, malted nuts, gluten preparations, and rice. Avoid drinking with meals, especially tea and coffee. Take fruit or vegetables with meals.

363. Alopecia Areata

"Lesmurdie" writes: "I am about thirty-five years of age. Lately the hair on my jaw has started to disappear, a small patch at first, then gradually spreading. It is now about the size of a two shilling piece. Smaller patches are appearing on the opposite side. For some time there does not appear to be any hair left, but after a while a few shoots of grey hair make their appearance."

Ans.—Wash the parts with soft soap, leaving it on for five minutes. Then apply the following ointment every night:

℞ Hydrarg Bichloride grs. i (one grain)
Lanoline ℥j (one ounce)

After a week's treatment paint the parts twice daily with the following:—

℞ Ol Sinapis ℥j (one dram)
Ol Ricini ℥ii (two drams)
Sp. Rosmarini ad ℥iv (4 ounces).

364. Prevention of Corns

"Lesmurdie" also writes: "Is it a fact that callous flesh on the sole of your foot will turn into a corn? I have a little patch just near the big toe, and it pains at times. Please advise best procedure."

Ans.—Soak the foot for half an hour in hot water. Scrape off as much of callous skin as you can, and then paint daily with the following:—

℞ Salicylic acid grs. xx
Collodion ℥j (one ounce)

365. Tight Feeling in the Throat, etc.

Mrs. W. T. writes: "I am suffering from a very tight feeling in the throat and a pain round my left breast, shoulder, and arm. Could you tell me what it is, or do you think I ought to see a doctor?"

Ans.—It is impossible to state what the trouble is apart from a thorough examination. We would advise that a doctor be consulted. The trouble may all be due to some stomach derangement.

366. Dyspepsia

S.A.C. writes: "Have been troubled with indigestion for over ten years in the form of belching wind. If over-tired at night or a bit excited, it is like spasms accompanied with shivers, and sometimes utter helplessness with burning feeling all over. My head feels as if something were pressing on top, and affects the sight. Have suffered of late from nervousness, and backache between the shoulders. Have also feeling as if lump under right breast, shooting toward right arm pit."

Ans.—Flatulence, we believe, is brought about by the too acid contents of the stomach coming in contact with the alkaline secretions of the duodenum—the first part of the bowels. The acidity may be due to excessive secretion of the normal acid,—hydrochloric,—and this begins directly food is taken, or to the development of abnormal and irritating acids an hour or two after meals, due to the decomposition of undigested, starchy foods. We would advise that purely starchy foods, such as bread and potatoes, be used very sparingly. In place of bread use zwieback (double baked bread). The latter is better prepared from fresh bread, and should be baked in a cooling oven. The bread should be crisp, but not browned to any extent. Avoid drinking with meals, especially tea, coffee, and cocoa. Cold water also interferes with the digestion. If really thirsty, hot water or milk and hot water may be taken. Eat slowly, and masticate all food thoroughly. Two or three varieties of food at one meal are quite sufficient. Vegetables and fruit disagree, also milk and milk foods with much sugar, meat and milk. Avoid everything baked with fat and baking powders, such as pastry, cakes, and scones. Foods cooked with fats should not be subjected to a heat greater than boiling point. Rest or gentle exercise only should be indulged in for half an hour before or one hour after meals. The best time for drinks is from two hours after meals up to one hour before meals, and on retiring at night and the first thing in the morn-

ing. Granose biscuits may with advantage be substituted for bread. Avoid sloppy foods and the coarser vegetables, such as cabbage, carrots, turnips, and parsnips.

367. Biliousness

A.B.C. writes for advice on the above.

Ans.—Popularly biliousness indicates a condition in which one feels sick, off colour, headaches, and the vomit contains bile. Chalmers Watson writes: "The cause of this condition is a duodenal and gastric catarrh, this catarrh being doubtless associated with a general congestion of the liver. This catarrh is doubtless of bacterial origin, previous dietetic excesses on the patient's part being the primary factor in its development. In people predisposed to it, chill acts as an exciting cause, more especially in gouty patients. The dietetic treatment is simple, and consists in starvation for twenty-four hours or so, aided by rest and the use of a blue pill and saline purge. . . . The later dietetic treatment consists in moderating the diet which has usually been rich and varied, and especially restricting the amount of sweets. This advice is very frequently disregarded. The patient prefers the pleasures of the table, and relies on an annual visit to some spa for the correction of the functional disorders of the liver and other digestive glands induced by his immoderate eating and drinking."

368. Sluggish Liver and Stomach Troubles

C.S.Y.B. writes: "Kindly advise best rules to adopt *re* diet and general regime for sluggish liver and stomach troubles. I have no pains except a *slight heavy feeling* in the stomach after a *heartly meal* at times, and an abnormal craving for unnatural foods, such as *sweets* and food highly seasoned with herbs. I overcome constipation by systematic exercise, free use of fruit and olive oil (excluding all other fats in free form). Are any of the following foods objectionable: Eggs, (raw, slightly boiled, or poached), nut

meats, lima beans, lentils, peas (dry and green), cooked tomatoes, vegetable soups, and seasonary herbs; dried fruits, such as figs, dates, raisins, and currants. Do you know where unpolished rice may be obtained?"

Ans.—Heartly meals should never be taken. The heavy feeling shows that the food has too much bulk. Sweets and highly seasoned foods should be avoided, also all foods cooked (baked) with fat or grease of any kind. Olive oil is a good form of free fat, especially when no other free fats are taken. A couple of eggs may be taken during the days in raw or lightly cooked condition. An egg is better cooked without being brought to the boiling point. Avoid free use of all legumes. Green peas are not injurious. Figs, dates, raisins, and currants are certainly sweet, but their laxative properties more than counterbalance the sweetness. Dates are better after being washed and freed from excessive amount of sugar. We do not know where the unpolished rice may be obtained.

669. Weak Heart, etc.

"Mother" writes: "My little girl aged six years suffers with a weak heart. She often complains of headaches and pains in the stomach. She has been under doctors' treatment nearly twelve months, but gets no better. Her heart beats very quickly at times."

Ans.—Probably the whole trouble is digestive. The heart and the stomach are not only in close proximity, but they are also very closely connected as far as the nervous system is concerned. Parents are often very much in fault in allowing their children to eat between meals. We have frequently noticed an immediate improvement when this habit has been stopped. Absolutely no food should be taken between meals, not even an apple, where the digestion is weak. Tea, coffee, and cocoa must be avoided. Tea and coffee have an injurious action on the heart, and cocoa on the digestion. The meals should be chiefly made up of milk,

rice, zwieback, granola, granose biscuits, the more easily digested vegetables (cauliflower, green peas, French beans, and marrow), fruit, cream, butter, and stale bread. Avoid cakes, scones, pastry, hot buttered toast, and too many mixtures at one meal. The whole body should be sponged daily with cold water, and the child should sleep in a large, well-ventilated bedroom. Children of six years need at least ten hours' sleep at night.

370. Neuralgic Headache

"Mother" also complains that she is a great sufferer with her head, eyes, and nose. "They ache very much at times. I have been wearing glasses for some years, but I have had them changed so many times lately, and cannot get them to suit. I very often wake in the morning with a sort of neuralgic headache. I cannot look at anything very long."

Ans.—We would recommend "Mother" to see an eye specialist—a medical man. Eye strain from unsuitable glasses is a common cause of headache. There may be other irregularities that need attendance.

371. Injury to Knee

L.E. writes about her granddaughter: "About two months ago she fell among some plum tree cuttings, and a thorn ran into her knee below the knee cap, and broke off so far in that the doctor could not reach it, so sent her to the hospital for an operation. The hospital doctor said there was no need of an operation, and after a time discharged her as being cured. For some days she cannot put her foot to the floor, and she cries night and day on and off with a pricking pain above the knee. Other days she is able to limp about. Her knee is very much swollen."

Ans.—The knee needs absolute rest in bed. Good, thick, hot fomentations should be applied three times daily. Apply four fomentations within the half hour. After the heat and swelling have gone, alternate the hot fomentations with cold

wet compresses—applying the hot application for ten minutes and the cold for one minute. If a fortnight's treatment does not succeed, an operation may still be necessary, and a reliable surgeon should be consulted.

372. Condensed Water

J.T.C. writes for advice *re* drinking condensed water, and asks how it can be manufactured. He states that he has read "on several occasions in LIFE AND HEALTH of the benefit derived by drinking condensed water."

Ans.—The writer does not remember seeing any such recommendation in LIFE AND HEALTH, and does not believe that condensed water is in any way preferable to water in its natural state.

373. Pain in Back and Left Side

"Troubled" writes: "My daughter aged twenty years is complaining of pain in her back and a dull pain in her left side very low down. At times it is a dull pain, and at other times a sharp pain. I should be obliged if you would tell me what it might be, and advise me."

Ans.—The patient requires a thorough medical examination. It may be due to some ovarian or womb trouble, or perhaps constipation. Sufficient information has not been given from which to form a reliable opinion.

374. Tired Feet

"Ferus" writes: "I wonder if you could give me a cure for tired, very tired feet? My feet are free from corns or any trouble of veins, but about three o'clock in the afternoon they get so tired and swollen feeling, that they sap all my brain and energy. I drink and smoke very very little. I am active, busy, weight about 10 stone, and am 5ft. 4 in. high. I change my boots three times every day, bathe my feet often with tepid water. I wear humanic shape boots, and of a good make, and not too heavy. . . . Physically I am as sound as a bell, except that I get

neurasthenia under extreme business pressure."

Ans.—The trouble is probably of nervous origin. The deep veins may be engorged, although the superficial veins may be free from varicosity. Tea, coffee, sexual excesses should be avoided. Massage and galvanism to the lower limbs would probably give relief. Thin silk stockings should be worn. At midday apply alternately hot and cold water to the legs—three or four applications of each, finishing with the cold. Two or three weeks' treatment at one of the sanitariums would be beneficial.

375. General Debility

"Trust," W'bool, writes: "I suffer with tiredness after slight exertion, aching across the shoulders and down legs and knees, no energy, and continual feeling of listlessness. Sometimes I cannot sleep, and lose my appetite, and then have to force myself to take food. Have had to take powders ordered by a doctor to get sleep, and also medicine which seems to bring back my appetite, but when I leave off the medicine I usually have to get more, sooner or later. I take as little as is necessary. About eight months ago I had a nervous breakdown, and was under a doctor for several weeks. Previous to that I overworked myself, got insufficient rest, and was worrying too much. Although during the past few months I have gained in weight, I do not feel at all strong and vigorous as I once was. . . . I eat ordinary plain food, and take three meals daily. . . . Food does not seem to disagree with me after eating, not to the extent of causing pain or wind, etc."

Ans.—A feeling of lassitude and weariness is frequently due to autointoxication, poisoning by imperfectly digested food. In these cases there is a slightly coated tongue, especially at the root, often a disagreeable taste in mouth of a morning. The urine is of a dark colour, and probably there is constipation. Too bulky food, excessive animal food, tea, coffee, and cocoa, lack of fruit in the diet and

drinking of pure water between meals, all tend to autointoxication. In the absence of these causes we would judge that our correspondent is suffering from general debility, from insufficient nitrogenous food. Nitrogenous foods especially build up the nervous system and give energy. We would advise at meals: Milk or milk mixed with plasmon (one and a half teaspoonfuls to half pint as directed on the packages), eggs, raw or lightly cooked. Granose biscuit should be used largely in place of bread. Hot milk and zwieback make a good dish. It is better to eat the zwieback separately and sip the hot milk. If the tongue is clean and the bowels regular, take after each meal citrate of iron and ammonia (as much as will go on a sixpence). This is especially useful where the blood is poor, as shown by general paleness of face, lips, gums, etc. Live out in the open air as much as possible, and sponge the body daily with cold water. If the digestion is good and tongue clean, probably a week or more rest in bed would do good. We do not recommend the drugs spoken of by our correspondent. We are also asked if marriage would be detrimental. We think that it would probably be beneficial after a few weeks' treatment as outlined.

376. Face Burning

"Mignonette" writes: "Will you kindly tell me the causes and cure of the face burning? I am troubled greatly with this complaint, especially in the evenings and when I take a meal (mostly at dinner time), and if any visitors come I get so nervous, and my face will burn for an hour or more."

Ans.—The most probable causes for transient flushes of the face are indigestion, constipation, painful menstruation, and anæmia. These conditions should be attended to.

377. Dyspepsia and Debility

"Warwick" writes: "I am eighteen years of age, thin, and am suffering from a weak heart. I am exceedingly nervous

when in company, and sometimes when I speak in company my voice fails me owing to a choking feeling in the throat. I suffer from brain fag, and cannot think hard at all. My digestion is bad, and I suffer from wind. Troubled with pimples on the face. Sometimes I get giddy turns which last only for a few seconds. My body is partly covered by a brownish rash. Will you kindly advise treatment, and give me a diet in the form of a daily régime?"

Ans.—Probably if the digestion is attended to all the above symptoms would disappear. Observe the rules often given in LIFE AND HEALTH for digestion. Do not drink with meals, especially tea, coffee, and cocoa. Masticate the food thoroughly, always using some dry food with meals, such as zwieback, wheatmeal or granose biscuits. Avoid all fried foods, foods cooked with fat or grease of any kind, pastry, scones, hot buttered toast. Only light exercise or work for half an hour before and one hour after meals. We would suggest the following articles of food for each meal:—

Breakfast and Tea.—Well-cooked rice with milk (raisins may be added if necessary), or granola and dates, or milk and zwieback. Lightly cooked egg, granose or wheatmeal biscuits, bread and butter

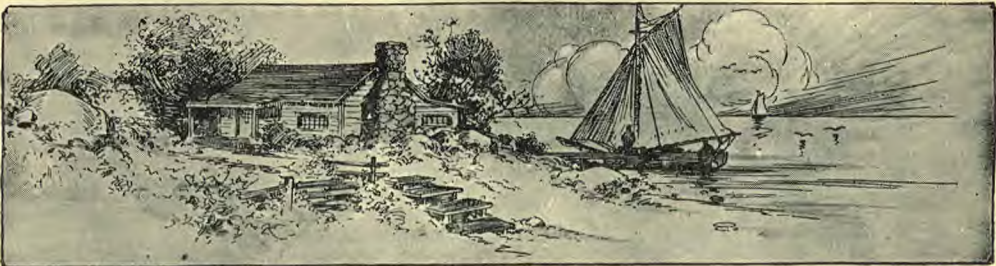
(brown or stale white bread), fruit (stewed or fresh).

Dinner.—Macaroni, granola fondu, gluten biscuits cooked in form of "mocked tripe," or omelette, cauliflower, spinach, green peas, French beans, creamed rice, or bread pudding.

378. Nose and Throat Trouble

"Anxious Mother" writes: "My daughter aged fourteen years fell from a horse and broke her arm three years ago. From that on she suffered with very sore throat. Our doctor thinks her nose must have been broken, and overlooked at the time of the accident. He removed several pieces of bone, and there is always an inflamed, scaly appearance on the bridge of the nose. She complains of a continual aching pain from the nose down the glands of the throat, and with the change of weather her throat is very much inflamed."

Ans.—Attend well to the digestion and bowels. Twice daily douche the nose and gargle the throat with Burroughs Wellcome Compound Eucalyptia Solds. One powdered and dissolved in five tablespoonfuls of tepid water. A nose and throat specialist should be consulted.





Diet in an Automobile Factory

DAVID PAULSON, M.D.

THINK of the master mind that could organise a factory so as to turn out two complete automobiles every minute. Yet that is what is actually accomplished in Ford's factory. In this great enterprise, "efficiency" has become a word to conjure by.

It is natural that a man who has brains enough to make two automobiles every minute should be able to discover that there is close relationship between what his men *eat* at home and the kind of *work* they turn out in his factory. So he has recently established a department of dietetics. The thousands of his workmen will be taught how to eat more sensibly; and it is estimated that even from a financial standpoint they will save a million dollars a year. For remember that the average man spends more for food than for any other one item; and in most instances, fifty per cent of this is worse than wasted. A shilling is often spent for a certain food, when threepence would have purchased the same amount of nourishment.

Eat Three Times Too Much

Mr. Ford says: "We eat three times as much as we need. The other two-thirds is not only unnecessary, but positively harmful to us. We wouldn't feed an engine three times as much fuel as it needs; yet we pay out good money to gormandise at the expense of both our income and our health."

The last few spoonfuls eaten at a meal

are the cause of all the trouble for the man who overeats. That little additional amount day after day overtaxes the system, and frequently makes the *difference* between efficiency and inefficiency, clear-headedness and stupidity. On this point Mr. Ford says, "We cram dessert down our throats when we don't need it, because it tastes good." And Mr. Ford is right. Too often, after the demands of the system have been met, and the appetite has been fully satisfied, when the fancy dessert is served, we are assured that if we will "just taste it" and discover "how good it is," we will want to eat it.

e.w. m.w. An Important Discovery

Mr. Ford has discovered a great temperance truth that was demonstrated abundantly to my own satisfaction years ago in my experience with drunkards in darkest Chicago. "I have the greatest sympathy for a man addicted to liquor," says Ford. "His appetite is a disease, caused in many cases by unwise eating. That he craves strong drink is often not his fault."

Mustard, pepper, and all these condiments and fiery spices train and develop artificial tastes and appetites, which are no longer satisfied with plain, simple foods and drinks, but absolutely demand still more stimulating foods and drinks. In other words, they create a thirst that the town pump cannot satisfy, and nothing but the saloon will quench it.

The food served as free lunches is

always of the kind that develops a demand for the saloon keeper's wet goods. But unfortunately, the same kind of stuff is served in too many Christian homes, and even to those who are heroically struggling against the awful liquor thirst. Too frequently, the cook is in partnership with both the saloon keeper and the undertaker, for unconsciously she makes business for both.

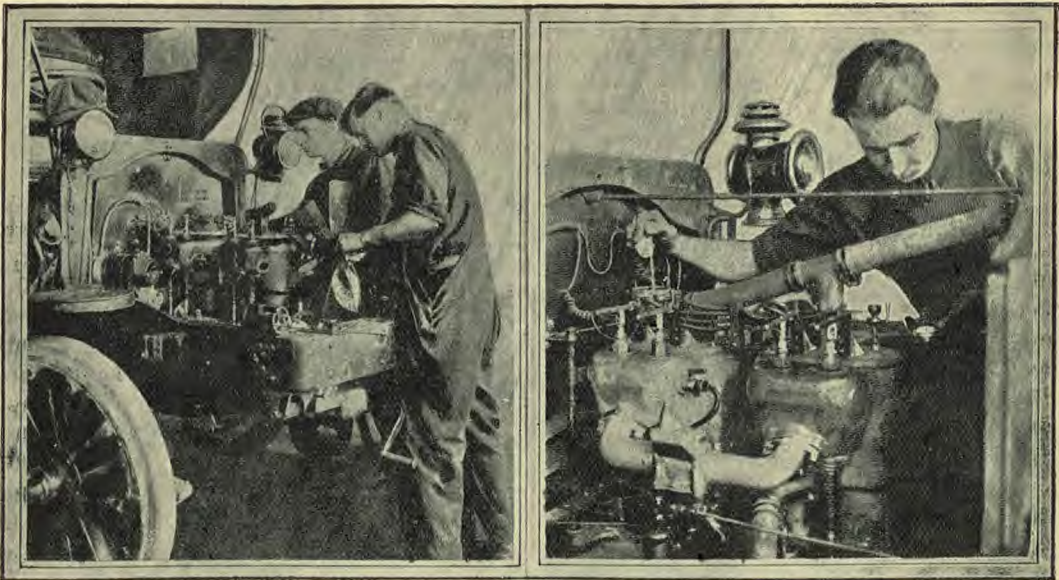
Sickness Is a Harvest

Dr. A. S. Gray, a writer on health topics for the *Chicago Daily News*, has

prisoner has broken a man-made law, while the invalid has violated a God-made law. However, it is only fair to admit that nature compels some of us to pay up our parents' debts.

Worships Custom and Habit

Professor Mendel, of Yale University, says that in matters of diet the average mortal "worships the dictates of custom and habit in matters pertaining to his nutritive welfare." He eats what he likes, for the same reason that the pick-pocket steals. Both may be fortunate



Motor Car Mechanics at Work

Scientific American 3

well said that if one eats and drinks correctly, breathes pure air, and has the right amount of mental and physical exercise, he will not fall a victim to the disease germs that surround him, or even to those slumbering within his own body; in other words, that sickness is not, as most people suppose, an accident or an incident, but the deliberate harvest from our own sowing.

Ill-health does not rain down ready-made from heaven, but is the natural result of violation of nature's laws. Some one has said it is a greater disgrace to be sick than to be in prison, for the

enough, for a time, to *escape* punishment; but sooner or later, they generally come to grief. Then one goes to the hospital, the other to gaol.

Recent laboratory experiments have demonstrated that even if rats are fed all they can eat of a rich and abundant diet, if there is one necessary food element lacking, they will speedily develop sore eyes, lung disease, and other distressing symptoms; but as soon as the dietetic deficiency is corrected, the symptoms disappear. For exactly the same reason, frequently children in the slums, and sometimes those living on the boulevards,

have sore eyes. But instead of having their diet corrected, the doctor is called; and he drops medicine in their eyes, instead of educating the cook.

The Necessity for Holidays

AT this time of year, says the *Illustrated London News*, most people are asking themselves whether they shall or shall not take their annual holiday.

The question is not so much where we should go to but whether we should go at all. On the one hand, there is the necessity for economy which the war—albeit but slowly—is surely bringing home to each one of us. Even for a bachelor, the saving that can be effected by cutting off the annual holiday is considerable; while, in the case of the father of a family with limited means, it might save him from further pinching for several months. But against this is to be set the question of health, and its corollary—the possibility of earning money. Everyone knows that the brain becomes jaded by ten or eleven months' continual work, that the quickness to seize an opportunity for profit becomes impaired, and that right decisions in cases of doubt are at once slower and more difficult to come at. Difficulties which look like mountains to a brain unrefreshed become reduced to their proper proportion of molehills after a few weeks in which the same brain has been allowed to lie fallow.

The fact is that all these symptoms of what the advertisements call "brain-fag" are but nature's way of warning us that the flow of blood to the brain is not as free as it ought to be. Anæmia of the brain—which, contrary to the general belief, is quite as common among children as with adults—is the mother of nervous irritability, of indecision, and of indisposition to concentrate the mind upon anything, quite as much as of dyspepsia and of other more easily recognised physical symptoms.

As to its causes, while they are many and various, there is none among them

more likely to pass unnoticed than the eye-strain which is inseparable from the case of the brain-worker who is, like most of his class, condemned to a sedentary occupation. For this eye-strain there is no remedy so effective or so rapid as more or less complete rest from reading and writing for a few weeks, coupled with moderate physical exercise and plenty of sleep.

As to other things, the change of air to be found in a short visit to the seaside or some other pleasure resort, and the alteration in diet following the increased appetite thus gained, will all tend to bring about an improvement in the digestive powers, and will thus increase the flow of pure blood to the brain. If he is careful to avoid excess alike in food, sleep, and exercise, there can be no doubt that the brain-worker will, after a few weeks' holiday, return to his desk with his brain clearer, his nervous system restored, and himself in every respect fitter to bear any strain that may be put upon him. Such benefits are in the great majority of cases cheaply purchased at the cost of some pecuniary sacrifice, and, in the times which seem to be coming upon us, may even be of material benefit to the nation. Wherefore it would seem that the annual holiday should not this year be given up.—F. L.

How Fatigue Will Poison You

MEN and women come in the morning to their tasks with a spring of fresh energy within them. Little by little during the hours of labour they empty that spring. When it is dry, they must draw from forces which should be untouched. By some strange chemistry which no one understands too well, these intrusions on the physical forces which should be inviolate, produce in the human system a true toxic condition—fatigue poison, auto-poison the scientists call it.

If this fatigue poison passes a point where the period of rest following is not equal to the task of throwing it off, and filling afresh the spring of energy, the

man goes back to his toil a little unfit; the longer he goes on, the more unfit he becomes. Slowly the poison invades his system. The repairing forces—food, relaxation, pleasures, and sleep—become less and less equal to the task. The man becomes more and more open to the attack of disease; less and less able to do his work; unfit to improve upon it; unable to grow. He is an unsafe man, too, one not to be trusted among machines in dangerous places. The man has been poisoned into unfitness by the slow accumulation of fatigue poison which he could not throw off.

It was not work which did this. It was too much work. He needed the work to keep him fit. Without it or its equivalent, a regular physical exercise, his spring of energy would have as surely deteriorated as it did from overwork. The spring of energy standing idle would have soured within him.

It has taken years of observation and experiment to establish with anything like scientific accuracy the baneful effects on the labourer and his product of the too-long day. This has been done finally with a completeness which even the courts are recognising. Moreover, in establishing these facts, there have been discoveries made of the effects of the shorter day which have been as heartening as they have been surprising. They are discoveries which upset all the old theories about hours.

Briefly put, they amount to this: An eight-hour day in a well-managed shop yields as large a quantity of work as a ten-hour day, and cuts out almost entirely certain irritations and interruptions which always have characterised the longer work period. As for labour, it has become an

axiom in its circle that "shortening the day increases the pay." There is many a manufacturer that will tell you that shortening the day increases the profits.—*Ida M. Tarbell, in the American Magazine.*

The Longest Price of War

THAT war is costly as well as hideous we all know. Preparation for war is expensive enough, but war itself is ruinous. It destroys things useful to life,



Too Much Work

such as houses, bridges, and railways; it is wasting the wheat harvests of Europe as I write; and it ruins trade. For example, the immense worsted trade of Yorkshire with Germany and Austria perished in a night a few months ago, and so did the importation into England of almost priceless drugs from Germany. From such cases it has been argued that even the victor in a great war may lose more than he gains, because of the injury he does to his own commerce. If you fight and kill your best customer, you are likely to be a starving conqueror.

John Ruskin Was Right

But John Ruskin was right when he

said, "There is no wealth but life." If we are going to talk about the cost of anything at all, we must reckon with real wealth as well as with golden counters. We began by saying that war destroys things useful to life, but war is costly, above all, because it destroys life itself. Even the winner in modern war pays a price in lives for which no indemnity can ever compensate him.

The cost in lives may indeed be all but ruinous, and the greater the glory the nearer may be the ruin. The history of war supplies many a proof of that; and although all the world may be willing to lend a nation money, what is money where there are no men? But when we notice such obvious things, we are usually blind to the vastly greater truth that lies behind them. There is a price of war that is more important, more dreadful, more unjust, and that takes far longer to pay than any other, and it is a price also that has to be paid in the only wealth, which is life. The mere question who wins the war has nothing to do with it. The questions who was right or wrong, who began it, who gained or lost territory, who paid tribute to whom when peace was declared, how the taxes rose or fell, which industries prospered or which decayed—all these questions are negligible when compared with the longest price of war, which all fighting nations have paid and must pay.

All the prices of war fall most heavily upon the future. In Great Britain we still pay heavy taxes every year for the Boer War and other wars of the past, right and wrong, glorious and inglorious. But the longest price of war is *wholly* paid by future generations, and hurts the future only. The people who will live in the years to come get none of the glory for which rulers wage war; they, at least, are innocent; they are at the mercy of the past, which did not consult them, but which makes them pay.

The Case of Paris

Here is the terrible argument. Take the case of Paris as I write. No able-

bodied man between twenty and forty-five is to be found there! When the boys reach the age of twenty they, too, if they are healthy, will be sent away. All the able-bodied, all who have good eyes and good teeth, who are not lame or deaf, who have sound hearts and lungs, must go away—in hosts of cases never to return. But if their lungs are full of consumption, or if their hearts do not beat as hearts must beat on the march, or if they cannot see, or hear, or stand on their feet at all—then the men stay at home, and are not killed. So war not only demands a price in life, even of the victor, but it demands the life that is strongest and fittest, healthiest and best.

Every afternoon nowadays I take my daily walk in Hyde Park, where thousands of young men are drilling for what we call "Kitchener's Army." The standard for admission is high, and has lately been raised. The doctors reject a large proportion of all whom they examine. In the park the two kinds of men may now be daily seen and contrasted. The healthy and vigorous and clean are drilling; the diseased and dirty and broken-down and idle are lying about on the grass, looking on, smoking, and doubtless jeering in their hearts. These last we shall keep, while the others are soon going across the sea to die. Exactly the same process has been followed in selecting the armies beside which, or against which, they are to fight.

It is not only the fine qualities of body that must be sacrificed to war; fine qualities of mind are demanded, too. The coward may stay at home, either by not volunteering, or by pretending to be ill when he is not. On the Continent of Europe many a man purposely injures himself or shams illness in order to escape military service. The patriot, the man who loves his country, and who would die for what he believes to be her freedom and good name, goes and dies indeed; but he who cares only for his own skin will stay behind if he can. So he whom we, or any country, could best spare is left to us, along with the deaf and the

blind, the consumptive and the crippled. Clearly it is a bad business.

But it is vastly worse than at first appears, and history proves it to be so. There is a fact of life called heredity, which plays a dreadful part in determining the longest price of war. According to the laws of heredity, we are all largely dependent upon what our ancestors were for what we can be; consequently, the future of any race depends upon the quality of those who become its fathers and mothers. That is true not only of human beings, but of all living things.

We associate this idea with the name of a humane and gentle Englishman, Charles Darwin, who argued that the progress of life largely depends upon it. There is, he declared, a process of "natural selection,"—or, in Herbert Spencer's phrase, "the survival of the fittest,"—in virtue of which the future of any race is determined by those of each generation who are best qualified for life, as its problems are presented to them in their particular circumstances. Birds with good wings, fishes with good fins, tigers with good teeth, would be "selected" by "nature," and heredity would see to it that their offspring, on the whole, inherited those advantages.

By Struggle and Survival?

Some have found in this theory an argument for war; they maintain that since life advances by struggle and survival, strong nations must crush weak ones if the future of mankind is to be strong. None of the champions of war who declare that peace corrodes and ruins nations have thought about the matter deeply enough to learn that the argument they quote is the most fatal of all to their own horrible creed. For the truth is that war brings about "reversed selection"—in which the best are chosen to be killed, and the worst are preserved to become the fathers of the future.

Rome and France furnish illustrations of this awful truth. The greatest empire of the ancient world was Rome. When she had conquered all her enemies she

fell. Ever since then thinkers and historians have sought the reason. To-day there are many who believe that it has been found. Rome was always fighting. She had far and wide frontiers, which must ever be defended. The defence needed the best men she had, and got them. A great German historian, Professor Seeck, says that in Rome, out of every hundred thousand strong men, eighty thousand were slain, and that out of every hundred thousand weaklings ninety to ninety-five thousand were left to survive. The Roman Empire perished for want of men, says the great English historian, Sir John Seeley. *Vir*—a real man—gave place to *homo*—human, but no more; and when the living foundations of empire thus decayed, all the rest came down with a crash. The descendants of the vigorous race that had conquered the known world spent their time shouting for "bread and games." The laws of heredity were not at fault; the vigorous, in fact, had died, and it was the rejected, those unfit to be Roman soldiers, that stayed at home and became the Roman fathers of a nation whose course was run.

If a conqueror wants tall men to fight for him he gets them, and they die for him. But whether he wins or loses, he cannot expect the next generation to be so tall; and they are not. Napoleon only three generations ago wanted and used the biggest and strongest men, and they fought and died for him. Later, Michelet, the great French historian, declared that by his wars Napoleon had taken almost five inches from the stature of the French people. Observers in France to-day are noting how small are the French soldiers compared with the German and the British.

Mere stature is not very important in itself, of course, but we who have long studied what are called the vital statistics of France, and who have compared them with those of other nations, are very sure of the truth of the remark made by a famous student of life, that not even the genius of the Frenchman, Pasteur, who was said by Huxley to have paid by his

discovers the whole cost of the indemnity exacted from France by Prussia in 1871, could restore to the physique of his fellow countrymen what Napoleon had robbed it of. As a student of France, and as one indebted to her—as to Germany—for many happy days I am sure that she is now paying an awful price for the conquests of the conqueror whom she loved, and whose bones lie beside the Seine under the cross of Christ—the con-

civilised Europe. Now, as in the past, the fate is well-nigh sealed of any nation that spills her best blood upon the soil, her own or her enemy's, and leaves the weakly and diseased to become the fathers of the future. What is glory, what is territory, what is power, if only a race of weaklings inherit them? Only so much more for such a race to lose. That is why all the wise, all the good, all the truly great, all the really patriotic, all who



War Respects Neither Person nor Property

queror who, as a great living Frenchman, Professor Richet of Paris, computes, expended eight million human lives in his lust for power.

So It Was and Will Be

So it was in the past and so assuredly it will be now. The laws of nature are not mocked. In the long sequences of time they have their sure effects, whether we foresee them or not. As it was with Rome and France, so it will be yet again with Germany, and France, and other nations, winners or losers, in the ghastly battle-field that a few months ago was

live, not for themselves, but for their country, seek ever to protect the quality as well as the numbers of the children of their land, through whom all things must be maintained, and therefore to whom all things should be first devoted.

Alas! then, for the innocent, the helpless, the unborn of every land, the best men of which are being sacrificed in these fearful days of ours, and not least those of hapless Germany. All accounts agree that the price now being paid in terms of healthy young German life is enormous. There are limits to its quantity. For example, it is well known that the amount

of consumption in Germany is appallingly high. But the consumptives are spared now. Even though Germany should win and take territories all over the earth, she would, in almost ruining the future quality of her great race, still have to pay the longest price of war.

On all hands we hear people discussing other prices for this war, but for myself they interest me very little. Some say that this war may mean the economic ruin of Germany. If that were to be so, the loss to mankind at large would be of little importance. The wonderful technical processes that have been elaborated in Germany, and that have gained for her so much well-deserved prosperity, would not be lost. I have in mind, for example, the most marvellous drug in the world, the discoverer of which, a German Jew, was acclaimed in 1913 by all the doctors at the International Medical Congress in London until their hands and throats were sore. Whatever happens, this war will not destroy the knowledge which that drug of Professor Ehrlich's represents. If not another molecule of it were ever again made in Frankfort, it would still be made in London and New York.

Some, again, prophesy political ruin for Germany—loss of territory and international influence, and so forth. I know not whether these prophecies be true or false, and I care comparatively little. The small States have done great things ever since time began. We owe much to present-day Switzerland and to present-day Holland, although the Dutch Empire is no more. A politically weakened Germany might be worth more than ever to mankind. But what if Germany were to be *racially* ruined? What if the vigour of her future were now being spent and lost in France and Belgium and Poland, and if the world that is to be were the worse for such a loss? There, to my mind, is the most tragic and pitiful question of all.

A Nation's Womanhood

One fact alone prevents this longest price of war from ruining even victorious

nations more quickly and surely than it does. It is that war does not demand the healthiest and bravest and best of a nation's womanhood to be destroyed for the glory of the men who make wars. At least, the generations to come may have mothers and grandmothers as fine as if there had been no war at all; and of course, so impartial are the laws of heredity, both boys and girls to come profit accordingly.

Americans should be specially interested, I think, in the longest price of war, for it vitally concerns them. If Europe is to undermine its racial vigour by the reversed selection of war, and if the United States of America are to escape that destructive process, while the long frontier between them and Canada remains gloriously unfortified, it is difficult to question the conclusion that the future leadership of mankind must be transferred from Europe across the Atlantic, where peace and her victories hold sway. However that may be, the argument against war as a good thing in itself will remain. It was the most famous living genius of Belgium, M. Maeterlinck, who, in "The Blue Bird," taught us all to look to the kingdom of the future, to the unborn children who will come some day to save and lead mankind; and it is the future of man, above all, that teaches the solemn truth that "they that take the sword shall perish with the sword."—Dr. C. W. Saleeby, in *Youth's Companion*.

The Hospital Notice

IN the vestibule of a certain hospital visitors see a card bearing this advice: "Never utter a discouraging word while you are in this hospital. You should come here only for the purpose of helping. Keep your hindering, sad looks for other places, and if you can't smile don't go in." Not in the hospitals only, but in the home and on the street, there is the same need for the kindly, sunny smile. The way to have it is to get the heart right with God. *East and West*.

How Big Should a City Be?

CITIES that are using all legitimate efforts, and even some efforts that cannot be so described, to climb to a slightly higher rank in the census-list, says the *Literary Digest*, New York, may be interested to know that Ebenezer Howard, an English authority on city-planning, places the maximum population of the ideal city at about 32,000, depending somewhat on the size of the component families. Increase in population should be provided for, he thinks, by building another city near by. Mr. Howard's ideal city covers 6,000 acres, of which about half is cultivated, the other half being occupied by streets and buildings. This we learn from a paper by Prof. J. R. Smith, of the University of Pennsylvania, reprinted in *Engineering and Contracting* (Chicago, July 28). Says Professor Smith:—

"The average American predicts failure for any such enterprise. However, England feels the city problem much more keenly than we do in this country, for it has had the industrial city longer, and, in recruiting for armies, particularly for the Boer War, England has discovered with horror the physical degeneration which results with generations of city-dwellers, with inadequate dwelling facilities, no gardens, no ground, no play facilities. After much hard work, Mr. Howard succeeded in forming a Garden City Association that raised enough subscriptions of cash to start. . . .

"It has succeeded. In nine years, between 1904 and 1913, about thirty factories have moved to the place, which had a population of 8,000, and was steadily increasing. The crucial test, however, of its success is the balance-sheet. It was financed by a group of individuals who were willing to put up some money, buy the land, and get their 5 per cent cumulative dividends eventually if it succeeded. It followed the usual English plan of giving long leases to land and letting tenants improve. . . .

"The financial plan provides that the promoters shall get 5 per cent, and after that further profits shall go to the city in improvements and reduction of taxes. One of the manufacturers told me he could foresee the time when the town would be without taxes, and then the manufacturers would come there 'in droves.'

"I regard this attempt to eliminate the crowding-evil from the manufacturing town as perhaps the most important single social experiment going on in Europe, for it is a statistical fact that no large city population anywhere is physically and numerically maintaining itself. In 1913, I spent several days in this city, going through it very carefully to see how it appealed to the manufacturers. I had letters of introduction to the prophets of the place, but really I did not care how it appealed to the prophets, for I knew that in advance. I did not care how it appealed to the poets, the artists, the retired bankers, the maiden ladies living on snug incomes, nor the cranks, nor the merchants who sold to all these, nor even to the workers who made up the bulk of the population. The worker goes where there are jobs. The butcher, the baker, and the candlestick-maker come to serve him, so that the vital part of a city is the way it appeals to the man who promotes the primal industry, which is usually manufacturing. Therefore I interviewed the manufacturers of the place, making a special attempt to try to find those who were most distinctly what you would call of the practical turn of mind in contrast to the altruistic. Everywhere I found the same enthusiasm. I went to get their ideas, but first I must go and look at their plants. They all pointed out the great superiority of the plant on these two- or three-acre cheap sites over the plants they had left in London, many of which were crowded, and so dark as to be lighted by gas, and so inadequate as to



BROADWAY, NEW YORK

World's Work

interfere with the best efficiency of work. . . .

"It is the most beautiful factory-town I have ever seen, for the reason that every house has room enough for flowers in front and vegetables behind. At no place do they have lots more than twelve to the acre, which means that lots can be practically 20 x 200 feet, even in sections given over to the artisan. That makes provision for a small front yard, cottage site, little back yard, and 100 feet left for garden in the rear. . . .

"The most significant part of the whole thing is that it has been done by the application of existing practices and existing laws with existing human science. Most attempts at social reconstruction have to await a conversion of the majority to a new point of view, and if the dreams of the socialist come true, we must also develop an entirely new system and type of business administration. In contrast to that millennial process, a garden-city like Letchworth, England, can be built now in any well-chosen location. Any group of capitalists with constructive imagination and good business ability can start in and do it under existing law. As to its areal aspects—there is plenty of room along the Delaware River for all the industrial population now near it (and much more) to be so situated that they could avail themselves of all the principles involved in Garden City, and have the best access to the harbour. They now have very poor access to it.

"If our urban people lived in such cities as Garden City it would beyond a doubt reduce the cost of living, increase wealth through by-industry, increase pleasure through the possibilities of recreation, increase efficiency through in-

creased health. The land-speculator alone would lose—lose his present much too widespread opportunity to take something and give nothing in return. Something for nothing is a process that is variously regarded according to our social enlightenment."

It is significant that the editor of *Engineering and Contracting* agrees emphatically with the writer in his conclusions regarding the undesirability of large cities. He asserts in a leading article



An English Garden City

that the idea of the great city as a permanent construction is itself an error. None of its component parts exists long. He says:—

"Its buildings, its streets, its transit, its sanitation-works endure in part only from one generation to another. There is constant shifting of its business and industrial centres—even the character and magnitude of these change in time—and social life shifts its activities and habitation often and widely. All this is trite, it will be said; the city as a unit remains and is permanent. One may remark of Nineveh and Babylon, in answer, that such a retreat is not necessary. There are increasing indications that people are beginning to understand

that the big city, the city great in population and area, is not as fit to serve the only purposes that a city can serve as are smaller aggregations of the units which collectively we name a city. Newly created industrial cities are becoming familiar in America and in England, and commerce and industry are coming every year to closer agreement with sociology in their estimation of the advantages of the small city. Acceptance of the logical conclusion is perhaps distant, but this conclusion is beginning to be admitted.

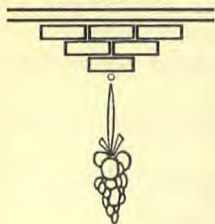
"People are fond of comparing the birth and growth of a city with the birth and growth of a living organism. It is perhaps not an unfair comparison. The biologist, be it noted in this comparison, recognises that a living organism is not necessarily higher in the scale of being simply because it is larger and more complex. The simpler organism can exist under much more simple conditions, and may therefore be quite as fit as a more complex organism which requires more complex conditions under which to survive and thrive. We shall see that this comparison is particularly true of the city. The small city of 200,000 people may be and is usually just as capable in all that a city affords its inhabitants as is the city of 2,000,000 people.

"As engineers, let us see how the en-

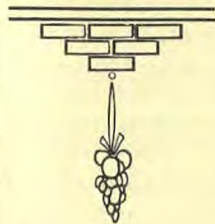
gineering tasks of a city are affected by size. The engineering tasks of a city are primarily to provide transit, to supply, purify, and distribute water, to provide sewerage and dispose of sewage, to secure sanitary housing, to pave and keep clean streets and roadways. The accomplishment of none of these tasks becomes a serious problem until the city area and population become large. Generally the larger the city is, the more difficult and therefore costly are the solutions that must be resorted to, assuming that quality of service is maintained. In a word, all the engineering difficulties of a great city are due primarily to its size and not to any superiority of the service provided. Cities of 200,000 usually have as good water-supply and as good sewage as do cities of 2,000,000, their people get from home to work as quickly, their streets are as clean and well paved, their housing and sanitation are as good. Where, then, is the advantage of great size? Is it in educational advantages, opportunities for amusement or social life or religious activity? Everyone knows that in none of these things does the small city deny its inhabitants any material advantage had by the inhabitants of a large city. Why should cities vie with one another to attain size? Size, merely, makes a city no more fit to serve its inhabitants."



**Mr.
PUSS**



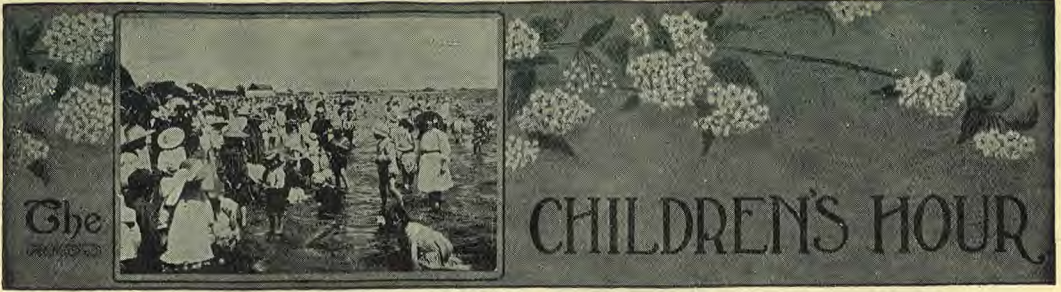
**The
BAKER**



I'M Mr. Puss, the Baker,
From the shop across the way;
I've called to ask for orders,
Pray what can I send to-day?

A kitten's party! Yes, Ma'am,
You shall have the very best,
I'm sure my custard trifles
Will astonish every guest.

Six dozen tarts and cheesecakes
I should think would be enough.
I'm noted for my pastry,
Both the plain kind and the puff.



GRIT!

R. Hare

KEEP your lip a "stiffer," Billy;
Pack life full of stick an' go;
Don't begin to dream of sinkin',
That won't help the show.

"Hills are steep!" well, push the harder;
Grit your teeth, then bend an' lift.

"Push" means more nor gold an' silver,
Or their peerage gift.

"Money scarce!" well, grit is scarcer;
That's the truth, 'twixt you an' me;
Where you find a hand that's honest,
Fifty laggards you will see.

"Disappointed!" well, that's common;
But it needn't knock yer 'bout.
Many a cloud has silver lining—
Turn it inside out.

Do not envy blokes that whistle
In their motors 'hind their span.
Billy, be what millions cannot—
Be an honest man!

Let the fame of fortune dazzle,
Keep your grit an' hold on tight;
Somehow, cannot tell exactly,
Grit will come out right.

Tim's Game

SCHOOL was out now, and Carlton felt that he could do as he pleased all day long. He spent most of his time playing at the barn or down at the pasture branch or out at the fields where the men were at work. He seldom came to the house from morning until dinner-time. Then he was always very hungry, and mother always had a good dinner ready for him and for his father and little sister Lula. If he had noticed, he would have seen that mother had always looked tired when he came in to dinner; and if he had thought about it, he would have known that she had to bring in the stove wood,

and draw and carry several buckets of water from the well, besides many other things that a boy ten years old could do as well as play all the time. But somehow he did not notice, and he did not think. Mother knew that if she waited for Carlton to notice and think she would have to keep on doing everything herself all summer. But she thought about how long he had been going to school, and how glad he must be to get out, and she kept on bringing wood and water, and doing other things and let him play all day long for a whole week.

Then, as Carlton came up to the house one Monday morning, he was surprised to find a notice written in large letters on a piece of white paper pinned to the kitchen door: "Boy Wanted Here."

Carlton did not go in just then. After a while his mother heard a knock at the kitchen door, and when she opened it there stood Carlton in overalls and wide straw hat.

"Mornin', lady!" he said, taking the big hat from his head. "My name is Tim. I came here to get a job if you want a boy. I haven't had any breakfast."

"I am glad you came, Tim," said the lady. "I need a boy about your size very much. Are you hungry?"

"No'm, not much," said Tim. "I can begin to work right now if you want me to."

"What can you do, Tim? And what wages are you willing to work for?"

"I can carry in wood, and bring water and cut some wood, too, if the logs are not too big. I can go to the store for you and—and I can set the table and

wash the dishes and sweep the floors; but I don't like too much. I will help you do all that kind of work, though, sometimes, till your little girl grows up big enough to help you," he said, glancing at little Lula, who was standing behind her mother, laughing.

"I think you are just the boy I want, Tim. I should like to engage you right

find the coops. They are in the back yard."

Away ran the boy in the overalls and big straw hat, and when breakfast was ready he came in with rosy cheeks and a hearty appetite. "Tim" was a willing helper about the place all that week. Mother didn't look nearly so tired after he came. And the strangest part about it was that "Tim" seemed to be as happy and have as much fun as Carlton had while playing all the time.

When Saturday evening came, mother said she didn't know how she had ever been able to get along without the boy. "What shall I pay you, Tim? I like you better than any helper I ever had."

"Oh, nothing, mamma!" said Carlton, catching his mother around the neck. "I'd be ashamed not to help you; and it's fun to play Tim."—*Exchange*.



Tim

off, if we can agree about the wages."

"Oh," said Tim, "never mind about that. Wait till next Saturday."

"Very well, you may consider yourself engaged for a week. Would you mind feeding the little chickens while I finish getting breakfast ready? Here is some wheat. You will not have any trouble to

bows on the shoulders. The dress trails on the floor."

Dotty clapped her hands. "Who will be at the party, mother?" asked Bobby. It was always the same people at every party, but the children were never tired of hearing their mother name the guests.

"Well, Mrs. Mattress will be there.

Mrs. Bed's Party

A Story for the Tiny Folk

"COME, children, put away your playthings. It is time to get ready for the party."

Dotty pouted just a little, but Bobby put his soldiers away at once; their mother always made Mrs. Bed's parties seem attractive.

"What shall I wear to-night?" That was always Dotty's question.

"You may wear the pretty white gown that I have just finished," answered her mother, with a smile.

"It has a round neck and elbow sleeves; it is trimmed with fine lace, and blue ribbon is tied into

She always helps Mrs. Bed make her guests happy and contented. As she is of a retiring nature, very little will be seen of her, but her presence will be felt; then Mr. and Mrs. Sheet, who are always restful, will help receive; the Misses Pillow will come with their cousin, Mr. Bolster; the Misses Blanket will be there to-night—one of them has been away during the summer. As they are twins, you will not know one from the other, but you will not care; both are agreeable.

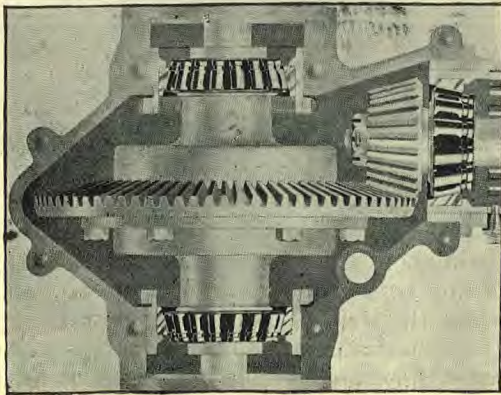
“Mr. Spread will be there early in the evening, but before the party begins he usually goes away. It is the same way with Miss Counterpane. She is helping during the day, but she never stays to the party; little girls like Dotty Dimple stay till the break of day.”

Dotty took her little candle, and Bobby held her trailing white gown, and joyously they followed their mother up the broad stairs to Mrs. Bed's party.—*Selected.*



Going to the Party

On Being a Cog



“I'm but a cog in life's vast wheel”

“It's just the same, day after day,” said Dorothy—“housework, and mending, and shopping, and marketing to make the money go as far as it can, and the reading club and church, and then all over again. I'm getting to feel just like one cog in a great big wheel. I don't count. What difference does it make what I do, or whether I do anything at all? Anyone else could make father and the boys just about as comfortable as I do, for I haven't learned to be very much of a housekeeper yet.”

Jane took up a pair of scissors and snipped out a few lines from the morning

paper. "Here, catch!" she said, and tossed it over. Dorothy caught it as it fluttered down. "Read it aloud," said Jane. She had just come to live next door, and Dorothy had taken a great fancy to her laughing, clever face.

"'Pride in humility,'" read Dorothy. "Oh, it's one of those 'line-o'-cheer' things:—

"'I'm but a cog in life's vast wheel,
That daily makes the same old trip.
Yet what a joy it is to feel
That but for me the wheel might slip!
'Tis something, after all,
to jog
Along, and be a first-class cog!'"

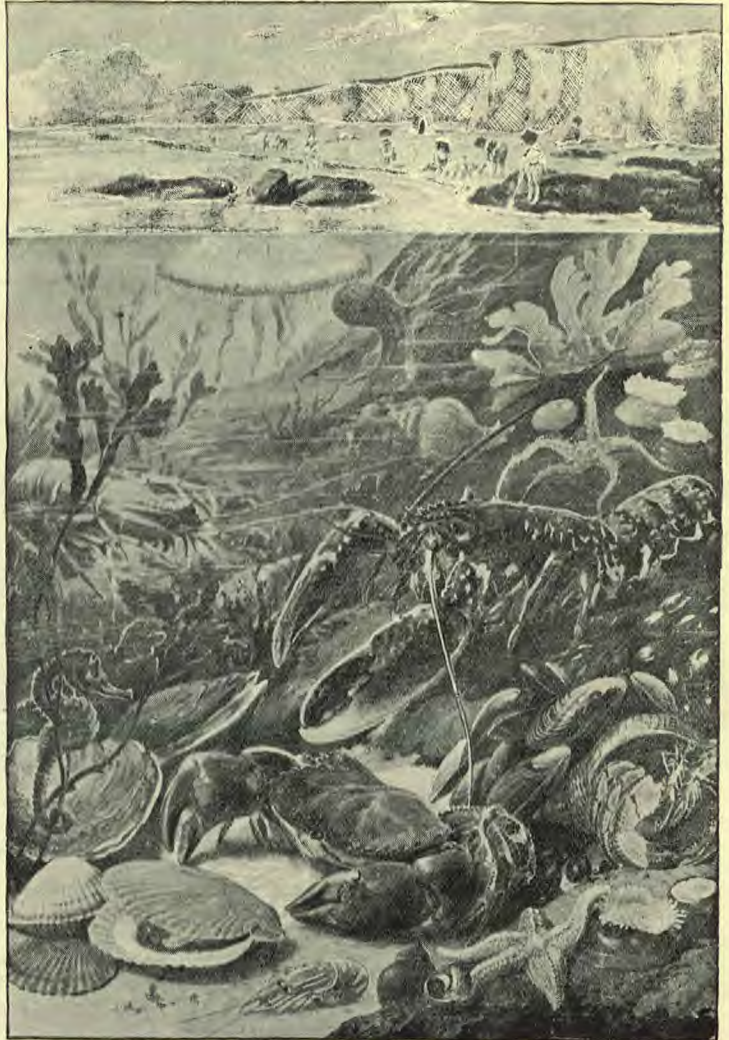
"Just so," said Jane. "There's your answer in the daily paper for to-day. I noticed it, because I often feel the same way that you describe. I suppose everyone does. Probably kings do."

Dorothy pondered. "I think I'll learn that by heart," she said, and she did.—*Home Messenger.*

Hermit Crabs Have Little House-keepers

It has been said that crabs are as artful as a "barrowload of monkeys," and no one will deny that there is considerable truth in the remark. The common hermit crab actually keeps a housemaid to clean out his house. When he first starts life this particular species of crab hunts for some large shell-fish's shell in which he can live at ease, rent free. He usually chooses a large whelk-shell, and introduces a large sea-worm belonging to what is known as the Nereis family, and

which grows to a length of six or eight inches, to keep the interior of the shell clean. The crab feeds heavily on sea creatures that wander carelessly into the shell, and throws the indigestible parts of



At the Bottom of the Sea

Children's Encyclopaedia

them about the floor. The Nereis worm promptly consumes these remains, and keeps the shell as clean as a new pin.

The artfulness of this crab, too, is strikingly illustrated by the ingenious manner in which he protects himself against the large fish which look upon him as an ex-

cellent article of food. Sometimes he induces a sponge to grow on his shell. Sponges in a living condition give out a strong odour, which is distinctly unpleasant to fish, and even a dogfish will not attack a crab protected in this manner.—
The Visitor.

THE DISHES

SOMEBODY didn't wipe the dishes dry!
How do I know? Because I saw them cry.
Yes, crying as they sat upon the shelves—
I saw them and they couldn't help themselves.
They made no noise; each plate was in its place;
But, oh, two tears were on the platter's face!
Oh, don't you think a little girl is mean
Whose dishes cry because they're not wiped clean?
—*American Motherhood.*



When it was Moving Day in the Hayfield

L. J. BRIDGMAN

The clickety-clank of the mowing machine
Sounds a warning to dwellers in fields of green;

Mice, rabbits and toads and each tiny neighbour
Must hurry and pack and not mind the labour.

More alarming the sound than when a dog barks
Is the mowing machine and its cutting remarks.

Life and Health

The
Australasian Health Magazine

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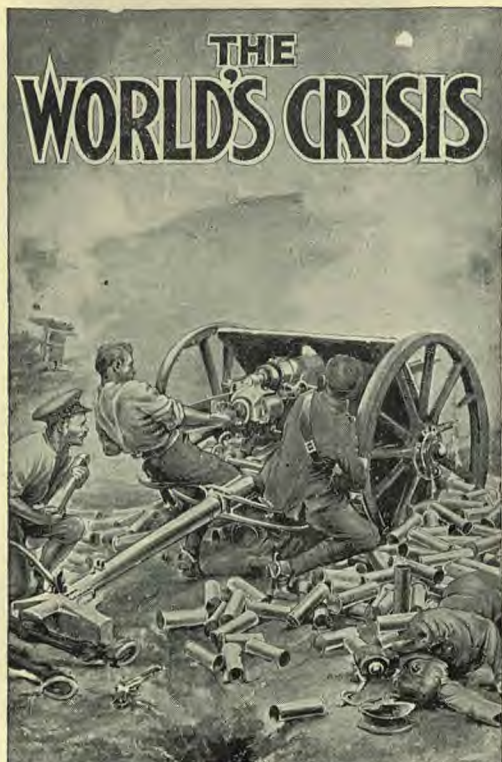
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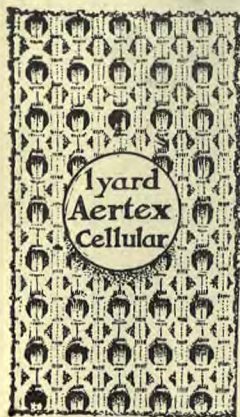
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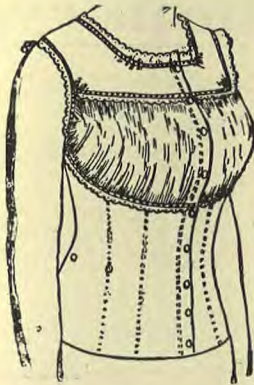
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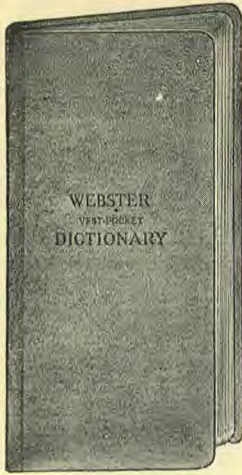
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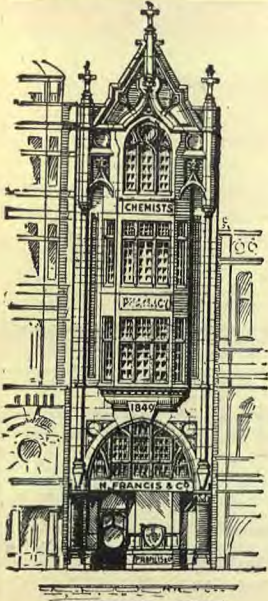
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