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HEALTH

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THE TENTH ANNIVERSARY OF THE W.H.O.

THE tenth anniversary of the W.H.O. was celebrated on the 27th of July 1958 throughout the Madras State and the theme chosen was "Ten Years of Health Programme." Speaking at the celebrations in the City over which the Madras Governor presided, Shri Dr. A. LAKSHMANASWAMI MUDALIAR paid a glowing tribute to the work of the Organization during the past ten years. He reviewed the work of the W.H.O. and stated that it was growing from time to time and that the W.H.O. had a system by which research workers came to a particular centre and discussed the results of their work, so that there would be no wastage or duplication of effort and all new discoveries could be broadcast so as to facilitate further work to be carried on. Shri BISHNURAM MEHDI, the

Governor of Madras dwelt at length on the progress made in the prevention and control of disease and in the promotion of the health of the people in general and of the mother and child in particular. Commending the work of the W.H.O. he said that in India they had received the assistance of this organization for the promotion of 12 malaria projects, 10 projects for the control of venereal diseases and yaws, and 21 for the control of tuberculosis and a similar number of projects for the promotion of maternal and child health besides several other projects in other fields of medicine both preventive and curative.

Among the major achievements of the W.H.O. were the joint development of a large penicillin factory and a D.D.T. factory in India, the establishment of

maternity and child health projects and assistance to 3,000 rural health centres and also the development of medical institutions.

Reviewing the progress that had been made in the Madras State during the last decade in the fight against diseases, Dr. V. R. THAYUMANASWAMI, the Director of Medical Services said :—

"The general death-rate has been brought down from 21.2 in the previous decade to 15.2; infant mortality, from 159 to 114; maternal mortality from 8,800 to 5,400; cholera death rate from 0.47 to 0.27; small-pox from 0.14 to 0.09; plague from 0.03 to 0.003; fevers, mainly typhoid, brought down from 4.25 to 2.57; dysentery and diarrhoea from 1.64 to 1.13; respiratory diseases from 2.17 to 1.61. The figures were no doubt impressive, but not such as to be very proud of. We have embarked on more ambitious programmes for the next decade. We are changing over from control to eradication and malaria is engaging our foremost attention. On the curative side the number of medical institutions has increased to 593 as against 347 in 1947. The number of beds has increased to 19,320 from 7,871 in 1947. Thus the number of institutions and the number of beds at present are nearly twice and thrice respectively, compared to those in 1947."

In this connection, the Public (Information and Publicity) Department of the Madras State Government has prepared a number of feature articles relating to various aspects of Public Health promotion in the State.

The Madras State's Director of Public Health has contributed a feature article on "The Philosophy of Public Health," which will be found elsewhere in this issue. Other feature articles, on various themes of public health are found in the well got-up brochure of the Publicity Department, e.g., Malaria eradication, Maternal and Child Health, Nutrition, Rural Health Programmes and Family Planning etc. The authors have all reiterated the need for public co-operation and response in larger measure. The salient features of three of these articles are given elsewhere in this issue.

We wish to point out that the ultimate success of all our schemes in the field of Health depends almost entirely on the measure of public co-operation that is forthcoming. The aid offered by many international organizations is itself illustrative of the spirit of co-operation that animates their endeavours in this field. With the co-operation of all these and other agencies, the Government, the voluntary social service institutions and the people at large, we should be able to achieve at no very distant date, our ideal of a Welfare State, where it will be possible for everyone to enjoy the highest attainable standard of health in our country.

Science has produced so many wonderful substitutes lately that it's hard to remember what it was we needed in the first place.—(Woodmen of the World).

The PHILOSOPHY of PUBLIC HEALTH

Dr. N. PARTHASARATHY,
Director of Public Health, Madras

WE have had a century of vaccination; yet, small-pox is still prevalent in our country! We have Acts and Laws, Codes and Regulations, to enforce the maintenance of Public Health. While we have succeeded in some measure, in the provision of public amenities which have a bearing on the health of the people e.g., protected water supply and drainage, we have to bear in mind, that these projects have become acceptable to people not so much for their sanitary importance as for their convenience.

We are traditionally and culturally accustomed to certain principles of personal hygiene such as daily baths, cleaning of homes, washing of apparel etc., which are creditable habit-patterns, in relation to personal health; but we have also acquired countless other habit-patterns, through generations, which are contrary to scientifically acceptable canons and codes of personal hygiene. Surprisingly enough, we seem to have been concerned not so much with community health, though in several other walks of life the concern of the community has been quite evident, even in the distant past.

With such a back-ground, heaving a decided pull at the progress of public health in our country, modernization, through the latter centuries, has also had a say in the matter, and a certain amount of further deterioration in public health has set in.

This philosophy of public amenities accepted by the people more as physical conveniences than as sanitary measures, coupled with a variegated traditional and cultural pattern of life, has been largely responsible for the evaluation of the Enforcement or Regulatory Phase of Public Health. However the experience of the public health administrators throughout the world has proved time and again that enforcement of public health achieves little, and that only for a short while. Permanency or sustained public health progress on a wide scale through enforcement of regulations has not been achieved anywhere, except under extraordinary circumstances. On the other hand, we see nations that are advanced in public health, have attained that level not by enforcing health laws but by educating their people. They have attempted to educate their people in public health at all levels—the pre-school and school children, the under-graduate and post-graduate, the home and the barn, the farm and the factory, in fact everywhere. Added to this, of course, is the raising of the standard of living.

With this knowledge to fortify our thinking, if we do try to educate our people in public health—which is not merely preventive medicine but promotive medicine, not merely a medical

science but also a social science, we should naturally be able to progress, at least by stages. Let us hope that everyone who is concerned with the moulding of public opinion will come to our aid in the fulfilment and advancement of public health, a great national welfare activity. —(Issued by the Director of Information and Publicity, Government of Madras).

MALARIA ERADICATION

Dr. P. G. KESAVALU,

Asstt. Director of Public Health, Madras

Two varieties of malaria generally occur in our country, the benign variety and the malignant variety to a lesser degree. Malaria tends to disappear from the patient, by itself, in a few years' time provided he is protected from reinfection from time to time. Logically, therefore if we can arrest the transmission of malaria from man to man through the bite of the malarial mosquitoes in a given time, we should be able to wipe out malaria from the country. This is the objective of the National Malaria Control Programme sponsored by the National Government throughout the country.

But, unfortunately, some of the malarial mosquitoes which were being effectively destroyed by the residual insecticides like DDT have, in recent times developed varying degrees of resistance or immunity to these insecticides, thereby seriously hampering the programme of malaria control through the destruction of the malarial mosquitoes.

The malarialogists of the World who have carefully

investigated the problem consider that unless an all-out effort is made promptly and quickly we may miserably fail in our attempts at malaria control. They have also concluded that malaria should be treated as a global problem for, so long as there are malarial pockets here and there, the disease cannot be conquered.

In line with these recommendations, therefore, our Nation has launched the Malaria Eradication Programme with international assistance at a tremendous cost. The aim of Malaria Eradication, as distinct from Malaria Control, is to bring down malaria to such a low level that it will have to die out ultimately. With this objective in view, the Madras State has planned to protect almost the entire population of the State under the National Malaria Eradication Programme, instead of mere protection for 37 lakhs of the population, under the Control Programme. Our anti-malarial operations are being expanded tenfold. The attack phase of the operation is on and the maintenance phase is to follow.—(Condensed by T.N.S.R.).

NUTRITION

A Review of the Results of the Campaign in the Madras State

Dr. P. V. GEORGE,

Assistant Director of Public Health, Madras

THERE has been a phenomenal awakening in every country, India in particular and Madras especially, on matters of food and nutrition, following the post-war effects of shortage of preferred staple foods and of the induced discipline of organized rationing; this has resulted in a willingness on the part of the people to tolerate unfamiliar foods and to appreciate that it is possible to live at levels, high or low, on particular foods, maintaining health and vigour. Thus, wheat which had been taboo in South India, is now a much-wanted cereal, and the *chappathi* has become as much a favourite in the South as the South Indian *idly* in the North. Ragi, the poor man's millet, has now become a break-fast specialty and its demand is greater than its output. The increasing awareness of the value of milk in the diet of children and mothers in particular, has made it a feature of diets both rural and urban; for this we have to record our deep gratitude to the UNICEF, CARE, World Council of Churches and other world service organizations. The large scale distribution of skim-milk powder through schools, maternity centres, hospitals, etc., in all remote corners of the country has aroused an ever increasing demand for this valuable food. The continuous efforts of the Government to increase

milk production is yet another proof of the ready response of the Government to the popular demand for more and more milk. The consumption of other protective foods like meat, fish, eggs, vegetables, pulses, fruits, etc., has been comparatively very low in South India. The Grow-More-Food Campaigns of the Department of Agriculture, Animal Husbandry, and Fisheries are fast progressing to meet these deficiencies in production and to stabilize costs within the means of the people.

The provision of free mid-day meals to poor school children and the supplemental feeding of expectant and nursing mothers, are admittedly important measures in the promotion of national health. A nucleus of school-feeding programmes is even now visible in every district in the State and it is hoped that with the co-operation of the public, this laudable measure will expand further, till it becomes an integral part of the scheme of elementary education in the State. The Corporation of Madras is distributing free mid-day meals to over 27,000 children every day. This well-organized scheme has evoked competitive efforts in the rest of the country. The feeding of expectant and nursing mothers, is also being attempted through the organized Maternity and Child Health Centres in urban

and rural areas; the diets provided in public institutions, like student hostels, orphanages, jails, hospitals, etc., are sought to be improved by periodic examinations and analysis of their food values and rendering of advice on better methods of cooking to minimize nutrient losses.

Exhibitions, lectures, film shows, distribution of educative illustrated pamphlets, etc., are all undertaken as vital propaganda by the Public Health Department. The infantile and maternal mortality rates in our

State have shown appreciable decline manifestly due to improved nutrition. Thus the deaths among children in the growing ages which used to be nearly 50% of the total deaths have diminished greatly; the longevity of the general population as shown by the expectation of life at birth, has increased in recent years to over 33; the heights and weights of both boys and girls at nearly all age levels, show a trend towards significant improvement. — (Condensed by T.N.S.R.).

MATERNAL AND CHILD HEALTH

Dr. R. VISALAKSHI,
Public Health Dept., Madras

THE 'Maternal and Child Health' division of State Public Health Department of Madras has steadily progressed in the last two decades through the efforts of the State and Central Governments. The First and Second Five Year Health Plans laid emphasis on the provision of health services for mothers and children in addition to other public health programmes. As a result of these efforts and those of other development projects, a net-work of Maternal and Child Health Services has now been organized on a state-wide-scale.

We have at present 533 Maternity Centres and Homes run by Local Bodies, 734 Maternity Homes and Centres run by State Government and 114 by voluntary agencies, making a total of 1381, as against 209 centres, ten years ago. Most of these Mater-

nity and Child Welfare Centres are located in villages. The Maternity Centres are run by a staff of 99 Medical Women, 273 Health Visitors, and 1667 Maternity Assistants specially trained for this work.

The opening of 480 more such centres is the target for the Second Five Year Plan. Out of these 192 centres have already been opened during the last two years. The cost of this scheme is about 18 lakhs of rupees, and will benefit about fifteen lakhs of people.

Though the percentage of skilled assistance to mothers during labour has increased from 5.4 in 1947 to 20 in 1957, still a majority of labour cases continue to be handled (*mis-handled?*) by illiterate, indigent *Dhais*. Since it is not possible to replace all these untrained *Dhais* by trained midwives

for many more years to come, an important step towards solving the problem of Maternal and Child Health has been taken in our country *i.e.*, to train the existing *Dhais* to conduct clean and safe deliveries. Under the Second Five Year Plan, a six-month training is given to *Dhais* at Maternity and Child Welfare

Centres by Health visitors and Maternity assistants. 3600 *Dhais* are scheduled to be trained in four years at 900 per year. The total cost of this scheme is Rs. 6 lakhs, of which Rs. 5.76 lakhs will be borne by the Central Government. Under this scheme 246 *Dhais* are now undergoing training in the Madras State.

(Condensed by T.N.S.R.).

The Importance of Mental Health

R. DWARAKANATHAN, M.A., B.L., Advocate, Royapettah, Madras-14

HEALTH is often defined as the absence of disease, whereas the correct definition will be that disease is simply the absence of health. If this view point is accepted it necessarily follows that we are entitled to expect health, and to regard it as the normal feature of living. Medical science should really concentrate on the preventive and positive aspect rather than on the negative curative aspect. It should carefully take stock of all the factors which go to make up a healthy human being *e.g.*, fertile soil for growing foods in plenty, wholesome foods, pleasing environmental conditions, physical well-being and mental health.

The term "Psychosomatic" medicine which has now come into fashionable parlance, merely means "relating to mind and body" and packs up into one portmanteau-word the fact that mental causes can help to produce physical ailments and *vice versa*. We all know that worry can cause our digestion to be upset and doctors know that it can

start or aggravate peptic ulcers; asthma, a most distressing condition is due partly to mental states and partly to physical agencies, allergens as they are called. These and many other human ills are at present given the grandiloquent name of "*psychosomatic diseases*" and "*psychosomatic treatment*" aims at restoring both body and mind to normal functioning. As Dr. George Sava says, "it is just a recognition of the fact that man appears to be a dual creature of mind and body and that the two interact in everything he does even to the extent of causing or aggravating his diseases."

We have it on good authority that well over a million people a year in Great Britain now undergo various forms of psychiatric treatment and though we have no accurate data about similar conditions here, there is no doubt that mental disorders, mild, moderate and severe, are definitely on the increase in India. The very crowded condition of the mental and general

hospitals of our land bear evidence to this.

"The followers of Dr. Freud consider that such troubles are all due to stresses set up by our attempts to suppress or redirect our pugnacious and sexual instincts, but surely this is a gross oversimplification. I do not for a moment accept that so many of us are the sexual maniacs-at-heart that Dr. Freud would have us believe. Could not part of the trouble be due to our environment? For perhaps 100,000 years man lived first as a food gatherer, then as a garden cultivator and farmer; only in recent years has he been cut off from the land. As a direct result of the Industrial Revolution, the population of Britain doubled itself in 50 years and a situation has been produced in which many thousands of people are living packed together in cities, doing jobs that 83% of them at least dislike, or at best regard as a troublesome necessity. They are cut off from the rhythm of Nature, from sowing and reaping, from seed-time and harvest, from the traditional festivals of the countryside; their energies are narrowly specialized, they rarely see a job whole and carry it out whole, as a craftsman does, because so often they are merely links in some office routine or mass-production schedule. Denied the satisfaction and fulfilment of the old-time craftsman, unhappy at their jobs, eating deficient, highly processed food, bombarded by noise, worried by H-bombs and the cost of living, they soon become out of balance—mentally and physically."

The above quotation from the "Health For All" for June '58, sums up the situation in a wonderfully succinct and clear manner and is applicable to Indian conditions as pointedly, as to other countries of the world. Psychologists, the world over, are becoming keenly alive to the great truth, well known to the Rishis, Yogis and other highly cultured religious men of India and the Far East, that when we learn to control the subconscious mind, we can easily control the body as well, nay life itself. Our Yogis have been able to penetrate into the mystery of death.

Life, we should remember is not a matter of the merest accident, but is the sordid result of special design conceived and developed by human intelligence of the highest order. If health deserts us, it is only because we fail to obey the laws of nature and create new rules of conduct, not germane to correct modes of living. Let us all therefore, learn to realize that mind and body constitute an entire whole and mental health is as essential as physical health to the well-being of the human organism. (JAI HIND)

First Priority: The Things that can be put off

Lawrence Lowell, a famous President of Harvard, once said to me that he had tried to train himself to begin the day by doing the things that *could* be put off and leaving till later what could not be put off. That which "can be put off" means not only that which will not be mechanically brought forward by an interview already fixed or an urgent letter on the desk; it also often means some question which, without a special effort of volition, we should be inclined to put off, a problem with slightly uncomfortable associations, or an inchoate train of still vague and only partially conscious thought which will drift into forgetfulness unless the "salt box" is used.—(Graham Wallis in *The Art of Thought* via *Reader's Digest*, January 1958).

FASTING AS A THERAPEUTIC MEASURE

BY

Rao Sahib T. N. S. Raghavachari, "Chandrika," Madras-14.

FASTING has been in and out of fashion from time immemorial, not only as a discipline but also as a compulsory therapeutic measure in some cases; "a lost art in one age and a rediscovered science in another." In India, however, fasting for health, and fasting for discipline have held continuous sway over hundreds of years. Even today, the observance of a fast every fortnight on Ekadasi day by the Hindus and of a months' fast during the whole day during *Ramzan* by the followers of Islam is well known. An annotation in *Health for All*, (London) June 1958, under the caption 'To Eat or not to Eat' is of great interest in this connection. "Down the ages physician-philosophers have sung its praises while practical physicians have used it in the saving of lives. Its unpopularity is due not to its ineffectiveness, but to its demands upon the patient's habits, whereas medicine is popular not because it is (always) effective but because it is convenient. Even in Nature Cure circles, where fasting has been

advocated more consistently than in any other school of thought, it tends to go in and out of fashion."

A group of doctors from the Institute for Cardiovascular Research, Prague, Czechoslovakia, writing in *The Lancet*, of London for April 12, 1958, stressed the value of fasting in some forms of kidney disease, and mentioned incidentally, that "many victims of the concentration camps, who had previously had allergies, shed them during their detention period on a semi-starvation diet." They also wrote: "After fasting, all the acute manifestations of the kidney complaints rapidly subsided but we do not know why." They conclude: "We believe that fasting reduces the severity of the antigen-antibody reaction responsible for acute glomerulonephritis, and should be an essential part of treatment."

If this should start a reassessment by the medical fraternity of the value of fasting in other conditions and for other reasons should we not all welcome it?

Best Time to Shave

Do you bound out of bed in the morning, make straight for the bathroom, and start shaving? May be it would be better if you went downstairs and made a cup of tea first or spent a little while reading the morning paper. The *British Medical Journal* tells us that "in the morning after a good night's rest in the recumbent position, the face is well hydrated and indeed slightly oedematous"—that is the face may be slightly swelled due to the fluid in the tissues. And it goes on to quote an authority who "showed that a closer shave of the region of the beard could be obtained, if shaving was delayed until the fluid drained down from the face as it does after spending some time in the erect posture—(*World Digest*).

The Place of Religion in Medicine

II

(Continued from p. 156 of HEALTH for July 1958)

The Rev. Dr. Oren H. Baker, Dean of Colgate Rochester Divinity School, said in his lecture :-

"THERE is a story about six men who were set adrift in a life-boat after shipwreck. Two were Irish, two were Scotch, and two were English. When they were rescued, some days later, the Irishmen were engaged in eager argument, the Scotsmen had organized a philosophical society, the Englishmen were not yet introduced. This story is not without application to attitudes which have been observed in the relations of physicians and clergyman..... There are signs however, that all this is changing..... We have begun to acknowledge openly that religion has a place in therapeutics and that we would now like to move from introduction to conversation..... You all know about the close association of religion and primitive medicine, a relationship which continued through many centuries. Yet in the fact that ancient men used certain rites to invoke the aid of beneficent powers, on the one hand, and other rites to placate or repel evil spirits, on the other, I find the early beginnings of a functional dualism that has persisted, through many alterations of means and techniques to the present time. As the centuries passed, medicine, frequently opposed by religion, moved toward autonomy until it achieved full

emancipation and grounded itself firmly at last upon science, from which has come the amazing achievements of recent times.

At least two facts should be noted in this latter development. First, the altruistic and humanitarian attributes of religion have supported medicine in the establishment of hospitals and made common cause with it in protective and preventive measures designed to ensure the blessing of health and long life to all. A second inference from our history is that when scientific progress has required accommodation, religion has assimilated the new facts without compromising its distinctive genius..... We can say now, perhaps for the first time, that medicine is making the overtures to religion as a result of studies in psychosomatics, which are bringing it into the realm of the spirit where religion has always had paramount concern. Without expressing too much optimism, it may indeed be that this new *rapprochement* will open up unusual avenues for human good during the next half a century. Recognizing the confusing variety and complexity of religious belief and practice in our culture, I shall present *three propositions* with brief elaboration sufficient to make myself clear.

My first proposition is :- Religion arises in man by virtue of

his unique character as a self-conscious organism endowed with a capacity to perceive the meaning of his own *existence* and undertake the direction of his life through that meaning. In this statement, five affirmations about man are involved. In the reference to "*existence*" we acknowledge his place in the natural order both from the standpoint of his origin and his continuing nurture. We recognize that he is an "organism" consisting of diversified members each of whose functions is timed in relation to all the others in a living unity. In saying that he is "self-conscious," we include the facts of his involvement in a social *milieu* and his psychical internalization of social experience. In the reference to his capacity for the perception of meaning, we stress his need to believe, his unique gift for speech and symbolization by which he puts his world together in abstract forms. In this character, he is a person. He does not live by bread alone, but by words. Finally, we are saying that words, formulating meanings, direct rational action.

My second proposition follows from the first:—It is a part of his self-conscious activity that man should know himself as an individual in separation from the world of physical objects and other human beings. Religion draws the picture here in two dimensions which we may call the cosmic or universal order on the one hand, and the order of social relationship, on the other, both of which natu-

rally merge in man's perception of the meaning of his existence. He must therefore, be prepared to accept the consequences of his acts which ultimately add up to a final judgement on his life.

In short, it is this separation from his Creator, with the necessity of living responsibly, that gives rise to the existential anxiety with which all religions have sought to deal. Birth is a separation of profound organic and emotional consequence..... The human individual must henceforth make his own way by progressive adaptation to his environment and the circumstances which surround him. Weaning time comes in a few months and interaction with parents and siblings accentuate differences, and any illness that may occur creates the feeling of separation, the degree of which depends on the seriousness of the illness. To be sick means isolation, enforced inactivity, worries about family, business, past acts, and a host of other matters, to say nothing about pain and the final separation of death.

We come finally to the *third proposition* which affirms the union of *faith* and *belief* in a supportive community. *Faith* is that attitude of the soul which enables a man to stand anything that can happen to him. *Belief* is the formulation, or structuring of faith, in propositions accepted as true and used to sustain constructive attitudes to re-enforce the will to live, and to transform suffering into

serenity and peace. There is no need to make special argument for the power of belief; religious belief girds the soul for facing of ultimate destiny.

It holds us together in the face of tragedy and disaster and creates a community of grace, love and forgiveness that assuages the isolation and loneliness which are inescapable properties of our existence.

I was influenced in my thinking by two eminent doctors one of whom was Sir William Osler who had a brilliant career on both sides of the Atlantic. He was a man of amazing energy and resourcefulness with a de-

votion to his patients that had the quality of religion. It was his custom, when possible and appropriate, to be present when his patients died. One of the most moving narratives that ever came to my attention was an account of his final ministrations to a little girl. Sitting by her bedside with her parents, he talked to her with an ease and calm confidence that pushed back the shadows of the dark hour. It was an act that affirmed the dignity and worth of human life in the very presence of physical dissolution. In his time, Sir William was called "the doctor's doctor" and here is a moral for his profession.

Overcoming Excess Hair

Eighteen of 21 women bothered by excessive hair growth had excellent to good results from taking small doses of *prednisolone* a synthetic hormone; in each case the hairiness was apparently due to over activity of the adrenal glands which then produced excessive amounts of certain hormones, say Drs. W. H. Perloff *et al* of the Temple University School of Medicine, writing in the *Am. Med. Assoc. Archives of Internal Medicine*. The synthetic hormone apparently combated this tendency. The value of this finding is expected to be limited however, by the fact that *prednisolone* can cause severe side-effects in some people and must be used only under close medical supervision.—(*Today's Health News*, May 1958).

Fashion and Care of the Feet

Many girls who have perfect feet in their eighth or tenth year develop severe deformities when they reach school-leaving age, many of such a degree that they may eventually require operative treatment. The present day fashion of continued all day wear of shoes of a 'slip-on' or casual type which must necessarily be too small so that they can stay on, or cause cramping of the toes to keep them on, can during these formative years cause hallux valgus.

Painful bunions (corns) and curling under of the toes, sometimes of such a degree that the nails are walked on. . . . From an economic aspect only it is doubtful if in years hence the country can afford comparatively young, middle-aged, and elderly women hobbling round on deformed feet. The strange fact is that the young girl of today, who would laugh at a whalebone corset of Victoria days treats her feet in the same way as her great grandmother treated her waist.—(*Annual Report on School Health Service* for 1957, Huddersfield).

[Note: This fashion which has insidiously caught on, amongst, some school and college girls in India, will, we trust be given the go-by in view of the serious deformities referred to in the above report. Ed. HEALTH].

Spontaneous Pneumothorax or Hole in the Lung

THERE is a lot known about spontaneous pneumothorax, in fact just about everything. Put rather crudely it means that the lung has burst, but it is only a tiny whole like a nail prick in an inner tube of a tyre. It is caused by a weakness in the structure of the lung that is inborn and is not at all uncommon. Most of these cases never have a second attack, but some of them have two, three or four. Sometimes the weakness is due to tuberculosis, but this is not so common and I will not refer to it again, except to say that it is very important to make sure that the cause is *not* tuberculosis in these cases.

The burst takes place usually at some time when the victim is straining, say, running for a bus, climbing the Matterhorn, carrying a heavy basket of clothes to hang the washing on the line. I have known each of these cause a spontaneous pneumothorax.

When the lung bursts air rushes through the hole into the closed pleural cavity between the lung and the chest wall. The lung itself is put out of action and collapses like a slowly leaking tyre. Every breath makes the condition worse. But in most cases the pressure of air in the pleural cavity becomes sufficient to stop the leak and all is well.

At the moment of rupture the patient will experience a sharp

pain in the chest and become breathless. This will gradually increase until the time arrives when the hole is sealed. The symptoms will then cease to worsen. There is nothing to worry about. It is just one of those things.

The treatment is easy. We reassure the patient and keep him at rest in bed for about ten days. The air in the pleural cavity will be absorbed. The lung will expand. The patient will return to normal health and strength. The odds are that it will never happen again.

A few of these patients suffer a worse variety known as a tension pneumothorax. In this case the pressure does not close the gap. Every breath makes things worse until a hollow needle is pushed into the pleural cavity allowing the air to hiss out. This type may eventually call for surgical treatment.

I know a medical student who had his first spontaneous pneumothorax in 1936. He has had four in all. He served throughout the war in the R.A.F. and is a busy, hard-working family doctor.

Age, race, physique and occupation have nothing to do with the matter, but men are much more liable than are women. The essential factors are an inborn weakness, which cannot be detected, and a moment of strain.—(*Family Doctor*, January, 1958).

Today's Knowledge of Nutrition

The amazing discoveries of 50 years summed up by a Scientist who had a hand in them

ELEMER VERNER McCOLLUM, Ph.D.

MOST of those concerned with the study of foods and nutrition in the nineteenth century assumed that a diet which provided sufficient protein material, carbohydrates (sugars and starches) and fat, as well as a rather poorly-defined supply of mineral matter, was adequate for satisfactory nutrition. The value of the nutrients was assumed to be the same regardless of their source—be it seeds, stems, leaves, tubers, roots, fruits, highly milled grain products, meats, milk or eggs. Early investigators of human nutrition were primarily interested in determining the optimal requirements of each known nutrient under different conditions of life—growth, pregnancy, varying degrees of physical activity and so on. A secondary interest centred on the economic aspects of food—or more precisely, on determining which foods, in relation to their cost, would provide the highest protein and energy values.

The first scientific reports of this period appeared describing the feeding of small laboratory animals (mice) on mixtures of purified proteins, carbohydrates, fats and minerals—all the essential nutrients known at that time. In every instance, the animals promptly failed in health and soon died. Reflection on these disastrous results set the stage for an intensive search for further essential

nutrients—a search which led the way to the amazing expansion of knowledge about nutrition in the present century.

Progress in chemical techniques has revealed that proteins from various sources differ greatly as to the amounts of the 22 amino acids, or intermediate products in digestion, which they yield. We have also learned that not all 22 amino-acids are essential for adequate nutrition. Much progress has been made recently in assessing protein needs in terms of particular amino-acids.

Experimental feeding programmes soon brought to light quite an array of different kinds of nutritional failure. Some inadequate diets resulted in severe nerve injury; others caused injury to the tear glands with resultant dryness of the eyes. Some produced anæmias of one type or another; still others resulted in failure of the blood to clot at a normal rate, injury to the thyroid gland, bone changes such as the rickets once prevalent in infants and children, various types of skin disorders (dermatoses), fragility of the capillaries with widespread hæmorrhages characteristic of scurvy, and many other symptoms. Eventually it became clear that a particular physical disorder regularly accompanies a lack or insufficiency of some particular nutrient, even though

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the nutrient may be needed only in very small quantity.

Food nourishes our bodies in three major ways: it supplies energy or calories, it provides the material required for building and upkeep of bodily structures, and it supplies certain substances which regulate and coordinate life processes.

Proteins, fats and carbohydrates are the most abundant nutrients and together add up to all but a very small fraction of the total weight of nutrients in the diet. This explains in part why they were recognized as nutrients at a relatively early date. The essential minerals as a group rank next in abundance in ordinary foods, as well as in the quantity required for adequate nutrition. Essential nutrients required only in relatively small amounts include the vitamins and certain minerals, collectively known as essential trace elements.

An inadequate supply of iodine is the cause of certain disorders of the thyroid gland, including so-called simple goiter. The significance of traces of fluorine in the building of sound tooth-structures and in reducing susceptibility to dental caries is now widely recognized. Sodium and potassium are important in the body's chemical balance and require special consideration in treating certain diseases. Calcium and phosphorus are vital constituents not only of the teeth and skeleton but of the soft tissues.

Four vitamins are fat-soluble and always found in foods in

association with fat. At least 12 are soluble in water or watery liquids and are never found in association with fat. A lack or deficiency of any one of the vitamins leads in time to a specific type of nutritional disorder. Application of our new-found knowledge of vitamins has brought dramatic results

The isolation of the vitamins and the development of methods of making them from simpler substances in the laboratory have made it possible to study the functions of each vitamin in considerable detail. These studies, incidentally, have provided no scientific support for indiscriminate consumption of vitamins in pure or concentrated forms. Under normal conditions our vitamin needs can be amply provided for by *proper* food selection.

The crowning achievement of our twentieth century science of nutrition is that it has paved the way for establishing eating habits which will support the highest attainable standards of nutritional well-being for all.

Nutrition can be established on a high level, a low level or innumerable levels between. Current knowledge of food values and nutrient requirements makes it possible to assess the relative quality of any human dietary. From knowledge of the food habits of a people, a family or an individual, it can now be known whether those food habits are capable of supporting excellent, mediocre, marginal or poor nutritive states.

According to eminent historians of our time, mankind has been on this earth for not less than 300,000 years. For a large share of that time, man has been a hunter and food-gatherer, eating what he could find. Around 6,000 years ago, when the earliest civilizations were being established in a few places, man set forth in earnest as a food-

producer to alleviate his ever-pressing need to satisfy hunger. Yet for less than 50 years has man possessed the knowledge that would permit him to provide and then select combinations of foods to nourish his body as it rightfully and properly should be nourished.—(*Today's Health*, October 1957).

THE MAGIC METAL—LITHIUM

THE silvery-white metal called LITHIUM, unless it is immersed in oil or kept in an airtight container, soon decomposes. We, however, meet with products containing lithium, or which lithium helped to produce, every day. And in future years it is likely to alter the course of civilization.

It plays an important role in thermonuclear energy, which might help to end many of mankind's power problems. It is also a vital ingredient in the "high energy" fuels now being developed to propel inter-continental rockets.

For 125 years after its discovery by a Swedish scientist, in 1817, lithium was considered practically useless. It is of ubiquitous occurrence and may be found in every sod of earth dug out from our gardens.

Lithium is the lightest solid in existence and the third-lightest element in atomic weight in the universe—only hydrogen and helium, both gases, weigh less. Dropped into petrol it floats,

Hold a match to it and it burns with an intense white flame, and melts. A knife cuts it like cheese. It has an enormous capacity for absorbing water and air. Immersed in water it fizzes like soda.

It releases hydrogen when combined with water; so packets of lithium hydride were put into air sea rescue kits to inflate radio-aerial balloons marking the locations of drowned pilots and life rafts. Some lithium compounds were used to purify the air in submarines by sucking up carbon dioxide and other noxious gases, also to de-ice aeroplane wings because lithium has a low freezing point and an affinity for water.

The most important discovery is the use of lithium hydroxide in the manufacture of lubricants which are able to function properly in the hottest, coldest or wettest climates, where other greases melt, freeze or become water-logged. Lithium greases permit army tanks to operate efficiently anywhere from the

Arctic to the tropics; aeroplane pilots could zoom from the oven-like heat of a desert aerodrome into the icy stratosphere without worrying about engine troubles or failures.

After the war, the lithium industry might have died of malnutrition but for the sustained interest and endeavours of the metal's enthusiasts. So by 1948 a new lithium boom had begun, and many industries use it today in some form or other.

Enormous quantities of lithium compounds are used for air-conditioning and refrigeration as they absorb moisture as a sponge sucks up water. Many baths and refrigerators, and enamelled equipment of all kinds are now coated with lithium enamel: it has a brighter glaze and can be fired at lower temperatures in a shorter time, offering great savings in cost. Oil companies are producing a few "all-purpose" lithium greases in place of the numerous varieties that were once needed to keep cars, lorries and tractors, maritime and industrial equipment operating.

Lithium has made it easier, too, to fabricate difficult shapes in glass, such as television tubes and sealed-beam headlights. It makes the glass easier to handle and shape at high speed.

Lithium compounds are employed in the production of synthetic Vitamin A and antihistamines. Added to face creams, lithium keeps them firm in hot weather, soft in cold. Lithium is also used in producing such varied

items as optical lenses, gramophone records, screechless blackboards for classrooms. Experiments are also going on with lithium in petroleum to act as a detergent, cleaning the engine as it lubricates.

The U.S. Atomic Energy Commission's enormous purchases posed a mystery, since lithium is neither radioactive nor fissionable. A clue to the mystery finally came from Japanese scientists. After analysing strange particles that had drifted into their atmosphere from Siberia, they announced that the Russians had exploded a hydrogen weapon and that the particles contained sizeable quantities of lithium. The reaction of a light isotope of lithium (Lithium⁶) with neutrons from atomic fission creates tritium, which when fused with deuterium creates a thermonuclear explosion.

If, as many experts believe, thermonuclear power for peacetime uses can be created from lithium and deuterium, mankind will not have to worry so much about exhaustion of its reserves of oil, natural gas and coal, or uranium. The reserves of lithium in the earth's crust and of deuterium in the ocean's water are practically inexhaustible.

High-energy fuels which depend on lithium will probably be developed first to power rockets and guided missiles. Information on these "exotic fuels," as they are called, is a matter of security, but it is no

secret that they are all based on hydrogen. By locking hydrogen—an explosive gas with a gigantic kick—into a light element like lithium, a powerful fuel can be obtained that will be not only comparatively safe to handle but very light. This is of enormous importance in rockets which consume floods of fuel.—(Condensed from *'Chemistry'*).

Treat Your Stomach Well and Keep Fit

TREATED well, your stomach is one of your best friends. All it needs is a regular supply of the right foods and a fair chance to digest them. Merely to satisfy the appetite is not good enough. Your diet must contain: (1) Body-building foods to make good your wear and tear; (2) protective foods to keep you healthy; (3) energy foods to give you power and warmth.

Every day you should eat some of the body-builders (milk, cheese, meat, fish, eggs, peas, or beans) and at least one large helping of the protective foods (green vegetables, carrots, or fruits). Then you can fill up with wholemeal bread and potatoes, which are both protective and energy foods—not forgetting that you also need butter, margarine, lard, cheese.

No one likes having to hang about four hours waiting for work and then being swamped with too much of it; nor does your stomach. It works best and without grumbles if it is fed at regular times and without rush. And so, if you are tired or worried you should eat a smallish meal and make up for it later when you are less rushed or upset.

Some people digest quickly, but can't take much at a time, and for them frequent though small meals may be necessary. Conversation at meal-times should be cheerful and peaceful.

Constipation is best prevented not by medicines but by eating plenty of vegetables and fruits, by regular exercise, and regular habits. Stomach powders may relieve pain but they don't cure stomach trouble. In any case, indigestion is often caused by irritation or anxiety, and a stomach mixture or powder won't cure that.

You can always have a good digestion if you:—

1. Don't go to work on an empty stomach.
2. Take regular meals and regular exercise.
3. Eat plenty of body-building and protective foods.
4. Drink plenty of water, and no alcoholic beverages.
5. Avoid patent medicines, powders or pills.
6. Visit your dentist once a year.
7. Don't smoke at all.
8. Be regular in your habits, and above all,
9. Keep free from worries of any kind.

—(World Digest, June 1958, Condensed from *Better Health*, London).

GROWTH from INFANCY to ADOLESCENCE

(A Scientific Study)

Dr. Arnold Gesell is a household word in U.S.A., as few men in history have influenced the rearing of children as profoundly as he has done during 37 long years. *'Today's Health'* the leading American lay journal dealing with matters of health, published by the American Medical Association in Chicago, is presenting in instalments Dr. Gesell's authoritative views on 'Child Development' and also his findings from birth to five years through sixteen *plus* a special article on adolescence "The Difficult Years." The first instalment deals with the first five years, based on recent studies at the Gesell Institute, of the Yale University.

Each child no doubt has his own rate and his own pattern of growth. But in general, children do follow clear growth patterns from infancy through adolescence and once you, as a parent, learn roughly what to expect at various ages you can then understand, guide—and enjoy—your child much better.

I. (a) Developmental trends from infancy through age two.—

One month:—A child does a lot from birth to 4 weeks. An one-monther sleeps more definitely and wakes more decisively; when you pick him up he responds with noticeable tenseness. When he lies on his back, his head is turned to a preferred side, his arm extended on that side with the other crooked. The

four weeker reacts negatively to pain and denial. He looks at his mother's face briefly and is not yet ready to smile. He can cry and so impose his wants on the outside world.

Two to three months:—From 8 to 12 weeks the baby who cries may be rocked in somebody's arms and helped to sleep. He is hungry for lights, movement, and for people as well as for food. A pre-sleep breast, or bottle feed is a trusty method of inducing sleep. Music succeeds well with some babies.

Infantile colic is common at 8 to 12 weeks. Orange juice is one of the worst offenders and should be replaced by Vitamin C substitutes (tablets) recommended by your doctor. Since the colic seems usually limited to the first 12 to 16 weeks of life, it is believed that a growth factor may be involved.

Four to seven months:—The 16-week-old can wait for his bottle. He now coos, chuckles, laughs aloud, smiles back at you; his eyes glisten and breathing quickens. Around 20 weeks, many babies may even cry when the father comes near; fathers should not take such a rebuff personally, advises Dr. Gesell.

At 28 weeks a baby welcomes his father's voice which frightened him at 20 weeks. The child now likes to touch, pick up grasp, and put things in his mouth; shift them from one hand to another and bang his toys and dishes on any chair or

table. Thumb-sucking is now at a peak. It is not proper to attempt to stop it now.

At 32 weeks, there is another period of temporary imbalance. He withdraws from and cries at strangers. He tries to creep along.

Nine to ten months:—He responds to "bye-bye" and smilingly welcomes strangers. He can now get up to his hands and knees and pull himself to standing. He understands "no," vocalizes spontaneously, imitates simple syllables like da; da; ma; ma. At this period a mother may try to toilet-train her baby. Parents often continue bottle-feeding, fearing the baby will not get enough milk. This is unnecessary. Ten to 16 ounces is adequate and can be given on cereals, puddings and sipped in small amounts.

One year:—He is serene, confident, and friendly. He loves to have an audience. Delighting in give-and-take social games, he can imitate simple actions and especially likes a "peek-a-boo," (*Ittachu* or hide and seek). He goes about freely on all fours and enjoys being chased. He can usually take a few steps, hand-supported. He prefers standing up when fed. One year tends to be an age of reasonably smooth functioning in all fields of behaviour.

15 months:—Another three months later is a dart, dash and flying age. Now able to walk, he throws his toys out and then shouts at you to bring them back! If allowed he will climb

stairs endlessly. Though wanting to feed himself he is often unable to do so. The big problem at this age, is having enough energy yourself to keep up with him!

18 months:—At this age the child delights in doing the opposite. If you call him to come near, he either stands still or runs in the other direction. He often walks backwards. Tell him to put something into a basket, he will empty what is already there in it. He shakes his bed, hangs his head, moves the furniture about, tears books or wall paper and takes things out from almyrahs. Quick tempered, he wants to have everything 'now.' He likes to take but not to give. Avoid giving direct commands like "come here!" Instead lure him with food, or a favourite toy. Or pick him up and carry him; you must make it physically impossible for him to get into danger areas in the house. If he is doing something you don't want him to, try playing the piano, tuning the radio, crumpling paper, or anything interesting. You will be surprised how quickly he will abandon his activity to participate in yours.

Two years:—This is a much calmer age—a breathing spell for both parents and children. He finds it easy to obey, comes when he is called, understands nearly everything he is told and uses words effectively. He is now loving and affectionate and often does things to please people. He is less likely to fall; runs and climbs more surely.

Successful toilet-training does not occur much before this age. You can help your two-year-old get to sleep by anticipating all of his bed-time demands such as toileting, a drink of water, a favourite toy, his good night kiss. On the whole the two-year-old is a loving companion and genuine joy in many homes.—(Condensed from *Today's Health* for May 1958, by T.N.S.R. Chari).

(To be continued)

WHEN YOUR CHILD GIVES TROUBLE

Dr. DICK GLOVER, M.R.C.S., L.R.C.P., London

CHILDREN often love to create a sensation and they don't care how they do it. In fact, the more outraged the reaction they provoke, the greater their delight. They flog a joke or an action to death, and are completely baffled when amusement turns to indifference and later to anger.

It was funny or clever the first time, why isn't it always good for a laugh or a word of congratulation? Any doctor will tell you that children hate to be ignored. In fact, they would rather be punished.

To illustrate this, let me tell you a story. I was once talking to the father of a small boy aged four about his wife's illness. His son kept asking the same question over and over again. Receiving no response, he picked up the poker and gave his father a clout on the ankle.

He was immediately given a severe smacking. After his tears had subsided, he sat quietly playing with his toys, smiling happily. He had achieved his main object. He had been noticed and, for a short time, he had got his father's undivided attention.

When the second baby arrives: Nearly every first child becomes difficult when the second baby arrives, and may take it out on Mummy or Daddy if he can. The new baby needs a great deal of attention and comes in for a lot of praise and adoration from parents and friends alike. And the older child does not realize that parents can find extra love to give to the new baby, without losing any of the affection they have for him.

All that he feels is that where he used to command his parents' whole love and caresses, an intruder has arrived to steal his love and worse still, his limelight. So he may vent his anger on the baby, tickling, prodding, teasing and squeezing it on every possible occasion and hiding his true intention by pretending to be loving it.

What can parents do about this? Try to interest your child in the new baby by inviting help in dressing, feeding or bathing him or her. Spend as much time as possible in playing with him when the baby is asleep, but don't overdo this as you may spoil him and make matters worse. Do not try to

buy his affection by telling him that you love him more than the baby. Children have long memories.

When a second baby (a girl) arrives and jealousy raises its ugly head, parents should tell their first-born that baby had been specially chosen to be his friend and sister and that baby belonged to him also. This usually works very well, until you have occasion to reprimand him for teasing the baby; he *may* tell you then that you told him it was his baby also and therefore, he could do as he wished with her! This will obviously make you think a while and decide what to do next.

Stealing:—Most children steal at some time or other; it does not mean that they are heading straight for the Borstal School or that they have bad blood in them. They steal for different reasons than criminals. The law of mine and thine is not clearly understood by them.

They are creatures of instinct. If they are hungry they will take food, from your home or someone else's house. If they have no toys, their instinct is to acquire some. Sometimes they steal merely because they bear a grudge against society in

general and wish to show their unhappiness and displeasure in a practical and sensational way; so they steal something.

It is not advisable to thrash a young child for stealing, unless he has been taught the difference between right and wrong and is really old enough to understand. In their first years of life, children learn by copying their parents. It is therefore not only unwise but grossly unfair, to punish a child for doing something that he has learned from watching you.

The imitative instinct is uppermost:—If you both shout and swear at each other, he will shout and swear at you. Don't reproach him for failing to hand round his bag of sweets if you never offer your pencils or your chocolates. Remember, Mummy and Daddy are his idols and, in his mind, what they do must be right and proper. The secret of success is this. Teach by good example. *Good parents usually have good children.* So watch your own behaviour before scaring the daylights out of your children and making, all your lives a misery. In other words, don't torture your children and with any luck they won't torture you.—(*Family Doctor*, London, July 1958).

Nagging will cause illness

"A nagging wife can drive a man into a breakdown faster than bad working hours or conditions," declares Dr. Desmond Curran a British Psychiatrist. Difficult mothers-in-law can also play a part in causing individual sickness, he told a medical congress in London. He said "medical complaints—like hats and ties—have their fashions. People who think it's fashionable to have some particular disease can talk themselves into having all its major symptoms."—(*Today's Health News*, July 1958).

Terra Not So Firma

Pisa's Tower is not the only Building that's Slipping

THE possibility that man and his works will sink below the surface of the earth is remote. Yet the fact is that man's footings—particularly the footings of his buildings—are often precarious.

The latest reminder of this was the news that the *Leaning Tower of Pisa*, seventeen feet out of perpendicular and still sinking on its low side, may have to be dismantled and rebuilt—a victim of the flaw that made it famous.

The world's worst sinkage problems are in Mexico City and Venice—where groups of buildings rather than individual structures are involved.

The whole centre of Mexico City is heading slowly towards nether regions. The old, massive School of Mines has dropped four feet at its middle. The Palace of Fine Arts, which used to be entered by a flight of stone steps, now has a street-level doorway. Even newer buildings have joined the trend. Streets are sinking twelve to fourteen inches a year.

The trouble is that the city was built on a deep bowl of volcanic ash, light and powdery in texture. Between the bits of ash, particles of water are suspended. The weight of the buildings compresses the ash. Wells pull out water, allowing the ash to compress still further. Whenever a resident of Mexico City takes a drink his town sinks a bit more!

Venice's problem is that its foundations are being corroded by water. The city of canals is based, for the most part, on oak and pine, with mortar between the timbers. The lower beams have over the years kept their original hardness. The upper ones—where the water laps and lets in air (and bacteria)—are rotting.

Three thousand palaces, monuments, houses, and other masonry works are in danger of toppling into the canals. There is scarcely a building with straight walls. Steps previously leading to the water's edge are now submerged, putting doorways at canal-level. The sinkage is so bad that one estimate gives Venice only fifty years before it is a ruin.

Smaller sinkages exist in Long Beach, California, and at La Guardia Airport, New York.

Long Beach's troubles stem from the extraction of oil and gas from below ground. La Guardia Airport was built largely on garbage fill-in and has sunk in parts as much as eight feet. The field's administration building rests on jacks which have to be given a twist now and then so it won't be mistaken for a subway terminal.

Sinkage for the most part is a problem involving individual buildings, such as the old bell tower at Pisa. Another famous example is the White House in Washington, which, in addition

to acquiring a new steel-supported inner shell, was bucked up in 1950 after its inner walls had dropped two to three inches.

Some other well-known buildings that have had foundation troubles are Westminster Cathedral, St. Paul's Cathedral in London, the cathedrals of Strasbourg and Beauvais, and Trinity Church, New York.

Today no new building needs to have continuing sinking difficulties (unless built in a whole area that is descending). The modern underpinning of buildings has become a science. Techniques now include hydraulic jacking (jacks powered by hand, gas, or electricity press down the pilings under a structure) and something called the pre-test method—which uses the weight of the building as well as the force of the jack to compress the earth beneath.

These advances were made possible largely through the experience gained when the New York subways were built, a construction job that involved underpinning fifty miles of adjoining buildings.

An occasional New Yorker sometimes voices the fear that all of Manhattan Island is descending, owing to the immense weight put on it by sky-scrapers.

The island, engineers reply reassuringly, is as buoyant as

ever. More weight has been taken off it—through excavation—than has been added.

The dirt and rock scooped out during construction almost always have more total weight than the building subsequently erected. A 20-storey building scales in, for example, at 12,000 tons; the earth and stone removed for its foundation weighs between 20,000 and 40,000 tons.

This difference is less where older, heavier buildings are concerned, and greater in the case of newer structures, which are becoming lighter and lighter through the increased use of glass and aluminium. A 25-storey modern office building may weigh no more than a 12-foot-high layer of dirt of the same base dimensions.

Even solid rock doesn't prevent settling entirely, though it minimizes it almost to the point of unmeasurability. The Empire State Building in New York sank after its construction in 1930-31 only an estimated one-eighth of an inch—which still left an adequate portion above ground.—(*The New York Times Magazine*, via W. D.).

[NOTE:—So we have here in this article sufficient warning to be very careful in house construction, particularly in places where ponds and tanks and low lying areas are sought to be filled with garbage as a reclamation measure.—Ed. HEALTH].

No Tooth Decay

One in every 100 persons is lucky enough never to have tooth-decay, which is due to something present in their saliva, that kills the bacteria associated with tooth decay. This "something" has now been isolated by Dr. Gordon E. Green *et al* of Ohio University. It is apparently a protein, and the source of this is being investigated.—(*Today's Health*, July 1958).

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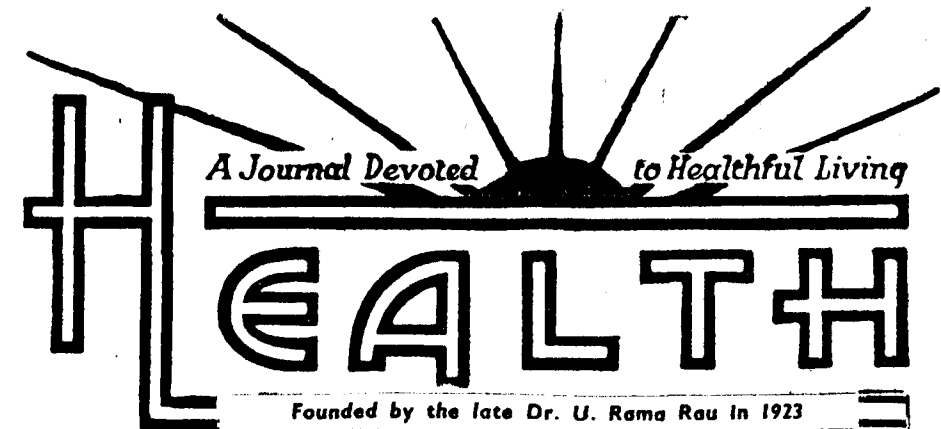
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CONTROL OF TUBERCULOSIS

Preventive Aspects Need Stressing

CONSIDERABLE interest is being taken of recent years in the problem of tuberculosis control. The results of the survey started by the Indian Council of Medical Research 3 years ago, using mass radiography would seem to show: that the incidence of this disease varies from 7 to 30% of the population; that males are more often affected than females and that the disease is more prevalent in people of 35 years and over, than in the age-group of 5 to 34 years. An unexpected finding however, is that lung tuberculosis is as common in villages as in cities and towns! Nearly 80 per cent of the people in India live in villages and outlying areas, where the level of education, health and nutrition of the people is low. The fact that the

infectivity rate in the rural areas is as bad as in the urban districts really demand an extension of our schemes of control to villages where the position, till recently, was not considered as bad as in the towns.

Lt. Col. M. L. AHUJA, I.M.S., very correctly says in one of his recent articles.

"Tuberculosis in India is like an iceberg—only a fraction of the mass is visible. The damage caused by what is not seen is incalculable.

Each year the money spent on treatment and control runs into crores of rupees. Hundreds of thousands of man-days are lost, as this disease in our country usually affects the group of people who should normally be working."

The basic principles underlying the control programme are;

(a) Prophylactic immunization of the susceptible population with B.C.G. vaccine, (b) early detection of cases by mass radiography and (c) wherever possible prompt recourse to domiciliary treatment, which is feasible, economic, efficient and also welcomed by the patient.

B.C.G. vaccination has now come to be acknowledged as exerting a material influence in the prevention of tuberculosis. The target is to vaccinate within the next 4 years, all the 170 million people who constitute the susceptibles in our country and in order to meet the vast demands for B.C.G. vaccine, the Government of India has established a large manufacturing centre in Madras at Guindy and also a plant for freeze-drying of this vaccine.

Other measures are also receiving attention *viz.*, the establishment of tuberculosis clinics and the development of domiciliary services. It is proposed to establish one clinic for every district, the target being 300 tuberculosis clinics which would all be fully equipped by the Central Government for X-ray and laboratory diagnosis and for domiciliary treatment; the buildings and staff will be the responsibility of the State Governments. Sixty such clinics are functioning at present.

It is proposed to establish eight Rehabilitation Centres for the training of patients, at a cost of nearly Rs. 30 lakhs.

Though considerable emphasis is placed on home-treatment of

patients, many patients with advanced disease require hospital treatment. Special thoracic surgery units, where major operations like lung resection etc. can be done, have been established in ten centres in various parts of India. There are at present about 23,000 beds for patients who need hospital treatment as against only 5,000 ten years ago. It is proposed to establish an additional 10,000 beds mainly for isolation of patients for which the Central Government is giving a subsidy to the States for this purpose; but even so, this bed-strength is quite insufficient to offer hospital treatment to the majority of patients who badly need it.

Domiciliary chemotherapy and chemoprophylaxis offer the only practicable approach to the problem. The Government of India will soon provide facilities for the training of doctors and other personnel in tuberculosis work. A scheme for establishing a National Training Centre for health visitors and social workers is being worked out; here greater emphasis will be laid on the *preventive aspects* on a community basis.

The people in our land should be unceasingly urged by constant and insistent propaganda by all welfare organizations to resort to hygienic methods of living; to our mind this constitutes the basic measure for the effective prevention of tuberculosis.

Developmental Trends from Infancy through Age Five

II

(Continued from p. 189 of HEALTH for Aug. 1958)

Two and a half years.—Two and a half years is a peak age of disequilibrium. Parents frequently say: "I can't do a thing with him!" Gesell researchers call this the "*Imperial Age*" because the two-and-a-half-year-old behaves like a Roman emperor!

The child is dictatorial, domineering, and demanding. Father is often rebuffed if he tries to take over the feeding.

A two-year-old cannot make a clear choice and stick to it. He shuttles back and forth between opposite extremes. "I want it—I don't want it." He also balks at anything new. If you tell him four stories before bed time yesterday, he wants to hear the *same* ones tonight, too.

Rocking is now often at a peak, so Gesell experts recommend padding the child's crib heavily or putting a soft rug under it. Constipation may be a problem, especially for a girl. Frequently the reason is that parents don't give her privacy, which she needs during elimination. Try a relaxed diet, prune juice, or a good non-abrasive laxative before concluding that your child's constipation is an "emotional problem."

Working around the rigid behaviour characteristics of two and a half is usually more effective than meeting them head on.

A little humour helps your patience and willingness to use

endless techniques will help you get through this difficult period.

Three years.—Three is a "good" age. Your child now says, "yes" just as easily as he formerly said "no". Another word that he now often uses is "we," revealing his new, co-operative attitude. You can often get him to do something by citing another child who is doing it "right." You can reason with him, too, by challenging, "let's pick up the toys so we can have more room to build after dinner."

Three likes to share—both objects and experiences. He doesn't need elaborate rituals and no longer wants everything to be done *his* way. Now more flexible, he enjoys doing things *your* way. People are important to him.

The three-year-old loves new words and phrases and they often act like magic in influencing him to behave as we wish. They include such words as "new," "different," "big," "surprise," "secret," "help," "might," "could," and "guess." Phrases like "how about?" "you could help," "you might try" can also motivate him to perform necessary tasks. You can bargain with a three-year-old. He can often be persuaded to do something unpleasant "now" if "later" he can look forward to an attractive reward.

Three and a half years.—But the parent soon has trouble

again! Three and a half is insecure. Having poor co-ordination, he often stumbles, falls, fears high places and may now begin to stutter. He may also complain that he "can't see" or "can't hear". A child whose hand and arm movements until now have been strong and firm may now suddenly draw with a thin, wavery line. Temporary crossing of the eyes isn't uncommon. Tension outlets are now exaggerated. A child may suck his thumb a great deal, blink his eyes, bite his nails, or exhibit facial or other tics.

At three and a half, whining is at its height. Some parents threaten, "If you don't stop that whining!" But the most effective way to cope with whining is to prevent it, *not* punish it. If your child whines, it means that he needs more attention, point out Gesell experts. He may need someone to play with; need to be helped to play more creatively; or have his day planned differently. He may need more rest or more frequent snacks, or more interesting things to fill his life, such as attending nursery school which usually reduces whining.

Three and a half is also extremely jealous and demands adult's exclusive attention. It helps enormously if you realize that insecurity is normal for this age. Knowing what to expect can keep you from blaming your environment and instil in you the patience to give your child the extra affection and understanding that he so urgently needs at three and a half.

Four years.—Four is even more difficult—more so than at any other age. A child is "out of bounds" in nearly every direction. The four-year-old hits, kicks, throws stones, breaks things, runs away. Loud, silly laughter alternates with fits of rage.

His language shocks everybody. "Where did he hear such awful language?" many parents ask. The less attention you pay to it, the more quickly it disappears.

A four year-old is usually defiant of parents, swaggering, and boastful. Even punishment threats have little effect. The line between fact and fiction is very thin for him. He may not actually tell lies—it's just more interesting that way. But learn to enjoy his imaginings.

You must set limits and be firm. But remember that this "out-of-bounds" behaviour is a *necessary* part of his development, say Gesell scientists.

Four and a half years.—At this age he begins to outgrow his "out-of-bounds" antics. Trying to differentiate between real and make-believe. Making a *real* drawing of an airplane, he includes a long electric cord so you can plug it in. Yet he can become confused between what happens on TV and what is real.

The four-and-a-half-year-old also finishes what he starts. For instance, when he begins building a farm with blocks, it ends up a farm, not (as at four years) a fort, a truck, or a gas station.

He shows a beginning interest in letters and numbers and

counts well. In drawing and looking at pictures, he is aware of the front and back, inside and outside. He may draw a man on one side of the paper, then turn on the other side to draw the back of his head! This is a 'catching up' age for many children, especially boys, who have been slow in physical or language development.

Five years.—Five is generally a "good" age. 'He's an angel,' many mothers now sigh. 'He's almost too good,' some fathers worry.

A five-year-old is reliable, stable, friendly, not too demanding, and well-adjusted. He is satisfied with himself just as

others are with him. He is content to stay near home base. Mother is the centre of his world and he likes to be near her, do things with and for her. He enjoys obeying her commands. The five-year-old likes to be instructed, get permission, and be a 'good boy.' He welcomes supervision and likes to be praised for his conformity.

While it lasts, five is an enjoyable age for everybody. But the laws of childgrowth show that a child needs more than five-year-old equipment to meet the world.

[Note:—Next month we will report the Gesell Institute findings on ages six through 10].

—(*Today's Health*, May 1958).

From Low Beginnings

A Glasgow boy aged fourteen, got his first job—sweeping and washing up in the laboratories at Glasgow University. Fifty years later, in 1953, he became Chairman of Imperial Chemical Industries, Ltd.—one of the largest industrial empires in the world.

There is still about Sir Alexander Fleck, at the age of sixty-seven, an air of enthusiasm reminiscent of the young man who, after three years as a lab boy, became a student. And then, at the age of twenty-two, graduated in chemistry and moved on to a teaching appointment on his University's staff.

By 1913, ten years later, he had his own research laboratory. The vast expansion of the chemical industry during the 1914-'18 war took him to the Castner-Kellner Alkali Company. That became a subsidiary of Brunner, Mond and Company in 1920 and that, in its turn, merged with the I.C.I. in 1926.

From this rather story-book tale one might expect to meet a business tycoon. One meets instead a scholar rather than an industrialist at heart, still the boy who became a student essentially because he "wanted to know." —(*Weekly Scotsman*).

[Note:—Sir Alexander Fleck will be accompanying the Duke of Edinburgh, when the latter visits India, to attend to the Indian Science Congress to be held in New Delhi between 21st and 28th January 1959.—Ed. HEALTH].

A Nightcap for Asthma:—Melt a dessertspoonful of honey and a level teaspoonful of butter in cupful of hot milk, and drink piping hot, last thing at night.—(*Good Health*, London, April 1958).

"He who has health, has hope, and he who has hope, has everything."

TAKE PROPER CARE of YOUR LIVER

IF you take proper care of your liver, your liver will take care of you.

The liver is the master laboratory of the body. Its chemical genius is fundamentally essential to the strong beat of your heart, the wide open channels of your blood vessels, the soundness of your digestion, the sharpness of your brain and the strength of your muscles.

The liver's cells brew a vast and varied chemistry essential to the smooth functioning of all our organs. As examples:—

"Our kidneys couldn't dispose of waste nitrogen if the liver didn't turn it into urea for excretion. The liver stores vitamins necessary to the birth of blood in the marrow of our bones. Although sex activity begins in our gonads, it's the liver that balances their hormones so that we're neither impotent nor sexually wild. The liver builds amino-acids into the albumin that regulates the balance of salt and water without which we could not live. And the liver's bile governs intestinal activity so that we're not poisoned by products of our own digestion.

When we're hit by hæmorrhage, we would die if it weren't for the liver. It not only controls bleeding but helps by another substance to guard us against clotting that may fatally block coronary arteries of the heart and blood vessels of the brain. It combats viruses and bacterial poisons and tosses them out of the body. It gets rid of dangerous excesses of medicines, and keeps our tissues safe from chemicals encountered industrially.

This super-chemist releases energy from food. From carbohydrates it makes and stores glycogen and splits it into sugar—slowly in life's routine and lightning-fast in emergencies. And it sees to the widespread deposit of fat for reserve food when we're ill or starving".

It's no wonder, in view of its tremendous activity, that the liver is the largest of all glands, 1/40th of the total weight of the body. Dark-red, dome-shaped, it fits snugly beneath the diaphragm, high up in the right side of the abdomen under the protective bony cage of the ribs.

Here's the liver's mystery:—"Its complex duties are all performed by just one kind of cell. Tiny, in millions, they are arranged in cords, one cell in thickness, bathed in a never-ending river of blood. Part of this blood, rich in foodstuffs for the liver's chemical kitchen, comes by way of a great vein from the digestive tract; another part, high in oxygen, comes by way of an artery direct from the heart. The liver mixes these two streams of blood just before they merge to flow round the cells, the working units of the master laboratory."

You'd think the incessant labour of the liver's cells would wear them out and kill them. It does just that. But the liver has a unique virtue: *potential immortality*. Brain cells, heart cells, dying, cannot be replaced. But the liver regenerates itself over and over again. Experiments have removed big pieces of the liver from an animal, again and again, at intervals, until the total amount taken out exceeded by far the total original weight of the organ. That's the secret of the liver's durability.

Yet the liver sometimes does break down under the mighty load it carries. The final consequence of breakdown is the dreaded cirrhosis. When—despite their remarkable trick of regenerating—liver cells die too fast,

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they leave behind them fibrous masses of hard connective tissue.

Luckily, as our liver begins sinking in this desperate state, it signals its plight. Vascular spiders—little blood vessels radiating out in fine branches—appear on the face and shoulders of victims of approaching liver failure. There's deep fatigue, muscles waste, sex-urge fails. The liver enlarges, and chemical tests show that it's no longer keeping up the level of the vital albumin of the blood.

The microscope reveals that in such sick people there's a sinister change in formerly healthy liver cells—as they get fatty. In their one-sided battle against unending chemical insults, the cells fill up with fat and die.

The first hope to fight this fatty doom of the liver came from a Canadian, Dr. C. H. Best, and his associates in Toronto in the 1930's. They found that the lack of certain vitamins in the diets of animals is a factor in the drowning of the liver cells in fat. By adding *choline*, a fat-moving B vitamin, they warded off this affliction.

In the 1940's this experiment spread into a portentous scientific fact:—What wrecks liver cells is often *nutritional* failure under their overload of chemical work. Of course, our livers are prone to many ills, including cancer and virus diseases such as serum jaundice and infectious hepatitis. But dominating all these, statistically, is the death of liver cells *due to their own malnutrition*.

Dr. Arthur Patek of New York began a clinical fight against this deadly hidden hunger of the liver cells of human beings, many of whom were far gone with alcoholic cirrhosis. His treatment? *Rest, a highly nutritious diet and big doses of liver extract, dried brewers' yeast powder, B-complex and other vitamins—and, of course, no alcohol*. The recovery of many seemingly hopeless cirrhotics was amazing. Yet not too surprising when we remember the astonishing doggedness of the liver. One of its prime duties, making albumin out of amino-acids, still goes on when 90% of its cells are destroyed! Properly treated nutritionally, many victims of cirrhosis with a sinister accumulation of fluid in their abdomens, formerly highly fatal, now return to work.

Nutritional treatment of cirrhosis holds hope not only for heavy drinkers but for us all. While liver disease is highly prevalent among alcoholics—some of whom are notoriously poor eaters and thus threatened with hunger that hits their livers—many of us may teeter on the brink of malnutrition, though we think we're eating adequately. For example, *choline*, vital to keeping fact out of the liver, is not too abundant even in the best balanced diet.

We're in luck, in view of the frequency of liver disease, that its predominating cause, malnutrition, doesn't need a specialist's attention. The general practitioner can not only treat it but can prevent it,

Treatment of liver malnutrition seems relatively simple. Dr. Frederick Steigmann of Chicago, who has treated more than 1,000 cases of serious liver disease over the past 15 years, feeds these patients a diet high in calories; average-to-high in proteins, high in carbohydrates, and average in fat. Though the diet itself is rich in vitamins, the patients are given supplements. Vitamin C is prescribed in big doses since only a little of it is stored in the body. Crystalline B Vitamins and Vitamin B₁₂—a powerful fat-remover—are administered in large amounts.

Patients severely ill are also given crude liver extract, not only for its B-complex but because of possible vitamin factors still not defined. And all patients are sternly forbidden

to take alcohol. Dr. Steigmann has thus cut down immediate hospital death from 48 per cent 15 years ago to 15.6 % today.

If the nutritional treatment of advanced cirrhosis is so powerfully curative, why not use it to guard the liver while its cells are still normal? If we give our liver the right nutrients to work with, its cells will help to guard themselves. The nutritional supplements, added to a good diet, can be much like those used in the treatment of a sick liver—but less intensive and expensive. It takes far less to prevent liver failure than to relieve it.

This *preventive* nutrition is a cheap price to pay for a strong liver—our best chance for top vitality.

—(Condensed by Paul de Kruif from *Today's Health*).

Pass the Salt, Please

It is one of our most cherished beliefs that we need to add salt to food for our health's sake. But the evidence goes to show that it is not necessary for our well-being. Indeed, as the Medical Correspondent of *The Observer* reports, "studies of the dietary habits of various races are producing evidence to suggest that eating too much common salt may be a *prime cause of high blood-pressure*."

Dr. Lewis Dahl, whose observations he quotes, states that West Indian Negroes with their partiality for salted pork, Egyptian peasants, who relish salted cheese, and Southern U.S. Negroes who eat quantities of salt pork, and fish, all suffer much more than whites, from hypertension. "In Japan, where salt consumption is far higher than among other Oriental peoples, the apoplectic stroke from high blood-pressure is the commonest cause of death.

"Adding salt to food is not necessary for well-being. Dr. Dahl points to such vigorous groups as the Eskimos, certain of the Chinese, and the North American Indians, the Lapps, and the Masai of Africa who eat only what salt occurs naturally in their foods. Moreover, during the past ten years he has personally studied 75 hospital patients who are receiving a very restricted salt diet for various diseases, and he has found them able to live active lives as well as being physically and mentally well.—(*World Digest*, June 1958).

Let us all work for peaceful co-operation and peace throughout the world, with an abiding faith in human goodness.—(P.F.R.).

What The Sex-Books Don't Tell You ⁷⁶⁴

(Forthright marriage guidance for young couples—
by a distinguished authority on sex problems)

Dr. DAVID MAGE

WHEN young couples approaching marriage today ask questions about physical intimacy, the questions, I find, often concern mechanical details of the sexual act. Behind these questions is a fear that only the right "technique" can guarantee the physical success of the marriage relationship.

Where does this unfortunate attitude come from? I have decided that it comes as much as anything from having *read too much* about the subject. "The book says" is a phrase that invariably comes up in my interviews. Well, what *does* the book say? After reviewing a good many of the books available on this subject, I have come to the conclusion that sex books try to do three things: (i) give physical facts; (ii) describe techniques of union; and (iii) set standards for sexual expectation in marriage.

I am not against this knowledge as such. The married couple should of course know the basic facts about their sex organs. But the mistake the sex books make is, that they over-emphasize the physical factors and fail to emphasize the emotional factors, which are really much more important. When sexual functioning gets out of adjustment, the cause is seldom physical. (If it is physical, a doctor is needed, *not* a book). So long as the emotional feelings between the couple are right, so long as

there is mutual trust and love, their bodies will invariably make the appropriate responses, and adjustments.

While marriage manuals do not ignore emotional factors, all too often these get lost in a welter of detailed descriptions of the sexual apparatus, internal and external. Coupled with this is an exaggerated and altogether uncalled for emphasis on the so-called "sexual technique," designed to enable the husband to bring about the right response in the wife.

This is a relatively new idea. In the Victorian era it was considered unladylike for a woman to make any active response in the sex-relationship. But the official theory to-day is quite the reverse. The wife *should* have an orgasm! If this does not happen easily, it is up to any self-respecting husband to master the technique that will *make* it happen!

Some elementary instruction here can be helpful. When the wife's responses are slow, a loving and considerate attitude on the part of her husband can sometimes enable her to achieve fulfilment which she might otherwise miss.

Unless the husband's efforts achieve success within a reasonably short time however, they

can lead to complications. There is a limit to which he can put restraints on his feelings without beginning to interfere with his own spontaneity. When this happens the result may be a hindrance, rather than a help, to his wife; the "technique" by which he hopes to win her response is often the very thing that makes it difficult for her to respond.

For the wife's response must be emotional and psychological—not mechanical. She seeks the experience of being possessed—but as a person, not as an object. Freely giving her body to the man of her choice is an exciting experience for her, playing an important part in awakening her own desire. Her fulfilment is bound up with her awareness that she is meeting an urgent hunger in one she deeply loves. (*This is the rational normal approach.* And it is lost when her satisfaction becomes the object of her husband's elaborate painstaking conscious and often vain efforts).

By tending to establish standards for the happy marriage, sex books also give a young couple a misleading impression. The sex books are not describing the average couple. They are describing the supposedly perfect physical relationship, which in their terms means mutual and simultaneous orgasm (a totally misleading and unwarranted advice; for 'orgasm' occurs not to order, but spontaneously and often in spite of conscious efforts).

The sex book description can play havoc with the feelings of

a sensitive young couple with high aspirations. They naturally don't want to accept a second-rate standard in their life together. But they should know that for many couples simultaneous orgasm is not likely to be always attained and yet that does not mean they cannot be happy in their sex life. They can—*unless they start worrying about it.* When two people set a sexual goal at which they do not fairly soon arrive, the husband, feeling that he is incompetent because his wife isn't "reacting right," becomes anxious. This adds powerfully to any secret worries the wife may have. The result is that their sex-relationship, instead of inviting them to fresh discovery, becomes a focus of increasing tension.

Sex books give the impression that success in marriage is essentially a question of good sex-adjustment.

This simply is *not true*. A mutually satisfying sex relationship is important, but lasting sexual satisfaction is the result, rather than the cause, of good inter-personal adjustment. I have known couples who in the early days of marriage achieved a sex relationship which the text-books would rank as perfect. But this did not prevent their marriages from going on the rocks. I remember one wife who put it neatly. "Our sex relationship was perfect," she said, "but we failed in our personal relationship. And now our sex relationship has nothing to express."

Precisely. A sex relationship between a married couple is closely linked with the totality of the interplay between the two. The sex relationship is, in the last analysis, a function of the *love-relationship*, not the other way round.

We need more emphasis on the emotional, aesthetic and spiritual aspects of the sex relationship and less preoccupation with the physical and the mechanical. We also need less dogmatic definitions of the course which sexual

behaviour should follow in marriage.

To quote from an eminent authority:—"A natural and mutually satisfying sexual adjustment is highly individual. There are no rules governing frequency of intercourse, position, timing and all the elements that go into developing a satisfying relationship. Whatever provides satisfaction for both partners and leaves them comfortable and healthy is best for them."—(*McCall's via Reader's Digest*, May 1958).

Ars longa, Vita brevis

The horse and mule live 30 years,
And nothing know of wine or beers.
The goat and sheep at 20 die
And never taste of Scotch or Rye.
The cow drinks water by the ton,
And at 18 is mostly done.
The dog at 15 cashes in
Without the aid of rum or gin.
The cat in milk and water soaks
And after 12 short years, it croaks.
The modest, sober, bone-dry hen
Lays eggs—for nogs—then dies at ten.
All animals are strictly dry;
They sinless live and early die.
But sinful, ginful, rum-soaked men
Survive for three score years and ten
And some of us, though mighty few,
Stay pickled 'til we're ninety-two!—(*Anon*).

World Peace

Let us all remember that violence cannot be the basis for the hope to preserve life and that only renunciation of violence and the peaceful co-existence of peoples in combination with gradual disarmament can afford a sound basis for international peace.—(*U.S.S.R. Bulletin*, Sep. 1958).

DENTAL HEALTH

1. The Teeth in Early Childhood

(Continued from page 131 of HEALTH for June 1958)

THE period of teething has fluctuating troubles for many mothers, beginning at above five months of age in most infants and carrying on until the third year. It is pleasing to watch the teeth developing into a well-formed set, in perfect line and harmony.

The teething period.—When baby is teething the gums are usually tense and hot, there is an increased flow of saliva, and he will have a great urge to bite things. This biting should be encouraged by giving him something hard to bite on. Occasionally, although it is seldom necessary, the gums have to be lanced to help an erupting tooth to come through more easily. It is a very simple operation and need give no cause for alarm.

If the gums are very inflamed relief can be obtained by massaging them with the little finger, using a solution of glycerine and borax. A generous quantity of cooled, boiled water should also be given during this stage, and sips of this on a small spoon will always be welcomed by the infant. Another sign sometimes accompanying teething is diarrhoea. It can be due to the general upset of the child and if severe, a doctor must be consulted. Attacks of vomiting and sometimes bronchitis may herald the eruption of a tooth and an accompanying cold is a common occurrence.

Delayed eruption of teeth.—Delayed eruption of the milk

teeth, can be attributed to rickets, which shows how important it is to have a diet rich in calcium and with a sufficiency of Vitamin D. Remembering that most of the milk teeth are formed before birth it is possible that their fate will depend upon the mother's ante-natal health, diet and habits. Also when the baby is born his own vitality will have its effect. Poor health will affect his appetite and there is the possibility of the calcium not being properly absorbed and used for bone-formation. Quite often delayed eruption is hereditary and we need not worry as long as the teeth appear eventually within reasonable limits.

Causes of decay of milk teeth.—That it is caused by chemical, bacteriological and physical reactions is generally accepted. Also it has been proved that whereas the enamel covering of the teeth once lost is irreplaceable, the underlying hard substance called *dentine* can resist the attacks of micro-organisms and can repair itself to some extent. This process of repair and resistance is probably related to the general health and vitality of the individual.

Care of the milk teeth.—At three years of age most children have a complete set of milk teeth. The future of these will depend upon the care taken of them and the good advice of the dentist.

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A child's teeth should be cleaned as soon as they are through the gums. The mother should begin this by first of all using cotton wool dipped in a warm solution of sodium bicarbonate. The child should be encouraged to clean his own teeth although the majority of children cannot manage to do this properly until 3 or 4 years old. When using the tooth brush the adult should stand beside the child holding the brush in the right hand. The fingers of the left hand should be used to draw the lips away from the teeth thus enabling a sweeping motion in a direction downwards away from the gums and over the upper teeth and a motion upwards over the lower teeth. This technique is necessary in order to clean properly between the teeth, although it is rather difficult to clean the back teeth this way.

Many people may still say "why worry about the first set of teeth?; they have to fall out anyway." It should be realized that the presence of the first

teeth is necessary for the proper development of the face and jaws, and the maintenance of space required for the proper eruption later on of the permanent teeth.

When we see that some of the milk teeth remain *in situ* until the age of thirteen or even longer, we can appreciate how really important their presence is. However, in some instances, due allowance must be made for heredity-factors, whereby some of the teeth decay whatever we do, and we can assume that they are better, either left in, if not causing pain, or extracted. In this way, pressure of the other teeth is sometimes relieved preventing their displacement, or proneness to decay. Excessively decayed milk teeth are often best extracted since they can be the breeding ground of bacteria causing decay; teeth causing bad breath (halitosis) should be removed. Whatever we do, it is best to remember the old adage, "a stitch in time saves nine." —(Mother and Child, London, Feb. 1958). (Condensed by T.N.S.R.)

Too Much Milk

"Over-feeding of children during the period of growth and development shortens this period, so that adult size is reached earlier, and also shortens life," Dr. Hugh Sinclair, Vice-president of Magdalen College, Oxford, told a World Health Day meeting this year at London University Senate House.

"I believe we must be careful lest by pouring unlimited milk down the throats of children we hasten chronic degenerative diseases. There are serious defects in cows' milk as a food for infants, and national dried milk has even more serious defects," he added. "Orange juice is not the ideal vehicle for vitamin C, and cod-liver oil is far from being the best vehicle for vitamins A and D."

Everybody should realize that the protection of the world from atomic death is the common cause of the people in our troubled times.

Are Skin-creams of Any Real Value?

Can They Do Any Good?

Dr. JOHN EBLING

FROM the safe harbour of scientific fact, that cosmetic business appears at best to be a half-charted sea. Are the more imaginative claims of the writers of advertising copy true, or are they mere travellers' tales?

To try to assess the value of an advertiser's claim one needs first to know something of the structure and physiology of the skin. Then several questions may be asked:—

"Is there sound evidence for believing that the applied substance might have a beneficial effect? Will it be sufficiently absorbed to be utilized by the skin? Does it work in practice?"

Unfortunately, manufacturers of skin creams are chary of providing all the answers. Frequently they do not state what the preparations are made of, and rarely do they publish objective evidence of their utility.

If a face cream works, the makers are unlikely to disclose its nature to competitors. If there is any doubt about its usefulness, it would hardly be good business to tell the prospective buyers!

The bed of the skin is called the *dermis*; on it lies a many layered cover known as the *epidermis*, which—like all other living tissues—is composed of little units or cells.

In the lower or *Malpighian* layer of the epidermis new cells are continually being formed by division into two, of pre-existing

cells; this probably happens at the greatest rate during sleep.

The older cells are constantly pushed outwards and they manufacture within them a horny substance known as *keratin*. As a result they die; the dead cells cling to their neighbours and form tough sheets—the keratinized layer—which is continually worn away.

There are no blood vessels actually within the epidermis, but they ramify throughout the dermis and produce a network of capillaries near its junction with the epidermis. By this pathway the epidermal cells get food—amino-acids for building up the protein keratin, and sugars necessary to provide energy for cell-division.

The skin surface is perforated by the hair follicles, which are pits lined with epidermis, from each of which grows a single hair. Opening into each follicle is a sebaceous gland which secretes a waxy substance called sebum on to the hair and on to the skin. Also opening directly to the surface are the sweat glands which secrete an acid watery fluid.

The normal healthy skin is quite strongly acid. If dilute alkalis are applied they produce only transient changes and the acid reaction is quickly restored; the acidity is thought to prevent bacterial infection.

The common fungal infection of the human skin, the organism causing athlete's foot, grows in areas, such as between the toes where there are no sebaceous glands. It can be destroyed by applying creams containing *undecylenic acid*.

Sebum is miscible with and contains water in an emulsion with the waxes; the outer layers of the epidermis swell up and become white, a wet dressing is left on the skin, also the palms and the soles when one stays too long in water.

Water to some extent penetrates the skin; a large number of important compounds—such as sex-hormones and Vitamins A and D—which are soluble in fats and oils, pass into and through the skin with ease.

Fats themselves, although they may be absorbed by the surface layers of the epidermis and perhaps at the mouth of the follicles, do not appear to pass further.

A direct proof that they do not enter the skin comes from some recent American experiments in which spermaceti labelled with radioactive carbon was put into cold cream and applied to the skin. No radioactive carbon entered the body.

On this evidence it seems improbable that facts and waxes can be of any nutritive value to the skin. Nevertheless, they form the basis of nearly all face creams. What then is their use?

The skin certainly needs a dressing of fatty material and this is supplied naturally by the sebum.

Civilized people constantly remove this natural dressing by washing with soap and water, a process either necessary because of the dirt of our industrial cities or desirable for æsthetic reasons which were not fully appreciated by our ancestors.

This excessive washing, when combined with cold weather, has a rather disastrous effect on the skin; the result is a cracking apart of the horny layer which is known as chapping. It is much commoner in older people whose sebaceous glands have become less active, and it can easily be prevented by application of any greasy or waxy substance, a vegetable oil or other fat. (Here's a case for weekly or more frequent oil baths enjoined by Hindu custom)

The time-honoured view is that somehow or other the fat lubricates the horny layer and prevents it from cracking.

Evidence from fairly recent experiments, however, suggests that the natural sebum—or the fat in face cream—does not of itself keep the horny layer pliable, but merely prevents excessive drying and consequent cracking.

The main function of face creams is to prevent this cracking of the keratinized layers of the epidermis due to water-loss. The cream puts back on to the surface of the skin the natural secretion of the sebaceous glands which is removed by washing and diminished by ageing.

Most creams are emulsions of wool fat (lanoline). Hormone creams must be put in a rather

different category. Most of them contain female hormones, or oestrogens—substances normally produced by the ovaries which have a widespread effect on the tissues; they help to bring about the development of the breasts and are involved in co-ordinating the cyclic changes which occur in the reproductive organs.

Oestrogens certainly appear to prevent changes associated with the ageing of the skin, and we have some idea of how they could work. They may increase the rate of proliferation of the epidermal cells, probably by promoting the utilization of sugars, and they seem to increase the rate of keratinization and subsequent loss of cells. They also probably affect the dermis.

One of the changes associated with ageing is the gradual loss of water from the skin, and it is possible that oestrogens cause water to be retained and thus promote a firm skin texture.

The necessary amount of hormone is very small and not

enough to produce undesirable effects.

Some skin creams are stated to contain vitamins. Vitamin A readily penetrates the skin, so there may be a rational basis for putting it into the face cream.

Water soluble vitamins of the B group are also important to the skin. I am told that yeast is a popular constituent of face-packs.

I think, nevertheless, that one should remain sceptical about the value of these so-called nutrient creams stated to contain vitamins aminoacids, sugars or their derivatives!

No satisfactory evidence has been published that they are beneficial in practice. Moreover, even if they can be absorbed and utilized, one would only expect their external application to improve the skin in conditions where they are normally lacking. I cannot help feeling that the best place for such substances is in the diet.—(*The New Scientist*, London).

N.B.:—The italics are all ours—Ed. HEALTH.

How to Make People Like You

I recently met a distinguished botanist at a dinner party. I found him most fascinating. I literally sat on the edge of my chair and listened while he spoke of hashish, and indoor gardens, and told me astonishing facts about the humble potato.

I told him I wished I had his knowledge—and I do. There must have been a dozen other guests. But I ignored everyone else and talked for hours to the botanist.

Midnight came. I said good night to everyone and departed. The botanist then turned to our host and paid me several flattering compliments. I was "most stimulating." I was this and I was that. And he ended up by saying that I was a "most interesting conversationalist."

I had merely been a good listener and encouraged him to talk! Remember that the man you are taking to is a hundred times more interested in himself and his wants and his problems than he is in you and your problems.

—(Dale Carnegie).

How Honest Are You?

Which sort of honesty is yours? Is it the kind that merely keeps you respectable, the kind that is applied no matter what the cost? This quiz will puncture vanity and self-deception, because sometimes the "obvious" answer wins the highest pointsand sometimes do not

1. If you suddenly find that for the last month you have unintentionally been using a season ticket which had expired, would you (a) Own up? (b) Realize you are on to a good thing and carry on using it? (c) Buy a new season ticket and keep quiet about your month's free trips?

2. Do you always tell the shopkeeper if he has given you too much change? (a) Yes. (b) No.

3. Do you consider it reasonable to give a made-up excuse for refusing an invitation? (a) Yes. (b) No.

4. When do you think one can tell a lie to a child? (a) To keep a surprise? (b) When they ask awkward questions? (c) To avoid unpleasant facts, like a death? (d) Never?

5. What is your attitude to the Customs? (a) You don't bother to declare small objects. (b) It is fun to get away with a little extra wine. (c) You always declare everything on principle. (d) You declare most things in case your luggage is searched.

6. Do you always give your fare to another passenger if the conductor is not around when you leave the bus? (a) Yes. (b) No.

7. Do you disapprove of evasion of income tax on a small scale? (a) Yes. (b) No.

8. Can you recollect an incident in childhood when you got away with a small theft or lie? (a) Yes. (b) No.

9. Do you think there is any harm in not telling the whole truth when answering applications for a job? (a) Yes. (b) No.

10. Have you ever used a dud coin in a slot machine, or telephone-box? (a) Yes. (b) No.

11. If you knew that your son (or daughter) had cheated in an important exam. would you: (a) Go and tell the head master? (b) Congratulate yourself on having a smart child? (c) Have a serious talk with him (or her)?

12. Do you think it is less dishonest to cheat a large organization such as the Gas Board, than to cheat an individual? (a) Yes. (b) No.

13. Have you ever told a good story about yourself to impress an audience? (a) Yes. (b) No.

14. If you were discussing politics with your boss and his views were different from yours, would you: (a) Just say what you felt? (b) Agree with him? (c) Be non-committal?

15. Do you always pay your share in a restaurant or in pub? (a) Yes. (b) No.

16. Have you ever taken a year off your child's age to get something half-price? (a) Yes. (b) No.

17. Have you ever helped to spread a rumour about someone you don't like? (a) Yes. (b) No.

18. Would you ever tell a lie to shield a friend? (a) Yes. (b) No.

19. Can you tell a lie without blushing? (a) Yes. (b) No.

20. Have you looked at the answers while doing this quiz? (a) Yes. (b) No.

Answer these truthfully and turn to page 214 for your "Honesty Reading."

POTATOES in the AMERICAN DIET

Solanum tuberosum, like everything else, has its advocates and its detractors as an article of diet. Under the title of "Potatoes—Facts for Consumers' Education," the United States Department of Agriculture has issued a booklet full of information regarding this vegetable.

In the natural state the potato is supposed to be indigenous to South America, the Red Indian name for it being 'batata.' It was carried to Europe by the Spanish Conquistadores, and according to the booklet was introduced into North America from Europe in the 16th century. In 1955 the total production in the United States was 11,350,000 tons. The average consumption per person in the U.S.A. is to be about 12 potatoes per week. Consumption is greater in the North-Central and North-Eastern States than in the South and West. Notwithstanding its liability to attack by various fungal and insect pests, *e.g.*, the 'Colorado beetle,' it is a fairly easy crop to raise,

and is an important article of diet in the 'wide open spaces' and probably among the lower-income classes. The higher income classes prefer potatoes tastily prepared in the form of 'chips,' 'straws' and 'crisps.'

Potatoes are graded according to size and shape—long and round. A great market has developed for pre-packed potatoes, inspected, washed, and packed in quantities conveniently suited to the requirements of small or large families and caterers.

The booklet also emphasizes the value of the potato as a source of vitamins B and C, protein, and iron, illustrating its thesis with graphs showing the content of these constituents.

The usual criticism launched against the potato is that it has a tendency to be fattening, but the booklet assures readers that the potato has a place in a reducing diet.—(*Bulletin of U.S.A. Dept. of Agriculture*, No. 178).

Fluorine in Foods

Most foods contain less than one part per million of fluorine, and this is true even of plants which are grown on soils which are rich in fluorine. This is thought to be because the fluorine in the soil is present as insoluble calcium fluoride, which is not taken up by plants. Tea, which grows in an acid soil, seems to be an exception, and in some countries tea is the 'food' of greatest significance in determining the fluorine, so that many people must obtain at least 1 mg. a day from this source alone. The only other foods which contain significant amounts of fluorine are sea fish, and products such as fish paste. Tea and fish would certainly help to protect the teeth of any person against decay, but a high fluorine intake has no effect on the amount of fluorine secreted in the milk. Proprietary baby foods containing powdered bone may contain quite large amounts of fluorine, so much so that infants fed on them may ingest more fluorine than adults eating a considerably greater quantity of food.—(*British Medical Journal*).

MY LIFE WITH THE MICROBES

SELMAN A. WAKSMAN *

MICROBES affect man's life in many ways, from the day of his birth to the day of his death, and even thereafter, since they attack and destroy his mortal remains.

Microbes are always with us, in our food and on our bodies, in our clothing and in our habitations, in the soil under our feet, and in the water we drink and bathe in. They are always ready to help us, or to destroy us. Only circumstances decide which it shall be.

The prevailing impression is that all microbes, or *germs* as they are often called, are the enemies of man.

It is usually not recognized that for every injurious or parasitic microbe there are dozens of beneficial ones. Without the latter, there would be no bread to eat or wine to drink, there would be no cheese or beer, no fertile soils, and no drinking waters, no clothing and no sanitation. Without the useful microbes, the earth would have long ago become covered with a layer of human and animal refuse.

One can visualize no form of higher life, whether that of man or animals, without the existence of the microbes. They are the universal scavengers, they destroy waste materials, they keep in constant circulation the chemical elements which are so essential for the continuation of plant and animal life.

Having received my early education in an agricultural

college, having worked most of my life in an institution devoted to the improvement of soil and crops, I have been concerned with the study of the microbes in the soil, where their occurrence and activities alter the growth of plants, cultivated and uncultivated.

I have been concerned with the good microbes. I have gradually learned, as have many others, that such microbes can also be utilized for purposes other than mere soil processes. Among these, their capacity to attack harmful organisms has become of every great importance.

Every particle of soil contains many millions of microbes, representing many thousands of kinds or groups. Each of these is represented in every soil by various subgroups, or genera and species, to which the microbiologist has given a variety of different names, for the convenience of recognition.

Thus, one hears of the genus *Bacillus* among the bacteria, *Streptomyces* among the actinomycetes, *Aspergillus* or *Penicillium* among the moulds.

The microbes that live in the soil exist there side by side, without destroying one another

*Born in Russia in 1888. Dr. Selman Abraham Waksman emigrated in 1910 to the U.S.A. where he planned to study medicine. But he changed to microbiology, and enrolled in the College of Agriculture at Rutgers University in New Jersey. After some years in California, he returned to Rutgers in 1918 as a teacher and research worker, and so became responsible for discoveries of immense benefit to suffering humanity.

completely and without one kind becoming predominant in suppressing all the others.

As I watched under the microscope a drop of broth inoculated with a very small particle of soil, I was able to observe the following sequence of microbes, depending on the chemical composition of the broth and the concentration of the nutrients.

When there was enough food, the microbes all grew and multiplied up to a certain point. Then they began to die off, some more rapidly than others. When the amount of food was limited, growth was scarcer, but it lasted longer; in that case, there was apparently no injurious effect upon the survival of the microbes.

When only a certain special kind of food was present, which not all the microbes could use, as paper or cellulose, only those that could use the particular material grew, whereas the others either failed to develop at all or made only a limited growth and then tended to disappear.

Often one kind of microbe produced materials that tended to change the conditions of the medium in which it lived, by turning it acid or alkaline or by reducing the oxygen concentration. These changed conditions, in their turn, affected the lives of other microbes, allowing some to develop more rapidly and repressing others.

Among the various chemical substances produced by some microbes which influenced markedly the growth of others, two

special groups of compounds appeared to be of paramount significance. These were destined to exert a great influence upon the further development of the whole field of microbiology and to find undreamed of applications in the improvement of human health and in the control of diseases.

These substances included, on the one hand, the growth-stimulating compounds, which came to be known as *vitamins*, and on the other hand, the growth-inhibiting compounds, which I proposed to call *antibiotics*.

In 1939 I was permitted to apply my efforts, and that of my small group of students and assistants, to the exploitation of the possibilities of utilizing soil-inhabiting microbes for the control of infectious diseases. I began at once to study the effects of soil-inhabiting upon disease-producing microbes, and the means for isolating the chemical compounds, or the *antibiotics*, produced by them.

While addressing the National Academy of Sciences in Washington, in 1940, I said: "Bacteria pathogenic (producing disease) for man and animals find their way to the soil, either in the excreta of the hosts or in their remains. If one considers the period for which animals and plants have existed on this planet and the great numbers of disease-producing microbes that must have thus gained entrance into the soil, one can only wonder that the soil harbours so few bacteria capable of causing infectious diseases in man and in animals.

"The soil was searched for bacterial agents of infectious diseases, until the conclusion was reached that these do not survive long in the soil.

"The cause of the disappearance of these disease-producing organisms in the soil is to be looked for among the soil-inhabiting microbes antagonistic to the pathogens and bringing about their rapid destruction in the soil."

Late in 1941 and early in 1942, it became apparent that we were dealing with a new field of science and that many new chemical compounds were about to appear, all of them possessing certain common properties. This had begun with *Gramicidin* in 1939, with the rediscovery of *Penicillin* in 1940, and with our own isolation of *Actinomycin* the same year. These were soon to be followed by a number of others.

My suggestion to call it "*antibiotic*" was immediately accepted and received universal recognition. Before long, physicians spoke of "*antibiotic therapy*," pharmaceutical companies were organized as "*antibiotic societies*," and new journals dealing with "*antibiotics*" were started.

The discovery that saprophytic, or "good" microbes were capable of producing chemical compounds that had the property of destroying disease-producing, or "bad" microbes, and the further discovery that these compounds could be utilized for the treatment of numerous infectious diseases never before

subject to therapy, appealed greatly to popular imagination.

Here were the miraculous substances that would do away with infections and epidemics. No wonder the public gasped in amazement at these compounds and at once designated them as "miracle drugs."

No wonder that many have suggested that this age be designated as the age of *antibiotics*, rather than the *atomic age*. The control of all infectious diseases of man and of animals is now virtually within sight.

My own laboratory has taken an important part in the development of this new field of science. My knowledge of one group of microbes, the *actinomycetes*, to the study of which I had devoted a quarter of a century or more, proved to be of great help.

Since the rediscovery of penicillin in 1940, almost all the important antibiotics have been found in cultures of these organisms. Here, for instance, is a list of some of the more important antibiotics discovered in my own laboratories, the great majority of which are produced by actinomycetes:

First came actinomycin in 1940; clavacin, fumigacin, especially streptothricin in 1942; streptomycin in 1943; grisein in 1946; neomycin in 1949; streptocin and fradicin in 1950; ehrlichin in 1950; and candicidin in 1952.

Of these, *streptomycin* has become most famous, since it made possible the treatment of numerous diseases, notably tuber-

culosis, never before subject to therapy.

With the isolation of streptomycin, it was at once recognized that we possessed here a chemotherapeutic agent which was bound to revolutionize medicine.

The first tests made with streptomycin in our laboratory early in 1944 definitely established that it was active against the tuberculosis germ in the test tube. Soon after, Drs. Feldman and Hinshaw of the Mayo Clinic demonstrated that it was also effective in guinea pigs infected with tuberculosis.

This was followed within a few months by the first clinical investigations, in which the abi-

lity of streptomycin to combat the disease also in human beings was emphasized.

Within less than three years, the medical profession became fully convinced that here was a new drug that could finally be used in suppressing, if not controlling, tuberculosis.

To be sure, streptomycin was shown from the first *not* to be an ideal drug; it certainly could *not* be considered as a cure for all forms of tuberculosis. Still it has been effective in saving many lives. It has opened a new field in therapy.—(Condensed from the book published by Robert Hale, London, via *World Digest*, June '58).

Answers to Quiz on Page 209

Your Honesty Rating. (1)-a, 0; b, 1; c, 3. (2)-a, 3; b, 1. (3)-a, 2; b, 0. (4)-a, 3; b, 1; c, 2; d, 0. (5)-a, 2; b, 2; c, 3; d, 1. (6)-a, 0; b, 2. (7)-1, 1; b, 2. (8)-a, 2; b, 0. (9)-a, 0; b, 2. (10)-a, 1; b, 3. (11)-a, 2; b, 1; c, 3. (12)-a, 1; b, 3. (13)-a, 3; b, 1. (14)-a, 3; b, 1; c, 2. (15)-a, 3; b, 1. (16)-a, 1; b, 3. (17)-a, 2; b, 0. (18)-a, 2; b, 0. (19)-a, 1; b, 3. (20)-a, 1; b, 3. Maximum total is 53. Is any-body that honest?

Over 40—Congratulations—and you have answered the quiz honestly too.

20 to 40—Not as honest as the day. But day to day honest—that's you!

Under 20—You may lack a sense of responsibility. And were you really honest in answering this quiz?—(From *Sunday Express*, London, via *World Digest*, Aug. '58).

U. S. Reports New Substance to Rid Body of Strontium

A material which can eradicate radioactive strontium, a possible cause of cancer and other diseases, from the body with safety was described at a recent meeting of the American Chemical Society. The substance which can remove the dangerous element from the living bone and other areas of the body is a tasteless yellow dye named *rhodizonate*. It fastens on to strontium atoms and the two materials combine to form an insoluble composite which can be evacuated in body wastes.

Another chemical called *tetrahydroxyquinone* acts similarly, according to U.S. authorities. This and *rhodizonate* may form the base for evolution of more anti-radiation substances.

WEIGHT-LIFTING

IAN MACQUEEN, F.R.C.S.

(Weight-lifting and body-building are booming. Runners, footballers, film-stars, doctors are among the enthusiasts now)

IF a hundred different doctors were asked what they thought of weight-lifting and body-building you would get a variety of answers; many of them may not be *strongly* against a boy taking up a course of body-building exercises. Any doctor would like to be quite sure that a boy had no illness which might be aggravated by strenuous exercise. Serious heart or lung disease, for example, could be made much worse by heavy exercise. But very few medical conditions should prevent a young man taking up physical culture. An interest in physical culture is a perfectly natural and healthy sign at seventeen or eighteen.

“Since the end of the war, body-building has boomed quite remarkably. Physical culture magazines have increased and so have the number of body-building courses advertised in their pages. Clubs have grown larger and new ones have sprung up. Weight training apparatus has become more widely used and specialized and is now made by many different sports manufacturers. Competitions for physical excellence are run by different body-building and weight-lifting organizations. Body-building includes much more than physical culture. In medicine the principles underlying techniques of muscle development have been appreciated. Body-building exercises are being used to restore strength and size to muscles weakened by poliomyelitis, to the thigh muscles of

patients who have torn knee cartilages removed, to the back muscles of patients with slipped discs, to muscles weakened by the fracture of bones and sprains of ligaments, and in many other conditions.”

Doctors call these body-building exercises ‘*Progressive Resistance Exercise*’ as they are performed against the resistance and are gradually and progressively increased as the muscles become stronger.

Basic training.—More and more Olympic athletes use body-building and weight-lifting exercises in their basic training. They can help in running, jumping, discus-throwing, pole-vaulting, swimming, shot-putting, and rowing.

Famous athletes, men and women, now regularly practise this form of training to help them improve their performances. Many professional football clubs strengthen their players with body-building and weight-lifting exercises. *Arsenal* have recently obtained the services of a British weight-lifting champion as an instructor.

Many private clubs and gymnasias in London and other big cities have among their members business and professional men, including doctors, who train regularly. By using bar-bells and dumb-bells the muscles are subjected to a lot of very hard work in a short period of time. Busy men find this a convenient way of keeping fit.

Girls, too, have caught on to weight-training. They do not develop bulging muscles like the men, partly because of their thicker layer of subcutaneous

fat and partly because they use much lighter weights. But they do use weights heavy enough to really tone up and harden their muscles. Many famous film, stage and television stars train with weights.

It is still a minority sport and many people, including some doctors, still tend to disapprove of it. Why?

Perhaps the most generally held misconception is that developing big muscles tends to make one slow, muscle-bound and clumsy. This is not true. The improved performances of many athletes after a course of weight-lifting shows it. In fact the Amateur Athletic Association have approved weight-lifting as a valuable basic training and have published a book describing how to do these exercises.

Contrary to popular belief, the body-builder is usually a most versatile athlete. The object in developing his body is not for public display, but to improve his health and strength and to enable him more fully to enjoy the sports that interest him. Unlike the specialist athlete, his interest is not narrowly centred on one event but on equipping himself fully for proficiency in any physical endeavour. To increase the size and the real strength of muscles they must be made to contract against progressively increased resistance. This is applied in four main ways:

(1) Coiled springs, like those used in chest expanders. (2) Weights. (3) Adopting certain body positions during the execution of a movement so that the resistance offered to the contraction of a muscle increases as it shortens. (4) Opposing the contraction of the muscles of one limb by the muscles of the opposite limb.

What are called free-standing exercises which simply move the joints

without any strong resistance to the muscles, tend to develop a certain amount of stamina but not muscular bulk or strength.

The most popular method, and the one which is probably the most certain in producing quick and lasting results is that using weights.

To body-build by weight-training it is necessary to have a bar-bell and/or dumb-bells. These consist of an one-inch diameter steel bar with discs of graduated weight held on each end by detachable metal collars. This simple apparatus can be obtained from several sports outfitters throughout the country. A lad just starting weight-training will need a set of weights totalling between 50 lbs. and 100 lbs.

The heavy discs can be bought separately so that he can add to his weight as he gets stronger. New bar-bell and dumb-bell sets usually include a well planned and illustrated course of exercises for beginners. Nearly all body building clubs have several sets of bar bells and dumb-bells which are shared.

A schedule should be discharged every six to eight weeks according to how many times a week one can train. A good average is three times weekly. This is ideal, and will give muscles time to recover and grow. What may seem very heavy at first seems very easy when you have learnt how to do the exercise correctly.

Initial gains will be very rapid, but will not continue at the rate they do at first, so do not expect this. The longer you train the slower the gains.

There are various ways and sequences of exercises but it is better to start with the upper body and finish with legs and abdominal work. Others prefer to start with legs or abdominals, but this is purely a matter of personal taste. — (*Family Doctor*, London, July, 1958: Condensed by T.N.S.R.).