

PEOPLE'S HEALTH

EDITOR: A.V. RAMAN

HEALTH MINISTERS' CONFERENCE
Srimathi Rukmini Lakshmiipathy.

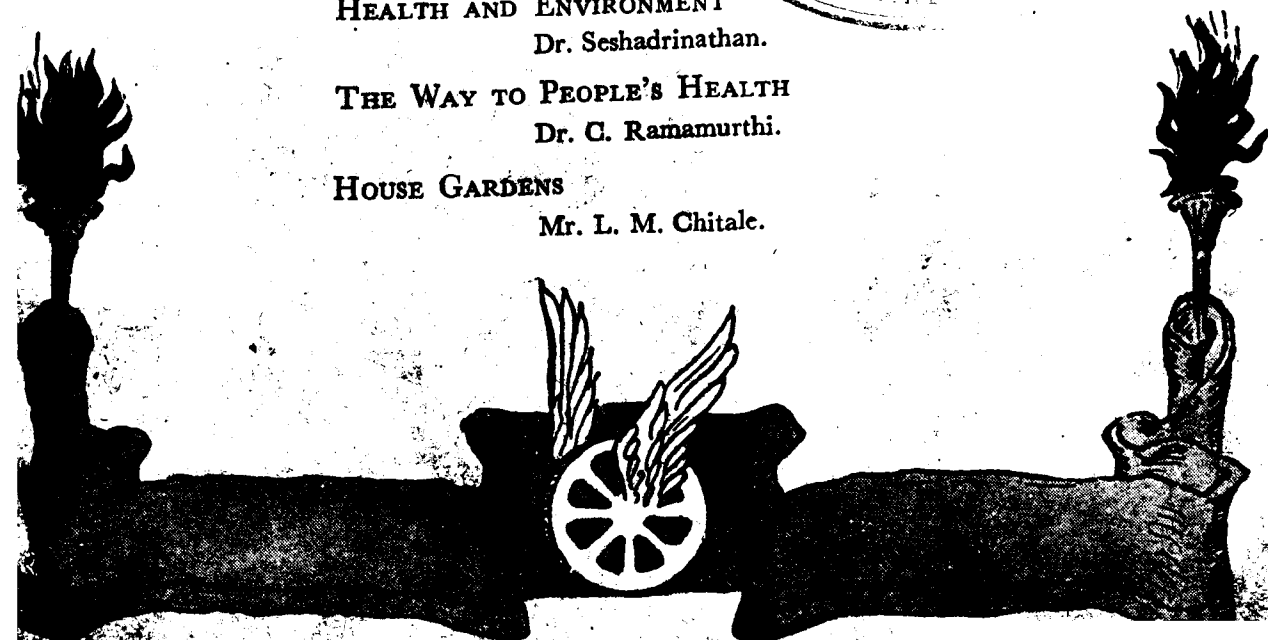
SANITATION IN RURAL AREAS
Sir S. V. Ramamurthi.

PLANTING FOR PROSPERITY
Mr. M. S. Sivaraman.

HEALTH AND ENVIRONMENT
Dr. Seshadrinathan.

THE WAY TO PEOPLE'S HEALTH
Dr. C. Ramamurthi.

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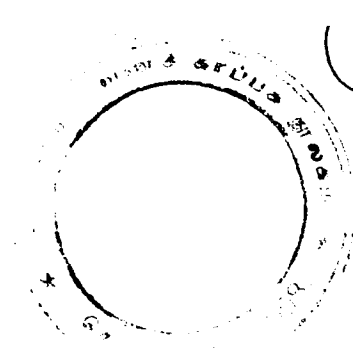
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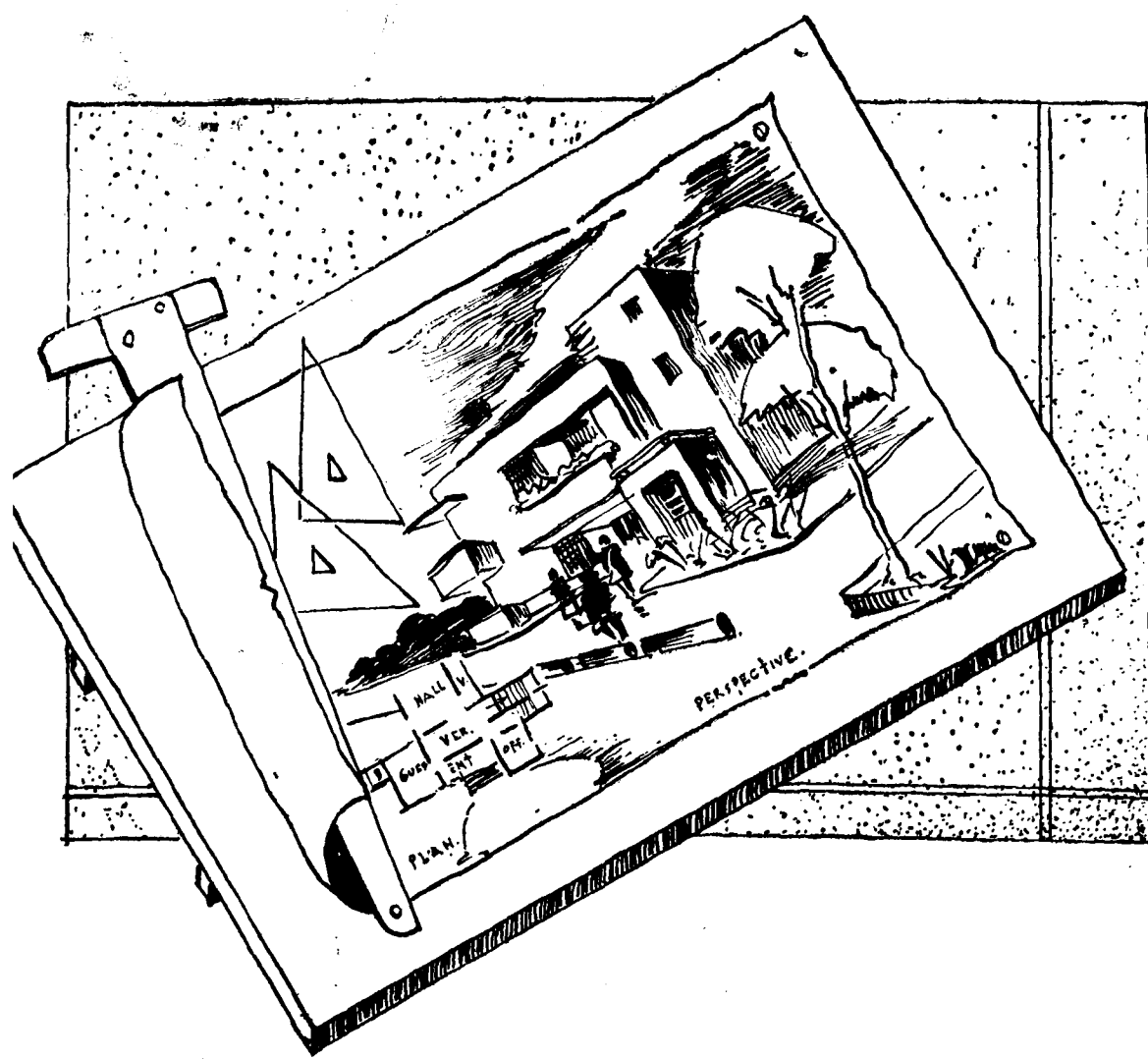
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Mechanical Data of the Magazine

Over all size, 10" X 7½".

Size of printed page, Crown Octavo, 8½" X 6".

Width of Column 17 cms. 2½".

Length of Column, 8½".

Number of Column, Two.

Kind of paper used, M. G. White printing.

Number of pages, 64.

Screen for half-tones, 85/100.

Type of printing press : Power.

Last date for accepting advts. : 20th of each month.

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Vol. I

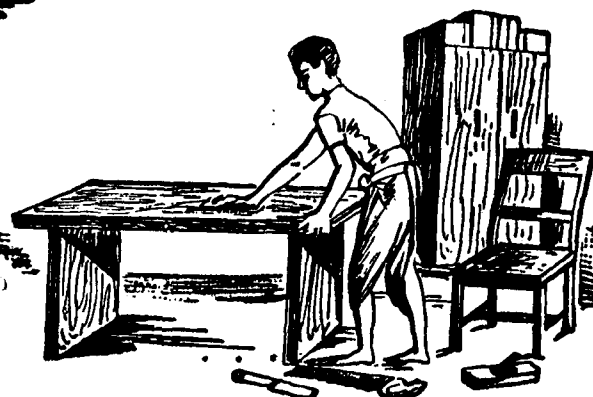
NOVEMBER

No. 2

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PEOPLE'S HEALTH

A Pioneer in the field of Public Health

VOL. I
No. 2

NOVEMBER, 1946

ISSUED
MONTHLY

EDITORIAL . . .

Unity or Diversity?

One of the resolutions recently passed by the Health Ministers' Conference at New Delhi runs as follows:

"The conference accepts the principle of amalgamation of Medical and Public Health Departments, and considers that the amalgamation should take place *when a suitable opportunity occurs.* (Italics are ours).

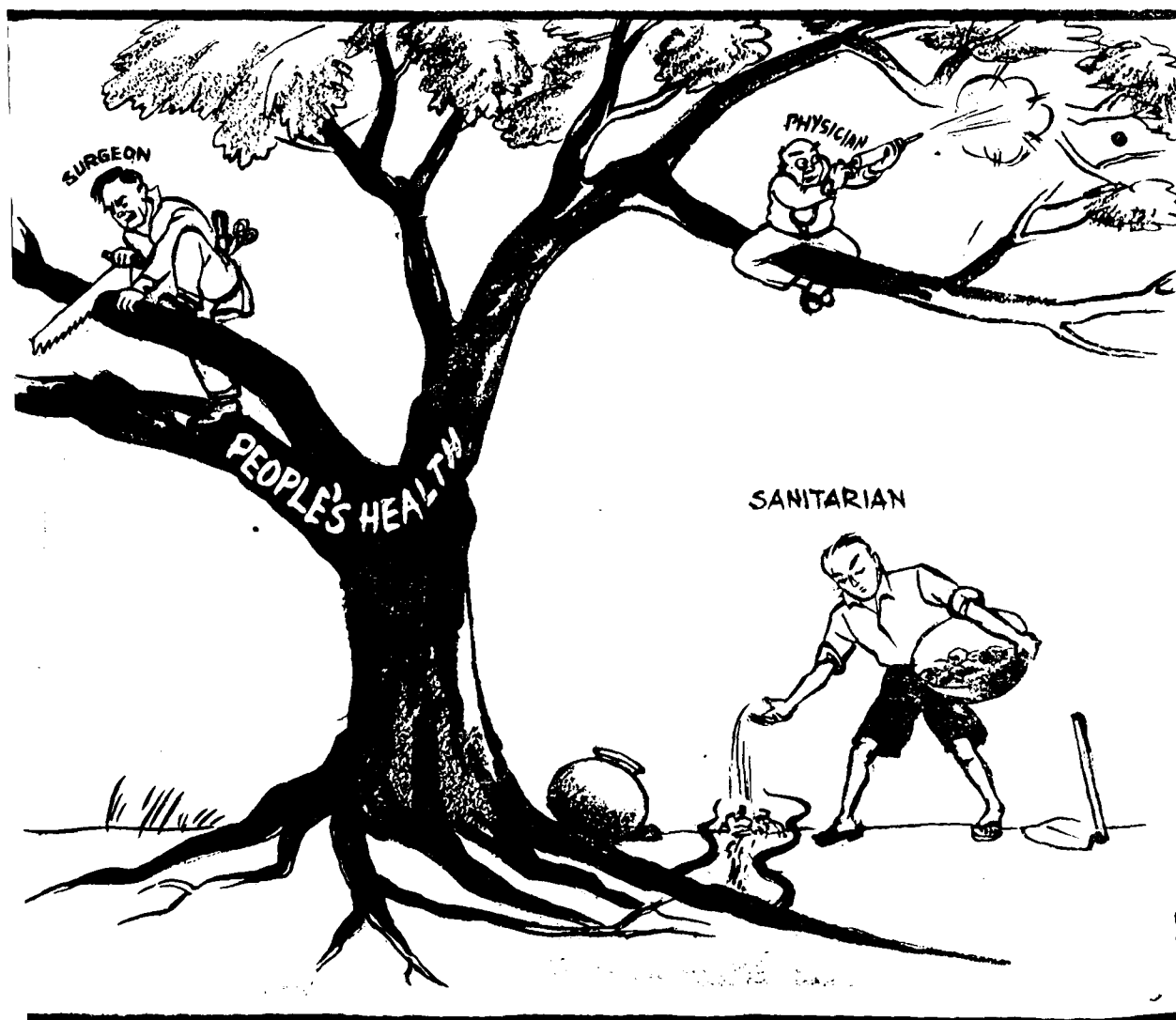
"The Hon'ble Ministers from Madras and Bombay, dissented from this view. The Hon'ble Minister from Madras considered that co-ordination between the two departments was preferable to amalgamation."

We are unable to congratulate the conference on its decision. When events are moving at atomic pace and India is rapidly fashioning her own destiny, the people are entitled to expect the national leaders to take a courageous stand and give a bold lead. The operative part of the resolution is too halting and hesitating. The Bhole Committee have made out an incontestable case for the amalgamation and the Conference could not escape accepting it. They have in fact accepted it but with an ill grace. They have done their best—or their worst—to kill it in the same breath. Amalgamation accepted; but let it wait for a suitable opportunity! When is that

"suitable opportunity" going to come? After another war? In the next decade? After this millennium? We ask, "Why not forthwith? What should stop its immediate implementation but bureaucratic tradition, governmental hesitancy, official conservatism, and bias for maintaining the *status quo* and the pull of vested interest?"

The sting however is in the tail. Madras province which claimed to be in the forefront in public health advancement, a province which prided itself on its health organization, a province which boasted of the one and only Public Health Act in India, has now written itself down as a reactionary and retrograde one. This writing down has been made indelible by the incorporation of the dissent in the resolution itself!

The Madras Minister might have been, perhaps, posted with the past history of the Province when the old District Medical and Sanitary Officers manned a unified department and did next to nothing to foster prevention in preference to cure. It is a fact that the arrangement proved a failure. It is also a fact that preventive health work developed apace, despite limitations, when it was taken apart and given a good lead. The reason why the old system proved a failure is not far to seek. A moment's reflection should reveal the obvious. If you put a person in charge of prevention and



. . . the root of the problem.

cure and at the same time, give him every facility to make all the money he can, from curative work, is it a wonder that he neglects the work which does not pay? One should be more than human to forego the lure of income from private practice, and take on the unwelcome, onerous and quite unremunerative task of prevention. If only they had been placed beyond the temptation of 'filthy lucre', they would have willy-nilly given their talent, thought, time and energy to preventive work. When the curative doctor is encouraged to develop vested interests in the ill-health of man, he cannot be expected to cut the sod under his feet by practising preventive medicine. If the so-called curative doctor is entrusted with preventive work and he happens to give step-motherly attention to it, the remedy is simple; and that is, to withdraw the privilege of private practice. Every medical man in State employ should be a full time servant and shall not spend any of his time or talent in making money on his own by the professional skill which the State has contracted for. That skill should be made available by the State to one and all alike, rich or poor. Service given on behalf of the State should not be made to depend on the recipient's capacity to pay. We refuse to believe that the dissenting Ministers were either ignorant of this simple solution or were persuaded by vested interests or considerations of expediency into ignoring it conveniently.

The Ministers who hold what we consider unprogressive view, should have been aware of what happened and is happening in other countries of the world where health work has progressed far enough to be worthy of our emulation. In all advanced countries, public health organization has been on an unitary basis. Nowhere has there been

such a complete divorce between prevention and cure as in this country. Nor has any progressive State given curative medicine such a lop-sided development and made it a rich and unrestricted field for exploitation. All work, curative and preventive, should vest in a single Health Department. The Medical Officer of Health or the Health Commissioner, should be the directing head of the entire service. Curative work—or the division of hospitals to use American phraseology—is only one of the many activities of the Health Department. It has its rightful place, due attention and appropriate encouragement; but is never allowed to overexpand itself and drown the other activities of the Health Department. The "repair-shop" is never the dominant show. Even in England where the medical profession had long entrenched itself in its vested interests of private practice by unabashed trade union tactics, the time has come when the death-knell is sounded; a National Health Service is instituted on a unified basis. This salutary reform has been forced on conservative England by modern trends all the world over. Health is gaining a larger significance, medicine is having a wider concept. People's health is now recognized by every sane administrator to depend on environment in all its aspects—physical, physiological, economic and social. The cause for every departure from normal health is now sought for in these environmental factors, and health service consists in the discovery and remedy of these adverse factors. This is the sum and substance of the new outlook on health, aptly synthesized in the term "Social Medicine." This social medicine will not permit of any separation of curative work from preventive work. We wonder why the dissenting Ministers fail to recognize

these important and significant developments and to come forward strongly in favour of amalgamation here and now.

Preventive work is undoubtedly a speciality. But on that ground it cannot be kept divorced from the curative side. Every branch of medicine is a speciality in itself; But it does not prevent the evolution of a basic doctor, nor does it stand in the way of all the specialities being handled by the same doctor in regions remote from well-developed centres. There is a time and place for specialists as such, at certain levels in the organization. With the evolution of the concept of social medicine, medical education is undergoing a radical change. Medical students are taught more of prevention than of cure, and they are asked to search for the cause before they seek the remedy. They are trained to look beyond the bed-side of the patient, penetrate into the social sphere and apply the remedy there, more than repairing the maimed. The Bhore Committee has given full consideration to this new development in its elaborate analysis and made proposals regarding medical education. It is for the Government in the Education and Health Departments to force the Universities to effect at once this salutary reform in the medical curriculum. Those who have already graduated with a curative bias can be given a preventive outlook in a short refresher course as was given some years back to the rural medical practitioners. There would then be no bar to the entrusting of prevention and cure to the same individual.

The unification of the two departments one of which has long enjoyed undue weightage is fraught with one risk. The success of unification,

the attainment of progress and the ultimate welfare of the people will depend to a large extent on the head of the service who is responsible for initiating and executing improvements; who gives directives to the entire service, keeps up their interests and gets the best out of them. If this head happens to be one who has his eye on hospitals and looks askance at the field of prevention, then woe unto unification! But even this risk is no deterrent to a salutary reform. Our Ministers have full powers in this respect and should know how to choose the right person and put him in the right place. Official hierarchies do have their own taboos; they even have their pet strategy of out-flanking movements to achieve their ends and safeguard their "interests". Our Ministers should be vigilant. They should not allow themselves to be frightened by these puny forces and facile considerations into reactionary policies. Let our Ministers think deeply and act boldly. That is the only way to ensure popular support and to effect an all-round improvement. Let not reaction clothe itself under puerile platitudes like "co-operation and co-ordination". These are mere high sounding phrases; in practical application, they often prove next to nothing. To put one under temptation and then piously pray that he should rise above it and "co-operate and co-ordinate" is fatuous. Amalgamation is the only remedy to our ills. It should be applied unhesitatingly and immediately. The question is so fundamental to the promotion of people's health that it should not be burked on grounds of expediency nor should it be shelved till a suitable opportunity occurs.

"Every variation from unity is but a progression toward nullity."—*W. Secker.*

My Impressions of the Health Ministers' Conference held at New Delhi

BY

The Hon'ble Mrs. RUKMINI LAKSHMIPATHY,
Minister for Public Health and Medicine, Madras.

Mr. A. V. Raman, the energetic Editor of the "People's Health" has persuaded me to give him this article on the recent Public Health Ministers' Conference that came off at New Delhi on the 10th, 11th and 12th of October, 1946 under the Chairmanship of Sir Shafaat Ahmed Khan, who was then a Member of the Viceroy's Executive Council in charge of Public Health.

This conference has been significant not merely in its own right but because it has reflected in its various stages, from the first proposal to hold the conference, through the various postponements and changes of venues, to its successful conclusion, the momentous changes that have occurred in the political sphere in India, both at the Centre and in the Provinces. The proposal to hold the conference was made by the Government of India as early as the first week of April, 1946 at a time when Madras and many of the other Provinces were still under section 93 Rule and when the Central Government was being manned by men, eminent no doubt, but representative of nobody but themselves. The conference was adjourned to May because of the expected advent of popular Ministries in many of the Provinces, a change which took place in Madras in the last week of April, 1946, and again to July in view of the possibility of changes in the Executive Council by reason of the talks that were then going on between the Viceroy and the Congress and the Muslim League. As we all know, these talks



ended fruitlessly, the only result being that the Executive Councillors were replaced by a 'care-taker Government' consisting purely of permanent Civil Servants. A postponement was made to August, the venue being changed to Simla; then again to the first week of September because the Provincial Legislatures were in Session, and finally to October, after history had been made at the centre by the assumption of office of the representatives of the people of India.

Even after this devoutly wished-for consummation, the arrangements for the conference still remained in a state of some uncertainty, faithfully reflecting the course of the further parleys between the Congress and the League through the good offices of the Nawab of Bhopal. On the 9th October, 1946 when I stepped into the

plane to commence my flight to Delhi, I was still not free from the apprehension that on landing at Delhi I would be told that there has been another re-shuffle at the centre and that the conference has been postponed. It was therefore with some relief that I learnt at Delhi that the talks between the Congress and the League and the Viceroy were still going on and that whatever re-alignment might be made, Sir Shafaat Ahmed Khan would be available for piloting the conference to its successful conclusion.

The Madras Contingent consisted, besides myself, of the Surgeon-General, the Director of Public Health, the Special Officer for the Re-organization of Indian Medicine and the Deputy Secretary in the Education and Public Health Department. We had already discussed the agenda at a preliminary conference in Madras and decided on the line that we should take at the conference. I was able to persuade Sir Shafaat Ahmed Khan to include in the agenda as supplemental items two resolutions, one relating to the positive place of the system of indigenous medicine like Ayurveda and Unani in the National Health Development Plan and the second to the need for abolition of the Civil side of the Indian Medical Service.

The Conference was held at Room No. 50 in the Central Assembly Buildings. To the clicking of innumerable cameras Pandit Jawaharlal Nehru, Vice-President of the Interim Government, inaugurated the conference with a speech in Hindustani. The Congress Provinces and the Punjab, as befitting the importance of the conference, had sent in their full contingents headed by the concerned Ministers. Bengal and Sind were represented by their Directors of Public Health. The States of Hyderabad, Gwalior, Patiala and

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Cochin had sent their Ministers or Members of Council, while Kashmir and Travancore had sent their departmental officers. The representatives of the Congress Provinces in their Khaddar dresses and caps arrived in certain uniformity, while the representatives of the Punjab, Hyderabad, Gwalior and Patiala looked resplendent in their turbans of different patterns. The representative from Hyderabad, Diwan Bahadur Aravamudu Ayyangar, was the oldest of those present being over 72, but he was by no means the least energetic.

Sir Shafaat welcomed the delegates and made a comprehensive speech in which he stressed the importance of sanitation, malaria-control and the provision of Medical services, in that order of priority. Sir Shafaat looked none the worse for the dastardly attack that had been made on him just before his assumption of office, though he carried the scars visibly.

The following was the Agenda :

1. Grants to Provinces for development and the administrative procedure for dealing with the development plans.
2. Objectives.
3. The District Health Organization proposed by the Health Survey and Development Committee.
4. District Health Organizations—District Health Boards and Councils and provincialization of district health services.
5. The provision of facilities for the training of medical and other personnel.
6. Central and Provincial Boards of Health and Health Councils.
7. The amalgamation of the Medical and Public Health Departments.
8. Water-supply and sanitation,

9. Establishment of anti-malaria organizations.

10. The policy in regard to Quinine and other anti-malaria drugs.

SUPPLEMENTAL AGENDA.

1. The positive place of Indian Medicine in the National Health Development Plan.

2. The need for the abolition of the Civil side of the I.M.S.

I am sure that the readers of the "People's Health" would not be interested in the details of the discussions and that they will permit me to pick out only the highlights. A great matter for satisfaction to Madras is that our considered views prevailed on most of the subjects discussed and that even where they did not prevail they were listened to with great respect. Others who made a great impression on the conference were Mrs. Vijayalakshmi Pandit (who joined the conference on the afternoon of the first day owing to trouble to her plane while coming up), Dr. Gilder of Bombay and Mr. Aravamuda Ayyangar of Hyderabad. Mrs. Vijayalakshmi Pandit held the conference spellbound with her effortless eloquence and the burning sincerity that underlay her utterances. Dr. Gilder spoke with assured professional knowledge, while Mr. Aravamuda Ayyangar enlivened the proceedings by quotations from Sanskrit and Persian. Most of the departmental officials present with one or two regrettable exceptions talked with due realization of their status in conference attended by Ministers representative of the people. Sir Shafaat evoked great admiration by his urbanity, good humour, patience and the skill with which he conducted the deliberations. The conference has to be considered a personal triumph for him. Sir Shafaat has laid such

sound foundations at this conference that it can be expected with confidence that the implementation of the Bhor Committee's proposals will go forward on sound and generous lines. Sir Shafaat made it perfectly clear that he would not tolerate any distinction between the so-called remunerative and non-remunerative activities and that he considered Education and Public Health to be productive in the true sense of the word.

During the three days of the conference, we had other engagements arranged for us, which we appreciated thoroughly. On the first day, Sir Shafaat was 'at home' to us at an evening party at the Imperial Hotel, to which the other Members of the Interim Government had also been invited. I had the opportunity of meeting Mr. Vallabhai Patel, Mr. Asaf Ali and Mr. G. Rajagopalachari and talked to them about matters of common interest. On the afternoon of the 10th, some of the Health Ministers visited the Malaria Institute of India and on the night of the 11th, Sir Shafaat gave a dinner to the Provincial Health Ministers, and in the evening, we were entertained at tea by the Vaidyas and Hakims of Delhi at the Imperial Hotel.

And so, we can congratulate ourselves on the successful termination of this preliminary conference at which many matters of great importance to the welfare of this country have been discussed at a representative gathering by the best brains of India and we hope that, with the help and encouragement of the Centre, our health schemes will go through with accelerated vigour. It is likely that another conference will be held in January, 1947 for deciding some more important items left untouched at this conference. For



Madras Minister of Health addresses the Conference.

me, in particular, I look back to this conference with pride and satisfaction because of the volume of support that I secured from my colleagues with regard to Indian Medicine, which, I consider, has a great part to play in the health programme of this country.

The readers of "People's Health" would be particularly gratified to note that recognition had been given to two of the important objects of the Magazine. "People's Health" stands for waging the war against disease, malnutrition and the root causes of poverty and ignorance to a successful conclusion, on the principle of unlimited social liability. Pandit Nehru stated in his opening speech at the Conference: "If funds could be available for big wars, there is no reason why they should not be provided for the fight against ill-health." So high priority, for the

provision of funds, should be given to safeguard and promote people's health.

"People's Health" stands for the improvement of environmental sanitation as the first and the most essential step in the progressive promotion of the people's health. Sir Shafaat Ahmed Khan, Member in charge of Health in the Central Government, has unequivocally stated: "If there is a question of priorities—and planning means priorities—I think an active programme to improve water-supply and sanitation in all towns and villages, is one of the most urgent needs." Thus, two of the important objectives of the Magazine have been recognized by the highest authorities in the land. Now the Provincial Governments should take steps to implement these objectives.

SANITATION IN RURAL AREAS

BY

SIR S. V. RAMAMURTHY, K.C.I.E., C.S.I., I.C.S.

There are four main directions in which this subject may be considered :

- (a) Rural public health ;
- (b) Rural housing ;
- (c) Rural water supply and drainage ; and
- (d) Rural conservancy.

It is notorious that conditions of sanitation in rural areas are so unsatisfactory that persons who have become accustomed to the amenities of urban life find it hard to go back to the village. During the evacuation from Madras and other towns in 1942, persons who left towns for villages were often so unable to live in the altered surroundings that they waited for the earliest opportunity of coming back to towns. People will hardly hearken to the cry of "Back to the village," when conditions therein repel them.

The post-war reconstruction plans of the Madras Government aim at rectifying the position along all the four lines that I have mentioned. They contemplate the establishment of public health services in rural areas. It is proposed to open rural health centres attached to village dispensaries for a group of villages with a population of about 10,000 persons. Taluk or group centres are to be provided for about 15 to 20 such centres. The group centres will be served by a well organised and well equipped district centre. These group and district centres are to be combined with medical institutions. In the course of 5 years, 450 village centres and 45 group centres are to be opened in those parts of the Province where they are required most. At each group centre, a second class health officer and a woman medical officer are



to be located and at each village centre a health inspector, a health visitor and two midwives. *I wish too that engineers of health could also be added to the staff.* The aim of the scheme is to make health services available to villages in remote areas and to help the villagers to maintain and improve their health. In regard to medical relief, the aim is to establish curative as well as preventive centres at a distance of not more than 5 miles from a village. At each such centre, there is to be a dispensary, with eight beds and necessary medical staff besides the health staff. In the first five years, 270 centres are proposed to be opened.

As regards rural housing, little action has been taken by local bodies. The Town Planning Act does not directly apply to rural areas and the provisions of the Act have to be extended to such areas by a special notification under section 39 of the Act. Local bodies have also pleaded poor finance as standing in the way of improving

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rural housing. The post-war reconstruction Committee has recommended legislation to make the Town Planning Act more comprehensive and more effective so as to provide that all urban and local areas come within the application of the Act. Every local authority is to be empowered to prepare schemes for planning slum clearance, improvement of insanitary and unhealthy areas and re-planning or re-building built up areas. At present, loans may be granted to local bodies for purposes of housing schemes but not grants. Unless some aid is given to local bodies in the shape of grants, it will be difficult for them to take up schemes of the kind referred to. In regard to industrial housing alone, the Government of India are prepared to give grants for such schemes undertaken by public bodies at 12½ per cent. of the cost of the scheme subject to a maximum of Rs. 200 per house, provided that the Provincial Government are also prepared to give an equivalent grant for the scheme.

As regards rural water supply, a ten-year plan for the provision of protected rural water supply in villages with a population of less than 5,000 was prepared in 1938. Much progress was however not made. Under the Post-war Reconstruction scheme, the portion of the previous plan not already executed is proposed to be taken up in the next ten years, including in the scheme all places with a population up to 10,000. The sources of water supply will generally consist of bore wells with iron and steel or cement pipes, masonry dug wells according to an approved design, wells with infiltration galleries and so forth. The plan is expected to cost 2½ crores in the first five years and nearly 4 crores in the second five years. As regards drainage, the Post-war Reconstruction plan is to provide drainage for all places with a

population of 5,000 and over, but schemes for rural areas with a smaller population have yet to be framed.

As regards rural conservancy, the plan is to provide all over the Province within twenty years a minimum of public latrines for the areas served by each health centre. It is also proposed to enforce the construction of private latrines wherever possible and to start a workshop at each district headquarters for making standardised conservancy plant and equipment.

I have stated above how unsatisfactory the present position is as regards sanitation in rural areas, how much leeway has to be made and what is proposed to be done under the Post-war Reconstruction plan. It is clear that the population of a village by itself is unable to deal with problems of sanitation with its own resources and its own organization. A villager is both an individual and a social being. The minimum physical needs of an individual can be met in a village through a stable agriculture and such forms of cottage industries as are possible in the village. In most villages, land which is not protected by a first class irrigation source is a precarious source of food. Rain fed land is notoriously so. Land fed by smaller tanks is only less so. A villager not only has his supply of food precarious but he does not get employment on his land for more than 4 to 6 months in the year. The Government have this year sanctioned a scheme of subsidies for digging wells on ryots' fields. A sum of Rs. 2 crores has been given as subsidy and about 60,000 wells have been dug new, and 30,000 wells have been repaired. These wells protect over a lakh and a half acres on which the ryot is assured of two crops instead of getting as hitherto one precarious crop. He is also assured of work on

the land for about 8 months in the year. Apart from miscellaneous cottage industries, there is one that fits very well into a cottage economy provided science can be used for the needs of villagers. This is spinning. It requires small space for a small implement. Spinning is an activity complete from minute to minute. It can be done during hours of leisure. It can be done when a man or woman or even a child has no work to do. It is not beyond the limits of possibility that a spinning implement may be devised so as to enable a person to spin not 4 ozs. a day as it seems now to be normal, but one pound a day. With agriculture protected by a well and spinning made possible to the extent of a pound a day, a stable cottage economy of agriculture and industry on a two to one scale can be established. Food and work thus found, a villager can raise his standard of living by providing for himself a decent house into which he can walk erect and not crawl like an animal, as is often the case with huts in our villages. His own yarn he can weave into cloth for himself. With food and work, clothing and housing, a villager can satisfy his minimum physical needs on a self-sufficient basis.

This is not however to say that his social needs will be satisfied. Nor are his physical needs satisfied on anything but a minimum basis. To get better and more varied food, there is need for a market. To get clean drinking water, pumps need to be fitted to wells and a supply in pipes organized. To plan and build better houses, there is need for more competent artisans and architects. To supply the village with better clothing, there is need for an organization which can take round clothing, and exchange it for the yarn the villager may spin. To get more

skilled work, there is need for entry into a larger economic area than a village. Social needs can be satisfied not within the area of a village but in the larger area provided by a group of villages, say, a Firka with a population of some 25,000 to 40,000 people, comparable to that of a municipality. In such an area the density of population is rural, the strength of population is urban. A self-sufficient economy for the satisfaction of physical needs may prevail in villages. The co-operative economy needed to satisfy social needs can be built up in the larger area which is not urban or rural but may be called rurban. Environmental sanitation is a social need and has to be satisfied through a rurban organization. In a rurban area, there is no reason why as in a municipality there should not be a hospital, a high school, a cinema, a workshop, a consumer store, a post and telegraph office, an administrative centre and so forth. A village by itself cannot meet the needs of sanitation to any appreciable extent. The individual has not got the resources. The organization is inadequate. The men who can supervise, find the village too small for them to function in. Rural reconstruction has, I think, failed so far, because it is undertaken in an area for which its aims are too big. The success of rural reconstruction can be attained only through enlarging the area of operation from a village to a firka. This is the main idea of the present scheme of the Madras Government in regard to rural reconstruction. There are about 100 municipalities in the Province. There are about 1,000 firkas in the Province. With a hundred municipalities and a thousand municipal unions, the Government and the people can get a compact grip over life and space in

the Province. It is easy to design on some uniform scale for each municipality and for each municipal union. The numbers to which the design has to be extended are not such as need to terrify. The various problems of sanitation in rural areas which I have detailed at the beginning of this article, viz., public health, housing, water supply and drainage and conservancy

can be satisfactorily dealt with in a rurban area; *remembering always that first things must come first.* When they are, it will be possible for people to move back from the urban area to areas which are not only urban but also rural. Such a movement will give us a more satisfactory distribution of the vitality and intelligence of this Province than we now have.

RURAL SANITATION.

HOOKWORM INFECTION IN INDIA.

"Some 210,000,000 persons in India have, it is estimated, this infection, but it is held that the average intensity of infection is low compared with Porto Rico, Central America and China. Though soil pollution is unusual, faeces are rarely used as a fertilizer. The heavy infection among estate coolies are probably due to aggregation of population when, for purposes of cultivation, the rainfall is high. Necator infection predominant in south and east India (it is the only infection about Darjeeling in the Himalayan foothills) is more and more displaced by *ancylostoma* as one passes west and north. The incidence of hookworm is given for various parts of India, but whether the diagnostic techniques used were of equal accuracy in all instances, is not noted. Hookworm infection as a public health problem is faced squarely. There is none of the suggestion, too often apparent, that all that can be done at the moment is all for which good hygiene calls.

"Whatever views may be held as to the effect of small numbers of hookworms on the health of the persons concerned, questions of emphasis and expense would undoubtedly remove the hookworm problem from immediate public health consideration over the greater part of India As has been amply demonstrated in many places the provision of latrine is a corner-stone in the control of hookworm infection without which little progress can be made, and it is becoming more evident that public latrines are as a rule not adequate for this purpose. On the scores of expense, utility, safety and general adaptability, the bore-hole latrines would seem to be the best type to adopt, in areas where the soil is suitable, as a household latrine.

"It is clearly felt that the dropping of faeces directly into the subsoil water is a smaller risk to public health than is constituted by hookworm infection—a tribute to the harm done by the latter. It will be remembered that in Tonga these latrines are 'an excellent breeding ground for cockroaches'."

(Extracted by R. E. Tarbett.—*P.H. Engg. Abstrs.*, Vol. XVII).

THE WAY TO PEOPLE'S HEALTH

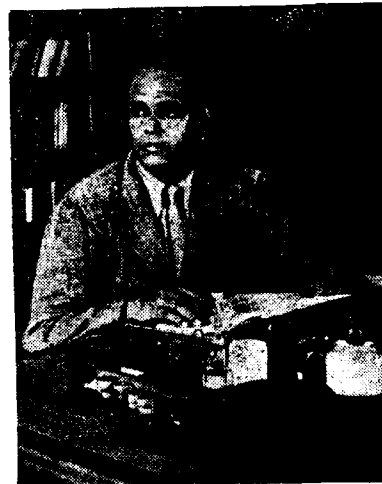
BY

RAO BAHADUR DR. C. RAMAMURTHI, B.A., M.B., B.S., F.S.SC.

The approach to the study of people's health may be made from two aspects: the biological and sociological. It may also be approached, on the one hand, from the aspect of the individuals of whom the people consist; or, on the other, from that of their surroundings and the occupations they pursue.

The biological aspect involves considerations of heredity and environment. These twin forces of heredity and environment, otherwise also called "Nature" and "Nurture", confront society and complicate the problem when child education and training are dealt with. Of the two forces, heredity has, probably, received greater attention; and biologists and psychologists are continually adding to the fund of our knowledge of the power and influence of heredity and its capability to benefit or injure the human race. The term heredity is not used always with a uniform or precise meaning in popular language. For the sake of clearness and precision, therefore, its meaning will be limited in this article, to the following terms:—

By 'heredity' is meant the transmission by the parent to the offspring of those physical and mental characteristics that are potentially present in the germ-plasm of the parent. The word germ-plasm is a technical term. It is used to denote the essential sex elements which combine to form the embryo that develops in time, into the adult. These characteristics may be inherited; or they may be result of toxins that injure the germ-plasm. They are usually present at birth. But often, however, they do not appear until later in life. For example, many



cases of insanity appearing in middle life, are truly inherited. On the other hand, certain defects present at birth are not necessarily hereditary. They are defects due to peculiar pre-natal conditions of the mother. These defects are classified as "acquired"; and they are not transmissible to their subsequent progeny.

Certain facts have been definitely established by students of heredity, and the sociologist can lay them down as foundations on which to build a system of preventive work. In some cases the child is destined, before birth, not to be benefitted by any later training; and such a child cannot be fitted into normal social life. Defective heredity is responsible for it. They remain as life-long abnormalities. They are cases of idiocy, imbecility, backwardness, deaf-mutism, criminality and certain forms of constitutional disease. These defects may be expected to re-appear in the offspring of each or any of the subsequent generation. It is an unfortunate fact that some of these defective groups are more prolific in the production

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of their offspring than the normal groups. That is, the birth rate among them is higher than among the general population. From this, it is apparent that there is a gradual dilution of the desirable qualities of the race unless preventive measures are taken.

Between twenty and twenty-five years of age, the individual of an enlightened community usually enters life to bear its full burden. And by that time, the person must be put in full possession of all knowledge and facilities to secure health and must be in the active habit of maintaining his body in the highest state of health and physical and all round fitness.

The end of the last century and the beginning of this was favouring the ideal of "physical strength" as the goal of all physical attainment, though occasionally the voice of the exponents of health and physical fitness, and not strength, were also heard. But, with the advance of years in this century, the fact that strength and health need not co-exist though some of the methods by which strength is secured also secured health, was recognized. This recognition changed our ideal from strength to physical and all round fitness and it revolutionised our methods of attaining the goal. Massive muscular development, at the sacrifice of the qualities of physical and mental alertness and quickness are no more the ideal of physical culture, though proportionate and supple muscular development combined with the qualities of quickness and alertness have an aesthetic and so an attractive effect. Time-honoured and so highly cherished notions of physical strength have given place to a sensible goal of harmonious physical, mental and moral culture, guided by scientific principles underlying the methods of the training and culture. It is this training and culture that

should be the aim to adopt in all homes, schools and colleges where the citizen of the future is reared up. Habits of health, not formed during this period and by the end of it, cannot be formed later except in very rare and exceptional cases and under very painful and unpleasant discipline.

Among the preventive measures to be considered are those that concern the improvement of the race.

This introduces us to the subject of eugenics, which is the science and art of improving the race by selecting for survival the superior qualities inherent in men and women and rejecting those that are inferior. Eugenics means race development. It is concerned with the improvements of a permanent nature.

So called practical eugenics is often made to apply wrongly to methods of promoting individual strength and capacity. The eugenicist is right when he emphasises the principle that every child should be well-born and it should be innately endowed with the capacity for development into a normal adult. But there is difficulty in practically carrying out the programme to attain the object. On account of this difficulty two phases of this subject have been developed: (1) a "negative" and (2) a "positive" phase. Negative eugenics deal exclusively with classes that are unfit to be benefitted by education and training. Among them reproduction must be prevented, so that the class may not reproduce itself and thus, theoretically, naturally it may get extinct. Marriages among the feeble-minded must not only be prohibited but steps must be taken to sterilise them. By segregating idiots, imbeciles, instinctive criminals and such other defective groups, in institutions, reproduction among them may be prevented; and thus, "negative" eugenics may

be practised. The segregation or custodial care must be permanent to make this plan successful. Of course, the best preventive measure is sterilization. But it is not possible to apply it to all. No plan of action, approved generally, to solve this problem has yet been developed, as there are difficulties in carrying out the prohibition of inter-marriages of those on the borderland of these defects and to whom even the mention of sterilization cannot be made. Sentiment is gradually growing in favour of the segregation of these groups. Prevention of inter-marriage between first cousins and other near relatives may be considered a form of "negative" eugenics. The presence of a large number of defectives among the Jews and Mennonites and other consanguineous groups shows how important such prohibitions are.

"Positive" Eugenics: Its elementary principles have not been established. Therefore, it has been practised but little. The first step to be taken is the creation of a standard of superiority or perfection for selection. This has not been done yet. With our present limitation of knowledge, it cannot be done. Even if this standard can be fixed, the most difficult problem is mating of individuals properly adapted to each other. The factors governing marriage today are financial position, coercive custom, love and convenience. It is doubtful whether for a long time, perhaps for centuries, education will deflect the course of love or finance for eugenic considerations. Occasional cases of eugenic mating may occur from foresight and self-restraint. But it cannot be thought of for the masses. Race progress by selection is the dominant note of "positive" eugenics. Galton and his followers originated the eugenic idea; and the mendelian law further compli-

cates the problem in its application to the human race.

People's health will be considered here below from the aspect of the individual. In dealing with this aspect, one has to begin from the beginning of his or her life, which begins in the mother's womb, nine months before birth. By the time the baby sees the light of day, it has already been acted on by three currents of "pre-natal" influences. The first of these is racial which is transmitted through the two long lines of descent by either of the parents. The second consists of the physical characters transmitted by each of the parents to the germ-cells to which the parents' bodies are hosts. The ordinary ups and downs of the parents' well-being do not easily affect the germ-cells because of the safeguards with which nature surrounds them. But long continued abuse of the body may injure the germ-cells within it. Alcohol, phosphorus, lead and certain other drugs and chemicals and the poisons of certain diseases, like syphilis, may affect the germ-cells injuriously. The third current of influence is that of nutrition. Its action on the germ-cell is very great. It was not sufficiently realised till recently. Both parents have an equal share in the influence exerted on the germ-cells, the union of the two of which (the male and the female) giving rise to the embryo cell which develops into the baby that is born. When once the germ-cells unite to form the embryo-cell a new life begins. From this point of time onwards, the third influence (of nutrition) begins. And whatever good comes to the child is the gift exclusively from them other; all other gates of gifts except the mother's are now closed. The mother, therefore can influence the well-being of the unborn child now which none else can. This is the pre-natal life, the life of the baby

in the mother's womb. Therefore, during pregnancy, proper attention must be given to the prospective mother. What is the influence that is exerted by the physical condition of the expectant mother on the physique of the baby in her womb and after birth? Investigation reveals that this influence is considerable. The child may suffer constitutionally, if subjected to abnormal conditions during its pre-natal life. No doubt nature has done its utmost to give abundant protection to the foetus (the unborn child) at the sacrifice of the interests of the mother; but this protection is not complete. The foetus receives its nourishment through absorption of food digested and absorbed by the mother. But the toxins that enter into the mother or formed in her body, are not withheld from but passed on to the foetus. If the foetus is not sufficiently nourished its development is retarded and sometimes defects of a permanent nature are produced. The nutrition of the pre-natal child is very important. Any interruption in the continuous absorption of food will halt the regular development of the foetus in the womb. Therefore its nutrition must not be interrupted for any reason. Other causes that injure the foetus are overwork, worry, fright and malnutrition of the mother during pregnancy. In all these cases, the injury caused to the foetus is chiefly through interference with its nutrition through that of its mother; and that, in turn, results in interrupted development or some peculiar defects of the foetus.

The channel through which the mother can influence the baby is through her blood. There is no nervous connection between the mother and the embryo in her womb. During this period, known as the period of gestation or pregnancy, the mother is the trustee and the nurse; and her whole task is

one of nurture or providing nourishment to the growing and developing foetus. The duty and burden of supplying the baby in the womb with the right sort of wholesome food and removing the waste products from the foetus falls on the mother. The food comes to the embryo and the waste products go out of it through the mother's blood. Through this channel, too, in spite of the protective mechanism, the unborn child may actually be poisoned by certain chemicals, including alcohol and the toxic products of certain diseases. The great source of maternal influence is through nutrition which is a constant factor during the sojourn of the baby in the womb. The mother's responsibility begins just here with safeguarding her own nutrition and through it, the child's nutrition. It is of great value to the baby. For, the baby that is born after a healthy sojourn in the mother's womb, begins life, after birth, with a good start. Therefore, in putting the pregnant mother through a good discipline in the matter of correct and regular habits of food and elimination, the baby in the womb is benefited in its nutrition. So the infant gets a good start in life.

[This is the second of a series of articles by Dr. G. Ramamurti. The first one appeared in the first number of "People's Health", October, 1946. This series will be continued in the succeeding issues of the magazine.]

—Ed., P.H.]

PLANTING FOR PROSPERITY

BY

MR. M. S. SIVARAMAN, I.C.S.

People's health is the outward expression of people's prosperity and prosperity is so intimately linked with plant life that the import of this connection is lost sight of, like most other obvious things. No apology is therefore needed for dealing with some fundamental factors which have a bearing on plant life and the prosperity of the country.

If the nations of the world are classified in the order of material prosperity or standard of living of the average citizen, a curious correlation will be noticed between prosperity and the development of power resources within the country. Highly prosperous nations like America which utilise for power their vast available supplies of coal and oil will occupy the foremost place, whereas others like ours which have hitherto plodded on mostly with man and animal power come far below. In the former there are more opportunities for cultured leisure, for proper physical, mental and spiritual development of the average citizen. In the latter there is eternal drudgery so overpowering that sometimes attempts are even made to make a virtue of it. The difference between the two categories is obvious. Nations that use for their betterment the bottled solar energy of bygone days in the shape of coal and oil in addition to what they make out of the annual incidence of the sun's radiation like energy from crops and plants, water and wind power, score over those that have to depend only on their annual dividends of the sun's energy.

Unless the new atomic era equalizes the energy resources of different



countries, this difference will persist until the supplies of cheap coal and oil are exhausted. All mankind will then have to depend mainly on the solar energy transfixed by plants in their vegetative parts, for plants utilise this energy to transform the carbon available in an incombustible form in the carbon-dioxide present in the atmosphere into combustible forms through the catalytic agency of certain compounds of iron and magnesium present in the green colouring matter of the leaves. Plants are unique in creation in this respect, for no other form of life ranging from the bacteria to the mammals can directly draw upon the sun's rays for synthesising nourishment from elements devoid of life-promoting energy.

Life in the form we know it, is really transmuted solar energy. A fuller utilization of this energy is therefore a necessary preliminary in any attempt to improve the standard of

living. Excluding wind and water power, plants alone can help us to capture more energy and even water power resources depend indirectly on plant life for their successful utilization. Stated as a fundamental proposition, the key to the economic regeneration of our country is simplicity itself. We have to utilise to the utmost advantage every type of energy—potential and kinetic be it derived from coal, oil or wood; wind, water or tides; starch, sugar or alcohol.

The first step in spreading plant life is to have a nation wide planning of crops, trees and forests and determine the types, quantity and location of these so as to secure the maximum of economic advantage. Every acre of ground cultivated or uncultivated, waste land or forest should contribute its quota of captured energy without detriment to land situated elsewhere. In other words, Agriculture, Arboriculture and Sylviculture should be co-ordinated to produce the maximum of benefit to the people.

In a tropical country like ours the sun is so intense that the soil soon loses its moisture unless this is replenished from time to time. Moisture is therefore one of the main limiting factors in plant production and conservation of soil moisture should therefore be our guiding principle in the use of land. Till recent times it was widely believed that rainfall could be increased by a large scale plantation of trees. In America this belief even led to the passing of the Timber Culture Act of 1873. But the latest scientific view is that forests undoubtedly affect some of the climatic factors though not rainfall and that local precipitation in any place is the result of the hydro-dynamic cooling of water vapour caused by any forced ascent of the water laden air into the

rarified atmosphere. This occurs when such a mass is caught in a convection current or when it impinges against a physical obstacle like the slopes of a hill or the sides of a denser mass of air. Topography therefore exercises a great influence on local rainfall, but the meteorological forces involved are of such tremendous magnitude that no human effort can produce any significant modification. We have therefore to take the rainfall as it comes and attempt to influence the dissipation of rain water as best as we can with a view to conserve the moisture needed for plants.

When there is a shower of rain over land, the rain water is disposed of in three ways. A part of the rain flows over the surface, a part gets absorbed and a part evaporates into the atmosphere. The run-off may flow in streams and rivers and fill up irrigation sources. It helps to increase the water stored underground till it empties itself into the sea. The infiltrated portion may directly augment the subsoil water and sometimes emerge as springs elsewhere. But the one constant factor throughout is the evaporation of the water both from land and water surfaces and through transpiration from the surface of leaves of plants. Every measure which prevents the waste of utilizable water into the sea and ensures an increase in the subterranean supply of water helps to promote plant growth.

If the precipitation at any given time exceeds in intensity and volume, what the soil, vegetation and land surface can absorb at that moment there will be run-off and the excess water flows on the surface. This run-off will be all the greater if the soil is impermeable and the ground undulating without any impediments to the flow and it is here that forests

play a helpful part. For the canopy of the forest trees reduces the force of impact of rain which otherwise would displace the soil particles. The tree trunks, fallen leaves, twigs and branches intercept the flow of water and allow more time for percolation. The disintegrating action of the roots helps to improve the porosity and water holding capacity of the soil. The decayed roots act as drain pipes to lead the water into the soil below. The increase of humidity, general lowering of temperature and reduction of the force of wind under the cover of trees slow down evaporation. In general, forests on hill slopes and undulating ground help to increase infiltration at the expense of run-off and evaporation. They help to maintain a steady flow of water in the streams and springs long after the rains and serve Agriculture by minimising flood hazards and regulating and prolonging the supply of water from intermittent rains.

It is however a mistake to assume that all forests invariably improve the supply of underground water. Trees constantly transpire through the leaves, the water drawn up from below by the roots and some species of trees like the Casuarina, Tamarind, Eucalyptus, Pine, etc., transpire moisture more freely than others. If the rate of transpiration over a given surface exceeds the rate of evaporation from exposed ground, the level of subsoil water is reduced in that area in due course in the absence of fresh supplies. This is particularly true of large scale plantation of exotic trees in dry areas on level ground where the run-off is not a serious problem. Great caution has therefore to be exercised in promoting afforestation in such localities. In any case no such enterprise should be undertaken without due consider-

ation of the local rainfall and topography, of the available sources and quantity of underground water, of the nature and position of the rocks below, of the types and species of plants sought to be grown. For example any large scale extensions of Casuarina plantations on a perched body of fresh water as on the Rameswaram Island where rainfall is scanty may result in serious depletion of fresh water on the island.

The excessive transpiration of certain species of trees has been made use of in other countries for draining swampy areas where natural drainage will be prohibitive. To cite an instance, large scale plantation of maritime pines in the Landes in South West France in the last century transformed the local swamps into a healthy tract and when there was considerable clearance of these trees during the first World War the level of subsoil water rose up appreciably in that area.

Clearance of primæval forests in areas showing a tendency to swampiness should therefore be done with caution. There can be no doubt that the *Podu* or shifting cultivation practised by the hill tribes of the Agency tracts of the Godavari, Vizagapatam and Ganjam Districts has resulted in local rise of subsoil water in places and the consequent increase in the incidence of malaria. Prohibition of such cultivation and extensive plantation of wattles and suitable species of Eucalyptus like *E. Rostrata*, *E. Robusta*, *E. Citriodora* in the Agency and similar areas will help to combat malaria in those areas.

Every measure that arrests run-off secures the soil from erosion. Similarly factors that injure vegetation such as drought, fire, severe grazing or clearance increase the chances of erosion. Prevention of erosion of the soil in the

catchment basins of streams and rivers is a necessary measure in improving infiltration of water and minimising the silting of irrigation sources. It is therefore of vital importance to Agriculture to extend the forest reserves to the slopes of each and every hill and watershed wherever possible or economically feasible and protect such reserves from indiscriminate destruction.

The problem of waste lands of which we have about ten million acres in the Madras Province is relatively simple. In these areas evaporation from the ground exceeds precipitation and so the lands are unfit for profitable cultivation or growing trees except under irrigated conditions. Attempts at extension of dry cultivation over such areas should be firmly put down and cultivation should be restricted only to super-marginal lands. The others should be bunded, enclosed and sown with green manure crops like wild indigo (*Tephrosia Purpurea*) or Avaram (*Cassia auriculata*) or seeds of grass that can thrive under semi-arid conditions. These lands should be used by the village communities for rotational grazing and securing added supplies of farm-yard manure, green manure and plant materials for manufacturing artificial farm-yard manure. Such manure when applied to cultivated lands will help to conserve the moisture and promote agriculture.

I have emphasised the need to afforest all slopes as a measure of maintaining water supply for agriculture. But forests serve also as important sources of fuel, fodder, manure and miscellaneous produce. The location of such forests and plantations near villages even on level ground may be sometimes advantageous depending on the balance of consideration of the relative gains and disadvantages. In general it may be stated that in the

rain fed dry areas where precipitation is precarious it is inadvisable to resort to large scale plantation of trees that are exacting on moisture. There can be no such objection to locating plantations in irrigated areas or areas of abundant rainfall. The village fuel reserves should therefore be mainly on beds of tanks and on the margins of streams and rivers. In addition to such reserves the cultivation of Casuarina on the tail-end lands of precarious tanks where the soil is sandy will meet the villagers' needs to an appreciable degree.

In some of the dry areas, plantation of trees on level ground has to be encouraged as a measure of minimising wind erosion. The blowing off of the surface soil is an alarming feature in the wind swept areas of Dharapuram and Udumalpet Taluks of Coimbatore District, and in parts of Trichy, Tanjore, Tinnevely and the Ceded districts. Shelterbelts placed at right angles to the direction of the wind will afford protection on the leeward side to more than twenty times the height of the trees. White babool (*Acacia Leucophloea*) and mesquites (*Prosopis Juliflora*) are eminently suited for this purpose. Such shelterbelts when planted at regular intervals retard the force of the wind and bring about favourable climatic changes. Dessication is diminished, temperature reduced and humidity increased and the cultivator is enabled to commence the agricultural operations earlier in the year before the monsoon winds subside.

Avenue plantations raise other problems. The choice of trees to be planted along roads should be based on the nature and depth of the soils, and the available quantity and depth of subsoil water in the locality. Trees that are not very hard on the underground moisture like the Banian and other

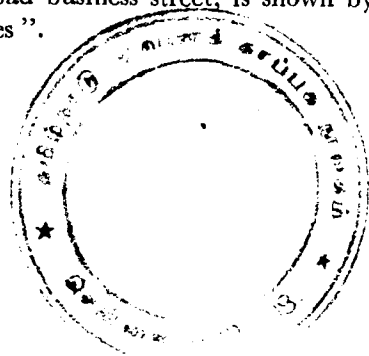
Ficus species, the Margosa, etc., should be preferred. The present policy of some of the Local Boards in planting the so-called profit yielding trees like the Tamarind in dry areas requires to be revised: for the profit that accrues to the Local Bodies is but a fraction of the loss sustained by the neighbouring ryots when the dry crops are adversely affected by the dessicating action of such trees. Tamarind as a rule should be raised as a plantation in select areas, on the bunds of tanks and streams and not along the borders of roads adjoining rain fed dry fields.

I have dealt with some of the broad scientific principles about the influence of forests, tree and plant growth on climate and agriculture. The forest is a product of natural forces and if left undisturbed the forest land gets attuned

to its environment. Any violent disturbance of such natural balance is fraught with serious consequences to agriculture and should be done if at all only after careful consideration of the results. We have to extend the forest areas and plantations but indiscriminate afforestation to the detriment of agriculture should be avoided. The problem of planting trees cannot be solved on a regional basis. It is a complicated problem which has to be tackled for each locality with reference to the varying local factors, always keeping in mind the ultimate goal of increasing plant life in the country. For more plants mean more food, more fabric, more fuel, more prosperity, more of everything that makes life worthwhile.

"It is obvious that both from a hygienic and æsthetic point of view great benefits accrue where tree-planting in streets is carried out on a systematic plan, without overcrowding, and by keeping the trees within reasonable bounds.

As trees breathe not only by their leaves, but also by their roots, it follows that it is difficult for a tree to be in a healthy condition in positions where the ground is hard, and for this reason they thrive better when placed in the middle of the street rather than on the sidewalks; it is better still to provide a narrow strip of grass, as is invariably done in the finest streets in French and German cities. Another reason why trees should be planted in the middle of the street rather than at the curbs is to shade the street without interfering with the light and air of the adjacent houses and obstructing their view. At the same time they may be of service in dividing the traffic. Of course, a greater width of roadway is needed to make the system practicable, but it has the one great advantage of allowing a larger amount of sunshine to penetrate to the houses, and the cost is lessened by having fewer trees, whilst the appearance of the street is quite as good. That trees are not in the way on a broad business street, is shown by the tree-planted boulevards of Paris and Marseilles".



(INIGO TRIGGS).

HEALTH AND ENVIRONMENT

BY

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The *People's Health* very aptly begins with a sketch of the environment that faces the average man in India. It is hoped that these sketches will appear in the *People's Health* as a regular feature. The health of the people is more dependant on the environment than one is aware of. Health and disease are difficult to define.

Labourers in the fields carry on without complaints and in apparent health when they actually harbour hookworms in their intestines; compositors in printing presses may carry on without complaint with a fairly high percentage of lead in their tissues, and pass off fit for work. Workers in cotton factories may carry on, even though their lungs may be filled with cotton fibres; workers in cement factories may carry on with hard grit in their lungs. These people cannot afford to fall sick till they actually break down and the end approaches quickly to relieve them of their sufferings.

Children in endemic areas carry huge malarial spleens without much apparent discomfort. In areas where Kala Azar is endemic, children go about with huge liver and spleen as if there was nothing very much wrong with them. Few school children of urban areas are free from the effects of chronic nasal catarrh, viz., tonsils, adenoids and ear discharge. These conditions are so common that not much notice is taken of them. If mortality is high in such a population it is taken as a matter of course, and nothing to worry about, for man's instinct is to live as best as he could in his environment.

Deltaic areas in the East Coast and low lying areas of the West Coast of India form the permanent homes of bowel diseases like Cholera, Dysentery and Typhoid. Corresponding to the changes in the seasons of the year these areas have their low endemic incidence of these diseases followed by high, higher and highest incidence.

The humid late summer months usher in outbreaks of these diseases. The chain of chronic carriers of bowel diseases in these populations maintain the endemicity. The carriers of dysentery suffer from acute exacerbation during the humid hot months and during the periods of scarcity of food and



water. Children with pot-bellies form a common feature in these localities. Attacks of dysentery have reduced their power of assimilation and the stomach and intestines have become distended from want of tone, but have developed increased capacity to hold more food than actual requirements will warrant. Many of these children survive and change in later life to better configuration, and the inertia and irritability of the earlier years are replaced by a more active outlook.

In all these instances it is the onlooker who feels more upset than the people who are subject to these physical abnormalities. The persons who are anxious to increase efficiency in production from the land and the factories, are also anxious to improve the working capacity of the workers in the fields and in the factories. Otherwise, the mind of the common worker on the land or in the factories gets tuned to the environmental disabilities.

The tuning of the mind to the environmental disabilities has been much disturbed recently. The mind of civilized man has assumed greater control over his physical constitution. Civilized man is seeking greater physical comfort and so his efforts are directed to altering his environment to meet his needs. His ideas of health are naturally different from those of primitive man. His standard of health is so delicately poised that he is sensitive to the slightest alteration in the stability of his environment. His mind is tuned to ideally clean surroundings, and quick motion in vehicles even as fast as sound. Since civilized man tries to alter the environment to suit his needs and since the rest of mankind also

form part of his environment he seeks to change it to suit his mode of life and mental outlook.

It is this that makes us look upon the state of sanitation and individual health that prevails in India as highly unsatisfactory. We feel it is incumbent on us to alter the environment as far as possible to enable the average man to lead a better life than he has done so long.

To do this we have to rouse the consciousness of the average man in the street to a better ideal of life. Self satisfaction in matters of public health is to be deprecated. A constant dissatisfaction and discontent is essential to make the environment look brighter and cleaner, for, however much we may rouse ourselves to effort, the ideal will still remain unattainable in the distance. To slacken our efforts to attain that ideal will spell disaster to the nation.

Such habits like the fouling of riverbeds and river banks, have continued down through the ages, because it has not been realised that the inevitable increase of population means more concentrated pollution of river water by these habits. Tank and well water are also polluted from infected clothing and otherwise. Indiscriminate fouling of grounds and leakage of wash-water into imperfectly, stoned wells form a frequent source of pollution of drinking water supplies. Most villages and many towns have no proper drainage; the sewage water from houses naturally finds its way into rivers. The villages are usually surrounded by paddy fields. River water is drawn into these fields. The water is then drained back into the river; in doing so the water takes in human excreta from the bunds of fields. Nature has numerous methods of keeping down pathogenic germs in the water that drains off from such fields. But pollution often goes to a higher level than can be tackled by this natural purification process. It is this water that is often utilised for drinking and for domestic purposes.

It might be easy to say that such conditions facilitate the survival of the fittest. Sources of infection remove the ill-fitted individuals from society leaving only those who are able to resist the usual infectious diseases. What happens is really something different, most of those who are left behind as a result of epidemics are ill-fitted to carry on the normal duties of life and compete in the economic struggle for existence. Individual life may be carried on somehow, but society as a whole being ill-equipped may suffer.

The absence of corporate feeling has been considerably responsible for the absence of sanitary conscience in the individual. Even those members of society who are scrupulously zealous about personal cleanliness possess no sense of social or environmental cleanliness. In the cities and towns, not to speak of the villages, indiscriminate fouling of streets by allowing children to defecate and adults to urinate in the streets, go on unchecked. All attempts on the part of the authorities to enforce better habits on these people have not been successful since the people have not been taught in the school-stage that it is dangerous to the society to be exposed to such insanitary habits. Mental inertia and apathy may result from inherited factors, but it is more often the result of environment. The magnitude of obstacles in the way of a better life makes one despair and succumb to the environment. Mental apathy in the individual collectively develops into mental apathy in society. The fatalistic attitude of the villager of the plains is in all probabilities the result of his environment. The different elements in the environment force themselves into the human system. Hookworm disease, chronic dysentery, chronic malaria, physical disabilities to filarial infestations, chronic under-nutrition or malnutrition such as diminished protein intake, vitamin deficiencies, anaemia, all contribute to dull cerebral activity, and consequently physical activity.

People have to be roused to activity by continued and persistent propaganda. We have become train-minded, bus-minded. Coffee-habit, tea-habit and other habits have caught us all by sheer propaganda. Why should we not become sanitation-minded also by propaganda?

The older method was "I teach you, you learn." This has been replaced by a new concept. The people have to be interested in a subject to make them learn. It is the interest that has to be created.

The scheme should at first be therefore, to demonstrate by pictures, pamphlets and films, how people in more advanced countries are living. Perhaps imperceptibly the picture-houses are doing it; still it has to be systematised and more vigorously and positively done.

Side by side with pictures of ideal conditions, the existing conditions should also be shown. I should even omit any comment at first. Actual photographs of villages should be exhibited, the streets with stray dogs fighting for remnants of food; children and even adults fouling drying ponds near by; pigs

hurrying to such spots eager to act as scavengers, one or two men trying to wash in the water of the drying pond. This is what actually happens, but, for the common man it does not appear to be anything unusual unless he sees the ideal picture. The ideal village can be described as follows: Every house has a proper privy of the borehole type; the drying pond is replaced by a fenced play-ground with a well in the centre; the well has a hand-pump, or the fenced area may be replaced by a small maidan for cattle to graze. The well has a clean drain round it; the waste water is gradually allowed to spread through gravel into the grazing ground so that grass grows abundantly.

Pictures of this sort can be multiplied. What we have got to do is to take photographs of existing conditions. Draw sketches to illustrate corresponding ideal conditions.

Every village and town in the presidency has its own problems—villages with a small

population, poor income, scarcity of water; villages with larger population, abundant water-supply, but easily contaminated; towns with trading centres and markets, but with no protected water-supply; pilgrim centres with an uncontrollable floating population; towns with municipal squabbles interfering with organized efforts at sanitary or other improvements; industrial towns with industrial waste waters flowing into water courses from which water is taken for domestic purposes. These problems should be individually considered, and possible measures for improvement suggested. To begin with, this can form a feature in the "People's Health."

A thing that is well begun is half done. The Editor of the "People's Health" has well begun his propaganda and I am sure it is going to be a successful campaign. One would like to see it to come out also in the languages of the province.

PEOPLE'S HEALTH.

What does the magazine stand for?

1. "People's Health" will not be concerned with party or personal politics. It will place the health of the people above political, communal, linguistic, religious, territorial and other such considerations.

2. It will aim at guiding, mobilising and stimulating the activities of the Provincial and Central administrations and the people in the war against disease, malnutrition and the root causes of poverty and ignorance. It stands for waging this war to a successful conclusion on the principle of Unlimited Social Liability.

3. It will stand for the improvement of environmental sanitation, including town planning and housing, as the first and most essential step in the progressive promotion of the people's health.

4. It will ceaselessly strive to integrate official and non-official activities for promoting the health of the people.

5. It will convey correct and up-to-date information on all aspects of people's health in non-technical and popular language, for the benefit of the common man and the specialist alike.

6. It will aim at rousing civic conscience and inculcating in the people pride in their village, town or city.

7. It will specialise in the reconstruction and improvement of villages, particularly in the field of sanitation, to ensure the health of the masses.

8. It will demand on behalf of the people the due performance services which should be rendered by the State in the light of the progress made all over the world in the promotion of the people's health.

9. It will press for a high of the financial and administrative priority for schemes calculated to promote the people's health in any programme of reconstruction.

10. It will try to enlist the enthusiasm of Young India for knowledge relating to health and harmonious growth of all human faculties.

11. It will attempt to educate the house-wife and the mother on home environment and the upbringing of children.

12. It will plead for the provision of healthy surroundings to workers in industrial institutions and also point out the ways in which this could be achieved.

13. It will press for the reorganization of the administrative and professional services so as to achieve a correct and proper utilisation of each service, and with a view to promote co-ordination and teamwork of all the related services.

14. It will fight all forms of quackery, superstition and evil customs.

15. Its supreme aim will be to serve as a clearing house for scientific and up-to-date knowledge pertaining to national health and as an authoritative and fruitful forum for the discussion of all ideas and plans relating to it.

Without the active co-operation of our readers the Editor cannot achieve the objects in view. We therefore cordially invite you to offer your suggestions for making the magazine a power for social good.

HEALTH WORKERS !

FOR YOUR BENEFIT

BY

ONE OF YOU.

REFER YOUR PROBLEMS TO US. THEY MAY BE BAFFLING OTHER WORKERS ALSO. WE SHALL HELP TO SOLVE THEM. IF YOU HAVE SOLVED ANY OF THEM, LET US KNOW. IT WILL BENEFIT OTHERS.

[Ed., P.H.]

GREETINGS!

In our first issue, we treated our comrades to a fare of our own. Rather discursive rambling from an attempt to define Preventive Medicine to the secrets of Aerobiology. We hope you found it palatable—and to your taste.

Having begun by exploring the aerial regions, let us leave our microscopic friends—or enemies—for a while. Let us look at the other sides of this air business. After all, the disease germs are minute things. They do not abound in air every where. They are easily controlled—and easily avoided too. On the other hand, we ourselves are in greater numbers. And all of us live in air—and live 'on' air! An envelope of air surrounds our bodies. We need air every minute of our life. We have all been told, as children, that without air we cannot survive even for five minutes.

Now, why is air deemed so essential? What is it that air does to us? How exactly does our life depend on it? How does it influence our living? And again, using the air so much and so often, do we do anything to it in return?

To understand this, we must know something of the nature of air. What it contains and what each component can do is relevant. We must also know something about ourselves. How our body lives, how it works, what happens when it lives and works, and what part air plays in it are also facts interesting and necessary to know.

* * * *

Take what we call "fresh air"; the air ordinarily found in open spaces on the surface of the earth; the air which enters into our houses and buildings; the air we all breathe. We call this "fresh" because it is found in nature. It is manufactured by God for us. It is unsullied by mortals. It gives us life. We give it that name for another reason. This air has one remarkable quality. It seldom varies materially in composition. Wherever it is found, it is just the same mixture of gases and in the same proportion. It may have different physical properties in different places; but it never contains anything new. The properties of this fresh air have been assessed accurately and in detail by many. What concerns us and what is important are the following:

1. It contains about one-fifth of its volume of Oxygen.
2. It contains nearly four-fifths of its volume of Nitrogen.
3. It contains varying quantities of water vapour. In some places water vapour may be almost absent. We call it dry air. In others it may be the maximum that the air can hold without dropping it as rain or dew—We call it humid air.

Note.—Although this section is addressed primarily to Health Workers who are usually trained for the profession, the 'common-man' would be profited by perusing it.

—Ed., P.H.

PEOPLE'S HEALTH.

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4. It varies in temperature. A property which every one of us is most aware of! It is too cold near the poles and too warm near the equator. The range is wide. Its difference from normal human body temperature is a crucial point.

5. Air is ever in motion. Even when we feel that air is still, it is not really so. It is moving so slowly that we cannot feel its motion. At the other end, there is the violent motion of the cyclone or tempest.

* * * *

Take ourselves. We have bodies which grow and work. This growth and work are made possible one may say, constitute—life. What happens in life? The minute cells of the body change. They take in what they want, give out what they do not need. They increase in size. They multiply. And finally they perish. A cell is a highly complex chemical component. The changes that we call growth, multiplication and decay are in fact chemical changes. And fundamentally, all these chemical changes are processes of oxidation. It is the food we take in, that is so oxidised. The end products of this oxidation are oxygen and carbon dioxide.

There is a by-product also. Oxidation is always attended with the generation of heat. While we oxidise food, we are also producing heat. The greater the food digested and oxidised, the greater the heat resulting from it. Every organ or tissue that carries on its allotted function oxidises food as it works, and produces heat. The amount of heat is generally measured in physiology in terms of what is known as the large Calorie. One Calorie is the amount of heat required to raise one pound of water through one degree Fahrenheit.

The total amount of heat generated by the body in one day has been measured by many physiologists. For an average adult, it is as follows:—

Heart	..	70	Calories.
Respiratory muscles.	150	"	
Liver and intestines.	400	"	
Kidneys	..	80	"
Skeletal muscles	..	1700	"
Total.		2400	Calories.

The daily work that we do accounts for 60 per cent. of the heat. Our digestion generates about 20 per cent. and breathing, circulation and production of urine account

for the rest. If our work is hard, the heat produced is correspondingly greater. A labourer walking with a small load will produce 8 Calories of heat a minute.

* * * *

Heat production by engines is well known to Engineers. They express heat in terms of B.T.U.s. (British Thermal Units). Heat production by the human body in terms of B.T.U.s. has been estimated by several physiologists. Attwater estimated that an average adult gives off 366 B.T.U.s; Flugge's value is 495 B.T.U.s. The New York Commission found that children between 7 and 8 years of age gave a heat output of 300 B.T.U.s. children 13 years old 500 B.T.U.s. and young adults 464 B.T.U.s. From all these observations, an average was derived. This average is the heat output of a normal adult doing ordinary work. It is 400 B.T.U.s. per hour or 9600 B.T.U.s. per day.

* * * *

Generating so much heat, one may imagine that our body is an engine and could be used as one for power purposes! God however, has willed otherwise. It is not possible to convert all the heat into power or energy. In this respect, the human body is a wasteful or inefficient engine. Only about one-fourth of the total heat produced is converted into energy and utilized for work. In hard working man, a little more of the heat may be transformed into energy and work. But his body system seems to compensate for this by producing more heat merely as a result of work.

Now if a body produces heat, but converts only a portion into energy, the rest of the heat will remain in the body. If this happens, our body temperature will rise. It will go to unknown heights. We all know however that the normal human body keeps a steady uniform temperature. How is this brought about? What happens to all that extra heat produced, which the body does not want? Where does it go, and how does it go? These are very interesting questions. We must know the answer if we are to understand what is happening to ourselves day in and day out.

* * * *

All heat that is not wanted by the body is dissipated. It simply goes out of the body. It is merely wasted. It cannot remain in the body. If it does, our body temperature will rise. With high temperature our physiological

processes will be interfered with. To prevent this, our body simply throws off all extra heat that it does not need. There is a centre in the midpart of the brain which controls this. By stimulating appropriate portions of the body, it sees that all unwanted heat is lost from the body.

How is this loss actually effected? By very simple means. Heat from a substance can be lost only in two ways. Either the heat must be transferred to another substance or the heat must be used up as energy. The human body loses heat in both ways. It transfers heat to substances around it. The only substance which is constantly present round the body is air. So heat from the body is given off to the air. The air takes up the heat from the body. This exchange of heat from the body to the air can take place only on the surface of the body. It is only there that contact occurs. Also, air can take up the heat only if it is cooler than the body. So this method of heat loss is possible only in cool climates and in winter. The blood in our body carries the heat to the surface. There it contacts air, separated only by a thin layer of skin. The entire surface of the body under the skin is permeated by a close network of minute blood vessels—capillaries. When heat is produced and has to be dissipated, these vessels dilate. A large volume of blood is brought close to the surface for cooling. After the heat is lost to the air, the skin becomes chilled; the capillaries contract; less blood comes to the surface; greater thickness of skin is interposed between blood and air; result heat loss is curtailed. This alternating expansion and contraction of capillaries regulates the heat loss under moderately cool conditions.

The cool air in immediate contact with the warm surface gets heated until its temperature equals that of the warm surface. This is cooling by conduction. Air however is not a good conductor of heat. So heat loss by conduction takes place at a very slow rate. But warm air has another property. It is lighter than cool air. Therefore it tends to rise. As the warmed air rises up, its place near the skin is taken by a fresh lot of cool air. This is in turn warmed up. Exchange of heat effected in this way is called convection. Besides air, other colder objects near human bodies can also absorb heat across space. This transference goes by the name of radiation.

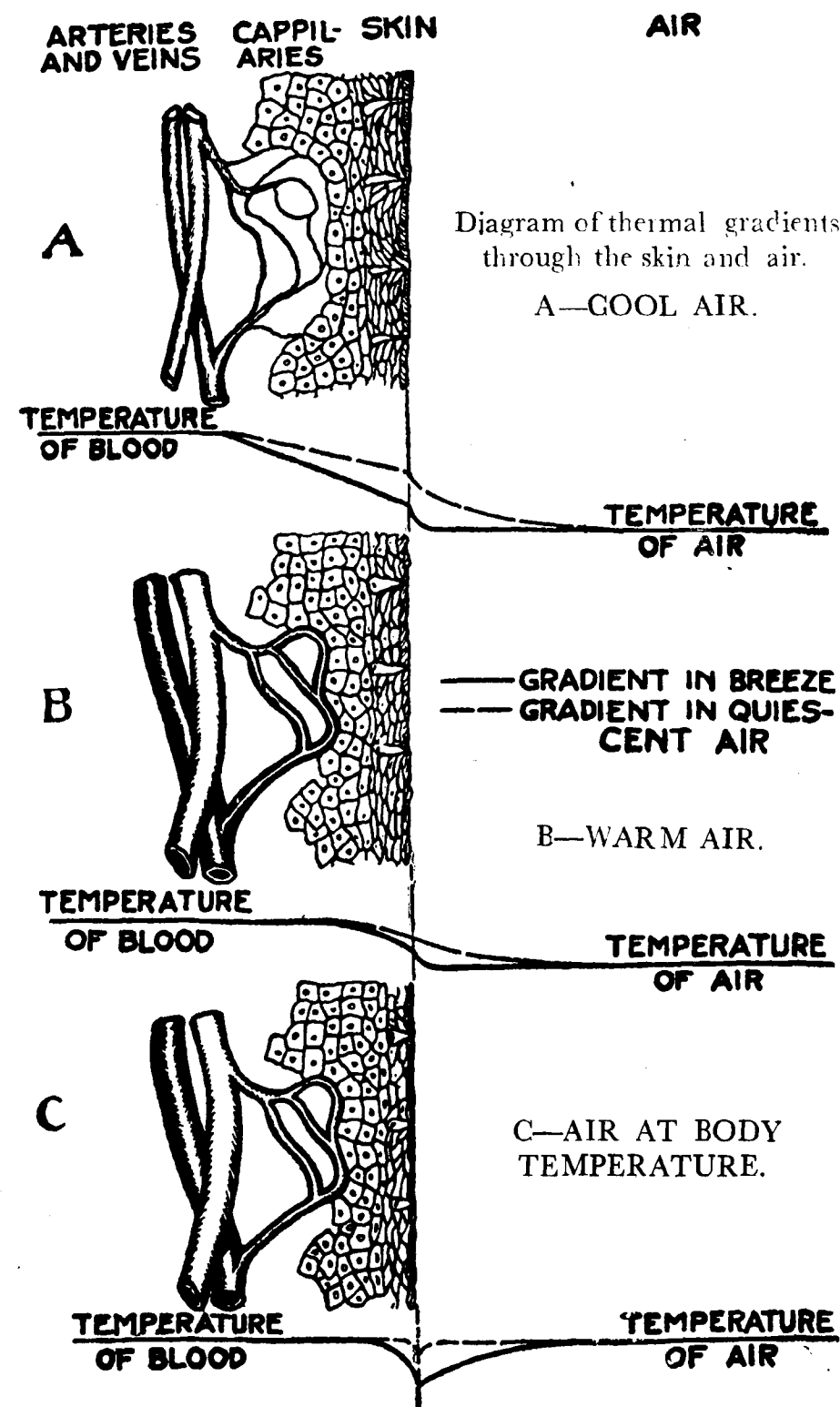
So, transference of heat from the body to air mostly and to other objects partially takes place by conduction, convection and radiation. This kind of heat loss is termed "Sensible loss."

This "Sensible loss" has a limited range. It depends on the temperature of the air first. The cooler the air, the greater the heat that it can absorb. In other words, the greater the difference between body temperature and air temperature, the greater the heat loss by "sensible" means. As the air temperature approaches that of the body, the amount of heat it can take up becomes less. So "sensible" heat loss diminishes gradually with the warmth of the air. A stage is reached when the temperature of the air and of the body are equal. Then heat loss is stopped. If the air temperature is higher, the body takes up heat from the air instead of giving heat to it.

At this stage, the heat regulating centre in the brain sets in motion the other method of heat loss. This method makes use of a well known physical principle; namely, "the evaporation of water involves the absorption of heat." To set this about, the sweat glands in the skin are stimulated. They become active, extract water from the blood and tissues, and pour it out on the skin as sweat. This sweat evaporates and the water vapour gets mixed with the air. Such evaporation is not possible unless heat is used up. Evaporation of sweat therefore removes a great quantity of heat from the body. Loss of heat by this means is termed "Latent loss;" for it is dependent on the "latent heat" of evaporation of water. The heat so removed is not small. One gramme of water absorbs 0.58 calorie of heat in evaporating.

Loss by "latent" means comes into play when external air temperature is near that of the human body or higher. At this stage, this is the only means of heat loss. Sensible heat loss cannot operate when air is warmer than that of the body. All the sweat that is evaporated goes off as water vapour into the air. Air has some limitations in this. At a given temperature, a given quantity of air can hold only a certain quantity of water vapour. If air already holds the maximum, it can take up, there can be no more evaporation of sweat and addition of water vapour to the air. When this happens, the water laden air must be removed. A fresh layer of air with less water vapour must be brought in contact with the skin. Then evaporation and consequent heat loss can go on again. The water content of air is known as humidity. Latent heat loss depends on humidity.

We trust our readers will be interested in the following extract, which explains how the skin works:



(With acknowledgment to 'The Principles of Public Health Engineering,' by Earle B. Phelps. Publishers:—The Macmillan Company, New York.)

" It may best be illustrated in a diagrammatic way. The diagrams show in a conventionalized way the general relation. At A the situation is shown as it exists in cool air. The blood is withdrawn from the surface and separated from it by an insulating layer of skin. Immediately underneath this sketch is a line of temperature showing the temperature of the blood, the intermediate layer of skin, the surface, the skin, and the external air. If it be recalled that the rate of heat flow is proportional to the rate of change of temperature, which in the sketch is the slope of the line, then it will be clear that heat will run down these lines as water would run down similar physical grades; the steeper the slope, the greater the flow. This line is known as a temperature gradient. Alternative gradients are shown for quiescent and for moving air. In the latter case, the gradient is steeper and the rate of heat flow greater.

"At B a second condition is shown. Here the temperature of the air is higher, and some compensating change has been necessary within the body. This is shown to have been accomplished by the expansion of the capillary, bringing a part of the warm blood much nearer the surface so that the actual surface temperature is raised. This maintains substantially the same external gradient as previously.

"At C we have the condition of the external air at the body temperature. No cooling, either by direct conduction or by convection, is now possible, but evaporation has increased to such a point that the drop in temperature at the surface is large and a short steep gradient is formed at this point. It is seen also that heat from the exterior air is now flowing toward the cooler skin, so that in this case evaporation has to cool the air as well as the skin."

(From the "Principles of Public Health Engineering," by Earle B. Phelps.—The Macmillan Co., New York.)

Now, in both these methods of heat loss, there is one factor in operation. That factor influences the rate of loss in both. It is the movement of air. In heat loss by sensible means, the hot air rises up. Cold air takes its place, gets warmed and rises. The cycle goes on. This movement is a motion caused merely by a physical property of the air. Warm air is lighter and so goes up. Suppose air is moved by other means. Let us have a mild breeze, or a fan. The air in contact with the

skin is moved not only by its warmth and lightness, but also by an external force. By this more rapid movement, fresh lots of cooler air are brought in contact with the skin. Heat is lost from the body to the air more rapidly.

In heat loss by latent means, the sweat evaporates into water vapour. In doing so, it withdraws heat from the body. The rate of evaporation depends on the humidity. When air takes up its maximum of water vapour, no more evaporation can take place. Then that air has to be moved out, and fresh air replaced. In this case, unlike in the previous one, humid air cannot move by itself. It has to be moved by outside forces. A breeze or a fan is necessary to effect this movement. In tropics, heat-loss is mostly latent. That is why we need more breeze and more fans to keep us cool.

There is yet one more factor which influences heat loss in both these methods. It is the clothing we wear. The material, the texture, the thickness and the number of layers, all play a part. They interfere or obstruct free contact of fresh air with the body surface. They therefore lessen the cooling power of the air on the body. So called civilization determines our clothing. But it often sets a fashion which clashes with the needs of the body. If our dressmakers were physiologists, we would all be clothed in maximum comfort and health.

We have been too engrossed in the qualities of air and of the body that we may lose sight of what we sought to find. Let us summarise first and then proceed. We saw that air has oxygen, can hold water vapour and varies in temperature. It is ever in motion. We also saw that body oxidises food, generates heat and—rather wastefully—loses it. Now, how exactly do the air and the body interact? How do these properties influence one another? What is the result of this mutual contact. And what bearing it has on our practical living?

Let us answer the last question first. Because it is the simplest. We began with the statement that air is absolutely essential to life. As such, it ought to be equally important for good health. Such an essential commodity should not be in short supply. Nor could it be spurious or spoiled stuff. It should be available to everyone in plenty and in suitable condition. If everyone lived and worked in open air, this will not be a problem. We however erect buildings for our living and for our work,

Unfortunately buildings have walls; and walls obstruct air supply. We are consequently compelled to learn the art of ensuring air supply in such obstructed places. That art is the art of ventilation. To know how to "ventilate" ourselves, we have to learn how air and body interact.

The two important functions of our body, namely, the assimilation of food and the maintenance of a normal temperature depend on air. Assimilation of food requires oxygen. This oxygen is got from air. Assimilation also produces carbon dioxide. This is not wanted

by the body. What is not wanted is quietly thrown into the air. While air helps life by giving oxygen we return the debt by fouling the air with noxious carbon dioxide. Oxidation is attended with heat production. Much of the heat is not wanted by the body. This unwanted thing is also given up to the air. It goes partly as direct heat and partly as water vapour. Thus air performs two vital functions for us. For both of which it is required by being fouled and altered uselessly. James Kerr, an eminent hygienist, tabulated these functions diagrammatically and side by side:—

PHYSIOLOGICAL FUNCTIONS OF AIR.

Respiratory.	Thermal.
1. Acts through the lungs.	1. Acts through the skin.
2. Independent of the physical conditions of the air.	2. Entirely dependent on the physical condition of the air.
3. Dependent on the chemical composition of the air.	3. Independent of the ordinary composition of the air.
4. Cannot be substituted by water or other means.	4. Can be substituted by water or other means.
5. Easy to control and regulate.	5. Difficult to control and regulate.
6. Removes carbon dioxide.	6. Removes heat.

In this business of air supply then, we aim at two things. One is keeping up regular supply of oxygen and removing the carbon dioxide. The other is removing heat and keeping the body temperature normal. Both are vital. Both are needed for healthy and vigorous functioning of our body and mind. Ventilation is the art by which both these vital objects are achieved. If ventilation is poor either or both these purposes are not fulfilled. Our body functions are impaired and we suffer.

Now, the question is, are both these objects equally important in ventilation? Does our normal functioning depend to an equal extent on oxygen supply as on heat balance? Is one more essential than the other? Can we pay less attention to one and more to the other? These are important questions. For, on answers to these questions depend the requisites of ventilation. How much of air is to be supplied, in what form, with what qualities and how our buildings are to be adapted to such requisites is determined by what we want to achieve and to what perfection.

We must therefore know how far each purpose is essential, what factors influence each, what standards constitute perfection and what limits of variation are permissible. We

must also know by what index each object can be judged and by what yard-stick measured. These fundamental questions have tortured the brains of hygienists for over a century. Hundreds of experts have spent their lifetime exploring this problem. Many are the facts observed and recorded. Numerous inferences and conclusions have been drawn. An account of all these, forms a most fascinating portion of the history of human health.

We all know what is meant by bad or injurious air. It is air that causes discomfort, air that is not conducive to health. We can also say quite easily which place is badly ventilated. The discomfort in such places is best felt by a person coming from outside. Such a person promptly complains that the air is "stuffy." He feels a disagreeable smell. As he continues in the room his nose gets dulled and he gradually ceases to feel the disagreeable smell.

The person who remains for some time in a badly ventilated room feels no smell but feels other forms of discomfort. In fact, he gradually feels sick. He gets a headache; has a feeling of nausea. His appetite becomes dull. He develops lassitude and a disinclination to work. He

becomes drowsy. Sometimes he may even faint. These symptoms are felt by people crowded together temporarily in a small space with inadequate ventilation.

Persons living in over-crowded tenements with bad ventilation are compelled to breathe repeatedly "stuffy" atmosphere. Such continued occupation of ill-ventilated places produces similar bad effects in a worse degree. Chronic headache, lassitude, depression of spirits and loss of appetite are common. At a later stage anæmia supervenes. There is a tendency to "take colds." General vitality is impaired, and there is a lowered resistance to disease.

There is something in this badly ventilated air which causes all these symptoms. The search for this 'something' has been frantic for a long time. Lavoisier, the "chemist of Oxygen fame," formulated a theory towards the end of the 18th century. He stated that the discomfort in ill-ventilated rooms was caused by the presence of an excessive amount of carbon dioxide in the air. Being a chemist of established reputation, his words were taken as gospel. Removal of carbon dioxide and replacement of oxygen came to be looked upon as the most important consideration for the air in buildings. Carbon dioxide was regarded as a poison which should not be allowed to accumulate. Deficiency of oxygen was thought to be the cause of many of the symptoms, especially the anæmia and the air hunger.

This carbon dioxide theory held the field for half a century. Then came Petten Koffer, an eminent hygienist. He examined the problem deeply. His conclusion was that the symptoms were not due to the lack of oxygen or excess of carbon dioxide. But while stating this conclusion, he added a protocol to it. He stated that, for hygienic purposes, the amount of carbon dioxide in the air fouled by human occupation was a safe indicator of its physiological utility. He laid down a standard for good air in terms of carbon dioxide. He deemed the percentage of carbon dioxide in air to be a convenient yardstick to measure the harmfulness of in foul air. This carbon dioxide percentage caught the fancy of all. It strengthened Lavoisier's view. It came to be universally adopted in ventilation tests.

De Chaumont was the next person to further develop this theory. His contribution was the correlation of smell to carbon dioxide. He made extensive observations of the intensity of smell and carbon dioxide content of air. He held that the acute sense of smell was a good detector of the impurity due to human occu-

pation. Since smell though acute could not be measured, he pitched upon carbon dioxide as the measuring stick. The results of his observation were as follows:—

Smell.	Percentage of CO ₂
1. Just noticeable	.. 0.06
2. Not very close	.. 0.07
3. Close	.. 0.08
4. Not very foul	.. 0.085
5. Very close	.. 0.096
6. Extremely close	.. 0.11
7. Very close and unpleasant.	.. 0.15

A most important deduction was made from the above observations. Air becomes foul due to human occupation. This fouling is indicated by smell to a person coming from fresh air. So, whenever the slightest smell begins to be felt, in any occupied room, ventilation has just begun to be imperfect. So long as no smell was felt ventilation was all right. Smell depends on the senses of the person making the test and is liable to error. Carbon dioxide is a stable gas easily detected and accurately measured. Even though smell may not be detected at times, carbon dioxide can always be estimated. Consequently the dictum was laid down that, whenever carbon dioxide reaches that concentration when smell was noticeable, ventilation is not good enough and has to be improved. This concentration is seen from the above table to be 0.06 per cent. This percentage of carbon dioxide became a potent weapon in the armoury of ventilationists. They declared with gusto that good ventilation should allow only 0.06 per cent. of carbon dioxide in air. Since fresh air contains normally 0.04 per cent. of this gas, the excess of 0.02 per cent. was deemed impurity. Thus, a factor in ventilation came to be laid down, which was given the euphonious name of "Permissible Respiratory Impurity." This permissible respiratory impurity remained till recently the most-talked-of thing in ventilation. Estimation of CO₂ was the crucial test. Even now, some die-hards can't bring themselves to ignore this. They still believe that the whole idea of ventilation should be concentrated on air removal to keep carbon dioxide diluted to 0.06 per cent.

This permissible respiratory impurity reigned so supreme that several standard requirements of buildings were worked out from it. These standards were accepted and incorporated in laws. They regulate the extent of floor area cubic space, and the quantity of fresh air that should be provided for each person. The standards, with slight modifications, remain in force to this day.

The standards were based upon the permissible respiratory impurity, the amount of carbon dioxide which a person gives out in breathing, and the number of air changes which a person can tolerate without a feeling of chill or 'draft.' The permissible respiratory impurity is 0.02 per cent. The amount of carbon dioxide output of a person can be easily calculated from known physiological data.

An adult person at rest breathes 17 times a minute. At each respiration, about 500 c.c. (or 30.5 cubic inches) of air pass in and out of his lungs. During this passage, the air loses 4 per cent of its oxygen. In return it gains from the lungs 3.5 to 4 per cent. of carbon dioxide. The total volume of carbon dioxide given out in an hour by a person is therefore — $17 \times 30.5 \times 60 = 1728$ c. ft. of air breathed per hour, 4 per cent of 1728 = 0.72 c.ft. of CO₂ given out per hour.

From actual experiment however it has been determined that an average adult gives off fully 1.0 c.ft. of carbon dioxide in one hour during gentle exertion. During hardwork, the carbon dioxide output is doubled. An adult female gives out about 4/5th of that of an adult male. Children give out half the quantity. If we take a mixed assembly of men, women and children, the carbon dioxide output per person per hour may be taken as 0.6 c.ft. on an average.

Now, 0.6 c.ft. of carbon dioxide is 100 c.ft. of air is 0.6 per cent. The amount that can be allowed—the permissible respiratory impurity—is only 0.02 per cent. If ventilation is to be satisfactory, the air should be so diluted that the percentage of CO₂ is reduced from 0.6 per cent to 0.02 per cent. Hence 100 c.ft. of air containing 0.6 per cent. of carbon dioxide should be diluted $\frac{0.6}{0.02}$ 30 times. In other words, 3,000 c.ft. of fresh air should be let in per hour per person. This was the first standard laid down.

This 3,000 c.ft. of fresh air should be so let in during the hour, that it will not chill the person. Those who worked out these standards lived in cold climates. They were extremely afraid of chills and drafts. Chills and drafts are caused by a rapid movement of air near the skin. When you let in 3,000 c. ft of air into a place, a similar quantity of air should get out. That is the air in the room is replaced by fresh air. If this replacement is to occur rapidly then air near the skin will be kept moving fast and will cause chill. If the replacement occurs slowly there will be no chill. When the

quantity of incoming air is fixed at 3,000 c.ft. the speed of replacement is determined automatically by the quantity of air already present in the room. If the room has 100 c.ft., the air will be replaced 30 times an hour; if it is 500 c.ft., 6 times an hour and so on. The observers in cold countries felt that only 3 replacements per hour can be allowed without producing chilly sensation. So they laid down that every person should be allowed an air space of 1000 c.ft., in buildings. This is the second standard they laid down.

Suppose we provide a room for one person. The standard requires that the room should have a cubic capacity of 1,000 c.ft. This 1,000 c.ft., can be obtained by varying dimensions. It may be 10×10×10, or 5×20×10, or 2×10×50. But any fantastic dimension cannot be adopted. Human beings occupy a room at the floor level or slightly higher, if furniture is used. It is the air at that level that is breathed in and out mostly. Air at levels far higher than the living level play no part. They are practically useless for our purposes. Hence, the height of rooms must be limited for ventilation purposes. Even though the height may be great, only a limited portion can be taken into account in calculating the cubic capacity of the room. That limit is set at 12 feet. Now, when you prescribe the cubic capacity and limit the height, the floor area becomes automatically defined. It is 1/10 or 1/12 of the cubic capacity. The floor area that every person needs therefore comes to $\frac{1000}{12} = 80$ sq. ft. roughly. This is the third standard laid down by the old experts.

The dawn of the twentieth century saw a revolution in these ideas. Intrepid investigators who felt dissatisfied with the above standards started questioning the basis. They threw doubts on the assumptions on which the standards were laid down. They challenged the victimisation of carbon dioxide as the villain responsible for the ills of ventilation. They devised bold and direct experiments. These pioneering individuals were followed by other scientists banded into Commissions, who made large scale observations under controlled conditions. The result was that the carbon dioxide theory and the wonderful "permissible respiratory impurity" was blown to bits. A new, correct and rational basis of ventilation was worked out. This part of the story is so interesting that we must keep it over for the next instalment.

READERS' FORUM.

This section is open to readers for their frank, free and fearless expression of views on all aspects of people's health.

Type-written letters facilitate work.

Rationing of paper restricts space. Brevity is the soul of wit.

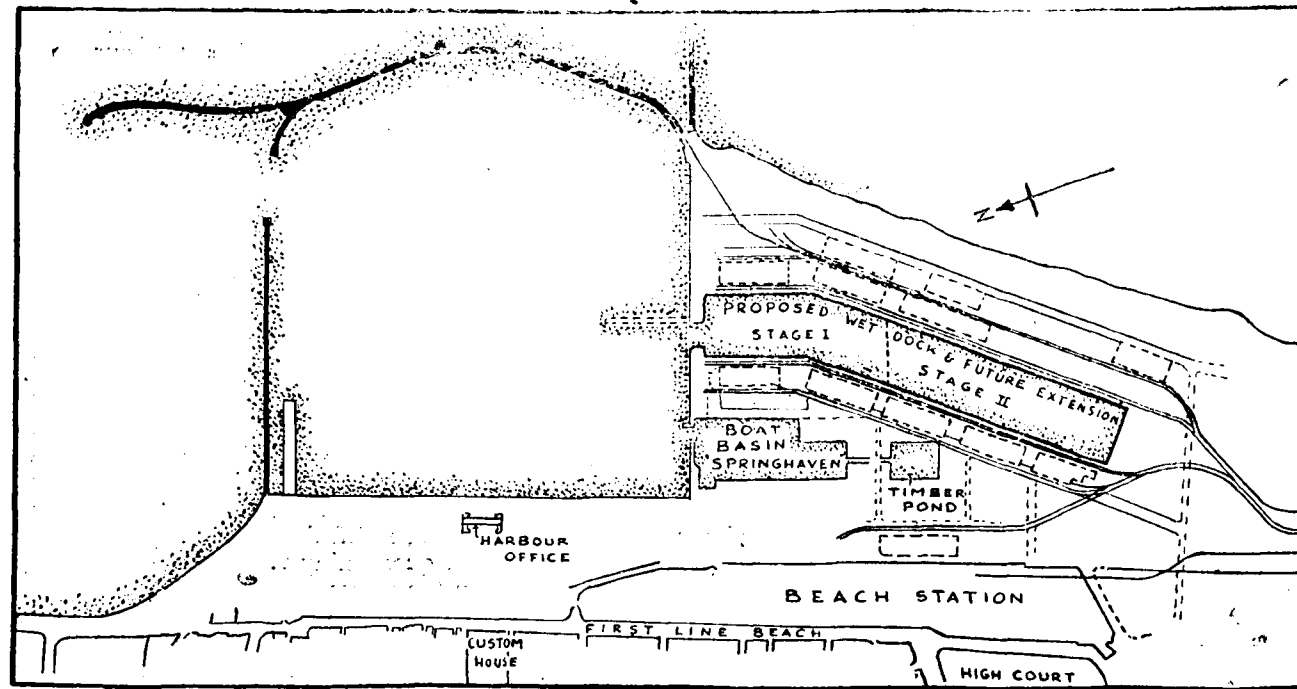
Please remember that "People's Health" is above communal, party or personal politics.— (Ed., P.H.)

DEWAN BAHADUR SRI L. VENKATAKRISHNAN, B.A., B.E., I.S.E., Chief Engineer, P.W.D., Madras, (Retired), writes:—

Mention is made in the *Hindu* of October 17, 1946, about a scheme for the improvement to the Madras Harbour. A copy of the map which accompanied the note is attached.

lished by the Director of Publicity, the improvements under execution in respect of the canals of the presidency are detailed. The total capital expenditure is put down at about 28.56 lakhs.

The goods brought on these canals are distributed in the city, from the nearest canal wharf. But in respect of goods for export or import, they have to be unloaded at the basin



By the Courtesy of the *Hindu*.

Materials for export from Madras are brought in both by rail and canals. Madras is connected to other coastal towns as far north as Cocanada and as far south as Mercanum backwaters by the Buckingham canal.

I believe there are schemes for improving and extending both these. In pamphlet No. 3, Design for Prosperity, COMMUNICATIONS, pub-

wharf, carried laboriously along the crowded streets of George Town, to the Harbour and stored there for export. This necessitates at least two extra handlings, cartage over long distances, traffic congestion and traffic hazards and greater opportunity for pilferage.

If this can be eliminated, it will not only save additional handling, save pilferage, remove

PEOPLE'S HEALTH.

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congestion from our roads and make for speedier handling.

It is believed a scheme was suggested some time ago to connect the north arm of the Cooum with the Harbour by a canal along the beach and if this is taken up by Madras along with the Harbour improvements, it will help canal traffic and the export merchants a great deal.

If a lock and sluices are provided at the Harbour end, this will enable Cooum being filled direct from the Harbour at high tide and enable much higher levels to be maintained than is at present possible.

By providing a dam with the crest at High Tide level at the point of offtake of this canal, this inflow can be discharged back into the sea through a set of submerged deep sluices at low tide. The regular flow will automatically tend to keep the bar open.

Perhaps, the present Government might be willing to reopen the question and examine it.

There need be no apprehension that it will silt up the Harbour, as all the flow will be from the Harbour to the basin, and no flow carrying either the locked-in waters or the flood waters containing the silt, will ever enter the Harbour.

106 PERIODICALS FOR 72,000 MEDICAL MEN!

DEAR EDITOR,

We are told that there are 72,000 medical men in puny England with a population less than that of our Province. What is more surprising is that these 72,000 medical men have a choice of 106 different periodicals giving news of the medical world. We here have not the same profusion of medical service. Even for the little that we have, there is an austere starvation in medical and public health news and views. Your venture fills a long-felt want.

I have read the small note in your first issue summarising what your magazine stands for. You have embellished it in your introduction. Reading this, seeing the high level you have achieved in the first issue and knowing what you are, I am reminded of the history of the oldest and the premier medical journal of England. Here is what Seton Valentine says of it in the June issue of the Strand Magazine:

"The LANCET is the most famous of all the medical journals. It is a weekly of austere appearance . . . For a century, it was the property of Thomas Wakely, who founded it

in 1823. He was a friend of William Cobbett and like that pugnacious worthy, a born fighter, and a propagandist with a vitriolic pen. A surgeon himself, Wakley objected to the great surgeons of the day keeping their knowledge from all but the students who paid to attend their lectures.

"So he founded his famous paper to disseminate medical information, to wage war on hospital nepotism, and to 'spread enlightenment to distant practitioners.'"

I think, I see a close resemblance between the founder of the LANCET and the founder of "People's Health." 'Pugnacious,' 'born-fighter,' 'vitriolic pen,' 'wage war on nepotism,' 'spread of enlightenment,'—well a choice collection of epithets which fits you to a T. Don't blush, dear Editor, I can't help saying it. May your journal become as firmly established and achieve as high a reputation as the LANCET!

Perhaps you may bark at me if I add a few tips, culled from the same account of the LANCET. Being safe behind a pseudonym, I venture forth.

"Wakley claimed as his own the development of open letters to prominent men, and the printing of biographies of living people, as against the full-dress obituary notice."

"The paper sent as it does today—special correspondents to the scene of epidemics and many of them provided excellent reporting. A profession that has produced a Somerset Maugham and a Conan Doyle is obviously equipped for that kind of work."

"Upton Sinclair's gruesome novel 'The Jungle,' which told of the finding of trouser buttons and human remains in Chicago-packed meats, was based on a report which was first published in the Lancet. This novel led to a scandal which shook the American meat industry to its financial foundations."

Now, don't get upset. If you don't like it, there is a W.P.B. under every Editor's table!

"COMMON MAN."

[It is for the readers of "People's Health" to establish the magazine firmly and to secure for it as high a reputation as the Lancet enjoys. We cordially invite our readers to offer their suggestions for making the magazine a power for social good.

—Ed., P.H.]

THE MADRAS CITY WATER-SUPPLY.

Mr. C.S. Ayyar, Retired Accountant General, writes :—

The citizens of Madras cannot adequately thank you for the lead you have given for improving the city water-supply. As you have rightly pointed out, from the Minister to the humble slum dweller, all had been suffering the situation in silence. I have been one of the sufferers myself. On the occurrence of two cases of acute diarrhoea in my family, I complained to the Health Officer in a letter dated 17th August, 1946, that during the normal hours of water-supply a lot of material, quite slushy, was being discharged through the house taps. During the hours of maximum demand, water was available only in the tap in front of the house. The pressure at which the water-supply was made admittedly according to the tests carried out by the Corporation authorities, a pressure of only $2\frac{1}{2}$ feet above the ground, was being maintained. Above all the stench of the water was being maintained for hours, despite being stored in country earthenware pots after straining it through a cloth. I expressed my fear that the sewage drains of the houses in the locality might be affecting the water-supply main. I requested the officials of the Health Department to verify the statement as to the stench. I heard from the Health Officer that my complaint had been passed on to the Water Works Engineer. When the Assistants of the water-works department came to my residence, I showed them the slimy cloth which was getting clogged in no time when the water was strained through it. The Assistant Water-Works Engineer, in his turn, wrote to me as under : "The road portion and the meter strainer have been cleaned and now there is no sediment. The Fire Hydrant at the dead end main is also being scoured periodically and the bad smell is subsiding.

The inside service pipe to your premises is very old and choked up. If you arrange to renew the service or clean it, through a licensed plumber, the bad smell may completely disappear."

[We have been complaining that adequate professional services are not being rendered by the Corporation to the citizens of Madras. It is less than amateurishness to suggest to a householder that renewing the service pipe

or cleaning it would help to put down the stench which the people had been experiencing all over the city. Are we to consider this advice as utter ignorance of water-engineering or incorrigible callousness or irresponsibility? In either case, it is the citizen who suffers. The City Fathers who are supposed to watch and further the interests of the citizens are supinely indifferent !

For want of space we are unable to publish other correspondence which bear evidence of similar attitude of the authorities of the Corporation.

We have however, every reason to hope that the Minister of Health, Madras, would respond to our appeal and examine the vexed question of the city water supply.

Ed., P.H.]

THE HUMPS IN GOPATHY ROAD.

COMMON-SENSE vs. CORPORATION ENGINEERING.

In a series of articles in the Press, you, in your personal capacity as "Mr. A.V. Raman" brought to light a series of defects in the administration of the Corporation. But as usual, neither the City Council nor the higher authorities seem to have taken any note of them. A responsible government, which should be responsive to public criticism, has not as yet, come into existence in this country ! People's health is allowed to suffer by the inaction of our own representatives in the City Council and in the Provincial Administration. Let me bring to the notice of the Public through your columns the latest act of vandalism which is perpetrated by the Corporation in the name of Engineering Science and for the relief of the citizens of Mambalam.

When Mambalam extensions were laid out, roads were formed and a culvert was constructed not far from the Sun Theatre in Gopathy Narayanaswami Chetti Road. It is well-known

that this reach of the road, to some extent on either side, is flooded even by a small rain-fall in the area. Apparently, to relieve this, the Corporation engineering authorities have devised method by which a hump is now formed in a road which was originally level. I ask in the name of common-sense, whether engineering requirements of the case demand such a hump being formed. What is required is a certain area of vent-way at a particular bed level to carry the maximum storm flow. Can this not be achieved by a rectangular opening of adequate size instead of a circular conduit? The necessity for the reconstruction of this culvert is an admission that the original work was unsuitable. If the design and execution were defective, who is responsible for the expenditure of the rate-payers' money on infructuous work in the first instance? It

cannot be suggested that the area of the catchment above the culvert has been since extended.

Further, why should the present bed level of the drain here govern the bed level of the culvert? The channel is a silted up one. The difference in level between the point of discharge of the channel and its head should, I believe, admit of the bed level at the culvert being lowered. Was this aspect of the question examined at all by the engineering authorities of the Corporation? It is, indeed, disgusting that the rate-payers' money should be thrown away by amateurish engineering without any regard either to engineering science or to aesthetic taste. I enclose herewith a photograph to illustrate the situation.

"A PROFESSIONAL ENGINEER."



Note the Archway on the Downstream Side: Circular Openings are provided on the Upstream Side.

HOUSE GARDENS.

BY

L. M. CHITALE, F.R.I.B.A., F.I.I.A., A.M.T.P.I.,
Consulting Architect.

The provision of adequate open space around a house is an essential requirement in a well-considered house plan to maintain good health of the occupants, to keep away dust and noise and to preserve privacy and seclusion.

The character of a house garden would depend upon the character and environment of the site, flat or undulating, woody or desert. In case of undulating site, informal planning is desirable. It gives innumerable opportunities for treatment. Terrace and ramp effects could be well secured in such sites. In case of level sites, a combination of formal and informal planning is preferred unless the plot of ground affords facilities for complete formal planning. In any case, garden walks should be informal. After fixing the location of the house on the site, one has to picture the garden and see how best it could fit in. Tapering plots are always difficult and unsatisfactory to deal with. They do not give much of scope in locating a house comfortably and designing a garden satisfactorily. It must be borne in mind that God created the earth. Its use by us must be in due harmony with His other creations. If we have to learn by the experience of the war, informal planning with due regard to nature is of great importance and this should be given due thought while planning house gardens.

In town houses it is not possible to provide gardens due to heavy cost of land and narrow frontages. Make-shift gardens could be had in open courts in the interior which are necessary for lighting and ventilation of various units for the house. Roof also could provide space for such a garden. Gardens in town houses should also be maintained so as to avoid mosquito breeding. Spraying gardens with chemicals as an anti-mosquito measure may prove disastrous to plants. One should be able to discriminate.

Roads and walks, fountains, trees and general setting as a whole become permanent features. Lawns, shrubs and flower beds need laying and renewing though their places are fixed when once planned in the garden. All this must be thought of and done when a building is planned and its layout is prepared.

The aim and function of a house garden is to enhance beauty and produce cheerful and



healthy environment for the occupants of the house. Utility and beauty have to be compromised and should aim at homely and informal atmosphere to ensure good landscape. A bit of green effect by providing trees and lawns has got a psychological effect upon the health of the occupants particularly in the tropical climate. If plot permits, a summer house, made of frame work wire netted and creepers trained on them and a few trees spotted at places, would give a delightful and comfortable shade and blessing to the occupants who could sit there under a cool roof during the sweltering heat of the hot weather.

Gates must be wide and have enough turning place and sufficient visibility to ensure the safety of cars and its occupants. To get in and get out must be comfortable and convenient. If cars are needed for modern comfort, quickness and convenience, surely, good and comfortable roads are also equally needed for safety, security and comfort.

Gate width must be 12 feet clear. Drive-way must also be 12 feet minimum with a provision for a loop or reversing space. There should be accommodation if space permits, for one car being stationary and the other moving. Road edges should be in granite or precast R. C.

slabs plastered or built in brick plastered over. They must not project in height more than 2 inches beyond the finished road surface. Garden paths should be 4 feet in width with edges finished as in the case of road edges, paved with uneven quarry forms of stones or such irregular forms made in concrete to match stone colour or colour effect of the house. Lawn and garden level in the compound should be 2 inches higher than the finished road level with a little slope. The whole site should have a gradient to easily and quickly drain off the storm water.

The location of the garage and outhouses in a site is of great importance. In a limited size of plot, garage-drive-space must be minimised as otherwise the drive space occupies most of the plot space unbuilt. In such a case, the car brings the occupants in and when done with it reverses back to enter a garage from outside the plot. Where large plots are available, garages have to be at the rear. In small houses with limited accommodation and limited extent of site, the garage could form a part of the house and built over for living purposes.

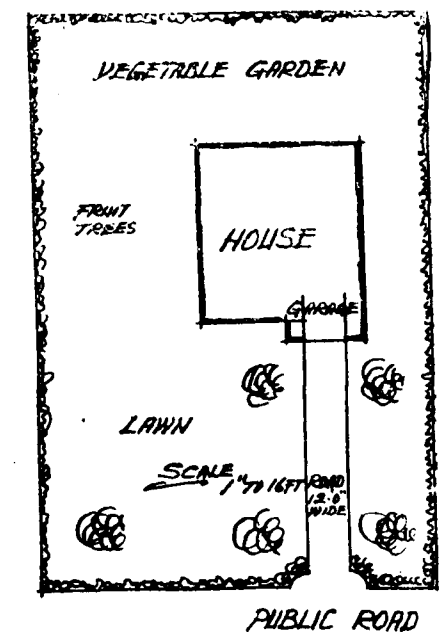
It may be mentioned that a compound wall in masonry is dreary and monotonous and it is out of date apart from being common. It should be replaced by evergreen shrubs about two or three feet in thickness and five to six feet in height to prevent dust blowing in and to ensure privacy. Wire fencing and framework to that height of evergreen shrubs, with creepers of sufficient thickness trained on them to stop viewing through is another method in modern use. The argument against this would be, what would be the protection against thieves crossing over, and annoyance from cattle. This emergency would not arise if shrubs or creepers selected are of the right type and if they are correctly planted and grown under advice of an expert. In this connection the public must be educated towards this method of fencing to create trust individually and collectively for mutual advantage and safety.

In the U. S. A. and Canada, fencing and hedging dividing the several properties from each other and from the roads is found completely eliminated. It is doubtful in a country of such marked individualism as India and even in England whether like such arrangement would meet with general approval. Simpler and more uniform treatment of the divisions if carried out with hedges and shrubs and with occasional groups of trees and flowers to emphasise the grouping of houses,

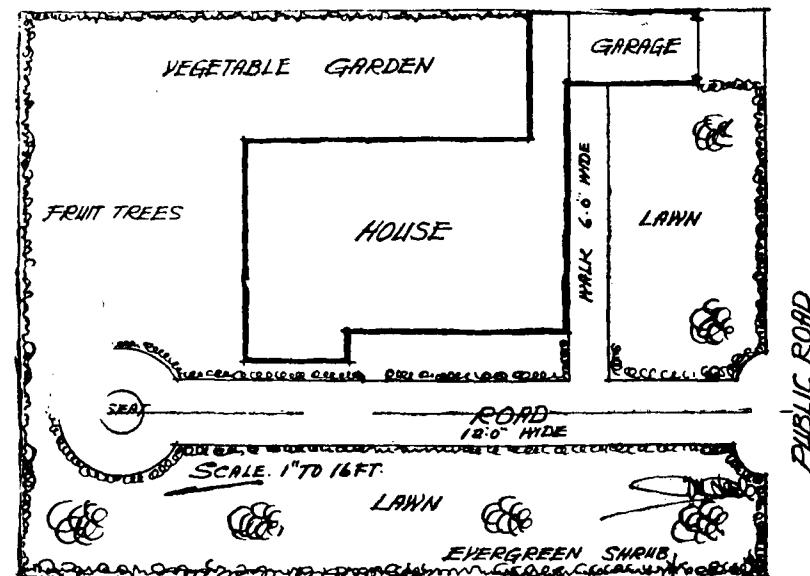
some continuity of design and harmony, in its main features, could be maintained.

Garden decorations enrich a garden and without them, a picture of the house would be incomplete and found missing in something. Terraces, steps, pavements, fountains, seats, pedestals, pergolas and a sundial form decorative features of a garden. They are made in marble, stone or in concrete. If made in concrete, they must be in perfect harmony with the colour, tone and texture of the whole picture. The setting of these must be correct and they have to be in their proper places. Modern tendency of a fountain design is that it should have a low base in natural setting and it should look like shooting up through a natural rock. Their design and selection must be well thought out with meaning and purpose and their appropriateness at appropriate places so as to bring them in harmony with the general scheme to produce a homely atmosphere for delight and pleasure, congenial and sentimental to an Indian Home.

Laying out of gardens and planting of trees, shrubs, flower beds and lawns should form a background and be subordinate to house picture. Garden colour effect must be in harmony with the house colour scheme, inside and outside. Types and kinds of trees, plants, crotons, flower beds and creepers must be studied and some data prepared to carefully



This refers to a compact house with a garage as a part of house with a room built over.



This refers to having a garage entrance from the public road without wasting space in the limited plot area.

select and plant them so as to allow them to grow properly and to desired height for securing the desired effect, harmony and pleasure. Trees with roots spreading over large areas must not be planted too near a building as foundations may get affected by them in due course. Shrubs should be allowed to grow low near a building and taller near the compound wall. So, it must be realised that types, kinds, cleanliness, neatness, tidiness, well-trimmed and looked after shrub is the secret of a good garden that brings us pleasure and delight, the most vital factors in life.

For privacy and seclusion, lawns, tennis and badminton courts should be placed at the rear, screened with creepers and shrubs sufficiently thick and tall to prevent viewing through them. Seats may be required where such a provision is made. Garden and verandah screens may be made in lattice or trellis work made of steel wire, bamboo, cane or wood. Creepers of evergreen variety could be trained on them.

Trees existing on the site should be preserved. It would be realised that growing new trees in a garden would take years before you see them grown sufficiently to cast shades and shadows. Our experience shows that this may not be possible in one's lifetime.

"Back to land and grow your own food, fruits and vegetables" are very much advocated by Governments and the public all over the world in recent years. This must be given effect to immediately as it would promote economy and healthy national growth all round.

Fresh vegetables and fruits are wholesome and tasty and they are rich in vitamins. Creepers yielding vegetables should be arranged in clusters and on screens all round the general vegetable garden. It must be remembered that a vegetable garden needs tillage, sowing of seeds, spacing and support, light and air, manures of proper type, kind and selection to suit climate and season. Weeding should not be overlooked. Different seasons are selected for sowing different seeds. The seeds selected should be of the quality that would give good yield. Time for sowing and planting must be determined. Ideal conditions of soils for gardens are that there should be 2 to 3 feet of black or red soil overlying sand or muram. Green vegetables need sun rays, good earth, water and air. From the air they take carbon-dioxide and from the soil they take nitrates.

Manures recommended are those of farm yard, green leaves, wood ashes, fish, ground-nut, castor and neem cake, horns, hoofs, bones and chemical fertilisers. Cattle manure is not available in required quantities due to alarming shortage of live-stock in normal time and in addition due to heavy operations of slaughtering animals during the war time. What little is available is used for making cakes for going keeping the kitchen fire glow! Any of the above as found suitable, accessible and available, may be used according to conditions prevailing in each locality.

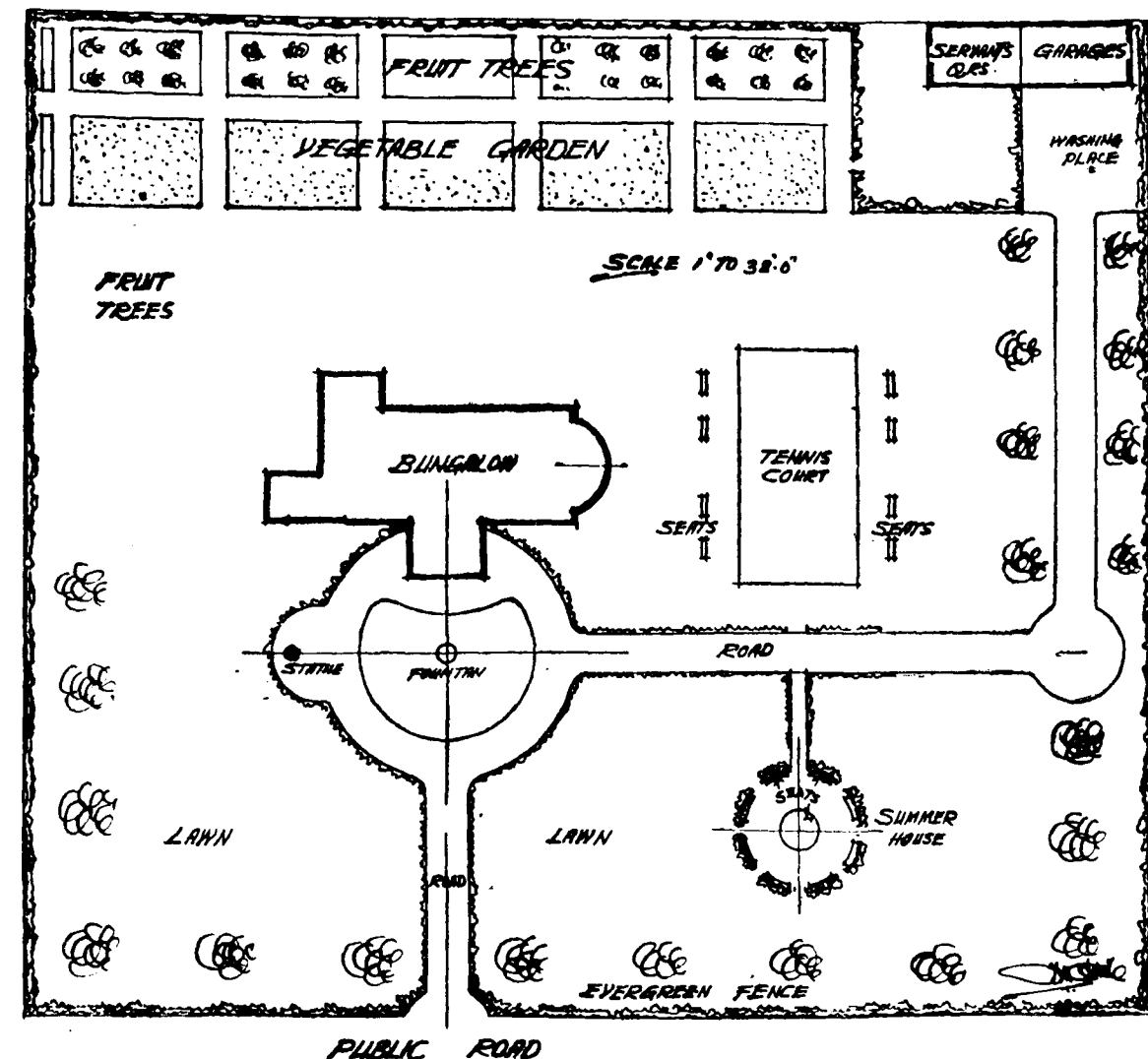
Vegetable gardens must be provided and looked after by occupants of the present and future owners of houses. The war has also taught us that keeping and preserving vegetable

gardens, in each house compound, is indispensable to keep us fit and healthy and above all self-sufficient.

Every tenant or owner should have garden space of sufficient size for cultivation. House gardens of ample dimensions, invite one for gardening. The enthusiasm for it is greatly stimulated by necessity. During the war gardening supplemented the family food supply. 1/12th of an acre per house is esti-

mated to provide, under intensive cultivation, sufficient vegetables required by a normal family. Gardening is a profitable hobby in which spare hours could be utilised.

The love for gardening is with us, with all classes of people however, humble. Even the poor occupants in huts plant a few creepers and spread them on the thatched roof. House gardening should be encouraged and suitable advice should be made available to all.



This is a high class house with all its amenities.

LAW AND PEOPLE'S HEALTH.

NEGLIGENCE OF MEDICAL ATTENDANT—LIABILITY OF EMPLOYER.

GOLD AND OTHERS *versus* ESSEX COUNTY COUNCIL.

A child was taken to a hospital maintained by a county council for treatment for warts on her face. The visiting dermatologist ordered treatment by Grenz-rays and sent his direction to the X-ray department of the hospital. The actual treatment was given by a technical assistant employed in the hospital. For the application of the rays, all but the affected parts of the face would be covered up with a lead-lined rubber cloth. However, one day the radiographer was in a hurry to get off. Instead of getting the lead-lined cloth, he covered the child's face with a piece of ordinary lint. On the mother asking him whether it was all right, he assured her it was and applied the

but also nursing. If there is negligent nursing, it cannot be said that the council has discharged the duty cast upon it. It makes no difference whether the treatment was given gratuitously or was charged for.—(1942) 2 All.E.R. 237. (Extracted by R.V.)

A WOMAN BELIEVED TO BE A TYPHOID CARRIER FOR 34 YEARS.

The conviction of an elderly typhoid-fever carrier in New York on a charge of violating the State sanitary code gave new publicity to a case similar in many respects to that of the late "Typhoid Mary." The condition of the woman, dubbed "Sally," was first discovered in 1925, as a result of an investigation of repeated cases of typhoid fever in a hotel where she was working as a cook. The investigators found that she had suffered an illness 34 years earlier, *i.e.*, in 1891, diagnosed

Ignorance of law is no excuse. Therefore a person has to act on his peril even though he may not know his legal obligation. Hence, it is necessary to educate the 'Common man' on the subject.

By giving extracts from the decisions of the Courts of Law in these columns, we do not encourage or recommend people to resort to litigation, at the slightest provocation. Our purpose is only to bring to notice the duty which the public authorities or individuals owe to the people and the rights and duties of individual citizen. *It should be remembered that litigation is an expensive luxury.*

—Ed., P. H.

rays. Later in the day, the child's face became red and inflamed; she was severely burnt. Though it was subsequently healed, it left a very unpleasant disfigurement in the face. A suit was filed on behalf of the child claiming damages for the personal injuries against the county council.

The Court of appeal held that the county council was liable for the negligence of the radiographer, who was its employee, though it had taken reasonable care in appointing him. The council is authorised under the Public Health Act to provide hospital accommodation for sick persons in the district and to charge the patients who are able to pay for the treatment. It is the duty of the council, once it has availed itself of the permission to set up a hospital, not merely to provide for treatment

at that time as malaria, but now believed to have been typhoid. The trial evidence showed that she had persisted in handling food and drink consumed by persons outside her own household in violation of the sanitary code and in spite of frequent warnings. The district health officer's report of August 4, 1939, concluded with the statement that information in the county office indicated that 11 cases of typhoid fever had been directly or indirectly traced to this carrier.—*P. J. Coffey: Jour. Amer. Water Works Association*, 32, 8 (From "*P. H. Engg. Absts.*", Vol. XXI).

TYPHOID CARRIER SUED.

The plaintiff charged that the defendant, "a registered carrier of typhoid bacilli (and the owner of a hotel), knowingly prepared and

served food to his wife although aware that she was forbidden to do so by law." The plaintiff said that the defendant "has been registered with the State Department of Health (New York) as a typhoid carrier since Oct. 20, 1925.

"The plaintiff said that two weeks after returning from the hotel, his wife died." He also charged that the defendant "was convicted of handling food in violation of the State law forbidding typhoid carriers to prepare or serve meals, and was fined £25.

"A general denial was entered by (the defendant) who said the conviction for handling food is being appealed to higher Courts."—*F. W. MACDONALD: Health News, New York State Dept. of Health*, 17, 164: (From "*P. H. Engg. Absts.*", Vol. XXI).

CONTRACTION OF SILICOSIS WHILE EMPLOYED—LIABILITY OF EMPLOYER.

This is a report of a case in the Supreme Court of Pennsylvania in which Robel sued the Standard Sanitary Manufacturing Company to collect damages because he contracted silicosis while employed by the said company. Plaintiff claimed the State statute requiring "Exhaust fans of sufficient power, or other sufficient devices, shall be provided for the purpose of carrying off poisonous fumes and gases, and dust from emery wheels, grindstones, and other machinery creating dust" had not been complied with to the point that sufficient equipment was provided to carry off dust from the room in which he worked. Plaintiff prevailed in trial Court and defendant appealed. Appellate Court upheld judgment of the lower Court. *E. L. BISHOP: Public Health Reports*, 56. (From "*P. H. Engg. Absts.*", Vol. XXI).

LEAD POISONING—LIABILITY OF EMPLOYER.

An action was brought in Georgia to recover damages on account of lead poisoning alleged to have been contracted by an employee of a metallic casket company while engaged in operations involving the grinding of lead and solder. The court of appeals ruled in favour of the plaintiff holding that:

(1) An employer must warn of conditions liable to engender disease and must furnish suitable protection, provided the employer is in a position to have a greater knowledge than the employee.

(2) An employer is chargeable with the knowledge that inhaled dust may engender lead poisoning.

(3) An employee will not be held to have such knowledge so as to be charged with the assumption of risk: *W. J. DIXON: Public Health Reports*, 56, 804-805.

INDUSTRIAL HYGIENE.

The subjects chiefly dealt with in industrial hygiene are poisons, dust, abnormal temperatures and humidities, illumination, noise, overcrowding, fatigue, medical and nursing services, communicable diseases in factories, mental and personal hygiene. Until the last few years little has been accomplished in occupational health hazard and occupational disease control due in a large part to the emphasis placed on accidents and compensation and also to the lack of development of applicable scientific instruments and laboratory methods.

A definite relation between the health of the worker and his occupation has been established which relation in turn affects the general health of the community. One of the important considerations is the loss of time and disability due to ill health which are largely attributed to preventable maladies due to remedial conditions in industry and the neglect of hygiene.

Approximately 15,000,000 of the 50,000,000 persons in gainful pursuit in the United States are employed in manufacturing, mechanical industries, and extraction of minerals. There are more than 900 occupations potentially hazardous to health in these industries. Investigations of U. S. P. H. S. and other health agencies have established that morbidity and mortality rates are higher for industrial workers and that the health of the worker is dependent upon type of work and working conditions.

A preliminary survey of occupational diseases in New Hampshire indicated the need for some agency to carry on industrial hygiene activities in this state. This agency should give industry, suggestions as to methods of setting up health services and controlling occupational hazards. *A. P. TROEMPER. Frederick, J., Vintinner. (From "P. H. Engg. Absts.", Vol. XIX.)*

THE CONQUEST OF AN OCCUPATIONAL DISEASE: PHOSPHORUS POISONINGS IN LUCIFER MATCH MAKING.

Nearly a half century ago, matches were made from white or yellow phosphorus, which is a highly inflammable material whose fumes

"JANGIRI" CASE.

THE MADRAS PREVENTION OF ADULTERATION ACT (III OF 1918)—RULE 28-B—INGREDIENT OF SWEETMEAT—WHAT IS.

The Crown-Prosecutor, Madras v. V. R. Ramanaatha Iyer, Proprietor, The Ramakrishna Lunch Home, China Bazaar Road, Madras.

Rule 28-B says :

"Where in a hotel, shop or other place, sweetmeats, savouries, and other articles of food of which ghee is commonly an ingredient are for sale and are prepared wholly or in part with a mixture referred to in rule 28, or with oil or fat other than ghee, there shall be exhibited in the hotel, shop or other place, one or more notices of such size and so placed as to be visible and clearly legible to any customer at the time of purchase that the sweetmeats, savouries or other articles of food are not made of ghee.

On 25-2-1944, a Food Inspector visited the hotel of the accused, purchased some 'Jangiris' that were offered for sale. On getting a sample thereof analysed by the Public Analyst of the Corporation of Madras, it was found that the fat used for cooking that 'jangiri' consisted of only 50 per cent. ghee and 50 per cent. fat, not derived from milk or cream. The accused

was then prosecuted before the Chief Presidency Magistrate, Egmore, for the infringement of R. 28-B, inasmuch as he did not exhibit a notice as required by the rule, showing that the 'Jangiris' were not made of ghee.

The Chief Presidency Magistrate, Egmore, acquitted the accused holding that the 'jangiri' in question did not contain 'ghee' or oil or any fat, as one of its *ingredients* because the ingredients of a 'jangiri' are blackgram, rice and sugar and the mere fact that the article of food in question has to be *fried* in oil or ghee did not make the latter an ingredient of the said article of food.

On an appeal against the acquittal by the Provincial Government, held by Leach, C. J. and Rajamannar, J.

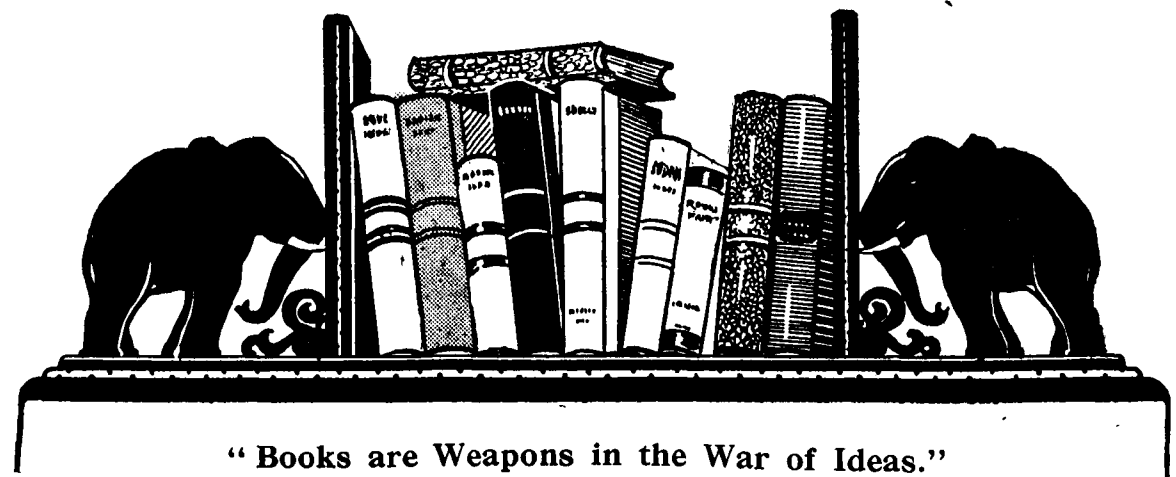
The acquittal was correct, since the word *ingredient* is defined in the Oxford Dictionary as "something that enters into the formation of a compound, a component part, constituent, element." Therefore the 'Jangiri' in question cannot be said to have oil or ghee as one of its ingredients, any more than the fat used in frying fish can be regarded as an ingredient of the fish.

Their Lordships dismissed the appeal.
(Extracted by P.S.)

THE PRINCIPLE OF LAW.

If there be any one principle more widely than another confessed by every utterance, or more sternly than another imprinted on every atom of the visible creation, that principle is not liberty, but law.—*Ruskin.*

BOOK SHELF.



"Books are Weapons in the War of Ideas."

"Some Books are to be Tasted, others to be Swallowed and some few to be Chewed and Digested." . . . and some to be Eschewed !

"COMMUNICABLE DISEASE CONTROL".

A VOLUME FOR HEALTH OFFICERS AND PUBLIC HEALTH NURSES.

Authors.—G. W. Anderson and M. G. Arnstein.

Publishers.—The Macmillan Company, New York.

First edition, 1941—Fourth Reprint, 1945—(\$ 4.50).

Size 8½"×6"; Pages 434.

The sub-title says that the book is a volume for Health Officers and Public Health Nurses. No other title will befit a book written by a former Health Officer and a present Nurse. And they have experience in theory and practice as well; the senior author passing from field work to teaching and the junior from teaching to field work.

2. Modern Public Health practice evolved from control of environment, passed on to control of diseases and later concerned itself with promotion of personal health. It is now trying to evolve a fourth stage—Social Medicine. The early heritage—Environmental control, otherwise called Sanitation—has been handed over to the Public Health Engineer. The main work left in the hands of the present day health departments is control of communicable disease. A book on this subject should be always welcome to the health worker.

3. The authors say that the book is written from the standpoint of the community.

It is not however a book for the guidance of a member of the community. It is eminently suited for the servant who caters to the community in the exercise of his profession or occupation. The book restricts itself to those details which are needed for the field health worker. It is so practical that the authors seem to have taken pains to avoid making it a scientific treatise. Every aspect of actual administrative work is dealt with. No information of use or value is omitted and yet the size is within reasonable proportions. It is well suited as a small text book to the overworked student. The first part which comprises over a third of the book deals with the general aspects of control common to all communicable diseases, and the second part with control of particular diseases. The references given at the end of every chapter are useful and well-chosen.

4. The book is written by Americans for Americans. It confines itself to those diseases which occur in America. The procedure described conforms to the administrative set-up and practice of the United States. This however is not a drawback but perhaps an advantage to readers in other countries. It may help them to adapt their procedure and organization to that of U.S.A. which has so far proved the best in the world. All the diseases have been dealt with under the same sub-headings. There is an uniformity in this which may border on monotony to some readers. That again is American habit. In fact, the authors say in the preface that they have considered the several diseases under a set pattern, because,

in their experience, clearer conception of the subject is obtained from an orderly pattern of thinking. Patterning a subject is of greater help to the memory, and students and workers may consequently prefer such a book.

5. The book was first produced two months before America entered the war. It must have been in great demand since then; for, it has been reprinted every year. Why the authors have not taken advantage of these occasions to revise the book into a second edition is not clear, unless it be that the war kept them too busy in other fields.

"BELL".

CITY DEVELOPMENT

BY LEWIS MUMFORD.

Seeker & Warburg, Lond. (1946), 190 pages. Size 7½"×5". Price 8sh. 6d.

The people of the Madras presidency still cherish the name of Professor Geddes. He toured this Province in 1914-15. It was his report on the thirteen cities he visited which made men think and think seriously on the past glories of our ancient cities and how their beauty could be maintained and even enhanced. Professor Geddes had to open our eyes to the beauties of the general layout of the typical South Indian towns and to bring home to us how the subsequent acts of vandalism neutralised them. The appeal of Professor Geddes came from his heart and no wonder it gripped other hearts as well. Lewis Mumford is one of the many who came under the influence of the teachings of Professor Geddes. The author says that in 1915 just thirty years ago, he first came across *City Development: A Study of Parks, Gardens and Culture Institutes* by Patrick Geddes, published in 1904—now long out of print. He further says that it was this book which stirred one of the chief interests in his life. In a spirit of piety, as he says he has given the title—"City Development" to the collection of six of his select and representative essays.

2. City Development is by no means a technical book. Lay men and expert city planners and builders alike would be profited by a perusal of the book. Lewis Mumford is a stimulating writer like his *Guru*, Prof. Geddes. His book makes one halt and think furiously. Technical Experts are compelled to introspect for a while whether their professional work would stand the scrutiny of

common-sense and whether their 'planning' as experts has exhibited proper understanding of human life.

3. The chapter on mass-production and housing should be of special interest at the moment to all those who are concerned in solving our present housing shortage. There are some who claim that pre-fabrication would prove a panacea for our ills. A perusal of this book would compel them to reconsider their view. Lewis Mumford makes a fair statement of the case. He suggests definite solutions.

4. Those who believe in the indefinite extensions of existing town limits on the conventional lines, should peruse the author's criticism of the London Plan of the County Council.

5. The columns of 'book reviews' cannot do justice to the excellence of the manner and style of the presentation of Lewis Mumford. This is a book which every one interested in the administration, planning and building of our cities, should read, with profit to themselves and to the public whom they serve.

"R".

"TEXT-BOOK OF PUBLIC HEALTH".

Authors.—W. M. Frazer and C. O. Stallybrass.

Publishers.—E. & S. Livingstone Ltd., Edinburgh. Eleventh Edition—1946.

Size 8½"×6¼". Pages 571. Price 25sh. net.

To the students of medicine and public health of the Universities of Great Britain, three books stand out pre-eminently as text-books. One is from Glasgow, one from Liverpool, and the more recent one from London. Of these, the Liverpool production may claim the merit for a balanced and appropriate treatment of this vast developing subject for the student.

2. The authors are intimately concerned with the theory and practice of public health. In both, they have gained considerable experience. The junior author has collaborated in the production of several former editions of the work.

3. The tenth edition of the book was published soon after the last war broke out. In this, a chapter was appropriately devoted to "civil defence". This has been omitted from the present post-war edition. In its place, a portion of the book is devoted to the latest field of public health, namely, "Social Medi-

cine". Several other portions have been revised and rewritten incorporating recent information. Every subject is handled clearly, and gives just the necessary information for the student. In the revision for the present edition, the authors have followed the requirements of the revised curriculum for the "Certificate in Public Health" and "Diploma in Public Health" courses. The book is also a very good background for the undergraduate medical student in whose training, preventive medicine is assuming a more dominant role. To those training for medicine or public health in the Tropics, there may be a few portions in the book not quite relevant and a few omissions which may be more relevant. But these are few; and the book can quite well be a suitable text for study.

"BELL".

"CLINICAL PRACTICE IN INFECTIOUS DISEASES".

Authors:—E. H. R. Harries and M. Mitman. Foreword by W. Allen Daley.

Publishers:—E. & S. Livingstone, Edinburgh.

Second Edition—1944, (22sh. 6d.)

Size.—8½"×6"; Pages 570.

The book was first published in April 1940. It was so good and met a long-felt want that a reprint was necessitated within a year. The popularity grew and the book was out of print long before the authors were ready with a second edition. They start the preface with an apology for this delay, caused by the war in which both the authors had to play a prominent part in 'their' field.

2. The second edition is thoroughly rewritten and enlarged. The latest knowledge is incorporated everywhere. The size has been kept handy by proper adjustment of type. The line diagrams with restricted colourings are original and add to the attractiveness of the book. The 'synopsis' prologues at the beginning of every chapter, which replace the 'summary' epilogues of the previous edition, are ably done, concise, precise, and yet full. They contain all that a hurried reader wants to know.

3. The arrangement of the subject-matter is in three parts, though they are not so subdivided. The first part deals with general phenomena of infection, the second with individual infectious diseases, and the third with treatment and hospitalization of these

diseases. The chapter on chemotherapy is a valuable addition in the new edition.

4. It is only when one uses the book often that that one realises the wealth of information that has been condensed in its small space. For the teacher it is useful to base his teaching on. For the student of medicine and public health, there is no other handy book to gain adequate knowledge. For the practitioner, it is valuable as a volume of reference when he is in doubt.

5. It is difficult to review a good book. The popularity of the book must call for a reprint soon. The recent advances forced out by war circumstances will naturally involve re-editing. One or two helpful suggestions may not be out of place. They may be welcome to the authors who say that "in this edition, we have tried to incorporate their amiable suggestions". The book is evidently meant for reference and use in England only. Else, it would not omit numerous infectious diseases which are serious problems in other countries. Cholera, Plague, Insect-borne diseases, Helminthic infections are also communicable diseases which concern the teacher, student, and practitioner on one side, and the community on the other. The reader would be greatly helped also by a little more detailed information on the invasiveness of the organisms of each disease and the resultant pathological processes in so far as they give a clue to the symptoms and spread. With these improvements, the book would achieve pre-eminence as a worldwide authority even as it has now in a limited zone.

"BELL".

"GLOBAL EPIDEMIOLOGY".

A GEOGRAPHY OF DISEASE AND SANITATION.

Vol. I—Part I—India & the Far East.

Part II—The Pacific Area.

Authors:—J. S. Simmons, T. F. Whayne, G. W. Anderson, H. M. Horack & Collaborators.

Publishers:—J. B. Lippincott Co., U.S.A., (Copyright holders) and William Heineman Ltd., London.

Third Impression—1944 (Rs. 28-2-0).

Size.—10½"×7½". Pages 504.

The volume is the outcome of the efforts of the Medical Intelligence Division of the Preventive Medicine Service of the U. S. Army to meet the urgent demands of the war situation. Though four persons are named as the main authors, the number of colla-

borators are many and varied. The quickness of production and the wealth and diversity of material collected reflect perfect team-work.

2. The scope and outlook of this rather gigantic task is well expressed in the introduction which says, "The information assembled has been primarily that which would be valuable in planning for the health protection and medical care of troops." Secondly, information of essentially civil value has been included as the military forces so often must furnish care to the civil population. . . . the health of the Military forces is vitally affected by the health of the civil community." The data furnished are grouped into appropriate sections to satisfy both the objects aimed at. Public Health Administration, sanitation including insect vectors, and poisonous animals and plants, medical and hospital facilities, prevalent diseases, are the main groups. In each of these, the information is well classified into subheads and concisely summarised. For each country, an outline of its geography and climate precedes and a succinct summary follows the data.

3. The unique merit of the production is that it is the first of its kind in the field. In fact, the authors say that they would not have attempted this had there been any other compilation already available which will serve the same purpose. For the first time, here is a volume which gives information useful not only to the troops, but to the visitor, the traveller, the trader, the industrialist, and the internationalist. With the shortening of time and distance caused by modern travel, contacts with other countries will increase in magnitude and frequency. The need for information of this character is bound to increase. What a destructive war helped to gather will be of basic value in peace reconstruction. The authors' hope that this might happen is well founded.

4. 'World Health' demands that such valuable information should be kept up to date and made available to all. Although freed from the demands of the war, it is to be hoped that the authors—or at least the more important collaborators who are prominent in the field of public health—will continue frequent revised publications of the book.

5. Unlike other medical publications, the volume is printed on featherweight paper which makes it easier to handle it and—what is more—it is priced cheap. It ought to find

a place in the reference library of every health authority.

"BELL".

THE MIRACLE OF THE HUMAN BODY.

Author:—Harry Roberts.

Publishers:—Odhams Press Ltd., London.

Pages 384—Half-tone illustrations—340.

Size 8" x 6".

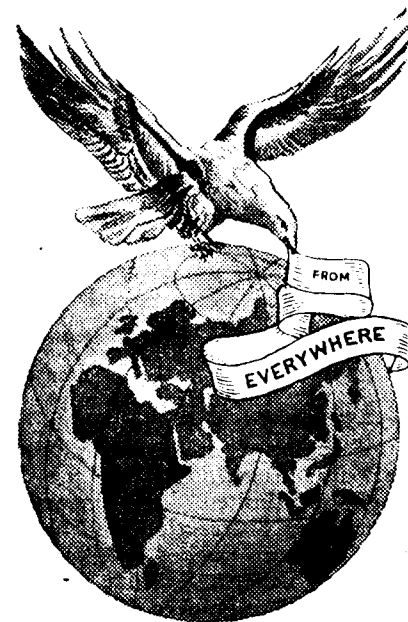
Price 7sh. 6d.

It is the right and the duty of every human being to know how his body is built up and how it functions. Everyone is curious about it. All are eager to know. Health laws are meant for the optimum growth and function of the body. Knowledge of the body is the basis for health practice. Writers who have the knack of unfolding a tale in simple easy style have a rich field in popular physiology. Harry Roberts is a writer of that stamp. He has made a scientific subject popular, abstruse facts simple. He takes the reader smoothly and glibly from one part of the body to the other. The simple style makes it easy for everyone to follow the complicated structure and processes. After explaining the different systems of the human body, he describes the functioning of the mind and the fundamentals of heredity in a chapter entitled "Mind, Body and Inheritance". He then gives the reader a concise account of how different other living objects grew and developed in nature. Thus the layman is enabled with the least effort to grasp the structure and function of his body, the working of his mind, and his place in creation.

What strikes one about the book is its simple and easy style. Anyone having a minimum knowledge of English language can follow and understand what is described. Most books on physiology—even those written for the lay reader—often require the help of a teacher. This book is a self-teacher—and that is perhaps its most outstanding feature. The book is profusely illustrated. The drawings are accurate, clear, self-explanatory and appropriate to the text.

The book deserves a place in every library. It is one of the best books on the subject for the lay reader. It is also a book for the student of elementary physiology. It can well be adopted as a text-book for high school classes, Nurses, Health Visitors, Sanitary Inspectors and the like.

"BELL".



EFFECT OF CAFFEINE ON HUMAN BEINGS.

To the Editor.—What is the present opinion on the effect of caffeine on human beings and the possibility of hypercafeinemia? Are there recent studies on the subject?

—BENNET W. KANTOLA, LIEUTENANT (M.C.) U. S. N.

Answer.—As ordinarily taken in beverages, caffeine produces a mild stimulation of the cortical centres characterized by wakefulness and alertness. In some persons, or with larger amounts, restlessness, muscle tenseness and an inability to concentrate are also produced. There is little effect on the medullary centres and peripheral organs, except for mild diuresis, until medicinal doses are administered. Then there may be respiratory and circulatory stimulation. With extra therapeutic doses, these effects become more pronounced and delirium may be produced, but fatal poisoning is almost unknown. A certain amount of tolerance is produced by continued use of beverages containing caffeine, and headache has been described as a withdrawal symptom.

Moderate, continued use of beverages containing caffeine would not appear to be harmful. Immoderate use probably impairs both mental and physical performance in the direction of inexactness and misjudgment.

Reference.—Dreisbach, R.H., and Pfeiffer, Carl.; Caffeine Withdrawal Headache, J., Lab. and Clin. Med. 28: 1212 (July, 1943).—From

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 people.

—Ed.

"The Journal of the American Medical Association," Vol. 126, No. 17.

FAITH HEALING.

To the Editor.—Frequently I have had occasion to answer well meaning patients with regard to the faith healing of various Catholic shrines, such as at St. Ann De Beaupre and at Lourdes. I find myself at a loss for concrete evidence of the psychological aspects of such miracles. Has any scientifically controlled investigation of these phenomena ever been conducted? What are the conclusions of these investigators, both *pro* and *con*? Has such an investigation ever been suppressed? I should be grateful for any information you can offer me regarding these queries. R. T. HAZELRIGG, M.D., CLEVELAND.

Answer.—It is certain that the suggestion of cure must benefit many persons in these shrines and the advertisement of the cures must certainly make the suggestion for cure potent. On the other hand, untold misery is caused to many hopeless sufferers from structural disease and degeneration by their long and useless journeys to shrines from distant places and often far off countries. One must remember that one hears of the cures; the disappointed patient does not advertise his disappointment.—From "The Journal of the American Medical Association", Vol. 126, No. 16.

FALLING HAIR.

To the Editor.—What are the possible causes of falling hair in women in the early forties,

aside from syphilis? Could hypodermic administration of vitamin B₁ for the treatment of neuritis cause this?

M. D. MISSURI.

Answer.—The cause of the commoner forms of diffuse alopecia affecting large portions of the scalp are toxic alopecia, hereditary alopecia and seborrheic conditions. Toxic alopecia, defluvium capillorum, may follow the ingestion or inunction of thallium acetate, the hair loss appearing in from nine to fourteen days. It may occur secondary to pregnancy or to febrile disease such as typhoid, scarlatina and influenza, the loss of hair beginning only a month or more after the termination of the cause. Hereditary alopecia is nearly always combined with seborrheic conditions, so that a differential diagnosis, is difficult in cases in which alopecia is known to be familiar.

The toxic effects of thiamine hydrochloride have been reviewed by Eisenstadt (Hysensensitivity to Thiamine Hydrochloride Minnesota Med, 25: 861 (Nov.) 1942) and by Leitner (Untoward Effects of Vitamin B₁, Lancet 2: 474 (Oct. 16) 1943). Except for 3 cases of herpes zoster reported by Sterberg in 1938, all have been allergic effects. Reports of alopecia due to thiamine have not been found.—From "The Journal of the American Medical Association", Vol. 126, No. 12.

EPIDEMIC OF DROPSY.

Epidemic of dropsy has broken out at Jamshedpur on a large scale. The incidence of the disease is mostly among middle-aged youngmen and women. The cause of the spread of the disease is attributed to the use of adulterated mustard oil. "The Times of India", Dated July 10, 1946, page 5, Col. 5.

RESTAURANT SANITATION AND CHIPPED CHINA.

TO THE EDITOR.—The Columbia County Department of Health is interested in promoting publicity for good restaurant sanitation. The elimination of the many and increasing number of cracked and chipped cups in our restaurants was one of our objectives. We hesitate to do anything further about this after seeing the August issue of Hygeia. On page 629 is a full page advertisement by the War Advertising Council with the title "The Chipped Teacup of the Patriotic Mrs. Jones." Is it your opinion that the danger of transmission

of disease through cracked and chipped cups is of greater or lesser significance than the conservation of materials during war time? We are trying in our community to maintain good sanitary conditions in spite of lack of materials and regret the appearance of this particular advertisement in the more popular magazines. While this particular advertisement relates to home use of cracked teacups, we believe it could easily be misinterpreted.

Sue Hurst Thompson, M.D.,
Hudson, N.Y.

Answer.—From the aesthetic point of view the use of chipped or cracked table-ware is to be discouraged. In the pre-sanitary days, when but limited attention was given to cleansing and disinfection, the crevices of chipped dishes were packed with particles of food and living bacteria. While it is possible to sterilise chipped or cracked dishes, few eating places carry out adequate disinfection so as to eliminate the menace of the chipped utensil. Even though replacements are now difficult, most health authorities, for the protection of the people, prohibit the use of chipped table ware: From "The Journal of the American Medical Association", Vol. 126, No. 10.

MORTALITY OF BREAST AND BOTTLE FED INFANTS.

TO THE EDITOR.—Can you give me information on the proportion of women who can nurse their babies? Most physicians now seem to advise bottle feeding as at least equally desirable. What is the comparative mortality of breast and bottle fed babies?

Mabel D. Murphy, M. D.,
Glendal, Calif.

ANSWER.—Sanford (Various Complementary Feedings Used During the Neonatal Period, THE JOURNAL, August, 5, 1939, p. 470.) In a study of 4,622 infants during the newborn period found that 14 per cent of the mothers were unable to nurse their babies, 30 per cent. required some complementary feeding and 56 per cent. were able to give their babies sufficient breast milk by the end of the tenth day of life. Statistics on the mortality of breast and bottle fed babies are open to criticism unless they represent the same group and environment and are large enough and cover a long enough period of time to make a fair comparison. In the Infant Welfare Society of Chicago from 1924 to 1929 in 20,000 babies

under 1 year of age in which 91.5 per cent. were completely or partially breast fed and 8.5 per cent. artificially fed, the mortality was 11 per thousand. Of this mortality 66 per cent were artificially fed, 27.2 per cent. partially breast fed and 6.7 per cent. completely breast fed. In the same organization in 1943, 6,702 babies under 1 year of age were cared for with approximately the same proportion of feeding. The mortality has now dropped to 4 per thousand, but still of this mortality 65 per cent. were artificially fed, 28 per cent. partially breast fed and 7 per cent. breast fed.—From "The Journal of the American Medical Association", Vol. 126, No. 9.

RURAL SANITATION.

R. S. Howard Paper read at Georgia Public Health Association Meeting, Allanta, Georgia.

HOOKWORM CONTROL IN GEORGIA.—Using the author's own words, "We remember that although Hookworm can be eradicated by sanitation and education, it requires the concerted efforts, through generations, of the health officers, the nurses and the sanitarians. Hookworm control, more than anything else, demonstrates the value of environmental sanitation. A stimulating thought for public health workers is that hookworm control is followed by a decrease in the incidence of other communicable diseases such as typhoid and dysentery. To-day we are better equipped than ever before. We have the personnel and the weapons, so let's declare war on the hookworm again: W. J. DOWNER. (From "P. H. Engg. Absts.", Vol. XVIII.

LIQUID SLUDGE. THE VITAMIN B₁ FERTILIZER.

The development of the use of sludge, first in the form of cake and then later as a liquid for the fertilization of lawns, is described in a very interesting manner. The results obtained demonstrate the value of the use of liquid sludge annually as a low-cost fertilizer. The suggestion that the luxuriant growth obtained may be due to vitamin B₁ present in the sludge is a most interesting one in view of the present popular interest in vitamins. This article should suggest means of building up popular interest in and good will for other sewage-treatment plants in the country where this type of fertilizer service could be undertaken at a moderate cost to

the consumer: J. H. HARDING.—Naseeb Damoose. Sewage Works Engin., 12, 308-12. (From "P. H. Engg. Absts.", Vol. XXII, No. 7.)

OLDEST TYPHOID CARRIER.

In a suburban community in Cook County, Ill., a grandmother, aged 97, recently had moved into the home of her daughter. Within one month thereafter a member of the household contracted typhoid fever and died of the infection. In the routine examination, no history of a previous attack of typhoid fever of any member of the household was elicited.

However, it is possible for an individual to harbour organisms of typhoid fever without giving such a history. Although no person in the household appeared to be incriminated as a carrier, suspicion naturally was cast upon the new arrival. On examination of appropriate specimens of all persons with whom the patient had been in contact, the 97-year old grandmother was identified as a carrier. She is the oldest typhoid fever carrier to have been found in Illinois.—S. M. MILLER. Ill. Health Messenger, 13, 103-04. (From "P. H. Engg. Absts.", Vol. XXIII, No. 1.)

CLEANLINESS AND SANITATION.—A DUTY AND A WEAPON.

The author is a member of the Department of Health of Puerto Rico and is well acquainted with sanitation conditions in the communities of the Island. The progress noted in the solution of public health problems is covered in the article.

He attributes the greatest cause of death in Puerto Rico to disease classified as diarrhea or enteritis transmitted through water, milk and foods, and through direct contact. The importance of safe water supplies and properly built sewerage disposal systems is emphasized. Safeguarding water supplies is the main sanitary problem which confronts the Insular Health Department. Malaria control work is being done, and food inspection has already been started.

Housing is still a great problem with overcrowding as a contributing factor in the spread of tuberculosis, which is the second greatest cause of death in Puerto Rico. Thousands of new homes have been built, but many thousands more are needed.

The Health Department faces a hard task in view of the poverty of the population and the limited economic resources of the Insular

Government. RAY RANERI.—Guillermo Arbona. *Puerto Rico Health Bulletin*, 6, 83-86. (From "P.H. Engg. Absts.", Vol. XXII, No. 9.)

DIVISION OF SANITARY ENGINEERING AND SANITATION.

This article, a brief summary of the work of the Division of Sanitary Engineering and Sanitation for the year 1941, discusses the supervision of water supplies, swimming pools, sewage treatment, general sanitation, rehabilitation of flooded areas, community sanitation, malaria control and milk control. Much emphasis was placed on the last two activities: GERALD W. FERGUSON—Paul S. Fox, *New Mexico Health Officer*, 10, 33-41, (March, 1942.) (From "P. H. Engg. Absts.", Vol. XXIII, No. 1.)

THE EXPANDED ROLE OF THE SANITARIAN.

This is an excellent article on the subject which should be read and re-read by every public health worker in an administrative capacity.

It deals with those sub-technical men who are every day on the firing line of the profession, as well as the responsibility of the trained administrators over them.

Successful leadership of any local sanitation program depends on a thorough understanding of sanitation, realization of responsibility for good technical supervision and proper co-ordination of all services available.

The author indicates that there have been failures in programs to utilise sub-professional sanitarians. In a case mentioned, lack of intelligent leadership was the cause.

Lack of sufficient personnel resulted in superficial effort, thinly spread services, and inefficient organization regardless of improvements in the workers' qualifications, energy, and enthusiasm.

In spite of inadequacies there have been many gains in the general picture, and conditions seem to indicate a constantly expanding role for the sanitarian: J. C. COCHRANE.—H. A. Kroeze. *American Journal of Public Health*, 32, 611-14. (From "P. H. Engg. Absts.", Vol. XXII, No. 10.)

HEALTH AS A NATIONAL ASSET.

A high standard of national health, physical, mental, and spiritual, is a primary need of

Great Britain. The calamities of great epidemics have been defeated because modern preventive medicine has learned their causes. Another and older stream of thought and endeavour has flowed, namely, social emancipation, and there has developed a "national social minimum," which included "school-feeding and medical supervision of children, workmen's compensation, health and factory reform, old age pensions, the children's Act, housing and town planning, labour exchanges, and insurance against ill-health and unemployment. Their administration was placed in the hands of local governing bodies."

"By means of school feeding and medical inspection on the children learned habits of health unconsciously—improved school premises sunlight and fresh air, open air education, daily cleanliness, surveys, toothbrush drill, physical training, taught healthy living to all the children, all the time. There was education, of the public in health and we find good ground for saying that, as a whole, the English people are to-day better housed, better clothed, better fed, better educated, and enjoy better health, than at any other period of our national history of which we have record." JAMES H. LE VAN—George Newman. *Britain To-day*, 69, 15-20. (From "P. H. Engg. Absts.", Vol. XXII, No. 8.)

SANITARY ENGINEERING— A DISTINCT PROFESSION.

This article consists of excerpts of an address on "Vocational Guidance and Sanitary Engineering Instruction" presented before the Sanitary Engineering Section, Society for Promotion of Engineering Education. The author is of the opinion that the curriculum of sanitary engineering has in the past and still is continuing to suffer by reason of its consideration as a modification or off-shoot of civil engineering rather than as a distinct branch of the engineering profession, that is, a field of engineering complete in itself. Suggestions as to subjects which should be taught to sanitary engineering students, but which are not now generally included in such teaching, are listed. M. H. KLEGGERMAN.—Arthur B. Morrill, *Sewage Works Engineering*, 13, 143-44. (From "P. H. Engg. Absts.", Vol. XXII, No. 7.)

PROCEDURE OF ENGINEERING PRACTICE IN MALARIA CONTROL.

Mapping is the first step in the beginning of the engineering phase of a malaria control

program. All types of maps are used for general purposes, study, lay-out of control work, progress of control work, and final record of the work. The type of control and laying out drainage works follow next. The outlet should be a first consideration because this determines the success or failure of a drainage system. The following must be considered before a drainage system is planned and laid out:

"(1) Does the main discharge into a deep capacious channel, or (2) into a steeply sloping draw or (3) into a sluggish over-taxed channel, or (4) a flat draw subject to overflow, or (5) into a bay, gulf, or ocean?"

Often closed drainage systems (or storm sewers) must be used as well as open-lined ditches. The former usually are used in the city and the author discusses the hydraulic principles that must be considered. The latter can be used "where (1) the soil is stable; (2) the area is not subject to heavy traffic or use, which would tend to destroy the banks, sidewalls, and alignment; (3) where sufficient fall is available and a self-cleaning grade is possible, so reducing subsequent maintenance; and (4) where there are none or only few animals to cross the ditches."

Precast concrete inverts and monolithic concrete construction are discussed.

Filling low areas is an expensive control measure but it is also a most satisfactory one. When an area is filled, consideration must be given to the shrinkage that will occur later. Experimental wells were dug in areas to be filled to observe the relation of the underground water table. JAMES H. LE VAN.—David B. Lee, *Rpt. 13th Ann. Meet., Fla. Anti-Mosquito Assn.*, 64-73. (From "P. H. Engg. Absts.", Vol. XXII, No. 11.)

THE RANGE OF MOSQUITOES.

The range of a mosquito has been the subject of dispute. Hopkins of the Uganda Medical Department (Africa) has recently contributed some valuable information. He "distinguishes between maximum range and maximum effective range." His study shows that with a prevailing wind the range of *Anopheles furestus* may be 2 miles or more. Two miles appears to be within the effective range. E. J. COLE.—*The Lancet*, 242, 145. (From "P. H. Engg. Absts.", Vol. XXII, No. 9.)

HOW FAR DO MOSQUITOES FLY?

What is the range of a mosquito? No one can yet give a definite answer to this question. It is not so easy to determine the flying distances of mosquitoes as it is to state the performance of a Spitfire. Many anti-malaria workers usually carry protective measures within a radius of a mile or even less. The discovery of dangerous species of mosquitoes much beyond this range has shown how ineffective this rule of thumb method is. Investigations carried out in a Transval district have shown that $4\frac{1}{2}$ miles was beyond the range of the malaria-carrier mosquito though just a few of them may be discovered even at these long distances. We should, however, remember that much depends on the prevailing winds and that aided by a favourable wind malarial mosquitoes may be carried over long distances from their breeding centres. A large breeding centre and a strong wind may thus take the mosquitoes into areas which otherwise would be free from the pest. An interesting fact discovered by observers is that the mosquitoes that come in during the evenings are mostly females and that the males arrive about the early mornings. Local or personal protective measures would be effective where there is a prevailing up-wind and the breeding places are not prolific. Where however the breeze is favourable and the breeding place is extensive, mosquitoes may fly over two miles or even more. Any protective measures taken should extend to this danger spot.

(From a press cutting.)

A POSSIBLE CURE FOR D.D.T POISONING.

A few months ago¹ we reviewed the experimental evidence on the toxicity of D.D.T to vertebrates and reached the conclusion that, if this new insecticide is properly used, the danger to man is very remote. Since then an account of D.D.T poisoning in man has been recorded²; but it does not affect this conclusion, since the symptoms developed only after a deliberate exposure to D.D.T far in excess of anything that would be likely in practice. Nevertheless, if D.D.T is to be as widely used in the future as we expect, it is not impossible that habitual carelessness on the part of an

¹ "The Lancet," February, 24 p. 248.

² Wiggles, Worth, V. B. Brit. Med. Journal April 14, p. 517.

operator applying the insecticide in solution may result in intoxication. It is therefore useful to know of a remedy. Brazilian experiments¹ suggest that calcium salts may be effective for treatment. The authors observed that the symptoms following administration of D.D.T are not unlike those of carbon tetrachloride poisoning. Since calcium had proved effective in preventing the effects of acute intoxication by carbon tetrachloride, it was tried for D.D.T. Dogs were given D.D.T (100 mg. per kg. body-weight in olive oil daily until intense symptoms of poisoning were observed.) It was found that intravenous injection of 20 c.cm. of 10 per cent. calcium gluconate effected recovery in 2-3 hours instead of the 12-24 hours necessary in the absence of treatment. Furthermore injections of calcium gluconate for several days before D.D.T administration much reduced the severity of the intoxication. The dogs used in the experiments were alive and well a month after the end of the experiments. "The Lancet," June 30, 1945, Page, 825).

FREE ENTERPRISE AND D.D.T.

Free enterprise is indeed wonderful, and never more wonderful than when we contemplate its glories as exhibited in the public sale of D.D.T. This marvellous new insecticide went on sale to the public about the first week in September; and it was about the first week in September that the federal government felt impelled to issue a warning. It seems that D.D.T in a concentration of less than five per cent. is practically useless; but it also seems that a good many of the D.D.T compounds that are now on the market have less than five per cent. Some have three, some two, some one-half of one per cent. There is not any law, it appears, which can compel manufacturers to specify the percentage of D.D.T they are using, and so there is not anything the federal government can do about it, except to utter its plaintive and practically unheeded warning. This of course is just as it should be, in a free-enterprise world. The D.D.T you buy won't do any good; therefore you will have to buy more, thus making extra business and keeping money in circulation. The flies, mosquitoes and other insects on which you use the mixture will come to no harm, and they will be kept active and in circulation, too. It could not be better if the National

Association of Manufacturers had planned it. From the New Republic: Sep. 24, 1945.

WELL OF DEATH.

A "well of death" the water in which burns human bodies like sulphuric acid, has taken toll of seven lives in a village of Alwar in Rae Bareilly district 35 miles from Lucknow (says a report in *The Times of India*). The well had been used for decades for bathing and drinking purposes. It acquired its destructive property almost overnight.

To improve the taste of the water, which was slightly brackish, the well was "treated" with some wild fruit and covered up for a few days. The day it was opened a group of villagers gathered round it anxious for a swim. The first villager who dived into it disappeared without a trace. Another followed him and he, too, did not come up to surface. Five others dived into the well in succession in an attempt at rescue and none of them survived that fatal dive. After the seventh man had gone down to his grave a bystander intervened and prevented others from committing suicide in their misguided attempts to continue rescue operations.

The Police later dragged the well and found seven bodies badly charred. It is suspected that the water turned into corrosive acid after being treated with the wild fruit. "The Hindu," dated June 6, 1946, page 8, col. 3.

ENVIRONMENTAL SANITATION IN INDUSTRY.

Physical and mental fitness of workers in war industries are necessary for maximum efficiency. They cannot be obtained under the insanitary conditions which prevailed the old time sweat shops. Important features of industrial sanitation are pure and palatable drinking water; sanitary method of dispensing water; clean, well-lighted, ventilated, convenient toilet rooms with ample facilities; suitable and sufficient showers and washing facilities; sanitary eating facilities; and adequate disposal of wastes. Indiana State Board of Health standards for these items, as outlined in a recently published leaflet, are discussed in the article: C. G. FASSNACHT.—Joseph L. Quinn, Jr. *Monthly Bul., Indiana State Board of Health*, 46, 5 and 19 (From "P. H. Engg. Absts.", Vol. XXIV, No. 1.)

¹ Vaz., Z., Pereira, R. S. Malheiro, D. M. Science, 1945, 101, 434

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