

PEOPLES' HEALTH



EDITOR
A.V. RAMAN



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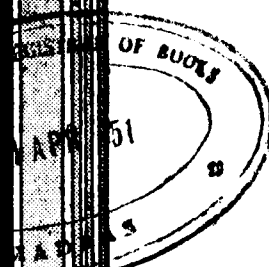
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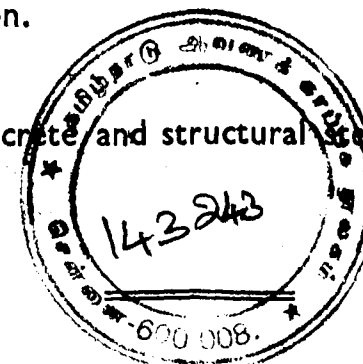
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PEOPLE'S HEALTH

A Pioneer in the Field of

Public Health

Vol. V.

MARCH, 1951.

No. 6.

CONTENTS

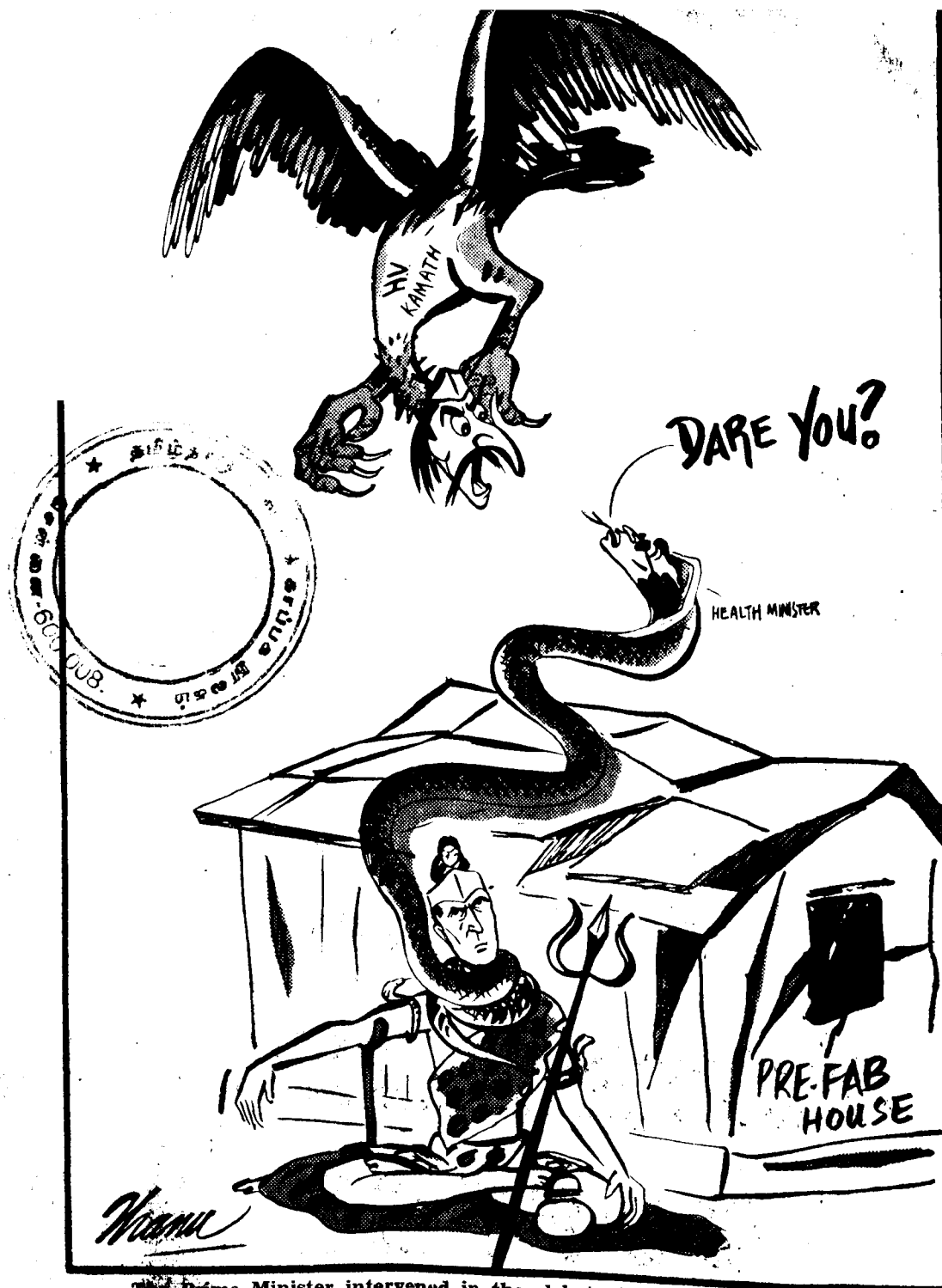
Subject and Author	Page	Page
It's the Place that Counts!		
—A Cartoon	220	A Fourth Great Dam In The American West
Editorial	221	—By Herbert B. Nichols
Sparks from the Anvil		
—By Sledge Hammer	225	Unusual Design For An American Student Nurses' Home
Pre-Fab Housing Factory		
—By An Engineer	228	—By Edgar C. Hayhow
The Building Of The Nation's Health		
—By K.C.K.E. Raja	231	How Britain Guards Against Water Pollution
Public Health Research In India		
—By K. Venkaramanan	238	—By Trevor I. Williams
Food Research: Synthetic Substitutes		
—By V. N. Patwardhan	243	Do You Know?
		Wit and Wisdom
		What Do They Say About It?

Narasim's

THE LAST WORD IN

COFFEE

NCZ-9



The Prime Minister intervened in the debate in Parliament and pulled his weight against Sri H. V. Kamath's cut motion, that sought to expose the bungling of the Health Ministry.



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Issued Monthly

EDITORIAL . . .

Five are the ornaments of a State: Absence of Disease, Wealth, Fertility, Happiness and Security.

—Kural, (74—738).

THE BUDGET SEASON

The presentation of Budgets and discussions thereon in State legislatures and in our Indian Parliament form a *tamasha*. Every Minister has his own method of entertaining our legislators through long printed speeches. Quite natural; for, every Finance Minister has his own conception of budgetting.

The Madras Finance Minister pressed to service a couplet from *Kural* to support the Police administration of the State. He gave plausible reasons why the demand under law and order which stood at Rs. 3 crores in 1945-46, has now risen to nearly Rs. 7 crores. He adds insult to injury by giving his own interpretation of the meaning of the couplet from *Kural*.

In the words of the Finance Minister, "The author of *Tirukural* holds that 'freedom from sickness and want, increased production and wealth, widespread contentment and joy, and security' are the prime requisites of an ideal State. He places *security* last evidently to show that all else is unreal without it." They say that even *Satan* can quote scriptures; but it is not said that *Satan* had the capacity

to twist the meaning of the text he quotes to suit his purpose. But, our Finance Minister is anyday cleverer than *Satan*! His comments throw to the background the well-known commentary of Kural by *Parimelazhagar*. Strictly according to the text, the absence of disease is the *first* ornament of the State. The author of Kural has assigned it the *first* place among the five ornaments referred to. Here again, our Finance Minister, can argue on the lines of Goldsmith's *Village School Master*!

Further, the dust he is capable of raising is a veritable cloud:

1. In order to relieve congestion in hospitals, a building programme has been launched at an estimated cost of Rs. 3 crores of which one-third has already been incurred and a provision of about a crore of rupees is made in the Budget.

2. The bed strength of certain hospitals is being increased.

3. The total number of dispensaries and hospitals of Modern Medicine, which was 1,187 in 1946 has now risen to 1,332.

4. The Government have outlined a five-year programme for the provision of water-supply and that they have committed themselves to a grant of Rs. 20 lakhs in the first year, Rs. 40 lakhs each in the next two years and Rs. 80 lakhs in the last two years.

5. In respect of rural water-supply, special attention has also been given and a ten-year plan is now under execution through the agency of the Revenue and Minor Irrigation staffs. An expenditure of over fifty lakhs is being incurred every year. Thus, the total expenditure under Medical and Public Health Departments, excluding the expenditure on buildings, has increased from 234 lakhs in 1945-46 to about 450 lakhs at present.

We need not go into the details of the proposed expenditure. Suffice however to say, that the bulk of the expenditure goes towards the *curing of diseases* rather than their *prevention*. To quote Kural again—

"Diagnose disease, find out its cure after tracing its root and apply the proper remedy"—Kural (95—948). This is exactly what is *not* done. Although there has been a change in the administration of the country, the fact remains that our Indian administrators follow the track which had been

THE CENTRAL HEALTH BUDGET

Judged from the performance of the Central Health Minister, there does not appear to be any need for a health minister at all at the centre. As has been pointed out in these columns, her two achievements are a few extensions of the medical institutions under the control of the Central Ministry of Health and the introduction of B.C.G. vaccina-

so carefully carved out by the foreign administrators. The guiding principle is not to *prevent* diseases by eradicating the bad environmental conditions which cause them, but to allow the living conditions of the people to further deteriorate day by day and to ensure thereby ample sources for creating diseases in man. India continues to be the reservoir of all preventible diseases and thus continues to be the market for the sale of good, bad and indifferent drugs manufactured elsewhere and in this country—a large and ever expanding market at that!

Our administrators do not seem to understand that the environment makes a man of man or makes a beast of man. Reports are pouring in that our people do not even get drinking water. In certain places, water is sold at four annas per pot. Only a few can afford the luxury of paying four annas per pot of water. What about the rest of the people? When primary necessities of life are not available, it is no wonder that people develop the traits of unruly beasts, giving an opportunity for the State to run the administration with mighty force of arms instead of running it as a welfare state. Even the foreigners who believed in force in running administration had to quit the country.

tion. The Central Minister of Health had used her mighty position to mobilise human guineapigs! We have, in these columns, warned the people from being deluded that they could be immunised against tuberculosis by B.C.G., even when they are denied food, shelter, water and a safe and sanitary surrounding. The B.C.G. propagandists were

repeating *ad nauseam* that B.C.G. is only one of the many methods of fighting tuberculosis but in practice it has become their only method.

WASTAGE OF PUBLIC FUNDS

The scandal relating to the Prefab housing factory and the bungling in placing orders for the supply of a large number of Jeeps, arms and ammunition and similar other scandals which are being brought to light in Parliament, should be an eye-opener to all administrations. In this issue of *People's Health*, an engineer of repute has analysed the prefab scandal. Although the Finance Committee presided over by the India's Finance Minister, passed a unanimous resolution that an enquiry should be held to fix the responsibility for the loss of funds, the Minister of Health, Govern-

A CHALLENGE

In these columns we have repeatedly set out salient arguments as to why B.C.G. vaccination should not be resorted to on a mass scale.

The propagandists of B.C.G. vaccination even though invited to attend public meetings wherein addresses were delivered against B.C.G. vaccination, did not care to turn up and question the lecturers. That being so, it is curious that Dr. P. V. Cherian, presiding over the Annual Meeting of the Madras City Branch of the Tuberculosis Association held on March 19, 1951 should have indulged in statements which do not seem appropriate in a scientifically minded person. It is the tactics of petty-fogging lawyers to resort to abuse, when arguments fail.

Dr. Cherian is reported to have said that B.C.G. has been universally accepted and that it is the most successful method of combating Tuberculosis. May

ment of India, wriggled out of the situation with adroit siliminess. Mr. H. V. Kamath very rightly demanded the resignation of the Minister of Health for the bungling in the department entrusted to her care. She would not resign. In our young Independent India, we have not been attempting to establish healthy conventions of democracy as in western countries. Tall talk about Democracy will never do. The people should realise in practice that their administration is a democratic one. Our people are shedding their illusions on this, thanks to ministries like our Health Ministry.

we remind him that it has not been universally accepted and that it is not the most successful method of combating Tuberculosis? Even the foremost propagandists for B.C.G. vaccination claim that B.C.G. is but one of the methods of combating the disease and not the only method. We are not inclined to accept his inferences from the experiences of B.C.G. vaccination in Travancore, unless we interrogate him on his statements.

He is reported to have said 'specialists and experts have acknowledged it as a successful method of treatment'. As such, he wonders how *persons least competent to speak on it can carry on propaganda against B.C.G.* May we remind Dr. Cherian that the subject under discussion, is not one of technical details on which specialists and experts alone can claim to express opinions but is concerned with *facts* which can be gathered from the literature available

on the subject? When medical-cum-public men claim expert knowledge, and decide the issue of mechanical filters *versus* micro-strainers, one should give credit to the laymen's assessment about the facts relating to B.C.G.

Dr. Cherian is further reported to have said that one or two *misguided* doctors had made statements against the use of B.C.G. Had he read the literature on the subject, he would have known that many medical men who enjoy world-wide reputation have expressed views against B.C.G. vaccina-

"PRACTICAL SOCIALISM"

In the last week of March, 1951, the experts in the Insurance line met at Madras under the presidency of Mr. S. C. Roy.

For years we are accustomed to considering the insurance agent as an inescapable pest—all credit to the poor agents, as despite this attitude, they come across more often than not—that they persevere with a steadfastness of purpose and an understandable devotion to self-interest. If their position is no better and their work is so embarrassing as indicated above, the apparent explanation is that the insurance companies in India have so far functioned as capitalist undertakings for declaring rich dividends and have not functioned as the commonman's good friends.

Obviously, the insurance companies are interested in the longevity of their clientele, and equally obviously the insurance companies are adequately ambitious, as their potential clientele are the whole population. It cannot be controverted that the prosperity of insurance companies depends upon the payment of premiums by the assured for as long a period as is possible.

There is no good of propagandists of B.C.G. vaccination carrying on a Guerilla warfare. We would invite them to come out in the open and address public meetings inviting questions from the audience at the end of their lectures. As Dr. Cherian is an elected member of the Madras Legislative Council and is a fresh, distinguished member of the Congress party now in power in Madras, we are sure he would address more public, less private, meetings and invite an open discussion on the subject.

We know of very prosperous insurance companies in India; we also know of mushroom growths in the line. We can dismiss the latter variety; but we would like to know what these *prosperous insurance companies* have done to divert a portion of their very substantial profits to the alleviation of human sufferings and to the general amelioration of the conditions of life of the people. In other countries, such as Great Britain and America, insurance companies undertake research work and subsidise similar works designed to make the people healthier, not by *curative* medicine but by *prevention* of disease and which are mostly caused by bad sanitary surroundings, so that with the nation's prosperity and the longevity of the nationals, their own prosperity may be assured.

What do we see in India? Has there been one company which is known to have interested itself in such well-warrantedly self-interested but all the same potential activities as cited above? But there is still the chance for insurance companies to make their field a *practical socialism*.



By

SLEDGE HAMMER

Fear not to lie, 'twill seem a lucky hit;
Shrink not from blasphemy, 'twill pass for wit;
Care not for feeling—pass your proper jest,
And stand a critic, hated yet caressed—Byron.

Dr. John Matthalai on the Problems Facing Free India

Speaking at the Madras Christian College, Tambaram, Dr. Matthalai is reported to have said:

"We are a people who by circumstances of our country and, I suppose by the natural endowment of our spirit and mind, are apt on the slightest provocation to take a melancholy and pessimistic view of things."

If everyone of us can, like Dr. Matthalai, step out of the Government of India and step into an air-conditioned room in Tatas, with just the break of a holiday in Kashmir, there would be no need at all for melancholia or pessimism.

Chronically successful men like Dr. Matthalai should not go about uttering the words "Shanti, Shanti, Shanti"! It is a dope we are familiar with, and therefore treat with contempt!

Doctors in Exelcis

I am informed on reliable authority that a meeting of automobile repairers, cycle repairers and tinkers will be shortly convened in Madras to request the Government

to pass an order authorising their foremen and mechanics to prefix the title of "Doctor" before their names, and arrange for all official records to observe the appellation. Their plea is that as they are in charge of car hospitals, cycle hospitals and establishments for repair of broken appliances respectively, their work involved as much skill as those of surgeons and as great diagnostic ability as physicians, and so they are entitled to the honorific. It would seem that the immediate provocation was the directive that veterinarians were entitled to call themselves 'Doctors' while all these years, we have known them only as "Cow Doctors", so to say Doctors. (*Animalis Causa*)! With progressive industrialisation, and the increase in the conferment of Doctorates (*Honoris Causa*) by Universities, all other titles having been abolished in India that is Bharat, the population of our country may in course of time consist only of two groups, Doctors and Others! And who knows, in an emergency, when a man is at the threshold of death and needs an immediate abdominal operation, a telephone call may bring to the door a car doctor with two tools, a wheel puller and a set of box-spanners! Anything may happen with a plethora of Doctors.

Offers Invited

Under this caption, we see an advertisement by the Chief Traffic Manager of the South Indian Railway, Tiruchirapalli, inviting offers for advertisements on S.I.R. Platform Tickets. It is stated that about fifteen lacs of tickets are sold every year, and that brief trade advertisements on the reverse of these tickets have **EXCEPTIONAL PUBLICITY VALUE**.

What scintillating business acumen! I wonder who thought of a thing like that! It reads almost like a bit from P. G. Wodehouse or Stephen Leacock.

I have been through the busiest railway stations all over this vast country of ours, and have seen several hundreds of persons buying platform tickets, and not once have I seen anyone giving a ticket even a look. I have myself bought such tickets over a period of four decades and have never to this day read through a platform ticket. Most of us buy platform tickets at a rush and get rid of them with complete indifference, and during the period of their stay in our pockets we have no time to notice the inscriptions on them! And yet, the Railway Administration would believe that platform tickets should carry advertisements! "Father, forgive them, for they know not what they do."

"Girls proving smarter than boys" —Said Mr. Homi Mody

Mr. Homi Mody, Governor of U.P. said at Lucknow on March 10th and added that "girls in his time were far too modest to want to outstrip men". Language, your Excellency! You may be misunderstood and misquoted, you know! Of course, I catch what you mean—you want the perpetual show of Act 2 Scene 1 in the Garden of Eden where Adam sits with his legs crossed and a frown on his face, and Eve, with long tresses and sad eyes comes up to him with the apple in her hand and says "just one bite, dear, it will do you no harm", etc. etc.! Quite, Quite!

Family Planning

The Madras City Council has resolved to permit women medical officers in charge

of child welfare centres to give advice on family planning to those who desired it. Having found it a tiresome job to look after the living, the Corporation would turn its attention to look after the unborn!

But we are told that matters like birth control and family planning should be handled at higher levels, more comprehensively and effectively by Governmental Organisation and under Governmental Control. And yet, here we see the Corporation busying itself.

Perhaps the next move would be from Government, asking Ration shop-keepers to stock and sell contraceptives at fair prices! They may even carry single line advertisements on them—a source of some revenue to Government!

Officers—Sit Down!

When some officers sitting on the official benches of the U.P. Legislative Assembly stood up to let the Chief Minister Pandit G. B. Pant pass by them, an opposition member asked the speaker whether it was necessary to which he replied "No"—you think that this eased the position for the miserable officers? Not a hope! After all, it is not a matter for the speaker to decide, it is one for a Pathologist to cure; standing up and kow-towing is a reflex action, a product of atavism! The corpuscles react that way, the muscles react that way, the tissues, tendons, in fact the entire fauna and flora of the human frame in India (that is Bharat) react with spasmodic sanctimonious surveillance! Don't you, dear Reader, remember the case of the officer who donned his turban when he heard the telephonic voice of his chief! Of course, you do!

Madras Trams

The Finance Minister disclosed in his budget speech that the tramways have been offered for sale to the Government—I suggest that Government should buy the Trams and make good use of them; I mean, they should use them for filling up unused tanks and low lying areas in the City so that valuable land may be reclaimed for house-building. I have a clean conscience and a wholesome mind, both of which account for the suggestion.

India—Not a hard-working Nation —Says Pandit Nehru

There's my sentiments too except, of course, when I see the labourer working six days in the week, (eating only during four of them) and spending the seventh in a queue at the ration shop; or the weaver who works for one day in a week and spends the other six looking out for yarn; or even the Government official who works with one eyed devotion (to the clock)!

But why should the Prime Minister fret so much? The aim of a welfare state is to provide for maximum enjoyment of leisure, is it not?

District Planning Committees

The Public Works Minister told the Madras Assembly that it was the intention of Government to set up Planning Committees in each district to ensure co-ordination in planning. I feel that instead of the word 'co-ordination' we may use the word 'constipation'.

Houses for Harijans

We are told that the Madras Minister for Harijan welfare faced a volley of questions in the Assembly on the 28th February on the question of Housing for Harijans. In fact, most of the questions were half-volleyed by him! The Minister said that in Municipal areas the duty of building houses devolved on Municipalities, while in rural areas, where the duty was, of course, Government's, there were no sites, and indeed, no money. However the Government was doing its best—their best being keeping the Minister in office! But why does the minister want to be a minister? Why not revert to being a Harijan? (He cannot half-volley this question! It is a lob over his head!)

Health Services

In a survey of public health activities in India, Rajkumari Amrit Kaur claims that Government of India have made people health-minded by expanding four hospitals, establishing a nursing college, sending medical personnel abroad for post-graduate study, increasing the number of beds in various hospitals, and

the establishment of a Drug Research Institute.

Would you say all this tended to make people 'Health Minded', or would you, rather, say 'sick-minded'? I am in two minds about this!

Unesco

Fifteen new born babies were christened 'Unesco' in a village in the Gulf of Mexico.

Strange coincidence this, because I heard just last week that several new born babies in the leading towns in India were christened "FIASCO" the day after Panditji's spirited defence of the Pre-Fab factory.

Municipal Socialist Party Formed!

The millennium has set in! Eight Councillors of the Madras City Corporation have formed themselves into a party the objects of which are to improve sanitation, provide civic amenities to slum dwellers and attend to the complaints of ratepayers. Jumping Jehosaphat! What are the other parties in the council for? Do they say, to hell with sanitation, to blaze with civic amenities, and damn all the complaining ratepayers? Do they really?

Just think of it, the miracle has happened! Eight good and true councillors of the City Council actually intend carrying out the elementary duties of a City Council. The Salt has not lost its savour!

Inoculation against Cholera in Madras

The Government have asked the Commissioner of the Madras Corporation and the Director of Public Health to report on preventive inoculation against cholera and the effect of such inoculation.

I am sure someone is behaving like a clown. Now who is it?

Electric Furnace for Cremation

The New Delhi Municipal Committee has decided to introduce an electric furnace instead of firewood for cremating dead bodies, and have constituted a committee of eight persons to implement the decision. In a case of this kind do they require eight people to do the job? Wouldn't one technician be enough to erect the plant? But perhaps the eight members of the committee have been previously cremated electrically, and their experience was considered valuable! That must be the reason!

PRE-FAB HOUSING FACTORY

by
An Engineer

In our country, criticism on policies is construed as criticism on policy-makers. Our administrators are touchy. Government in democracy should be by discussion; but, in our country, any discussion other than that supporting official policy is viewed with disfavour.

The author is a well-known engineer with wide experience in this country as also in the West. He has learnt the profession at the feet of great masters. It is a pity that in the peculiar atmosphere in our country, he is not able to reveal his identity, lest he should be a marked man for official persecutions.

Of course, whenever necessary, our country should have the benefit of the technical advice from foreign experts—experts in the real sense of the term. But, in our Independent India, the Indian statesmen have developed a glamour for pseudo-experts from foreign countries in preference to experts among our own countrymen. This is unfortunate.

—Ed. P.H.

THE statement made by Prime Minister Nehru on 22nd February '51 in Parliament on the Pre-fab Housing Factory and that made by Sri Shanmugam Chetty, Ex-Finance Minister to the Press on the 25th February '51 create some confusion and raise some important issues.

From both these statements it is clear that the present Director of Housing was sent as an Expert to look into the question of pre-fab houses. As a matter of fact, Mr. Shanmugam Chetty appears to have all along relied upon the expert advice of this Officer throughout his investigations in England and he goes as far as to say that this Officer assured him that, from a technical point of view, this type of pre-fab housing was a 'simple and satisfactory type of construction' and that acting on his technical advice, he (Mr. Shanmugam Chetty) approved the scheme for establishing one factory at Delhi which was expected to cost about Rs. 25 lakhs.

The Prime Minister states that a "number of errors were, however, committed largely due to the eagerness of the Government and a certain over-optimistic spirit of Mr. Shanmugam Chetty who entered into agreement". He also told the house that "we entered into the contract largely

because Mr. Shanmugam Chetty practically entered into it before he came to India".

Transferring Responsibility

The Prime Minister's statement amounts to placing the entire responsibility for the project on the shoulders of Mr. Shanmugam Chetty who, on the other hand, has stated unequivocally that he acted on the technical advice of the officer deputed by the Prime Minister and "approved the scheme for establishing one factory at Delhi which was expected to cost only about Rs. 25 lakhs and was expected to turn out about 50,000 houses of an approved type in a year." Mr. Shanmugam Chetty further states that he discussed "with the Technical Adviser and a representative of the Company, financial details of the scheme and left it to the High Commissioner's office to complete the contract". He adds that he was "chiefly concerned with financial matters connected with the building of the factory" and that naturally he had to rely for technical advice on the Officer who was deputed by the Prime Minister himself.

Thus while the Prime Minister practically throws the blame on Mr. Shanmugam Chetty, the latter does not accept that responsibility but claims to have acted solely on the expert advice given to him by

the Technical Adviser of the Government of India. As a matter of fact he does not even admit having concluded the agreement but merely to have considered and discussed the financial aspects of the factory with the Technical Adviser and the representative of the firm and to have left the question of completing the contract to the office of the High Commissioner.

The Rejected Stone becomes the Corner Stone

It is being admitted reluctantly by the Prime Minister now, that a number of errors were committed. The Health Minister also says that if there was any fault it was that there "has been too much credulity and belief in the firm recommended." The question is who recommended the firm, on what grounds, and after what kind of investigations? Obviously, the recommendation must have emanated from our Technical Adviser. It is perhaps relevant here to recall the fact that the scheme for the manufacture of these pre-fab houses in India was submitted, for the first time in 1947, to the Government of Mysore jointly by a representative of the Manufacturers and Dr. Koenigsberger, Technical Adviser in this case, who was at that time Town Planning Architect to the Government of Mysore. The Government of Mysore rejected the scheme.

Dr. Koenigsberger who was also sent away by the Government of Mysore at that time appears to have succeeded in securing confidence with the powers that be and led the Government of India to the same firm whose scheme for pre-fab housing had already been rejected by the Government of Mysore. The question is whether Dr. Koenigsberger at all informed Mr. Shanmugam Chetty that this scheme of pre-fab housing had already been rejected by the Government of Mysore and the grounds which had led them to do so. One feels that a shrewd financier of the order of Mr. R. K. Shanmugam Chetty would certainly have evinced more caution had he known that this scheme was a rejected suitor already.

The Expert Between Two Panels

One wonders what aspects of this scheme of pre-fab housing were investigated by our Technical Adviser. Any scheme which produces wall panels cannot disregard such questions as the strength and stability of the materials which constitute the panels, their durability and life, climatic conditions, thermal and sound insulation, comfort of living in a house constituted of such panels and above all their habitableness having regard to the ways of Indian life. All these matters are fundamentally regarded as lying within the sphere of the Engineer rather than that of the landscape architect. As a matter of fact, no Architect or Town Planner receives any training in materials of construction and would hardly venture to express an opinion on them. Nor would sound practice put these matters for opinion to an Architect and far less to a Landscape Architect and act on such advice. The country is entitled to know the report submitted by the Technical Adviser while recommending the soundness of establishing a factory for the manufacture of these wall panels and in particular, the opinion which may have been expressed in regard to these engineering matters. On the one hand, the Prime Minister's statement makes no reference to the technical advice tendered on the subject and on the other hand, Mr. Shanmugam Chetty's statement lays the greatest stress upon it.

In this connection it is interesting to recall to mind the press report which appeared in the *Hindu* of the 22nd February '51 which states that a sum of Rs. 2,79,733 was paid as charges to the 'Consultants' who had not given any guarantee regarding the strength and life of the wall panels to be produced in the factory. What one would like to know is why the Consultants were paid if the fact that they did not guarantee the strength and life of the wall panels was known at the time of placing the contract.

It is a matter for regret that despite all these technical considerations, the Prime Minister and the Health Minister continue to speak of the pre-fab housing factory as "one of the finest in India" and as the best factory, and in the same breath talk of

appointing a committee to suggest ways of using the factory, for other purposes.

The Prime Minister spoke of having received an assurance from the National Physical Laboratory that, with little experimentation, they would be able to evolve a suitable panel. The question is purely an Engineering one and one fails to see where the National Physical Laboratory comes in.

The Prime Minister speaks of the factory as being a project for taking up something for long experiments in the country. The question is not whether we should or should not experiment in India but whether at the time of placing the order the intention was to manufacture pre-fab houses or to undertake experimental work.

Figuring It Out

There is also a great disparity in the figures of cost given by Mr. Shanmugam Chetty and the figures now published from New Delhi. The difference in cost cannot be explained by the rise in prices which may have been caused by the devaluation of currency. Nor can they be understood having regard to the fact that the basis of supply of the factory was a contract.

One would like to know whether any Indian Engineer was consulted in the matter to confirm the opinions expressed by the foreign Landscape Architect. The matter, as we have already shown, is appropriately an Engineering matter and it seems hard to believe that Government could not find Engineers in this country who could advise them on materials of construction and the manner of their manufacture and utilisation. If it is the con-

tention of Government that they could think of nobody, could they enlighten the public why some eminent foreign Engineer—rather than an Architect—could not be more appropriately chosen for advice in the matter? Perhaps utilisation of local talent is itself a matter of great talent and the Powers that be have yet to develop that talent and cultivate it.

The practice of Engineering is always marked by precision, and no Engineer can easily escape the responsibility arising out of his miscalculations or his wrong advice. The problems connected with the promotion of pre-fab housing factory are engineering ones and it should not be difficult to fix responsibility. We are prepared to grant that, in his enthusiasm, the Technical Adviser may have disregarded the question of his ability to advise appropriately on the subject but that is no reason why he should escape his having chosen to advise on a subject obviously lying outside his technical province. Alfred A. Hudson in his book 'Law of Building and Engineering Contracts' speaks as follows, of professional skill:

"The services rendered to their employers by Engineers, Architects, Surveyors and Valuers being undertaken by them for reward, they are bound to possess an ordinary and reasonable degree of (professional) skill in the art or profession which they profess by undertaking to do the work, and to act with reasonable care and diligence in rendering those services and are liable for failure to do so."

During the debate in Parliament on the 27th March '51, on the Health Ministry's demand, Mr. H. V. Kamath said that the Health Minister had no business to stick to her office if she could not appoint a committee to hold an enquiry and fix the responsibility for the failure of the pre-fabricated housing factory. If the Health Minister could not order such an enquiry, which had been unanimously asked for by the Standing Finance Committee under the Chairmanship of the Finance Minister, "the only honourable thing for her to do will be to leave her office. That is the least that Parliament expects the Health Minister to do."

Mr. Kamath said he was told that the Managing Director of the housing factory "deliberately concealed from the Minister and the Board of Directors the breakages in the panels that were becoming obvious and the deviation from the patented process for the manufacture of the panels." The Mulgaonkar Committee had, Mr. Kamath believed, "reported about this matter but nothing was done about it". Now, said Mr. Kamath, "I hear reports—I hope they are not true—that the person who made a sorry mess of the Swedish pre-fab huts and this housing factory and does not know the A B C of housing—he is a landscape architect—is going to be appointed Chairman of the proposed Central Board of Housing".

"There is no will to punish the wrong-doer", said Mr. Kamath, "and that is why the country is getting demoralised and the Government is getting discredited. This must stop".

THE BUILDING OF THE NATION'S HEALTH

by

K. C. K. E. Raja

Director General of Health Services, Government of India



This year the Dr. Sir A. Lakshmanaswami Mudaliar Memorial Lectures were delivered by Dr. Raja under the auspices of the University of Madras on the 12th, 13th and 14th March 1951. We understand that, in due course, these lectures will be printed in the University Journal and made available in pamphlet form to readers. In the meanwhile, we publish a fairly elaborate summary of each of the three lectures in *People's Health* for the benefit of our readers. What is printed hereunder is the first of the series.

The appointment of Dr. Raja as Secretary of the Bhole Committee brought out his talents and potentiality for hard and sustained work. He has had unique opportunities to study the nation's health from many a standpoint—national and international. He has put forward thought-provoking ideas. He has duly emphasised the importance of the improvement of environmental sanitation, as a basic requirement.

—Ed. P.H.

Dr. A. L. Mudaliar's Contribution

DR. LAKSHMANASWAMI MUDALIAR, was the first Indian Principal of Madras Medical College. As the Vice-Chancellor of this University for about a decade and as Chairman of the Inter-University Board for part of the time, he has contributed such a lot to education in India and particularly to Medical education that few men can claim to have achieved in this country. With his rich gifts of innate ability, versatility and untiring energy he has, as we all know, made full use of those opportunities and given of his best to whatever tasks were entrusted to him by governments or by the people. I recall how ably he guided the proceedings of the Professional education sub-committee of the Health Survey and

Development Committee and how his personal contributions influenced greatly the recommendations of that Committee in the field of medical education. Later he was the Chairman of the All-India Medical Institute Committee and of the up-grading Committee appointed by the Government of India. He has also been good enough to accept the Chairmanship of the All-India Council of Post-graduate Medical Education, which is attempting to promote a co-ordinated advance in the standards of post-graduate medical teaching throughout the country. In the sphere of international health Sir Lakshmanaswami's services have secured for him an honoured place. From the beginning, his wide experience in medical matters, wise counsel and ability to put across to his audience his ideas

clearly and with force became recognised at the meetings of the World Health Assembly and, in the second year, he was elected as the Chairman of WHO's Executive Board, which is the body responsible for the technical guidance and control of the activities of that organisation. He held that post with distinction last year. He has also ably assisted the Hon'ble Rajkumari Amrit Kaur, our Health Minister, in placing India in a position of acknowledged leadership among the many nations that desire to promote the work of WHO in the interests of advancing the cause of public health, particularly in the under-developed countries of the World. I have had the privilege of working with Sir Lakshmanaswami for the past few years at the meetings of the World Health Assembly and can therefore bear testimony to the high esteem in which he is held by his colleagues from different countries.

In these circumstances, it was with genuine pleasure that I accepted the invitation to deliver these memorial lectures. This pleasure is enhanced by the fact that they are to be delivered at the Madras Medical College from which I passed out thirty years ago and to which I return after a varied range of experience and of opportunities for service, of which I could not have dreamt of in those days. When I was asked to give these lectures I thought that an appropriate subject would be "The Building of the Nation's Health" because I know that Sir Lakshmanaswami is deeply interested in the wider problems of health development in India and that he considers his own major field of interest and activity, namely medical education, only as a means towards the attainment of the ultimate objective of improved standards of health for our people.

Before I proceed I should like to say that the views I express are essentially mine own and do not necessarily represent those of the Central Government under whom I am serving.

What is 'Health'?

Health may be defined as not only the absence of disease and incapacity but also

the harmonious functioning of the human body and mind at the optimum level so as to enable the individual to enjoy life to the fullest possible extent and to put forth the maximum physical and mental effort of which he is capable. Perfect health implies the complete adjustment of a man to his total environment physical, mental and social. Thus, while health planning should naturally lay emphasis on the provision of adequate curative and preventive health services, it should equally stress the importance of creating and maintaining those conditions of life for the individual and for the community which alone can make healthful living possible. Hygienic housing, good food, fresh air, a working environment and conditions of employment which reduce health hazards to the minimum, adequate facilities for physical culture and recreation and, above all, provision for the wise use of leisure are all essential if the health and well-being of the individual and of the people as a whole are to be promoted on sound lines. Viewed from this broad standpoint, it will be seen that health has a definite positive aspect as apart from the negative one of preventing morbidity and mortality.

The real wealth of a Nation consists of its human and material resources and, of the two, the former is by far the more important. In the first place, the adequate exploitation of the material resources of a country requires a healthy and vigorous nation. Secondly, the whole purpose of civilised community life is to promote the establishment of those conditions which make life richer and happier for the people and this objective can be attained only by stress being laid on the improvement of the public health. The importance of health planning as an essential part of the overall picture of national development, thus becomes emphasised.

The comprehensive definition of 'health' that has suggested indicates that health planning will probably impinge, as has already been pointed out, on nearly all aspects of community life. It is therefore obviously necessary to define the scope of health planning within certain specified

limits. For our purposes, these limits may be confined to the establishment and maintenance of those personal and impersonal health services which are essential for the community. Matters such as housing, nutrition and physical education, while they are all important from our point of view, are extensive subjects in themselves and can receive attention from the health administrator mainly for the purpose of laying down standards which are considered desirable from the standpoint of health. The task of planning targets of achievement in those fields must of necessity fall on the shoulders of others who are more competent than myself and who possess an adequate background of knowledge and experience in such matters. They will no doubt be found in different departments of Government and among the public.

Existing State of Health

A detailed survey of the existing state of the public health in India is hardly necessary for an audience such as the one I am addressing. My excuse for making a short reference to the subject is that it helps to provide the background against which health planning in India should be considered. Compared with the more progressive countries of the world, the extent of preventable morbidity and mortality in our country is abnormally high at all ages and the toll of suffering and death falls heaviest on children and on women of the reproductive age. The average expectation of life that a new-born infant in India may look forward to is less than half of that which has been attained in countries like England, the U.S.A., Australia and New Zealand. Our infant mortality is high. The new-born child finds itself, on liberation from the protective environment of the mother's womb, in an alien world to which it has to adjust itself fairly rapidly, if it is to survive. The extent to which this environment has been made safe for the infant through purposeful effort to ward off harmful influences and to promote its intrinsic powers of resistance to such influences constitutes a satisfactory

standard by which to measure the efficacy of the community's health organisation as well as the level to which civic consciousness has arisen through the emphasis laid on the preservation of the nation's most precious asset, namely, the human material which will determine its future composition and, in a large measure, mould its destiny. Maternity, which should under normal conditions be a physiological function for the healthy woman, is responsible for a large amount of suffering, disability and death. Many countries have reduced their maternal mortality rates to about one-seventh or one-eighth of that of India. The diseases that have wide prevalence in this country are malaria, tuberculosis, bowel infections including cholera, dysentery and the typhoid group of fevers as well as pneumonia, besides certain conditions which people purposely conceal because of social stigma, namely, venereal diseases and leprosy. Anti-biotics and synthetic drugs are able to bring down effectively the period of suffering and the rate of mortality from most of these diseases, while insecticides like DDT have made it possible to shed malaria and other insect-borne infections of much of the terror they possessed in the past. In India our registration of births and deaths and of the incidence of diseases is, for a variety of reasons, very unsatisfactory. Indeed some observers have noted that omissions in birth and death registration may be as high as even 40 to 50 per cent in certain places. Moreover, except for the three epidemic diseases, cholera, small-pox and plague, figures for incidence are not being recorded over the country as a whole. The figures that are generally quoted, such as a hundred million cases of malaria per year in India or the presence of two and a half million active and infectious cases of tuberculosis, are only shrewd guesses by workers of experience in their respective spheres, these guesses being based partly on data collected from limited surveys in certain parts of the country by specially trained medical personnel. In the circumstances, it is difficult to construct with any reasonable degree of accuracy a picture of ill-health in the community which will

give some indication of the extent of medical aid that should be provided for our people. On the other hand, in Great Britain* where such statistics exist, it is reported that, during a month, 20 out of every 100 persons are, by their own definition, ill and that 12 out of these 20 are sufficiently ill to see the doctor. In the course of each year, for every 100 of the general population doctors see 150 persons with new illnesses. While on an average a person sees a doctor once in nine months the number of those who are continuously ill are 8 per 100 of the population. Would it not be safe in India, with our higher rates of incidence of sickness, to assume that we can at least double the figures quoted above for Great Britain? If this be so, about 16 out of every 100 among India's population are chronically ill and at least 24 per 100 should see the doctor for medical advice and treatment every month. Taking our total population as 350 millions we have to make provision for at least 56 millions as continuously sick patients, while the hospitals and dispensaries under the national health organisation must make themselves responsible for dealing with some 84 million sick persons every month. Under the Employees' State Insurance scheme it has been estimated that the total number of patients that a dispensary doctor can deal with in a day is 60 in addition to some domiciliary treatment he has to carry out. On this basis nearly 46,700 dispensaries and an equal number of doctors will be required only for giving out-patient or dispensary treatment to such a large number of patients. The needs of general and special hospitals and of outdoor medical organisations for curative and preventive health work will, of course, demand many more doctors.

After the partition of the country, the number of doctors in India is likely to be somewhere between 50,000 and 55,000, while the total number of medical institutions, including hospitals and dispensaries, was estimated by the Bhore Committee as about

* "Battle for Health" by Stephen Taylor—page 16—published by Nicholson and Watson, London (1944).

7,700 for British India as a whole. Even a 25 per cent. increase in the intervening years will bring up the figure only to 9,625. British India included all the Part A States and a number of Part C States as defined under the present Constitution. The bringing in of all other States, including Part B States, would probably be offset by the removal, on the partition of the country of some 70 millions persons into Pakistan. Therefore it may be safe to assume that the existing hospitals and dispensaries in Indian Union together total 10,000. The disparity between existing provision and the number required becomes therefore fully emphasised. It should also be mentioned that, in quite an appreciable number of these institutions, the strength of staff employed, equipment, drugs and other supplies are so inadequate as to make the medical aid given to the people quite unsatisfactory as judged by what modern medicine can offer. In the vast majority of public institutions, governmental and other, antibiotics, antisera and other drugs which are of a costly nature become available to patients only when they can pay for them. Thus, it can hardly be said that modern medicine has had a chance to show its worth.

A Campaign of Prevention Needed

In the light of what has been discussed, it is clear that the need for the provision of treatment facilities is abnormally high in our country in relation to the resources that are available. But even the most concentrated effort to expand such facilities will not help to reduce, to any substantial extent, the burden of our health problem. It is only the emergence of an adequate campaign of prevention that can save the situation. Such a campaign has to be organised from the dual standpoint of personal and impersonal health services to the people. The latter include, among other things hygienic housing, safe water supply, satisfactory disposal of human wastes and adequate nutrition. As Professor Greenwood, a distinguished Epidemiologist, used to point out, England laid her foundations for the promotion of the public health on the two solid bases of protected water supplies

and of sewerage systems for all the local areas with a reasonable concentration of population. These developments took place during the latter half of the 19th century as well as the establishment of control over the adulteration of food and drugs. The provision of public health staffs under urban and rural local authorities was also accomplished during the same period. The advent of the present century saw a rapid expansion of health services for the people which had the purpose firstly, of dealing with the spread of infection in the community through a campaign designed to promote a co-ordinated curative and preventive attack on diseases such as tuberculosis, venereal diseases and certain common infections of childhood like diphtheria, and secondly, of providing special health protection to particular sections of the community like mothers and children, the school going population and industrial workers. These developments in the sphere of personal health services led gradually to the recognition of the need for attention to the home environment of the individual, to the same extent that attention was required in respect of the factory, workshop, school or other place, where many hours of the day might be spent by him. The importance of education of the people to understand and follow the hygienic mode of life as well as to recognise their own responsibility to avoid infection and to prevent its transmission to others also became recognised. The pre-eminent place that the house occupies in relation to the formation of habits at an early age and to the laying of the foundation either of sound health or of the seeds of future illnesses began to receive serious attention. Health education of the parents and particularly of the mother became recognised as an essential part of the campaign for improved health for the coming generation. The rapid development of personal health services with their emphasis on the preventive aspect, has had a far-reaching beneficial effect on the public health of the British people. To quote a striking example, I heard a few weeks ago from Col. Sir Alexander Russell, who is well known to all of us here, that, as a result of an inten-

sive campaign of immunisation against diphtheria during the war years, the disease has disappeared altogether from Scotland. Incidentally, it may be mentioned that Sir Alexander served as a Deputy Chief Medical Officer of Health in Scotland during the War and that he was closely associated with the organisation and execution of the immunisation campaign on a nation-wide scale. It should at the same time be emphasised that the gains secured by adequate health services become possible only on a sound foundation of environmental hygiene.

Why this Poor State of Affairs?

It has already been pointed out that the incidence of ill-health in the country is so high that the provision of treatment facilities on a scale adequate to meet the total demand is well nigh impossible. A number of factors is responsible for this state of affairs. Inadequacy of funds and of trained personnel, the wide distribution of the rural population, unsatisfactory conditions in the rural areas in regard to housing, educational facilities for children and amenities of modern civilised life and the consequent unwillingness of doctors and other health workers to take up service in the villages, these are all factors which militate against a rapid expansion of treatment facilities over the country as a whole. In the circumstances, a rational approach to the problem should take note of the need to develop a preventive campaign with such resources as are available in order to reduce the total incidence of disease. Insecticides such as DDT have a wide range of application in regard to all insect-borne diseases and it must be remembered that, with the destruction of mosquitoes, fleas, flies and lice, quite a number of communicable diseases, such as malaria, plague, bowel infections, relapsing fever and epidemic typhus can be controlled satisfactorily. In fact, anti-malaria campaigns, when carried out systematically and continuously, have shown in many places, e.g., Ceylon and in our own country in Bombay State, that a fall in the general death rate of the community as well as in infant mortality takes place, that the birth rate increases and that

the incidence of plague in endemic areas of the disease is definitely brought down. As regards malaria, the results are striking beyond measure. Delhi used to attain, during epidemic years, an incidence of the disease as high as 130 or 140 per thousand of the population before control measures were introduced. Last year, it was as low as a little over 4 per 1000. It must be remembered that Delhi has today a large floating population and that reservoirs of malaria infection from uncontrolled areas may contribute a share to the much reduced rate of 4 per 1000. When I went over to Delhi from Calcutta in 1937, mosquito nuisance was so high that one required the protection of a mosquito net to pass the night comfortably. Today one can do away with the net all the year round. These are remarkable achievements and can be repeated elsewhere. It must be remembered that an antimalaria campaign under present-day conditions largely dispenses with the detailed study of the bionomics of the vector species by expert entomologists and of the application of the results of such studies to the adoption of control measures by naturalistic and other methods. Such studies may perhaps be still required under special circumstances but, by and large, a direct attack on the adult mosquito through insecticides has become the method of choice. In the circumstances, the problem of malaria control has become considerably simplified from the point of view of technical staff. Medical men with special training in malaria, entomologists and malaria engineers have all, of course, their own place in the scheme; but an extensive programme of antimalaria activity can now be developed with a minimum of such technical staff. Similarly, in regard to the sterilisation of water supplies and the immunisation of people against cholera, small-pox and plague, non-medical persons are now extensively employed. With an augmentation of such trained personnel, it should be possible to extend widely our present activities in regard to the prevention of a number of communicable diseases. These types of health staff require much less intensified training than doctors and are therefore

more easily produced and at a lower cost. Similarly work in relation to environmental hygiene should mostly be the responsibility of the trained public health engineer and to him should be entrusted such tasks as general sanitation, water supply, drainage and antimalaria works which require a background of engineering experience. The Sanitary Inspector should also be largely concerned with the promotion of environmental hygiene under the guidance of the public health engineer. What I desire to convey is that a re-orientation of our health policy is essential in order to provide increasingly larger amounts of money for the employment of non-medical staff in order to intensify a campaign of prevention rather than spend the major share of the available funds for multiplying treatment centres and for creating costly institutions offering the most up-to-date forms of specialised treatment. The value of such measures is not denied, but they will not yield the same return in the way of a reasonably rapid and substantial reduction in morbidity and mortality among the people as the less striking but more effective preventive campaign on the lines envisaged here. The question is, to my mind, one of utilising to the best advantage the limited resources which alone present day conditions make available to us.

Relieve Medical Officers of Non-Medical Duties

The suggestions that have been set forth here will also help to relieve the medical officer of health from much of the non-medical work which his routine duties involve. It may well be that, in the larger centres and in the more important posts, administrative duties will probably consume all the time and energy that he has. But it is essential that, wherever possible and particularly in the earlier stages of his career, he should not be deprived of opportunities to keep up his medical interest or to develop studies of a scientific nature such as those in epidemiology. School health work, the local infectious diseases hospital, outbreaks of communicable diseases will all provide him with opportunities for scientific collaboration with his

colleagues and for the use of his medical education as well as of the background of epidemiological and statistical training he has had. The recommendation of the Bhore Committee that the young medical officer should combine in himself both curative and preventive functions is indeed a sound one. This subject and certain other relevant matters will be discussed in the next lecture. Suffice it here to emphasise that the doctor of the future should be something more than a highly specialised technician and that he should develop a scientific outlook and approach towards the problems of health and disease. Such an outlook leads to a recognition of these problems in the larger perspective of man in relation to his total environment. A concentration on the ministrations of medical care to individual patients often fails to bring the larger picture of disease as a community phenomenon into sufficient prominence. Preventive medicine, on the other hand, lays emphasis on disease in relation to its prevalence among the people on the investigation of the factors associated with such prevalence and on the elaboration of measures to counteract the influence of those factors. Thus, to a surgeon the repeated cases of gastric or duodenal ulcer that come to his notice may appeal only from the standpoint of relief to the patients concerned. If he is, on the other hand, interested in the wider aspects of the problem, he will no doubt set about to study, in addition to giving treatment, the home environment of his patient, his dietetic and social habits, previous medical history and conditions such as worry or other psychological factors, which may

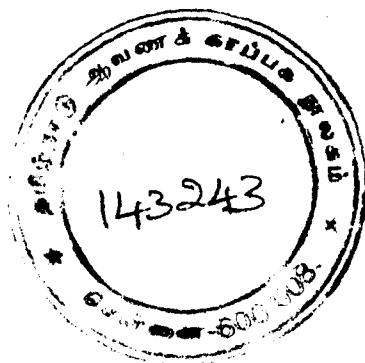
possibly be predisposing causes for the pathological condition for which he has sought medical aid. Such investigations naturally tend to become co-operative studies in which a number of scientific workers participate; for instance, besides the surgeon, there may be the medical social worker, the biochemist, the psychiatrist and the statistician. It is work on such broadened bases that holds out the promise of future progress in Medicine.

A growing synthesis of remedial and preventive medicine is of fundamental importance to the community and the medical man of the future should be equipped for both. The conditions under which he can be produced and made to work successfully are matters which require consideration at the hands of all of us. In the meantime, the plea that I put forward in the interests of promoting a more rapid improvement of the public health than has been achieved in the past is that a large body of non-medical preventive health workers should be trained and that, under the guidance of doctors, they should be employed on a variety of duties which will help to bring down materially the present high rates of morbidity and mortality in the country. The utilisation of non-medical personnel in increasing numbers so as to enable doctors to turn to the more important jobs is equally possible on the side of curative medicine. It is to the advantage of the community that the medical man, who has to undergo a long and rigorous period of training, should not be wasted on work which others can perform equally successfully.

INSTRUMENT AND CONDITION OF PEACE

In a world in which cooperation on the political level seems at present an unrealizable dream, it is heartening to recall that it has existed for a long time in the field of health. Widespread public health is both an instrument and a condition of any lasting peace. Dr. F. W. Behrler, *Minnesota's Health*, October, 1950.

PUBLIC HEALTH RESEARCH IN INDIA *



by

K. Venkataramanan, M.Sc., A.R.I.C.,



Our war against disease to be fought on many fronts

(1) "Resistance"

Our war against disease has to be waged on many fronts depending on our knowledge of the aetiology. But a general method applicable against all diseases is the building up of the individual's "resistance" against disease. We are not yet quite clear as to what is responsible for building up of the so-called "Resistance" or the "Stamina". Academically minded immunologists may argue that "resistance" is a naturally acquired immunity born of relatively insanitary conditions. This dangerous argument would perhaps land them in the position of one H.A.D. Linn (1950) who argued that native populations in Java who do not have good medical facilities should not be supplied with highly purified water-supply! Such an argument which savours of the spartan methods of improving the race is fortunately rare. While we know little about this so-called "Resistance", we would not be far wrong if we say that a sufficiency of good and balanced food, the knowledge of laws of health and the facilities to fight epidemics

Though measures of personal and environmental sanitation can markedly reduce the chances of infection, it is doubtful whether we can hope to wipe out the myriads of disease-producing agencies that came out of Pandora's box. The diseases that beset us may be variously classified according to the causative agents, their method of spread or their venue of attack. Besides the diseases that can be attributed to foreign organisms, we have those caused by toxic agents in food or water, those caused by malnutrition and other diseases such as cancer about which we still know so little.

* Adapted from a lecture delivered before the Biochemical Society.

constitute the main factors of building up "resistance".

(2) Environmental Hygiene

An equally important plank—perhaps the most important—in our war against disease is the promotion of environmental hygiene—a subject whose overwhelming importance is being realised slowly. This head includes a very large sphere of activity such as town-planning, provision of water supplies, inspection of foods and the proper disposal of wastes. While the principles underlying these measures are fairly well-known, the progress in applying these principles is much too tardy because of a number of reasons among which may be mentioned the shortage of money, materials and technical personnel.

(3) Immunisation

The third and a very important line of attack in our war against disease is immunisation by preventive inoculation. Unfortunately, this remedy is not applicable against all the known diseases though research is widening the field in which such a remedy can be applied. Simultaneously with the use of preventive inoculation, we have learned to take steps to prevent the spread of epidemic diseases. An example is offered by the adoption of extra-vigilance during fairs and festivals. In the case of certain diseases like malaria our main method of approach is to break the man-mosquito cycle by killing the mosquito or preventing the breeding of the larvae. The recognition of man's carelessness in promoting the breeding of mosquitoes by the indiscriminate digging of "borrow pits" has led to the advent of Engineers in the field of mosquito-control and with spectacular results.

(4) Curative Aspect

The fourth plank in our fight against disease is the curative aspect. The advent of the Sulpha-drugs and of the antibiotics such as Penicillin, Streptomycin and Aureomycin have changed our outlook on many of the diseases and given a new strength and confidence to the medical profession.

Now Cholera and Dysentery can be treated with a fair degree of success by the Sulpha drugs. Sulphones have yielded very encouraging results in the treatment of leprosy and have shed a ray of light into the lives of the unfortunate victims of this disease. In the case of Malaria, clinical trials of drugs such as Paludrine, Chloroquine and Camoquin are under progress while a large number of synthetic drugs prepared in our country are being pharmacologically assessed for antimalarial activity. The filarial worm finds its way into a relatively inaccessible site in the human body and challenges the chemist to produce a drug which can reach such sites in a sufficiently high concentration. This challenge is sought to be met by the use of "wetting agents". A number of new drugs suggested for use against filariasis are undergoing "screening tests" while a new drug "Hetrazan" which has yielded encouraging results is being tested on a large scale in parts of Orissa under the auspices of the I.C.M.R.

[In the case of Cancer, we have to depend on the extirpation of the tissue, and the use of X-Rays or radium-products to selectively destroy the malignant cells. The claim made by certain Russian scientists that the metabolic products of a certain parasite (*Trypanosoma Cruzi*) can selectively destroy cancer-tissue has led our research workers to study whether native parasites (such as that of Kala Azar or Oriental sore) have any similar action].

Present Position & Need for Research

The many sided efforts in the war against disease has certainly left us better off. We might well shudder if we try to imagine how things should have been before we knew about the methods by which diseases spread and before immunisation methods were discovered. Although it is true that executive difficulties often stand in the way of progress, we know how to control many of the infectious diseases and can at least feel optimistic about practically abolishing some of these scourges.

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Pathology of Diseases

Even from the fundamental points of view, we have to admit that there are large gaps in our knowledge of the pathological and physiological changes occurring in a large number of disease. To fill these lacunae, aspects such as the composition of gastric juices in health and disease, the anemias associated with hook-worm infestation, the changes between normal and cancerous cells are being studied in a number of research laboratories.

Improvement of Diagnostic Methods

Reliable and sensitive methods of diagnosis are of prime importance in the control of diseases. Early diagnosis is of the utmost importance in some diseases like cancer (whose onset is insidious) and cirrhosis of the liver. Numerous tests have been offered as diagnostic aids to detect cancer in its early stages but most of these have proved unacceptable. Nevertheless it appears to be a field in which bio-chemists can play a useful part since there are indications that urine-tests may help particularly to indicate cancer of the breast and the womb. Liver-function tests are being studied to enable us to detect cirrhosis of the liver in its early stages. An antigen-test developed at Guindy (Madras) has proved more reliable than the orthodox method of examining the peripheral night blood for microfilariae. Attempts are also being made to apply immunological tests to diagnose and treat allergic diseases like asthma and "hay-fever".

Pharmacology

We have yet to learn much about the mode of action of drugs on the causative organisms. For instance, do drugs exert their lethal action because they possess certain groups which enable them to combine specifically with the protoplasm of the causative organism and killing it while leaving the cells of the infected host unscathed? Or is it that the drugs act by making the environment unfavourable for the infecting organisms? Experiments on the respiration of the malaria parasite and the effect of antimalarial drugs on these respiratory changes have been started and

may be expected to throw light on this subject. As a result of researches in other countries, we have learnt that the beneficial effects of the sulpha-drugs (and possibly also of the antibiotics) in various infections are exerted by offering a compound similar in structure to materials (e.g. para amino benzoic acid) essential to the growth of bacteria, and thus interfering with the normal metabolism and multiplication of the bacterial flora.

Immunisation :

Even in the case of several diseases which have been receiving the continual attention of research workers and in which satisfactory methods of immunisation have been developed, it cannot be denied that there is scope for improving the present position.

Immunisation may be classified as "passive" or "active". In the former we administer to the subject the ready-made antibodies contained in the blood-serum of an animal (usually the horse) which has received graded doses of the pathogenic organism or its toxic principle. Researches have enabled us to concentrate the antibodies which are mostly present in the globulin fraction and thus to reduce the quantity of the inoculum as well as to avoid the discomforts caused by the injection of unwanted but associated constituents of the blood-serum.

In the latter case we administer small doses of the live culture of an associated organism (e.g. cow-pox-virus in the immunisation against small-pox) or a suspension of the killed or attenuated organisms into the subject whose system then develops the relevant "antibodies".

Typing of Bacteria

A large volume of research has been conducted to guide us in the choice of the types of the particular bacteria that should be chosen in the manufacture of the vaccines. When we talk of pathogens like cholera, the impression left in the mind of the layman is that we have got our finger right on the mischief-maker. As a matter of fact, there are a bewildering number of "castes and sub-castes" among even one

group of organisms which are characterised by a certain set of morphological, cultural and fermentation characters. We have travelled far from the days when an original strain was kept going for the preparation of vaccines and we now choose organisms freshly isolated from each epidemic, type them to reject the avirulent strains and use as many dissimilar varieties as possible so as to get what is called a "polyvalent vaccine". This differentiation is based mainly on certain cultural characteristics—(Rough and Smooth) and on serological reactions, but it is being realised that even these have limitations since the bacteria appear to be able to undergo "mutation" and lose their specific serological reactions. If only we could improve the methods of differentiating the types further and could discover more infallible tests to distinguish between virulent and avirulent strains, our vaccines would become far more potent than they now are.

Specific Polysaccharides

Fortunately, a clue is offered by the work done by Heidelberg and Avery on the pneumococcus. These workers showed that the "capsule" of the pathogenic bacteria contain a specific polysaccharide but that this polysaccharide is absent in the non-pathogenic types. With this analogy Linton and his associates did a good deal of excellent work and showed that the virulent cholera vibrio is associated with a galactose residue but that the avirulent types have, instead, an arabinose residue.

Another interesting finding (also first recorded by Heidelberg and Avery) is that injection of the specific polysaccharide into an animal provokes the production of antibodies. Linton and coworkers were, however, not able to establish a similar position in the case of the cholera vibrio but very recent work has shown that the isolated polysaccharides are active as antigens.

This approach is fraught with immense possibilities. The injection of the entire dead bacteria may become unnecessary and the subject may thus be saved the

discomforts caused by a foreign protein. The use of the polysaccharide fraction may yield a better antigenic response than the entire dead bacteria. From recent work with the specific polysaccharides from the dysentery bacillus, it would appear to be possible to modify the polysaccharides by chemical methods (such as acetylation) so that the toxicity is reduced without any change in the antigenic value.

Apart from its utilitarian value, this work on the polysaccharide factors is of absorbing interest from the fundamental point of view. The fate of the virulent pathogen in between epidemics is still a major puzzle. One of the suggestions is that the organism loses its virulence but that raises the question as to why and how the organism again acquires this lost property and plays its devastating role in the next epidemic. If we can define the conditions which favour this re-acquiring of the virulence, perhaps we can hope to prevent this change and thus nip epidemics "in their bud"! On the tentative assumption that the loss and the gain of virulence is due to the presence or absence of certain polysaccharide residues, we are led to the study of how these polysaccharides are synthesised by the organism and thus to an investigation of the bacterial enzymes, and the role of the substrates. Studies in these directions may enable us to at least alter our culture media in such a way as to favour the growth of the specific polysaccharides even if we do not find it practicable to alter the natural environments of the pathogenic organism in such a way as to discourage the regaining of the polysaccharides.

Chemistry has made giant strides during the last decade and we have at our disposal very sensitive and reliable tests which can be applied on small quantities of materials. We are also learning rapidly on the nutritional requirements and the metabolism of bacteria. I would submit, therefore, that these resources should be brought to bear on this very important subject and that more and more biochemists should enter this rich pasture of research.

Diseases due to Toxic Agents in Food and Water Industrial Health

As examples of diseases caused by toxic agents may be mentioned **Epidemic dropsy** (now traced to a contaminant in the mustard used for the extraction of oil), **Lathyrism** which has been traced by Acton et al to the use of a pulse locally known as Kesari Dhall (*Lathyrus sativus*) and **fluorosis** caused by the use of drinking waters containing fluorine exceeding 1.0 ppm. Recently evidence has come from certain parts of America that concentrations greater than 10-20 ppm. of nitrates in drinking water can cause cyanosis in infants when such water is used for making milk-foods. Such a condition has not been reported in India but it must be confessed that few attempts have been made to look for it.

Diseases due to Malnutrition

A large number of biochemists in India are busy on problems of food both from the aspect of increasing production and of avoiding diseases attributable to malnutrition. This is a very wide and complicated aspect and cannot be dealt with in the course of this short article. In passing, we may note the trends in research caused by the overwhelming pre-occupation with the problem of food-scarcity. While it is the job of the administrator to see that available food is equitably distributed, the scientist has helped by (1) laying down the minimum levels essential for maintaining health (2) demarcating vulnerable groups who should receive discriminatory protection and (3) attempting to process edible materials not hitherto accepted as human foods so as to render them fit for general consumption.

India is being rapidly industrialised and this raises both general and particular problems of health. The general problems raised are those of proper housing and environmental hygiene as well as the possibility of pollution of water-sources. The particular problems are those of "occupational diseases" due to peculiar conditions obtaining in the industrial concerns. To cite an example, the urgent need for fertilisers have given a fillip to the superphosphate industry in which large amounts of hydro-fluoric acid are likely to be released into the atmosphere. Evidence from other countries points to the hazard caused by such a source to grazing cattle. A number of other instances could be multiplied but one would suffice and that is the possibility of lead poisoning among workers in type-foundries. Apart from specific toxic agents, mere adverse conditions of temperature and humidity (as in the case of sugar factories) or mere dust in the atmosphere (as in some textile mills) or inert siliceous materials (as in mining industries) can cause serious hazards. This subject of Industrial Health is also one which is too vast to be dealt with in detail. Some aspects of this subject are being investigated in India but this again is a field in which the chemist can play a very useful part.

The picture presented in this brief article is admittedly sketchy but the impression left in one's mind is that so much more remains to be done. A wide and interesting field of research awaits us. The way may be steep and hard but every little step that we take will be in the noble cause of alleviation of suffering.

The world will never have lasting peace so long as men reserve for war the finest human qualities. Peace, no less than war, requires idealism and self-sacrifice and a righteous and dynamic faith.

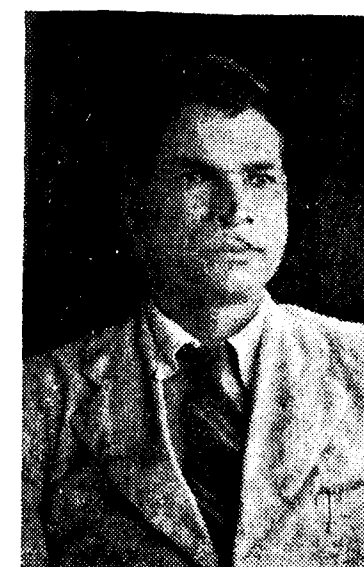
—John Foster Dulles.

FOOD RESEARCH: SYNTHETIC SUBSTITUTES

by

V. N. Patwardhan,

Director, Nutrition Research Laboratories, Coonoor.



THE present food shortage in the country has not only made it necessary to concentrate with all our resources on increased food production but it has also focussed our attention on the possibility of utilizing substitutes, which we would not have ordinarily thought of as human food. In our attempts to augment food supplies we have tried to make full use of known foodstuffs such as wheat and rice by drastically reducing their milling, if not altogether banning it. We have also attempted to increase the production of root and tuber crops. In addition, we have tried virtually to snatch food from the mouths of our cattle population by appropriating groundnut oil cake and bran for human use. Some people have gone so far as to advocate the consumption of grass and lucerne which ordinarily is the prerogative of animals to feed upon. That this step is misdirected can be realised if one remembers the fact that not only milk production but almost the entire agricultural production in India is dependent upon animals. They are already ill-fed and have shown an unmistakable decline in milk production and work capacity. Any further deterioration in their nutrition will undoubtedly be reflected in a further progressive decrease in food production.

The Resources of Land and Sea

The resources of land and sea for increased food production have not been yet

fully exploited, and hence there is wide scope for harnessing both these sources for the purpose of supplying the ever-increasing need of man. It is true that we in India are trying to exploit both of these for increasing our food production. At the same time, it would be profitable to learn by the experience of others and direct our attempts to explore the possibility of producing synthetic substitutes in this country.

"Synthetic Substitutes": Defined

Before we proceed further let us define what we mean by "synthetic substitutes" for food. Strictly speaking a synthetic substitute should result from processing of such materials which are not used as food. This processing may involve the application of several chemical or biochemical reactions which would impart to the resulting product, properties akin to the well known foods.

Man has always toyed with the idea of producing artificial food substitutes. The phenomenal progress in our scientific knowledge which the nineteenth and twentieth centuries have witnessed brought the object of obtaining such substitutes within the possibility of achievement.

In western countries a great deal of research has been devoted to obtain some of the foods by synthetic procedures and to prepare synthetic substitutes for others. Foods are complex substances and it is no

easy matter to prepare them synthetically. Our knowledge about their chemical composition, however, renders it comparatively easy to prepare artificially single components which are identical with the naturally occurring substances, or which closely resemble the latter in certain physical and chemical properties. More than one such single component can then be mixed to give an edible product possessing nutritive value similar to a natural food. Sometimes it becomes necessary to add the synthetically obtained substances to natural foods to restore the nutrients which have been lost in processing to which natural foodstuffs are often subjected. On the other hand, research could be directed to utilize the metabolic activities of some micro-organisms to produce substitutes which are more like the natural foods. Since the former usually contain more than one component to be found in the natural foods, they are more useful as substitutes. It is no doubt true that their significant contribution to the diet may principally lie in supplying any one component in comparatively larger amounts than others. But the fact remains that they are valuable as substitutes.

The object with which sources other than natural are exploited is to make available fresh supplies of foods to supplement the existing stocks or to produce something at much less cost than that obtaining at the moment for a natural food. There is another object as well although a subsidiary one. It is to prepare substances which impart taste, flavour, odour and colour to foods which are not unlike those associated with natural foods. Synthetic essences, edible colouring materials and saccharin are substances which would fall in this category. These synthetic food adjuncts had found widespread use in food industry long before synthetic substitutes for actual foods were even thought of as a possibility. It is only recently that appreciable progress has been made in synthesizing suitable food substitutes.

Qualities of Substitutes

When a foodstuff or a food adjunct resulting from chemical operations is identical

with naturally occurring food material, there is no difficulty in using it straight-away as human food. On the other hand, if the product merely resembles a natural food in certain chemical and physical properties but is not identical with it, certain important questions crop up which have to be decided before its use as food can be advocated. The digestibility of the substitute, its utilization in the body, its influence on growth and maintenance of health, any untoward cumulative effects on its continued use, etc., are a few of the aspects which have to be carefully investigated before such substitutes can find use as human food. Thus there is an inevitable time lag between the discovery of a substitute and its coming into general use.

An extremely interesting example of chemists' ingenuity is the manufacture of edible fat from coal. A method known as Fischer-Tropsch process was developed in Germany for the manufacture of hydrocarbons from coal. Some of the products are utilized as gaseous or liquid fuel and industrial solvents. A byproduct of Fischer-Tropsch process is known as "Gatsch". It is a soft wax-like product obtained on refining the crude mineral oils. When oxidized under suitable conditions it yields mixtures of fatty acids. These when combined with glycerine also of synthetic origin yields neutral fats. Such synthetic fats, although not exactly similar to natural edible fats, are capable of being used as food. In Germany during the last World War, thousands of tons of synthetic fat were used as human food. Extensive researches on animals and human beings have shown that synthetic fat can be assimilated in a manner almost similar to natural fat.

Role of Vitamin

During the last thirty years, considerable light has been thrown on the role of vitamins in human and animal nutrition. These indispensable accessory food factors occur naturally in several foodstuffs, but in such small quantities and are usually so unstable that majority of Indians do not derive more than suboptimal quantities from their daily diets. Storage of food-

stuffs, processing to which some of them are subjected and methods of cooking which sometimes are very drastic help to diminish or destroy the vitamins contained in foodstuffs. Their synthesis in the laboratory followed by their manufacture on a large scale in factories has put at our disposal large quantities of vitamins at comparatively cheap cost. Vitamin A, the deficiency of which is so widespread among the poor in India, is the latest to be obtained synthetically from an essential oil of plant origin. This achievement makes it all the easier to enrich some of our foods with vitamin A without affecting the susceptibilities of those who would object to any material of animal source added to their food. All the major vitamins also synthetically prepared are now readily available and are being utilized in some countries for enrichment of such foodstuffs as rice, wheat flour, bread, edible fats, preserved fruit juices, etc. In India their use is not yet made on such an extensive scale but it is hoped that with the development of our own industries and manufacture of vitamins in India, their use for enrichment programmes will greatly assist in our drive to improve the nutrition of the people.

Utilisation of Fungi and Bacteria

Let me turn now to another method of making synthetic substitutes. In this case we depend upon certain lowly forms of life belonging to the class of yeasts, fungi and bacteria. These micro-organisms have the capacity of utilizing simple materials for their growth and multiplication and simultaneously for conversion into important nutritious materials like fats and proteins which human beings and higher animals can use as food. Under ordinary conditions yeast breaks down sugar and produces alcohol, but if the conditions of growth are changed it can produce more fat and less alcohol. Certain fungi also are capable of synthesizing large amounts of fat when grown in suitable media. The fat thus produced can take the place of or supplement other natural edible fats. Similarly if a suitable strain of yeast is grown under a certain set of conditions it multiplies rapidly and when washed and dried can serve

directly as human food. During the war, food yeast was produced and consumed on a large scale in Germany as a substitute for protein rich foods. Food yeast was also manufactured in West Indies from Molasses and was found to be a very nutritious food, particularly as a source of proteins and B vitamins. A few tons were received in India and trials carried out at different places showed that it could form a good supplement to our poor dietaries as a source of protein and B vitamins. It is understood that plans for the production of food yeast on a large scale are receiving attention from more than one state government in the country. One great advantage in the manufacture of food yeast is the fact that it can utilize the byproduct of sugar industry or even sulphite liquor from wood pulp industry. Sulphite liquor when hydrolysed gives glucose, which can be converted into thick syrup and used as sweetening agent or it may be used in fermentation industries saving so much natural starch or sugar bearing foodstuffs used at present for the purpose.

Bacteria have also a role in this game of conversion of non-food substances into foods. The cattle which provides beef has itself to be fed on an adequate ration containing carbohydrates, fats, proteins, minerals, vitamins, etc. It has been recently observed that a substance known as urea can partly replace protein in cattle ration. Bacterial activity in the rumen of the animal converts urea into protein which is then digested, absorbed and converted into meat protein by the cattle, thus indirectly providing food for man.

So-called "Synthetic Substitutes"

I will now briefly refer to the last category of the so-called synthetic food substitutes. Recently we have heard a great deal of synthetic rice. This product has the least claim for being called a synthetic substitute. If one remembers that tapioca and groundnut cake are natural foods both for man and beast, one will realize that their mixing together and imparting granular structure should hardly entitle it to be called synthetic rice. I do not wish to discuss the question of the nutritive value

of synthetic rice nor the economics of its production. I only wish to state that the production of synthetic rice is a misguided attempt born of a misconception about peoples' dietary habits and prejudices. It is pandering to the public prejudice instead of educating people to use alternative food-stuffs. Nevertheless it is being widely advertised as an easy solution to our food problem. Unfortunately it is an example of imagination running away with discretion and wisdom.

What future is there for synthetic substitutes in India, and what are the prospects of our being able to supplement our food supplies by the production of synthetic substitutes? These are the questions which would naturally occur to one at this juncture. Apart from the fact that scientific knowledge would make it possible to think of other substitutes or the production of existing substitutes by better and more economic methods, their production on a commercial scale depends upon the stage of technological development a country has reached and naturally therefore on the existence of certain basic chemical industries. Under the present circumstances it should not be difficult to conceive of our knowledge and technical skill being utilized in not a too distant future for the manufacture in India of synthetic substitutes for foods and food adjuncts. Greater chances of success, however, would seem to lie in the direction of making use of

micro-organisms like yeast, bacteria and moulds for the production of certain vitamins, fats and proteins of fairly good nutritive value. These could not be correctly called synthetic, but they are very nearly so. We must pay attention to the development of such processes for the problems of food in India is important. Whereas our attempts to bring more land under cultivation and to increase the yield per acre are likely to produce more plant foods, there would still remain the need of supplementing them by producing more food from any other source that we can think of. The problem of equating our food supplies with the increasing population is an urgent one. While we do not see any hopeful signs of stabilizing the population, the attempts to ensure increased food supplies must be pushed ahead in all directions. It is often said that the people may not take kindly to the synthetic substitutes. One cannot blame people for not readily accepting foods not known to them, but there education and judicious propaganda can achieve a lot. One who has seen the changes in dietary habits of the people under the stress of food shortage cannot but be hopeful that given any food which is nutritious and palatable, the people will not reject it out of hand. But the essential thing is to produce food and more food. One needs not think of crossing bridges till one comes to them.

—Courtesy, A.I.R. Madras.

MAN AND SPEECH

The concept of man prior to speech is meaningless. Without speech man was not; without the names of things and actions he could not think about them nor make those primordial differentiations between things and actions and their qualities which are abundant in the most archaic and the most primitive languages. Speech was the instrumentality by which man attempted to grasp the meaning of his life and of the world. He has worshipped an unknown God: never a nameless one. Man and speech came simultaneously into being. Hence it becomes meaningless to distinguish between language as expression and language as communication or to ascribe priority to either function.

Ludwig Lewisohn in "The Magic Word: Studies in the Nature of Poetry."

A FOURTH GREAT DAM IN THE AMERICAN WEST

by

Herbert B. Nichols

Davis Dam, in the south-western State of Arizona, is a new reclamation achievement along the Colorado River.

This article appeared in *The Christian Science Monitor*, one of the outstanding newspapers in the United States. The writer is the natural science correspondent of the *Monitor*.

A new gem is being added to the crown of reclamation achievements along the Colorado River in the American West. At Davis Dam near Kingman, Arizona, engineers are allowing the water to rise behind it to form another sparkling lake in a sun-baked desert.

This fourth great dam being built on the lower Colorado River by the U.S. Bureau of Reclamation engineers is of earth, stone, and concrete construction. It joins with Hoover, Parker, and Imperial Dams in a great regional effort to make both power and water available to a wide area of three



A FOURTH GREAT DAM IN THE AMERICAN WEST.

An aerial view of Parker Dam on the Colorado River in the American West. With three others, this dam is helping to make both power and water available to wide areas of the three western States of California, Arizona, and Nevada.

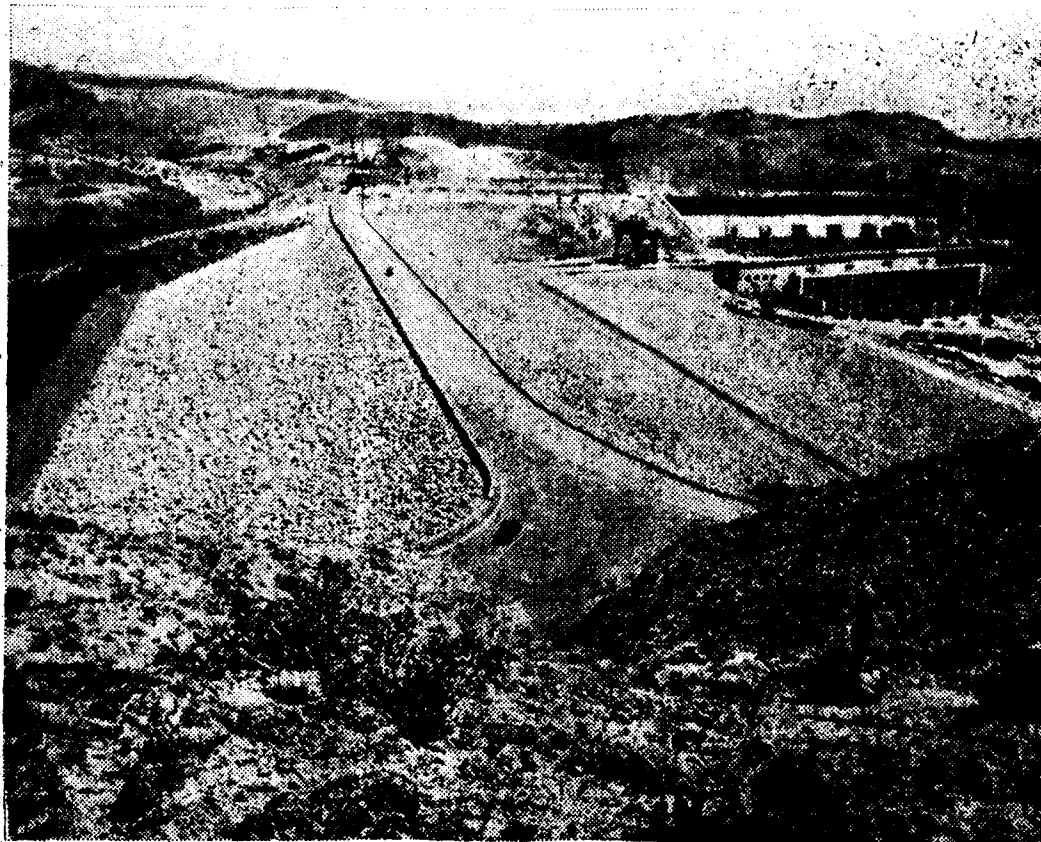
States (California, Arizona, and Nevada) which are mostly arid.

According to Oscar L. Chapman, U.S. Secretary of the Interior, "This marks another major reclamation milestone in developing the water resources which our western States must have to thrive and grow. Only by building dams, power plants, canals, transmission lines, and other facilities can the West obtain the water required for homes, farms, and industries to be maintained on a scale in keeping with American ways of living."

Mr. Chapman adds: "To a greater degree in the Pacific Southwest, but generally prevailing throughout all the arid West, people

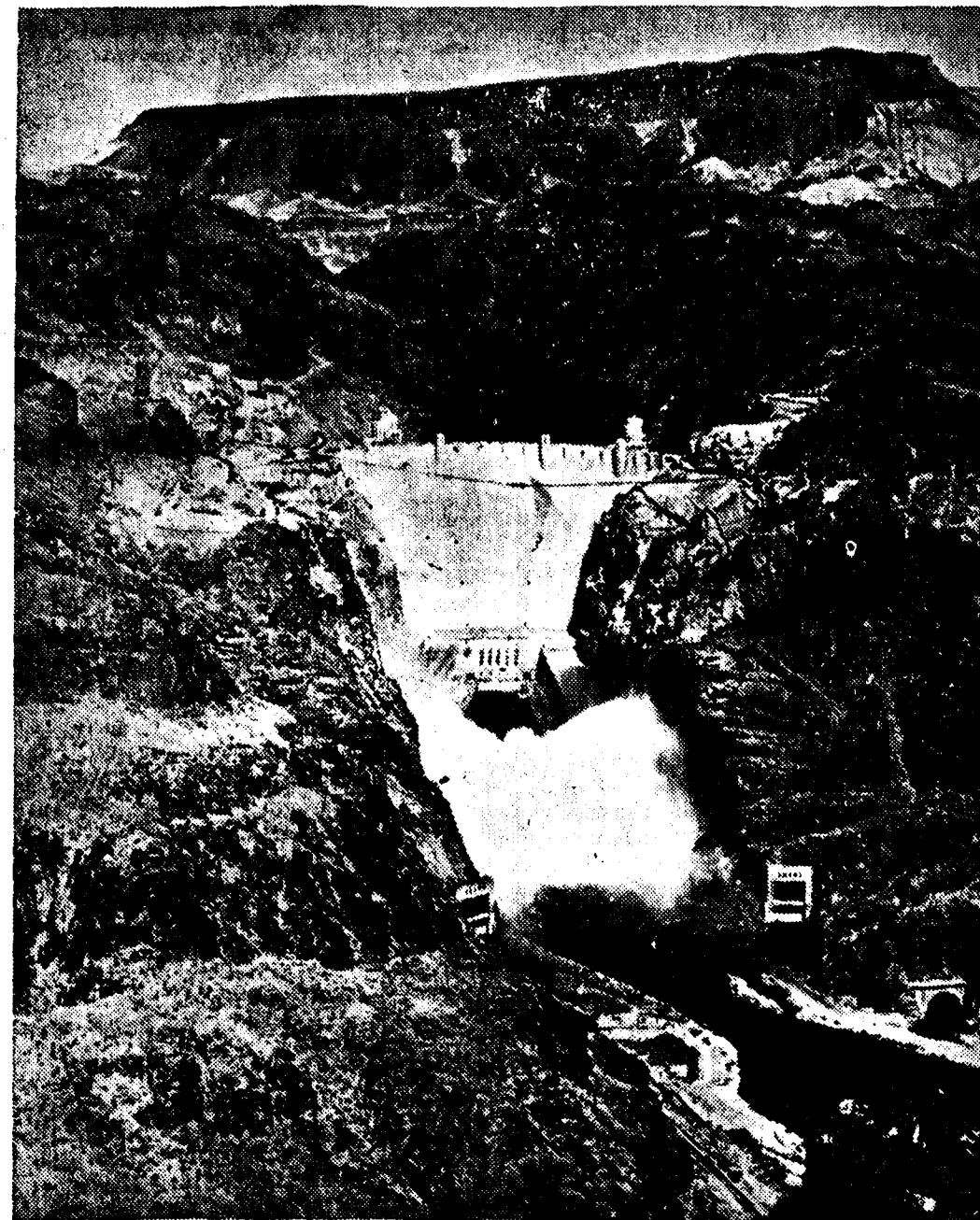
can live, grow crops, and operate industries only to the extent that the rivers are harnessed to provide them with water, power, and other benefits."

Reclamation is one of the major activities placed by the U.S. Congress under the Department of Interior. The construction of Davis Dam involved moving the unruly Colorado River out of its natural channel in one of the more spectacular feats of modern engineering practice. According to the U.S. Reclamation Commissioner, the total cost of the Davis Dam project will be near \$114,000,000; an investment, he says, which "will be repaid from power revenues and the other direct and indirect benefits flowing from the development."



A FOURTH GREAT DAM IN THE AMERICAN WEST.

This general view of Davis Dam and power plant, in the American West, shows progress on this U.S. Bureau of Reclamation project which is nearing completion. The first power is expected to be produced in the power plant in the spring of 1951.



A FOURTH GREAT DAM IN THE AMERICAN WEST.

Hoover Dam, as seen from below the dam, with Lake Load in the background. This is one of four dams in the American West which are helping to make both water and power available to three arid western States, California, Arizona, and Nevada.

Fourth Great Dam

Construction of the dam and power plant began in 1942 but halted shortly thereafter. It was resumed after the end of World War II.

Primary purposes of the dam are to regulate the Colorado River so that full power production can be maintained 67 miles north at Hoover Dam without diminishing supplies of water for municipalities, irrigation, hydroelectric power, and other purposes downstream—also to produce power from its own 225,000-kilowatt capacity plant.

Although not yet completed to a point where it can be placed in operation for that purpose, ultimately it will also aid fulfillment of obligations to provide Mexico with its share of the Colorado River's water under treaty rights.

The dam itself is 1,600 feet long; 200 feet high; and 1,400 feet wide at the base. A new channel for the river was dug on the Arizona side of the river, following which the giant structure rose in the dried-up natural bed of the stream. It is primarily compacted earth faced with stone but with steel-reinforced concrete spillways and power plant.

For a while, the lake behind the dam will rise 70 feet up its face and extend upstream for about 25 miles. But when the dam is completed it will be possible to extend the lake to a point 67 miles upstream to where it reaches the "tail-race" (the channel into which the water from a turbine is discharged) of Hoover Dam, impounding enough water to cover 1,000,000 acres nearly two feet deep.

A high point in the history of the U.S. Reclamation Bureau was the report to the U.S. Congress in 1918 by Arthur Powell Davis, then director and chief engineer of the service, whose recommendations laid the groundwork for today's achievements. Davis Dam is thus named in his honor—a monument to his outstanding career as an engineer and administrator.

Although the need for harnessing the Colorado system was apparent to many

natural scientists and engineers before the turn of the century, the work did not begin in earnest until construction began on Hoover Dam in 1931.

Key structure in the system, Hoover Dam is located in Black Canyon between the States of Arizona and Nevada. It impounds the flow of the Colorado River in a mighty reservoir now known as Lake Mead—115 miles long.

The uppermost dam catches the flood-swollen spring flows to store more than 30,000,000 acre feet of water, releasing it in a steady year around stream as needed. As this water surges through the penstocks and turbines, cascading out of the canyon walls below the powerhouse, it flows on down to Davis Dam.

Parker Dam and its Havasu Lake reservoir on the Arizona-California border is the next control feature. Parker is 88 miles below Davis—the third major link in the chain.

Parker Dam's primary purpose is to provide a forebay (a reservoir or canal from which water is immediately taken to run a turbine) and desilting basin from which to pump water into the Colorado River aqueduct to supply domestic and industrial water needs of the Metropolitan Water District of southern California. This combine embraces the cities of Los Angeles, San Diego, Long Beach, and 25 other cities and unincorporated areas in southern California.

Downstream from Parker is Imperial Dam, once again blocking the river's progress to permit diversion for irrigation purposes east and west. At the west end are the desilting works and the start of the All-American Irrigation canal. This stretches westward for 80 miles and has a capacity of 15,155 second feet, larger than many American rivers. On the east side is the take-off of the Gila Project Canal with a capacity at its head of 2,000 cubic feet a second, branching into a network of main canals 85 miles long.

In the construction of this multiphase Colorado River control system, many world

(Continued on page 255.)

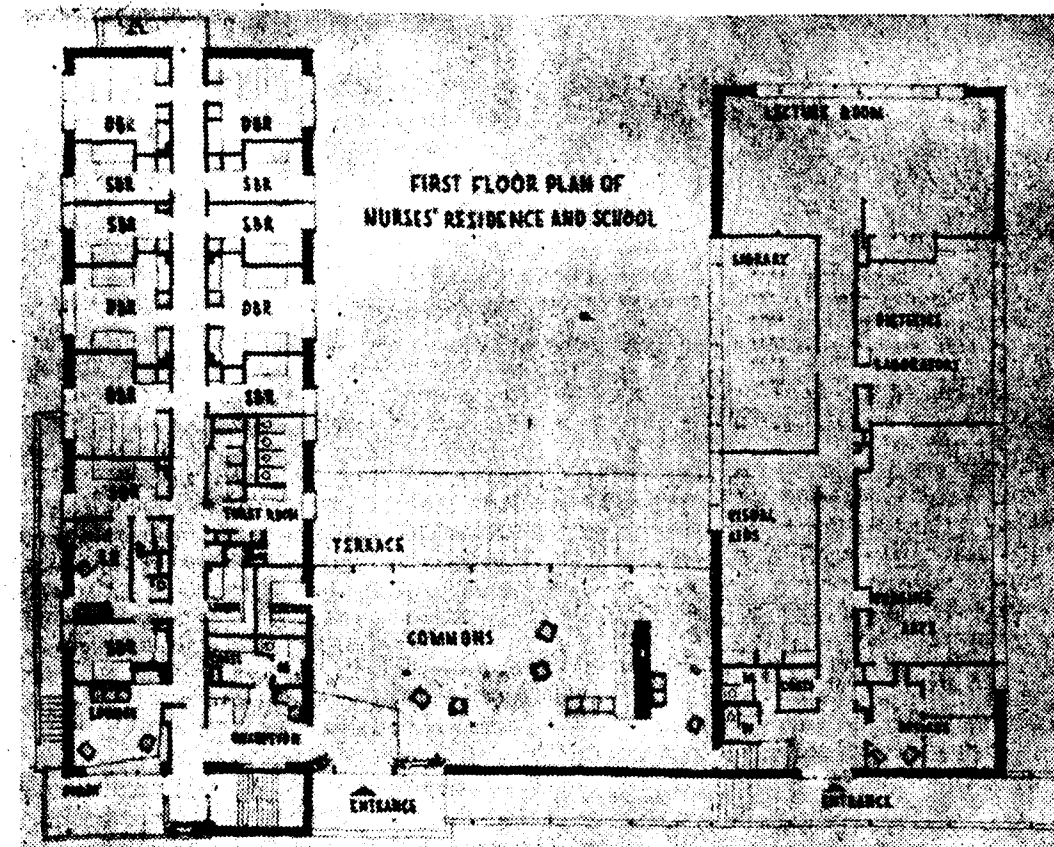
UNUSUAL DESIGN FOR AN AMERICAN STUDENT NURSES' HOME

by

Edgar C. Hayhow

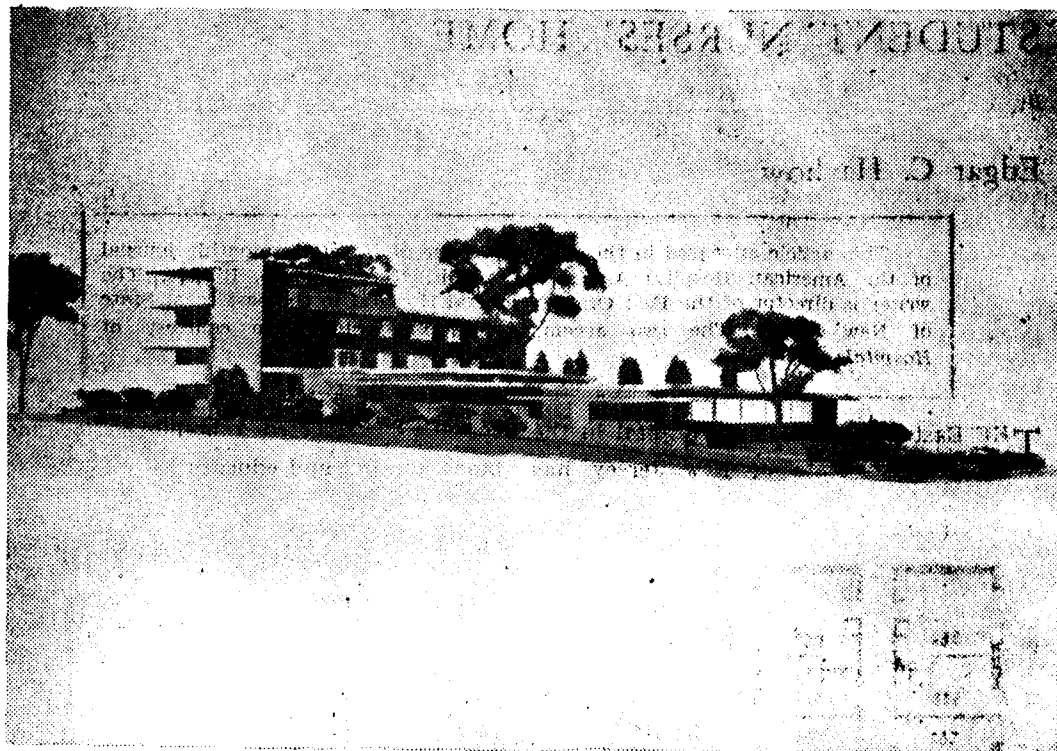
This article appeared in the May, 1950 issue of *Hospitals*, monthly journal of the American Hospital Association, published in Chicago, Illinois. The writer is director of the East Orange General Hospital in the east coast State of New Jersey. The two accompanying photographs are courtesy of *Hospitals*.

THE East Orange General Hospital in the recently constructed a building that combines housing and educational facilities for east coast State of New Jersey has



UNUSUAL DESIGN FOR AN AMERICAN STUDENT NURSES' HOME.

First-floor plan of the student nurses' home connected with the General Hospital at East Orange, in the State of New Jersey on the east coast of the United States. The unusual design separates the residence unit from street noises.



UNUSUAL DESIGN FOR AN AMERICAN STUDENT NURSES' HOME.

The nurses residence and school connected with the General Hospital at East Orange, in the State of New Jersey on the east coast of the United States. The modern building combines housing and educational facilities under the same roof.

the students of its nurses' training program under the same roof, with neither interfering with the other.

Providing complete facilities for 60 students, the building is composed of three units—the residence, the commons, and the school of nursing. Since these units adjoin each other, circulation of students and staff may occur either via the interior passages or exterior covered walkways. The plan is in the shape of a "U," the three-story residence and one-story school forming the two legs and the one-story commons (diningroom) the base.

A significant departure made in the planning of this building group by the architect is in the disposition of the various areas in such a manner that the residence facilities are divorced from the training school and its noise and traffic. At the

same time, the various rooms in the residence overlook the patio and the attractive grounds. In much the same manner the commons room has been lifted from within the residence and placed as a wing extending to the west and opening on a greensward and a patio terrace. These departures have been further dramatized by a contemporary architectural treatment, which is made possible by modern planning techniques and the new rigid-frame, reinforced, lightweight concrete structural system.

The residence unit of concrete and brick has been carefully placed, so that it is separated from street noises by the school, commons, and existing trees. With the residence in this position, the architect was able to utilize large window openings, allowing for ideal ventilation and sunlight to be

Unusual Design for an American Student Nurses' Home

enjoyed in each room. The basement contains maintenance, storage and student laundry facilities.

Unusual Design for Nurses' Home

Each of the three floors above grade has a screened porch, lounge, kitchenette, toilet facilities, both single and double bedrooms, instructors' suites, corridors with acoustical plaster ceilings, house phones, buzzer call system, dumb-waiter, and other modern appointments. The bedrooms have built-in wardrobe closets with sliding doors, lavatory closets, and dresser recesses. The roof terrace, partially covered and completely enclosed by a three-foot high railing, permits the nurses to enjoy both sunbathing during the day and the cool breezes on summer evenings.

The large, radiant-heated commons room both separates and connects the residence and the school. The south wall of glass permits an outlook on to a sun terrace and beyond to a spacious, well-landscaped patio. The fireplace wall at the west end separates the reading and writing alcoves from the balance of the room. Heavy drapery material is utilized as a flexible partition dividing the more active recreation activities from the more sedate groups around the fireplace. This room is served by a modern and well-equipped kitchen, and adjacent to it are the necessary coat and lavatory rooms.

The oak parquet floor of this room is depressed below that of the residence. Because of the planned flexibility of this room, it will serve the functions of both a general social area and a recreational center.

The one-story school building contains dietetics and nursing arts laboratories, a visual aids classroom with stadium seating, a library, a large lecture hall, which may become two smaller classrooms by means of a folding partition, toilet and coatrooms, a reception hall, and offices. The laboratory and visual aids equipment permits training of nurses in the most up-to-date hospital procedures. These classrooms have been lifted from the usual basement location and placed in an attractive, well-lighted and well-ventilated, above-ground, one-story structure.

The site rises from the street to the residence; consequently the roofed-over concrete walkway is stepped at three points to conform to the natural grade. A drive-away extends the full depth of the lot to the existing garage and parking area. The site is beautifully landscaped since it was once the grounds of an old East Orange mansion. Part of the grounds will be developed as outdoor recreation areas with plans for a tennis court.

U.S.I.S.

Does any relationship exist between the development of grey matter in man and his drinking water?

Prof. Burt and Dr. Dorothea M. Tudor have expressed their expert opinion on the subject. Here it is:—

"One far-reaching cause of subnormal mental capacity, ranging from 'some dullness' to pronounced defect, is the toxæmia which results from drinking water contaminated by human and animal excreta (by matters of animal and human origin). The process of deterioration is slow and chronic. There is no sudden onset of illness to call attention to what is taking place, and no apparent necessity to investigate for a source of toxæmia; the connecting link is not suspected, and so the mischief goes on working havoc in successive generations. A higher standard of water supply is demanded in the towns than in the country, and the mental deficiency is less prevalent, in urban than in rural population. If it were more generally appreciated how adversely contaminated water affects the mental health of those consuming it, nothing would be allowed to stand in the way of providing all villages with drinking water without suspicion."

HOW BRITAIN GUARDS AGAINST WATER POLLUTION

SPECIAL LABORATORY FOR RESEARCH WORK

by

Trevor I. Williams,

Deputy Editor of the scientific journal "Endeavour"

IN most of the world's great cities pure water is so readily available at the mere turn of a tap that the difficulties of providing it are scarcely realized. In fact, however, the provision of pure water, and the closely connected problem of preventing harmful and unpleasant pollution of rivers and other natural waters, is a highly specialized task calling for the application of many different branches of science.

The main incentive is the prevention of water-borne diseases, such as typhoid and cholera. Only a century ago the whole world was in constant dread of cholera outbreaks, whose toll of human lives ran into tens of millions. In 1826 an outbreak which started in Bengal spread, in the course of seven years, as far as the United States, travelling through Europe by way of Afghanistan, Moscow, Leningrad, Berlin, and Hamburg. From Hamburg it spread to Sunderland in England and within a few months the disease had been carried across the Atlantic to Quebec and thence to New York and New Orleans. Other epidemics almost as serious surged through Europe at intervals of about 10 years.

In the face of this grave threat Britain, whose high density of population made her particularly vulnerable, led the world in enforcing public health measures designed to prevent the spread of the disease. The effect of these was dramatic; Britain had no serious cholera outbreak after 1866, although it raged on the Continent in 1883, 1892 and 1908. The second of these outbreaks was so severe—at least a million deaths occurred in Russia alone—that an international convention was called in Dresden and led to the general enforce-

ment of measures similar to those which had proved so successful in Britain.

Varied Interests

This lead in the prevention of water pollution has been maintained in Britain, and today the Government maintains a special research laboratory near London for the sole purpose of carrying out research in this field. Its latest report, just published, shows how varied are its interests.

An expert from the laboratory has spent a considerable time in Persia, at the request of a firm of consulting engineers, making recommendations for the installation of a piped supply of pure water to replace the old system of open canals flowing from the river. As a preliminary to the building of a pilot plant, many tests were made on the local water, samples being taken at different times in the year. Detailed chemical analyses were made and experiments were carried out with several different agents designed to carry down suspended solid particles.

Eventually it was found that pure water could be obtained from the local supply by first allowing it to settle to remove most suspended material, then treating it with an iron salt to bring down the rest, then filtering it through beds of sand, and finally sterilizing it.

Reducing Hardness in Water

Other research has dealt with an interesting new method of softening water. It has been found that a considerable reduction in hardness can be brought about merely by blowing air through water to which a little finely powdered chalk has been added. This may have important

practical applications, for the Ministry of Health has recently recommended all public undertakings in Britain to soften, where practicable, water supplied for both domestic and industrial use. This is an important recommendation, for the use of hard water causes much needless expense.

Not only does it make necessary the use of excessive quantities of soap—for the soap must neutralise the hardness before it begins to form a useful lather—but it rapidly causes scale to form in all the pipes through which it passes, particularly when these form parts of hot-water systems. The annual bill for removing this scale is enormous.

Many modern industrial processes result in the production of waste waters which would be extremely harmful if discharged unchanged into local drainage systems. The electro-plating industry, for example, has to dispose of large volumes of liquid containing, cyanides. Paper mills, too, produce noxious waste liquids.

With the object of improving present methods of dealing with these, detailed research has been carried out by the laboratory on the discharge from a mill making paper from rag and hemp. A biological method of purification, in which microbes break down harmful substances, has many advantages, but the microbes cannot act in the presence of such toxic substances as excessive soda or chlorine. A method of removing these simply has been worked out and the investigation is being continued and extended to other

mills using different raw materials, such as esparto grass.

Other Experiments

Quite different, but no less important, research has been done in another direction. It deals with the causes of the silting up of the Thames Estuary. Analyses are being made of samples taken from the bottom of the river at many points and it is hoped to be able to correlate these with the movements and the nature of the water above them. As very large sums are spent each year on dredging a navigable channel as far up as London Bridge, this research is likely to have results of considerable practical importance.

Other experiments are being carried out to discover the effect on fish of poisonous substances, such as cyanides, likely to find their way into river waters from factories. Young rainbow trout are used for the tests. This emphasises a different side of water pollution research; it is designed not merely to protect public health but also to keep rivers, so far as possible, in fit condition for recreations such as fishing, boating, and swimming.

It is hoped that such research, coupled with new legislation regarding river pollution which will shortly be discussed by the British Parliament, will banish for ever the dark lifeless drains into which industrial development has sometimes converted what were once pleasant streams and rivers well stocked with fish and colourful with vegetation.

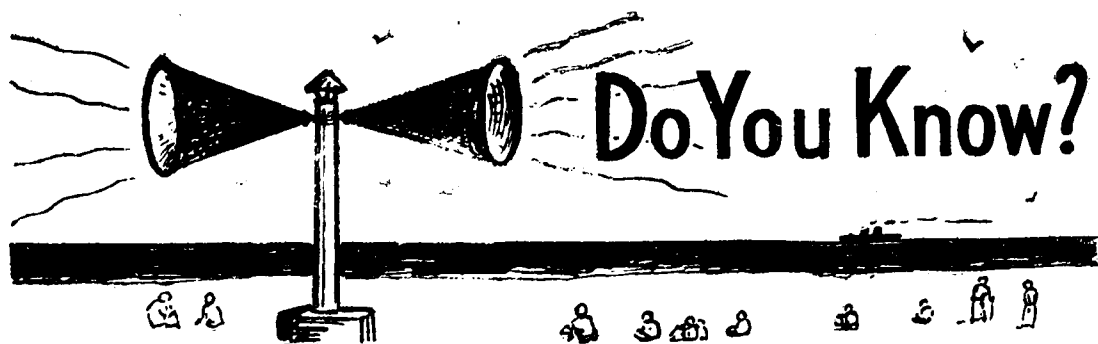
(Continued from page 250.)

engineering records were shattered. Hoover Dam is now the highest in the world (726 feet) and the second greatest hydroelectric power producer.

Lake Mead Reservoir at Hoover Dam, with its 550 miles of shore line and maximum depth of 583 feet, is the largest man-made lake (by volume) on earth today.

It has a maximum storage capacity of 31,142,000 acre feet. It is also one of the major tourist and recreation areas of the United States. Eventually, Hoover's 17 generators are expected to have a capacity of 1,332,300 kilowatts. At present, its capacity is 1,034,000 kilowatts.

U.S.I.S.



Backache—What to do about it?

Your backache can be caused by a mind ache. Do you know that? It is estimated that more than 50 per cent of the backaches of which women complain are mentally induced.

Not that the ache isn't actual—it is. It is there and it makes a woman or girl feel miserable. But let's get down to what causes it. You want to be free of backache. You want to show a happy face to your public. You want to enjoy each day more than you do. So let's talk turkey!

Remember that the spinal column houses the spinal cord which is the pipeline of the nervous system. See the connection at once?

If you are nervous, tense or worried you are clogging that pipeline and it cannot work as it should—your circulation cannot carry off and secrete the body's poisons. Thus they back up into the muscles and the weaker of the group complain. Then you get a backache or a headache or a neck-ache!

Rather than complain or rush to a doctor insisting that something is wrong with your spine, give yourself a little home treatment! You begin with relaxing your mind—pushing worry aside and doing something constructive about what caused you to worry. In other words—you face the issue. Then you get more diversion. You might even let the house run on its own steam for a day or two and you get out with friends or to a movie or for some shopping, or whatever gives you diversion. Then you think about exercising. You're fed up. You're too young and life is too good to go

on feeling like an old shoe. So do something about it.

Go through a relaxing exercise routine (yes, you can do it right at home), and you begin to do your tasks the easy way, take your troubles with less tension. You get a relaxing massage and then you awaken one morning and wonder where that backache has gone to! From now on you are not going to have a backache. You've taken care of that "mind ache" and hence, the backache. No doctor could do that for you—it was your job and you handled it.

Now get busy and live and have fun free of tension!

—Patricia Lindsay.

BCG

Q. What is the status of BCG vaccination for tuberculosis?

A. The addition of a vaccine to the present control programme requires careful and adequate consideration. It has been used for more than 25 years and recently many millions of people have been vaccinated. However, it must be stated there is no evidence that meets strict scientific requirements demonstrating that BCG affects the control of tuberculosis, despite the very suggestive results of a few studies. Since there is no general agreement on such fundamental matters as the preparation of a vaccine, the method of vaccination, what constitutes a successful vaccination, how resulting immunity may be measured, how long such immunity lasts and so forth, the procedure would seem to be still in the investigational period.

At the present time, methods which have proved effective in tuberculosis control

Do You Know?

257

should be increasingly applied to all segments of the population, regardless of decreasing mortality figures, as long as tuberculosis remains an important cause of death. These measures include mass X-ray, case finding, early diagnosis, rapid institution of treatment, isolation of open cases, and the restoration of the patient to normal life.

—The Journal

Staphylococcus Role Shows Cleanliness Need

More than half of the 34 outbreaks of food poisoning examined by Don M. Griswold, M.D., Medical Consultant for the Mississippi State Board of Health, were caused by the heretofore little-suspected staphylococcus toxin which may, and does, contaminate food at all times.

The staphylococcus organism is present on the skin of the hands at almost all times, indicating the necessity for high standards of cleanliness in the handling, preparation, and serving of food.

Dr. Griswold felt the data indicated not only the need for extreme cleanliness in food handling but also the study of certain industrial processes, sound training in bacteriology and chemistry, research into the natural habitat of pathogens, and clinical acumen in identifying pathological conditions.

—P. H. Reports.

Diarrhoea

Q. What is Psychogenic Diarrhoea?

A. Psychogenic diarrhoea is the nomenclature given to the nonspecific diarrhoea, resulting from emotional stimulation. It is also termed by some authors to be functional, idiopathic, nervous and hysterical. The word functional is prefixed to the names of all diseases, which are not organic in nature and it has a long range. Idiopathy means a peculiar affection. It is not con-

finied strictly to the functional group of diseases. Nerves do transmit impulses, but they are not the sole causative factors. Hysteresis, a deficiency, is a general condition, exhibiting occasional violent attacks of counterfeit organic disease. Therefore hysterical conditions are numerous and the term very wide. Hence this type of diarrhoea is called psychogenic.

—P. T. Jagannadha Rao.

What Proteins Are Good?

Q. It is understood that meat, fish and eggs provide the best quality protein for growth of the child's body. Are the proteins in peanut butter and gelatin considered of good quality? How do they rank with the first group? What others are next in quality?

A. Proteins are made up of substances called amino acids. Certain of these amino acids are necessary for the maintenance of normal growth. These are designated as indispensable or essential amino acids. The proteins of meat, fish, eggs and milk contain all the essential amino acids.

Those proteins which do not contain all the essential amino acids are called incomplete. They will not maintain normal growth and many of them will not even support life. Gelatin is a conspicuous example of this latter type. The protein of peanut butter is also classified as incomplete.

By a proper combination of foods containing incomplete proteins, it is possible to assure an adequate intake of all the essential amino acids.

If your diet cannot contain meat, eggs or fish, it is still possible to obtain the necessary essential amino acids by using generous amounts of milk and milk products. Of course, it must be remembered that there are many factors besides proteins which are necessary for an adequate diet.

—Today's Health.



*Wit's an unruly engine, wildly striking,
Sometimes a friend, sometimes the engineer.*
—George Herbert.

The Human Mind

Nothing so much convinces me of the boundlessness of the human mind as its operations in dreaming.

—William B. Clulow.

Arguments at Dinner Table

Never argue at the dinner table, for the one who is not hungry always gets the best of the argument.

—Whately.

Poverty in Its Place

Poverty is very good in poems, but very bad in the house, very good in maxims and sermons, but very bad in practical life.

—H. W. Beecher.

The Value of Faith

Faith is indispensable and the world at times does not seem to have quite enough of it. It has and can accomplish what seems to be the impossible. Wars have been started and men and nations lost for the lack of faith. Faith starts from the individual and builds men and nations. America was built by and on the faith of our ancestors.

—G. A. Sandberg,
(The NTA Reporter).

Democracy

"If we are to have democracy, we must have democracy in the reproduction of the race. . . the freedom of all peoples to reproduce the quantity and quality of human beings who are capable of sustaining a democracy."

—Burch, News Exchange.

To the Rescue

Living conditions would soon become utterly intolerable if it were not for the sanitary engineer who uses scientific means for combating the nuisances created by modern methods of living.

—Dr. Thurman B. Rice.

Foodhandlers First

The two factors which I consider of paramount importance in the satisfactory handling and preparation of food (are):

1. Clean, intelligent and honest workers, well instructed in the theory and practice of their important work.

2. Satisfactory premises.

You will notice that I place the workers first.

—Dr. E. L. M. Millar, in
The Sanitarian (London).

Wit and Wisdom

259

Big Little World

We live in a world of extremes: a world which it is possible to circumnavigate in a few hours; a world in which the carelessness or ignorance of one person may cause disease or death for many.

—Dr. A. Leslie Banks.

The Philosopher and The Commentator

When Bertrand Russell, British philosopher and Nobel Prize winner lectured recently at Columbia University he raised some interesting points concerning food, population and birth control. They were seized upon by Eric Sevareid, CBS commentator, in an arresting analysis broadcast on Nov. 17. Said Lord Russell:

"The food supply of the world as a whole threatens to diminish. . . This is an explosive situation. Left to itself, it must lead to a food shortage and thence to a world war. . .

"The standard of life has depended mainly on these things: democracy, trade unionism and birth control. . . without these three things, industrialism will create a regime like that in which the Pharaohs built the Pyramids. In particular, if world population continues to increase at the present rate, the abolition of poverty and excessive work will be totally impossible. . ."

—News Exchange.

Favours Vigilance

We do not advocate repressive measures on the part of regulatory agencies, but we do believe that alertness and prompt court action in the case of unwillingness to be truly sanitary is an essential feature of government health programs.

—Edward L. Holmes, Ph.D.

Home Pride

Even an auto repair shop may have a neat and homelike appearance, says the South Plains, Texas, Health Unit News. It reports that when one of its reporters found such a place and commented on it, the garage owner said, "Well, I spend a lot of my time here, and it is a kind of second home to me, so I want it to look that way."

"If more of our food establishment operators would take this same attitude," observes the reporter, "we would be amazed at the neater and cleaner places we would find."

—Health Officers News Digest.

No Room for Filth

A filthy restaurant is a disgrace to the community—a menace to the health of the community—and should not be tolerated.

—R. W. Dale, Exec. Vice-President,
Washington State Restaurant Assn.

A Tip to Medicine-men

Young Doctor: "Why do you always ask your patients what they have for dinner?"

Old Doctor: "It's a most important question, for according to their menus I make out my bills."

What Doctor?

Two seven-year-olds were passing the time of day. "What's your Dad do?" one asked the other.

"He's a doctor."

"Well, what kind? A dog doctor, or a dentist, or a specialist, or what?"

"No, none of those," was the reply. "He's a woman's organist."

—Contributed by Sally A. Dougherty.

Sense of Value!

He who sacrifices his conscience to ambition burns a picture to obtain the ashes!

—Chinese Proverb.

"Know Thyself"

The precept "Know thyself," was not solely intended to obviate the pride of mankind, but likewise that we might understand our own worth.

—Cicero.

The Main Idea

The public health worker should never lose sight of the fact that his primary objective is to prevent disease, not to enforce regulations.

—Dr. John D. Porterfield.

FROM EVERY WHERE



WHAT DO THEY SAY ABOUT IT?

Readers can contribute to this section. They are requested to send extracts of current literature which, in their view, would interest the readers.

—Ed., P.H.

Medical and Scientific Approach to Alcoholism

A pioneer programme for the prevention and treatment of alcoholism on medical and scientific lines was outlined by a Sub-Committee of the WHO Expert Panel on Mental Health meeting in Geneva earlier this month. According to this Expert Group national public health administrations should provide treatment facilities and advisory, educational and other services in this field. It was emphasised that this outlook was quite different from the approach of lay reform groups, and must not be confused with political and social action against alcohol as such.

In an effort to clarify terminology the Committee proposed the following definition of alcoholism: "Any form of drinking which in its extent goes beyond the traditional and customary dietary use, or the ordinary compliance with the social drinking customs of the whole community concerned." The Committee also agreed on a detailed description of three stages generally observed in clinical studies of the development of alcoholism. Each of these stages of "symptomatic drinking", "addictive

drinking", and appearance of organic damage or psychic deterioration, has a different significance for prognosis and treatment.

Analysing the extent and nature of the problem from an international point of view, the experts agreed that the level of per capita drinking in a country is no concrete evidence of alcoholism. Similarly there is extreme variation in social drinking customs in different countries and in the types of beverages consumed. In some countries, urban life is associated with a higher rate of alcoholism, while in others the higher rate is to be found in rural communities. High alcoholic consumption may in one place be characteristic of upper-level socio-economic groups, while in another it is at its highest at the lower end of the scale.

The Committee accepted the following as being the best available estimates for each country of the total numbers of chronic alcoholics presenting complications: Switzerland 50,000; Chile 43,000; France 375,000; Yugoslavia 90,000; USA 945,000; Australia 34,300; Sweden 30,800; Italy 135,800; Norway 8,400; Finland 8,800;

What Do They Say About It?

England and Wales 86,000. No figures were available for Asian countries.

In order to define the problem precisely the Committee urged the development of national statistics within every country on the incidence of alcoholism.

The numerical size of the groups affected underlined the need for adequate treatment facilities, according to WHO experts. The Committee felt that all efforts should be made to bring to light early cases of alcoholism where treatment is at its most valuable and successful, and was of the firm opinion that out-patient dispensary services are necessary. Such services can in the early stages of the disorder produce a high proportion of successful results, and are best situated in well-equipped general hospitals, at very small cost.

As regards means of treatment, the WHO experts felt that a medical approach devoid of any implications of moral censure, and backed by psychotherapy and social work, would offer the best results.

It was pointed out that no existing drug is a cure for alcoholism. They were rather aids to treatment. Important new drugs such as tetra-ethyl-thiuramdisulphide, when used by qualified physicians are however a valuable aid in well-chosen cases. A strong warning against their use without specialist medical supervision was issued by the WHO experts who pointed to several fatal cases.

The Committee paid tribute to voluntary organisations of the type known in the USA as "Alcoholics Anonymous", an organisation whose membership is composed entirely of alcoholics who have been able to become or are attempting to become abstinent. Experience of this movement is restricted to comparatively few countries outside the USA, but it is considered by many physicians to be the most hopeful social development which has taken place in the handling of alcoholism.

Finally the Committee recommended that WHO should take all steps within its power stimulate national public health services to

take positive action in preventing and treating alcoholism.

(Board on information from WHO Geneva Head-quarters).

Influencing Patients Through Reason

"A full equipment of diagnostic instruments will repay itself a hundredfold in the long run. Most patients have been to some other doctor at some time in their lives before coming to you. They will compare your use of diagnostic instruments with what they have before observed. A well-equipped outfit gives confidence. It will be reported in a way you hardly expect and a strong means of gaining reputation results.

"A pocket magnifying lens costs 1s.6d. to 2s. It is a good plan to inspect all skin diseases with one. In percussing use a pleximeter. An ivory one can be had for 2s. or less. A Tucker Wise's cyrtometer for measuring expansive movements of the chest costs 10s. 6d. and has a good moral effect on patients anxious about their lungs. It is one of the commonest convictions of patients that their blood is out of order. A profound impression can be made by Haemocytometers and Haemoglobinometers, etc. These are a little costly, but in a good-class practice they are well worth having.

"Every instrument that you can afford should be in evidence. A microscope, ophthalmoscope, a frontal mirror, stethoscope, test tube stand, spirit lamp, and reagents may lie on the table. The medical journals may be there also."

"It is better to be sure, cocksure, even if occasionally mistakes are made, than to go through life expressing doubt. Mistakes will do harm, but much less harm than a hesitating manner. A doubtful diagnosis can be given in an emphatic manner. You can say, as if you were certain, as if every medical man would be certain that the exact nature can only be told by further observation.

"When examining a patient, don't say 'This looks strange' or 'That is curious'.

Avoid saying 'I think the disease is so-and-so.' Say positively that it is what you think it is. If you have made a mistake in diagnosis or treatment, do not be too ready to admit it, say nothing.

"It is very unwise to diagnose where the diagnosis may turn out to be wrong. Errors of prognosis are often more dangerous than errors of diagnosis because the patient can easily check the error. When the time of recovery is indefinite, it may work to use indefinite language, to say that it will take 'some time' or that 'it depends on the vitality.' If asked whether a case will prove fatal, say that it will depend on the possibilities of complications. This leaves you a reasonable margin for uncertainty."

—Art of Practice.

Medicine in Ancient India

Indian Medicine is as old as the Atharva Veda. Yajurveda has much to say about metals and the chemical action on these. Charaka and Susruta have given an exhaustive exposition of the metals and of their use in medicine. Patanjali's work on metallurgy deals with the metallurgical and chemical processes, metallic salts, alloys and amalgams and mixtures. Nagarjuna advances further in his study of compounds. In Dandin's Dasa Kumara Charita, we hear of a Yoga Churna that brings in sleep, and a Yoga Vartika that can light without a match. In Gunadhya, we find a Churna (powder) that acts as an anaesthetic. Brinda of the tenth century gives the preparation of the sulphide of mercury and of cuprous sulphide.

—Indian Affairs.

Tuberculin Reaction and Tuberculous Infection

The findings from mass investigations on tuberculin sensitivity are often reported in terms of the frequency of positive reactors. On the basis of the degree of reaction to tuberculin, the population is divided into two groups intended to represent those infected with tuberculosis and those not infected.

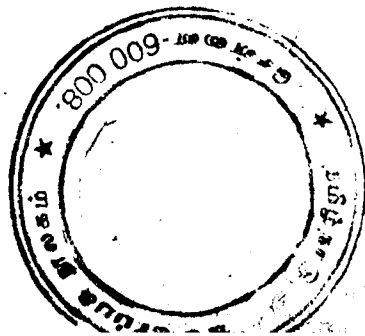
Division of the population in this way, however, will always be to some extent arbitrary. First, results will depend upon choice of test, technique, and dosage of tuberculin. With increasing dosage there will be an increase in the number of reactions that can justifiably be classified as positive. It is not possible by means of the character of the reaction to decide which is the most appropriate dose for separating infected from noninfected individuals.

Second, there is no sharp dividing line between two kinds of reactions even to a given dose which could appropriately separate positive and negative. The reactions range along a continuous scale which it is difficult to dichotomize.

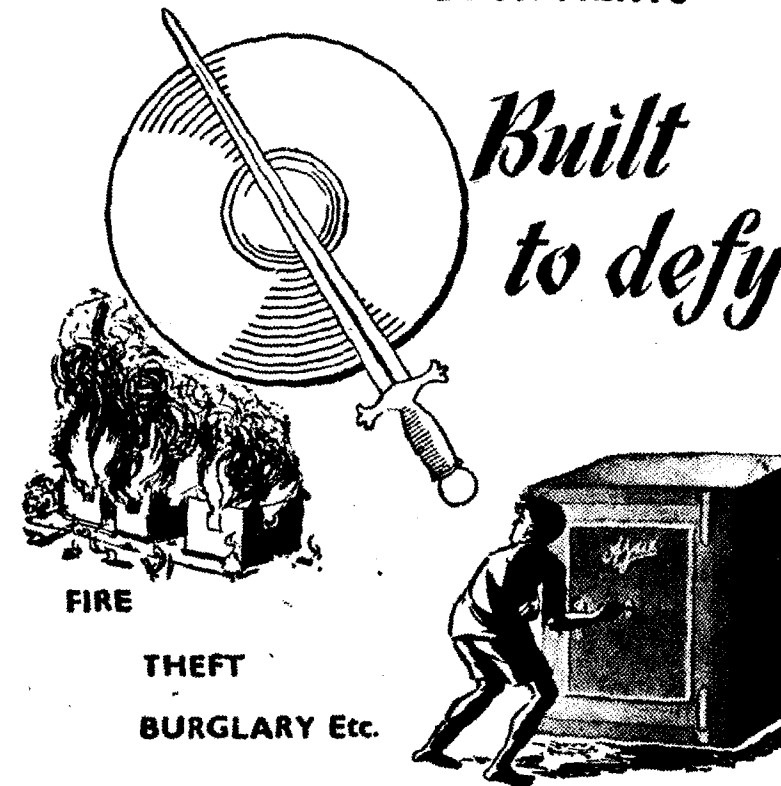
One method of interpreting the different degrees of reactions is to compare them with quite different criteria of tuberculous infection, such as radiologically detected pulmonary changes.

Another approach is to obtain distributions according to detailed categories of degree of reaction for different groups of the population. From an examination of these distributions, it may be possible to gain further insight into the relationship between level of sensitivity and the existence of tuberculous infection.

—Sven Nissen Meyer, M.D.
P.H. Reports, Jan. 51.



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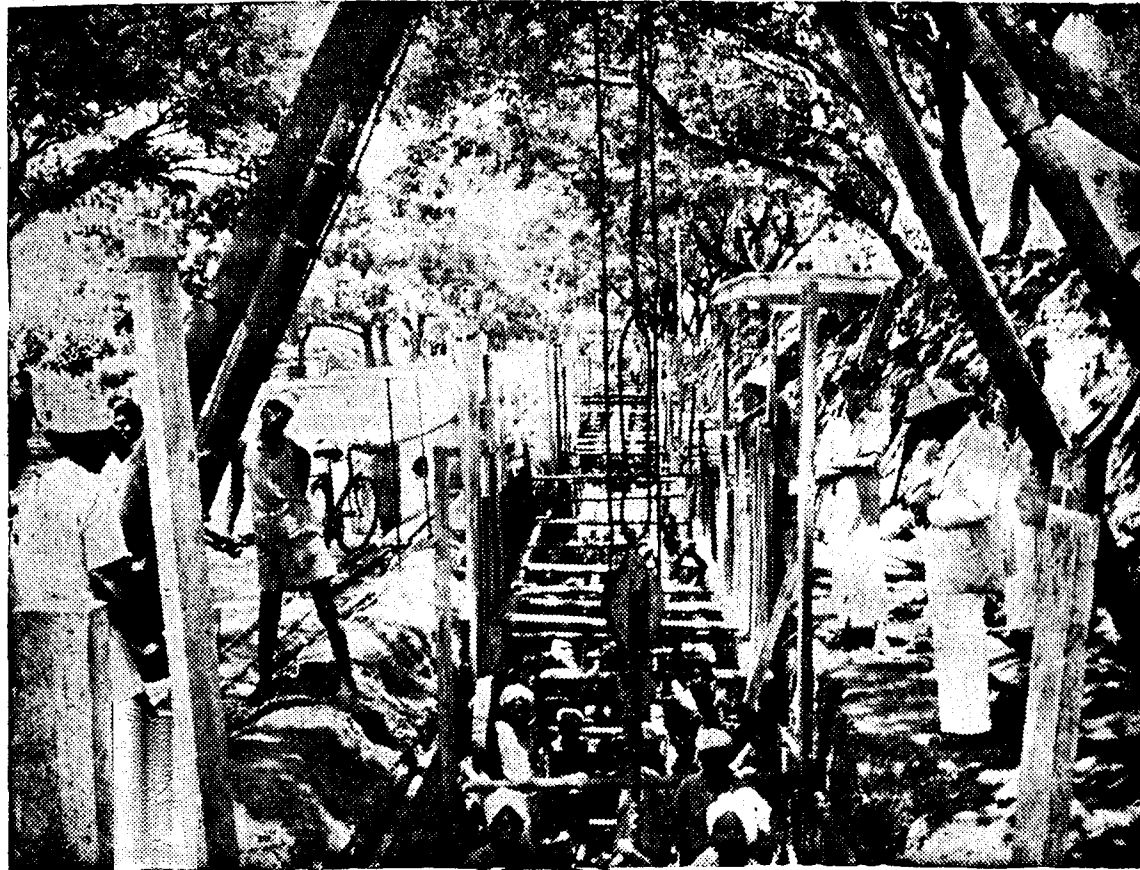


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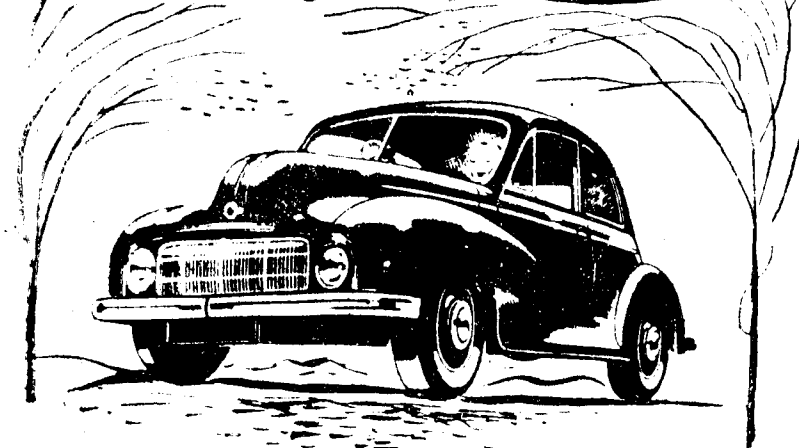
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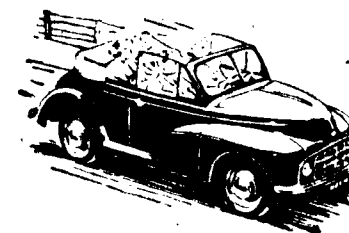


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