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PEOPLE'S

HEALTH

EDITOR: A.V. RAMAN



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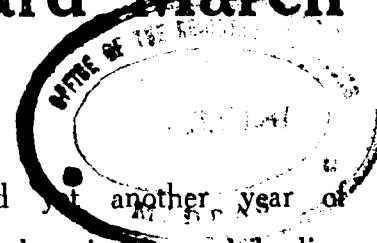
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DEVELOPMENT OF ROADS

The Indian Road Congress held its 11th Annual Session at Trivandrum on the 5th February, 1947.

Sachivothama Sir C. P. Ramaswami Aiyar, Dewan of Travancore, in his inaugural address to the Session stated, *inter alia* :

"I am disappointed at the recent announcement of the Central Government proposing not to include Indian States in the National Highway Programme. It is nevertheless the intention of the Travancore Government to construct roads on the basis of the same standards as may be decided with regard to the All-India Highways Scheme".

* *

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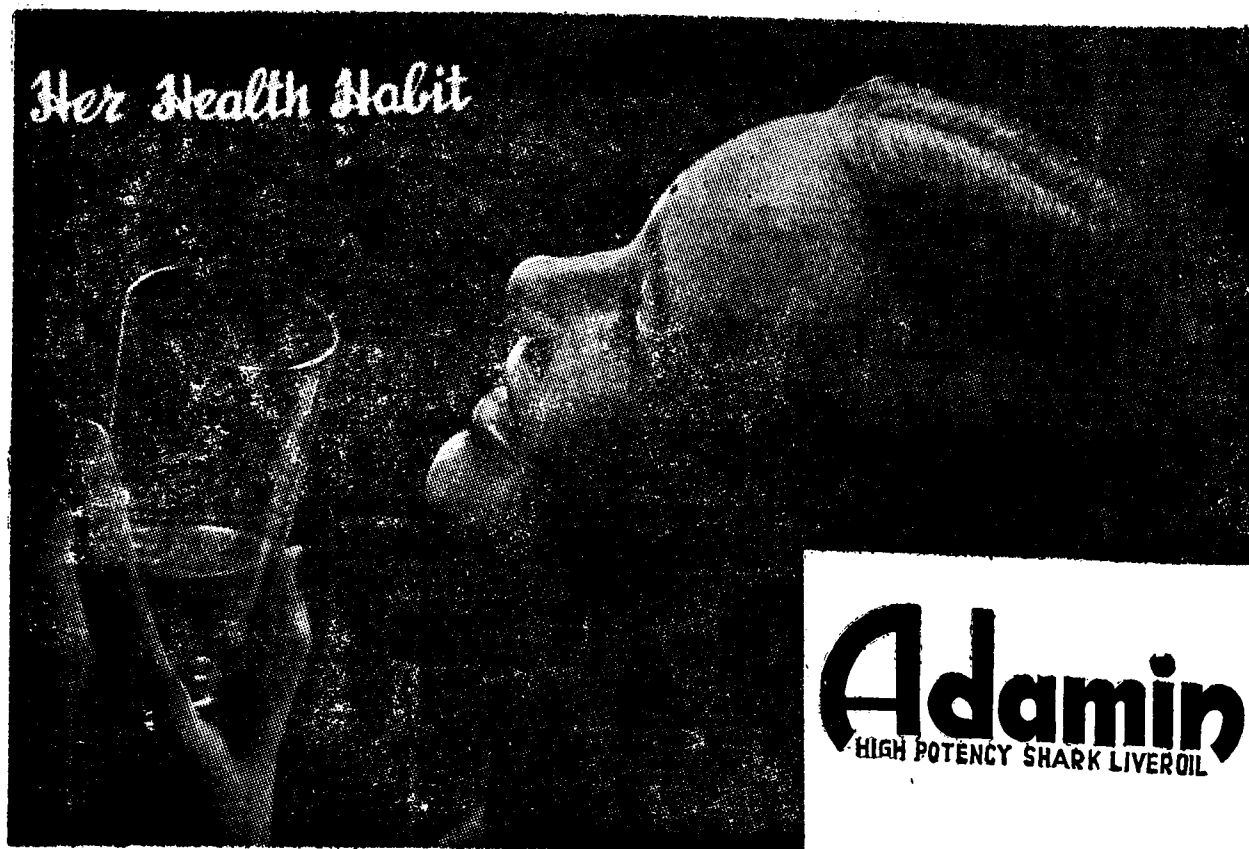
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Kindly remember that this magazine is primarily intended to disseminate correct and up-to-date knowledge among the people on all matters relating to their health. It is not a commercial venture. The subscription has been deliberately fixed as low as Rs. 10 per year. Issuing bills and reminders adds to our burden. It costs time, labour and money. You will be helping us to reduce our burden if you can kindly remit your subscription at once in case it remains unpaid on date.

We express our grateful thanks to all those business houses which have been using this magazine for their advertisements. Advertisers in these columns achieve their objects by reaching the very class of men whom they wish to approach. They also show in a practical manner that they are in sympathy with the aims and objects with which this magazine is published. They are thus, indirectly helping the masses.

THE MANAGER,
PEOPLE'S HEALTH,
"Lloyd Corner", Royapettah,
Madras, 14.

PEOPLES HEALTH

A Pioneer in the Field of Public Health

Vol. 1 MAY, 1947 No. 8

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A PIONEER IN THE FIELD OF PUBLIC HEALTH

!PEOPLE'S HEALTH!

VOL. I
No. 8

MAY, 1947

ISSUED
MONTHLY

Wisdom consists in the choice of the best ends, and the use of the most appropriate means to accomplish those ends.—*R. Watson.*

EDITORIAL . . .

ARE THEY FOOLING THE PUBLIC?

IN the February issue of *People's Health* (p. 230) we drew attention to the unsatisfactory attitude of some of our Madras Ministers in the debate on late Mr. K. O. Anthony's resolution recommending the constitution of a special committee to go into the housing problem comprehensively. The other day, when the question was raised again by Mr. N. M. R. Subbaraman, the Minister in charge of housing dealt with it lightheartedly if not flipantly. After having accepted the resolution moved by Mr. Anthony in the Legislative Council, what prevented the Minister from acting forthwith in view of the admitted urgency of the matter? Why should he take into his head to sponsor a scheme of his own even before the proposed committee examined the question? He announced that in view of the urgency of the matter,

he had evolved a certain scheme of his own. The attitude is not remarkably unlike that of a foreign bureaucrat. A popular Minister is expected to follow the principles of 'organic planning' worthy of a democratic administration. The problem is one of urgency no doubt; but the urgency did not arise overnight. The problem was there all the time. We pleaded that as a *first step towards solving the problem, the authorities should evolve a code prescribing what is the minimum standard for dwelling to satisfy the minimum requirements of Health and Sanitation.* Without doing so, money is being thrown away and is proposed to be thrown away further in the construction of dwellings here, there and everywhere. This is wholly unsatisfactory. Further, even if a committee is constituted to go into the question of our housing problem, its recommendations cannot be properly implemented by the Minister.



A DECADE OF PROGRESS!

Let him remember the classical words of Winston Churchill: "We shape our buildings and afterwards our buildings shape us."

If the administration exhibits slum mentality in the solution of our housing problem, it is bound to reflect on the people for whose benefit housing schemes are promoted.

When we plead paucity of funds at every turn, what is the fun of the available money being frittered away on ill-conceived, ill-coordinated and ill-digested schemes? If it is to win mere notoriety, we have no quarrel with the authorities; but if they are out to waste money in the name of the 'service to the people', we protest.

From Press reports, it would appear that the Minister in charge of Housing has been inspecting sites in the city and elsewhere for developing housing schemes. In fact, it is reported that he has gone to the extent of advising the authorities concerned to proceed with the land acquisition. So far as the city of Madras is concerned, we are told that the City Improvement Trust is preparing a Master Plan. If the Minister acts independent of the Trust, how can one be certain whether the proposed housing schemes at certain sites would fit in with the Master Plan in the making? This is again unsatisfactory.

It does not look as though the Madras Ministry means business. One Minister is in charge of housing. Another Minister is charged with the responsibility of liquidating slums. A third Minister is in charge of town planning. If the Madras

Ministry means to render service to the public, it should assign all these subjects—town planning, housing which includes clearance of slums and City Improvement Trust, to the Minister of Health.

"We cannot consider slum clearance, rehabilitation of blighted districts, or if you prefer to call it housing, as a thing apart. You cannot discuss diseases of the heart or of any other major organ without reference to the state of health of the entire body. Slum areas are symptoms of a systemic disorder and not the disease itself and civic surgery in and about the visibly afflicted parts, however well done, will not prove a permanent cure. Our thinking must go to deeper levels, we must find the causes underlying the symptoms, we must study the mental habits of the communities which permit slums to develop, we must apply, if necessary, sure enough remedies in perhaps bitter doses and not expect a cure-all in mere palliatives."—WILLIAM H. SCHUCHARDT.

We may perhaps, in this connection, invite attention to what Dr. T. S. S. Rajan who was the Minister of Health in the first Congress Ministry stated in reply to a municipal address. The Municipality appealed to him for the improvement of markets and the like. He stated that he was only in charge of dung and ditches, while his Hon'ble colleague, the Minister of Local Administration, was in charge of Finance and Factions and that he would communicate the request to him. As things stand at present, markets and municipal engineering service and others which have a

direct bearing on the health of the people are in charge of the Minister of Local Administration, while the Minister of Health is held responsible for the health of the people; or, in other words, certain sections of the City and District Municipalities Acts which relate to health are under the control of the Minister of Health, while others in the same Acts are under the Minister of Local Administration. Yet one more unsatisfactory feature! Local Administrations were primarily created for providing health, amenities, convenience and comfort to the citizens in the respective local areas. There is no justification for the portfolios being divided in the manner in which it has been done. It is altogether wrong to assume that the appointment of a Health Minister to be in charge of Health should mean that he should not have anything to do with the agencies through whom he should carry out his policies. Take for instance, Great Britain. It is the Minister of Health who is in charge of Local Government. There is nothing to prevent a similar policy being followed in this country also, till we reform our local self-governing institutions or liquidate them altogether. Here we seem to revel in divisions, sub-divisions somewhat after the fashion of castes and sub-castes.

We would appeal to the Prime Minister to re-examine the allocation of portfolios among his colleagues and allot the business to each of them with an eye to render service to the people.

DISAPPOINTING

Madras is unique in many ways. It has to its credit or discredit good, bad and indifferent achievements. It is the first Province which has placed in its Statute Book a Public Health Act. It was once felt that the absence of a Public Health Act was responsible for the poor progress in the promotion of people's health. In actual practice, most provisions of the Act are but dead letters. Enforcement of certain sections is hesitant and halting. There is the provision in the Act for the constitution of a Board of Public Health, which 'shall advise the Government on such matters as the Government may from time to time refer to it.' When this section was discussed in the Assembly, some members of the opposition felt that such a statutory body would only serve as a fifth wheel to the coach; while the Minister of Health who piloted the Bill through the House and some others strongly contended that great things might be expected from a Board of that nature. Events have falsified the great expectations then raised. The proceedings of the Board throw a flood of light on the nature of the subjects discussed. It has met many times and spent several hours in discussing matters of minor details of designs of public conveniences, of wells and the like. These are normally matters which experts should decide, on their own responsibility. The non-official members are flattered when they are called upon to give opinions on engineering details of design. The Minister of Health told the Assembly while discussing this particular section of his bill that the Board

would be called upon to consider even the finances of the local authorities. Nothing of the kind has taken place.

The members of the Board have no right of initiating discussion on a subject of their choice. The agenda is prepared by the Secretary of the Board who is the Director of Public Health of the Province. He must have had the advantage of attending the meetings of the Central Board of Health. He should have therefore had an opportunity of knowing the nature of the subjects brought before the Central Board. The Central Board's time is usefully utilized in discussing large matters of policy.

Even in such rare instances where the Public Health Board recorded resolutions on a matter of policy, no orders are passed on them, by Government. For instance, long, long ago, the Board resolved that the provisions of section 18 (ii) (c) of the Public Health Act should be enforced with a view to speeding up the execution of water-supplies schemes. Under this section, powers are given to a local authority, with the previous sanction of Government, to contract with any local authority or other person or agency for the supply of water. The enforcement of this section would remove to some extent the difficulties experienced for want of qualified technical men. Excuses are bad coins. Our Ministers rest content repeating parrot-like the Secretariat notes, putting forward plausible pleas for poor progress! We suggest a few methods of speeding up progress in the execution of

water-supply and drainage schemes in particular :—

(i) The repayment of loans by the local authorities should be extended to 40 years and more according to the nature of the work executed.

(ii) There should be no hard and fast rule that only a moiety of the cost should be given as grant. Pilgrim centres, the villages which lie *en route* and places which are not blessed with natural facilities should be given special consideration.

(iii) Business houses like Insurance companies should be invited to co-operate with the government in financing schemes calculated to promote the health of the people.

(iv) There should be no question of priority in the provision of water-supply or drainage schemes. These amenities are essential everywhere.

(v) Places which are subjected to periodical visitations of water-borne diseases, should be compelled to provide safe water-supply by enforcing the provisions of the Public Health Act. But, it should be remembered that the primary responsibility rests with the State and the local authorities should be looked upon as mere agents to carry out the policy of the Government.

We would commend to the Minister of Health to ponder over the anomalous position he occupies as the Chairman of the Board of Public Health. He is a party to every resolution passed by the Board. He should therefore assume responsibility to enforce it. In practice, however, he, as the Minister of Health, has no hesitation to turn down the very resolution to which he was a party. Either he should

give effect to the resolutions passed by the Board or he should allow some one else to be the Chairman of the Board, if he wishes to bring his independent judgment to bear on any question in his independent capacity as Minister of Health. The Minister should not move about with two faces!

U.P.'S WISE LEAD "BRAINS TRUST"

The Government of the United Provinces have their 'Brains Trust'. We understand that other progressive Provinces have also established their own 'Brains Trust' to advise the administrations on important questions of policy. Why not follow the lead in Madras also? It is altogether presumptuous on the part of any popular Minister to assume that he acquires knowledge on all subjects entrusted to his care, the moment he assumes charge of his exalted office. Any Minister who has a genuine desire to serve the people, should tap talent wherever it is available. He will then have the advantage of advice by an aristocracy of intelligence instead of being led by the nose by self-seeking mediocrities—official or non-official.

The 'Brains Trust' of the Government of U.P. has made its recommendations regarding the re-organization of the medical and public health services in that Province. We, in Madras, are still making up our minds on this important question of organization! Efficiency in organization ensures economy and successful achievement of the aims of providing public services.

HOW TO SPEED UP POST-WAR PLANS?

Sometime back, paper planning was the craze of the bureaucratic administrations. It helped them to dope the masses and to delude them. Every Provincial Government had its own post-war planning committee. There was a special sub-committee to plan the health schemes. Their deliberations were completed before the Bhore Committee's Report was published. But when that bulky report saw the light of day, Provincial Governments had their own schemes reviewed in the light of the recommendations of the Bhore Committee. The Government of the United Provinces had their own post-war plans re-examined by a sub-committee. We fail to see why Madras also should not have its post-war plans re-examined by the Health Sub-Committee which formulated the post-war plans for this Province. Criticisms were levelled against the Adviser's Regime that the Committees constituted by them were packed with hand-picked men and that they were not representative. We commend to the Minister of Health to reconstitute the Health Sub-Committee making it a fully representative one and to refer to it the post-war plans.

It is often said with some justification, that the best way of shelving a problem is to refer it to a committee! But this can be avoided by calling upon the committee to submit its report within a specified date. The terms of reference to it should be made quite precise.

AMALGAMATION OF CURATIVE AND PREVENTIVE MEDICAL SERVICES

The Special Sub-committee has recommended the implementation of the resolution of the Health Ministers' Conference. It has recommended that all preventive and curative work in the Province should be done under the direction of a single Director of Health Services. This is a wise lead. It is worthy of emulation by Madras and Bombay which dissented from the majority view on the question. We have discussed the matter at some length in our issue of April, 1947. (pp. 337-343).

STATE MEDICAL OFFICERS AND PRIVATE PRACTICE

The sub-committee referred to above has also given its categorical verdict that government doctors should be prohibited from private practice. It has urged the immediate prohibition of private practice and banning of all privately managed laboratories, surgical or medical clinics or X-ray establishments run

by government doctors and teachers of medical colleges.

According to a tabular statement furnished in volume I of the Bhole Committee's Report (p. 35), in the United Provinces, there were in 1941-42, 4,048 graduates and licentiates. This works out to one doctor to every 13,586 people. According to the same statement, there were in Madras, in 1941-42, 8,080 registered medical practitioners and this works out to one doctor to 6,145 people. The position is obviously at an advantage in Madras. Time has come to prohibit peremptorily full time government employees in the medical profession from practising their profession in private and for profit. The Madras Minister of Health as also others, will do well to take up the question immediately for consideration. The State medical institutions are almost becoming a public scandal. The mal-practices of medical men in these public institutions are notorious. The rot should be stopped at once, and the State hospitals should be made to cater to the needs of the poor who cannot afford to pay.

FIXED FEES FOR DOCTORS.

The mostrosity of the present system of private practices in medicine is that it gives doctors a vested interest in disease, which they are defending desparately. We, the victims, support them because we want doctors of our own friendly choice and not strangers planted on us by the staff.

The solution is simple. In Sweden the most civilized country in Western Europe, a private doctor is paid an agreed fee for keeping a family well throughout the year. He gains nothing and has more to do when there is illness in the family.

My Swedish acquaintances have found no difficulty in inducing English doctors to make this arrangement. Why not make it obligatory and abolish payment by the job ruthlessly.

George Bernard Shaw.

ALUMINIUM VESSELS :

THEIR UTILITY

AS UTENSILS

BY

K. V. SUNDARAM AYYAR, M.Sc., F.R.I.C.,
Government Analyst, Madras



ALUMINIUM in the form of its compounds is widely distributed in nature and occurs to the extent of 7 per cent in the earth's crust, in rocks, clays and slates and next in abundance to oxygen and silicose. Yet, its preparation and use for utensils do not go back to more than 50 years ago when Aluminium was cheaply produced by the electrolysis of its compound. Its white metallic lustre, comparative freedom from tarnishing and its lightness and above all its cheapness have all contributed to its popularity and use as a material for making household utensils, industrial appliances and even articles of art.

The widespread use of aluminium vessels for cooking and storing prepared food raises important questions whether aluminium is taken up by foods and if so, whether such food is in any way injurious to health. Experiments done in India

and other countries show that appreciable amounts of it are taken up by certain foods while other kinds are not affected. Water may corrode according to its hardness and may become cloudy with suspended aluminium hydroxide. Cold water may take up to 15 parts per million, although when water is boiled and evaporated to small bulk as much as 25 parts or more may be dissolved. Alakalinity in water favours corrosion. Distilled water boiled and kept overnight was found to take up from 8 to 20 parts.

Organic acids like those found in tamarind act on aluminium and the amount has been found to increase if salt is present, such as the case when *rasam* or *sambar* (South Indian preparations in which tamarind is a principal component) is prepared in aluminium vessels. The quantity dissolved has been found to vary from 15 to 40 parts per mille

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depends on the amount of salt present. Milk is scarcely affected when boiled and kept in aluminium vessels.

From these observations, it may be safely concluded and taken as an established fact that aluminium is dissolved by foods commonly used in the Madras Presidency. The problems which consequently arise are :

(1) Can aluminium irritate, corrode or act astringent in any part of digestive tract? Can it interfere with normal processes of digestion? Is it taken up by blood or other organs of the body and cause any derangement in the function of these organs?

In America, alum, a compound of aluminium has been used for over fifty years as alum baking powder, for preparing bread. It has been calculated that as much as 500 parts of aluminium per million of food may thereby be introduced. This amount is certainly much more than the amount taken up by food from aluminium cooking vessels, which can be put at 15 parts per million. Even allowing for the fact that bread forms ordinarily only a small part of a mixed diet, whereas a large proportion of daily food may have been cooked in aluminium vessels, the amount that would be introduced into the system by taking bread prepared with alum baking powder would be considerable. If the use of such bread is not attended by untoward consequences, it can be safely said that the amount of alum ordinarily dissolved in food by cooking in aluminium vessels will be innocuous to health. In 1914 the U. S. Department of Agriculture

who were then in charge of the Bureau of Foods and Drugs arranged for a referee Board of Consulting Scientific Experts who were asked to answer the following questions :

(1) Do aluminium compounds when used in foods, affect injuriously the nutritive value of such foods or render them injurious to health?

(2) Does a food to which aluminium compounds have been added contain any added poisonous or other added deleterious ingredient which may render the said food injurious to health (a) in large quantities, (b) in small quantities?

(3) If aluminium compounds be mixed or packed with a food, is the quality or strength of said food thereby reduced, lowered or injuriously affected (a) in large quantities, (b) in small quantities?

These questions were prompted by doubts which had arisen in the States as to the possible injurious action of alum introduced in bread as the result of using alum baking powder.

The conclusions of the Board were unanimous and were to the effect that aluminium compounds when added to foods in the form of baking powder in small quantities have not been found to contribute any poisonous or other deleterious effect which may render the said food injurious to health.

Experiments conducted on animals like dogs, cats and rabbits and pigs when fed on aluminium in the form of sodium aluminium sulphate produced no ill effects on health,

growth and reproduction. Volunteers who fed themselves with massive doses of aluminium in the form of tartarate did not experience any symptoms of food poisoning.

The available evidence is that aluminium in the amounts in which it is likely to be consumed as a result of using aluminium vessels has not any harmful effect on the ordinary consumer. Possibly a few persons may be susceptible to even traces of aluminium and exhibit "aluminium idiosyncrasy" and obviously when such effects are noticed, they should discard aluminium vessels, for preparing food.

In the writer's opinion aluminium vessels can safely be used for storing cooked food like rice, milk, water and specially to cover cooked food and for carrying food and as plates for eating food. Milk boiled and kept in aluminium vessels preserve its natural flavour and taste whereas milk boiled in vessels that can give even traces of copper develop off odour and the vitamin content also may be destroyed. For cooking acid foods, or for the matter of fact any food, there is nothing so cheap or likely to be attended to with ill-

consequences as the ordinary mud pots used by country folks in our villages. For durability and freedom from corrosion and all-purpose utility, there is nothing to beat the soap-stone vessels used in South Indian homes. Food prepared in mud vessels is perfectly safe.

The rich and others who emulate them have to pay a certain price for their costly preferences and luxury ways and in preferring metallic utensils to ordinary mud pot, they deny themselves the freshness and the taste of the food, prepared in mud pots and possibly incur some risk to health. While there is no need to be scared away by the prospect of health hazard by the use of aluminium vessels for cooking and storing of food, it is a safe rule to minimise the use of such vessels as far as possible. A warning however should be uttered against the use for cooking and storing liquid foods and beverages in vessels made of aluminium scrap metals dismantled from aeroplanes and other war discarded machinery. They are not made of pure aluminium but may contain metals like zinc and lead which are definitely known to be toxic.

STERILIZATION INSTRUCTIONS AS RECOMMENDED BY SANITARIANS.

The three methods recommended for sterilizing glasses and table utensils in public places are :

Washing in hot soapy water.

Rinsing for at least 1 minute in near boiling water or live steam, or rinsing in an active chlorine solution for 1 minute.

Glasses should be left upside down for 5 minutes to remove any chlorine odour. Wiping with a dish towel is not recommended.

Chlorine may be obtained in tablet, powder, or solution form, and the solution should be changed often. The health inspector should be consulted for further advice.

R. F. COLTART, *The Sanitarian*, 3, 165, (P.H. Engng. Abts., Vol. XXI)

THE AIM OF MEDICAL INSPECTION OF SCHOOLS

BY

DR. N. N. GUPTA

*School Medical Officer
Bhagalpur Division
Govt. of Bihar*



THE child is the father of the man and makes the nation what it is. The progress of civilization, the general good of society, all depend on how the child is reared. On the mental, physical and moral development of the child rests the future welfare of the race, and so the training child gets, determines whether the nation will be a nation of pigmies or of giants.

The system of modern education however does not try for a harmonious development of these three sides, but lays stress on the mental side alone. This produces a race of big-headed pigmies who can hardly walk straight due to the excessive burden of the huge heads on their slender shoulders!

It is very seldom that the institution tests whether the child is growing healthy or not. "It is the look out of the parents", the school authorities would say, "to see whether the child is suffering from

any disease or not". It is not their duty to ensure only children free from diseases come to schools.

The duty of the institution finishes with imparting instructions for seven periods a day for six days in the week. This process continues for seven to eight months in the year. The attendant strain is not attempted to be counter-balanced in any way. The health of the boy is not examined and if he does not show any signs of positive illness, he never engages the attention of anybody.

The evils arising out of such conditions are never sought to be curbed or eradicated and they do not engage the serious attention of anybody. It was in the year 1842 that France started medical inspection of schools by competent medical authorities maintained by the State. But their first attempt took some time to assume a definite shape and a definite system of school inspection was organised in Paris in 1879.

Sweden, however, claims to be a pioneer in this direction, for there appears to have been medical officers engaged in some schools as early as 1850 and by 1869; there was not a public school in Sweden that had not a medical officer.

Belgium was not slow in taking the cue and Brussels had medical officers appointed in 1874.

Germany did not lag behind; the first school doctor was appointed in Germany in 1883. Though she had been forestalled by other countries, she may claim the credit of having first a system of medical inspection of a comparatively modern type in full working order and between 1890 to 1900 the movement spread widely throughout Germany.

Hungary, Rumania, Norway and Switzerland soon followed suit in quick succession and by the first decade of the twentieth century, there was not a country in Europe that did not evolve some system or other of medical inspection of school children.

In England the year 1903 will always remain a memorable one in the annals of medical inspection of school children, the year that saw the publication of the report of the Royal Commission on physical training. The statistics published in that report showed a deplorable condition of affairs in regard to the physique of a large number of school children. The year following did not show any improvement and the report of the Inter-Departmental Committee on physical deterioration greatly stirred the public mind. Prior to this, the London School Board had appointed a medical officer in 1891. It was not

before the passing of the Education Administrative Provision Act in August, 1907, that medical inspection of children in public elementary schools was made compulsory. In U.S.A., Boston gave the lead in 1894 and was followed by Chicago in 1895 and New York in 1897.

In our continent, Japan quickly saw the advantage of this system and the following extract from an account of the system by F. J. Haskim is worth reproducing: "The Japanese system of medical inspection extends all over the empire and reaches the most remote rural community. The Japanese department of education is able to tell how many children are in schools in the empire, how many are robust, medium or weak and how many have defective eyesight and diseases are most frequent at different ages of school life".

In England, as previously stated, the attention of the general public was drawn in this direction by the Royal Commission of 1903 which was appointed as sequel to the rejection of a number of recruits during the South African War. The findings of the Commission were that (i) many of the defects found in the recruiting station had their origin in early life, (ii) that physical training in schools could not be efficiently developed except under medical supervision, (iii) that even for the purpose of general education, medical inspection of the school children had become necessary.

These findings formulated the objects of medical inspection which may be tabulated thus:

(i) To ascertain the actual health condition of the whole school going

population, i.e., to record their height, weight, nutrition, mental condition, etc.

(ii) To detect the presence of contagious diseases and thereby to protect the child and the community.

(iii) To detect physical defects that prevent the child from taking full advantage of education.

(iv) To find the capacity of the individual pupil to acquire knowledge in accordance with his mental and physical aptitudes.

(v) To ensure the best possible hygienic surroundings for the child, while he is at school with special reference to lighting, ventilation, water-supply, conservancy, etc., in order that the health of the child may not suffer.

(vi) To bring about a close relationship between school and home.

(vii) To teach the practice of hygienic and healthful living both in school and at home.

Findings for the year 1939 in Bhagalpur Division.

Cases examined		5532.
Number and Percentage with defective vision		
" Poor Nutrition	.. 556 viz. 18 per cent.	
" Enlarged Tonsils	.. 635 " 22 "	
" Neck glands palpable	.. 705 " 24 "	
" Anaemia	.. 271 " 9 "	
" Skin disease	.. 193 " 7 "	
	.. 212 " 8 "	

REMEDIES.—To counteract these evils, active co-operation between the guardians, school authorities and the public health department is very essential. Good and nutritious food, ample exercise and healthy surroundings must be provided for, if these examinations or any attempts towards them are to be successful.

Actuated by these objects the Government of Bihar inaugurated this system in schools under it in the year 1920, and since then, it is working. The Government has tried to bring a qualified medical man to the door of every school child without any charge on the part of its guardians, and wants that the guardians should respond and help in building up a healthy nation. Unfortunately our people are so apathetic that for fear of additional work, they discountenance even laudable efforts towards effecting improvement in existing institutions.

The organisation nevertheless has not given up its attempts and its utility is being admitted however slow may be its progress.

Willing co-operation is first sought and it is hoped that gradually all will equally realise its importance if they carefully go through its findings as a result of medical inspection of some important institutions.

Malnutrition, excessive mental strain, evils of bad company, are primarily responsible for the defects found, though a portion of them may be due to hereditary causes. Nutritious food, specially milk, should be given to the boys during school hours and necessary expenses should

be borne by the State, as the individual after all is a unit of the State and as every healthy individual is an asset to the State. Further as the school is regarded as the veritable source for the spread of infection amongst children, especially, measles, whooping cough, mumps, diphtheria, opthalmia, chicken-pox, scabies, tuberculosis, leprosy, etc., medical inspection and consequent segregation would be a measure of safety, the importance of which cannot be over-estimated. These infec-

tions when carried home spread the germs in the family and causes further mischief. Medical inspection proves a check to it and insistence on personal cleanliness is neglected in many instances.

The advantages of this system are too many to be enumerated, and with the co-operation of the public and the authorities of the schools continuing, it may be hoped that in the near future provisions could be made for the healthy growth of the individual.

SCHOOL HEALTH SERVICES.

There is a trend toward having the school depend upon the examination by the child's own physician. In New York City Schools in 1944, 35 per cent of entering children were examined by the private physician, in contrast to 10 per cent in 1938. If such a system is used, however, great care must be taken that the examination be more than a casual inspection and that a careful record be returned to the school giving the information it needs for the guidance of the child. And the private physician must learn that the school has information important to him in diagnosis and may help him in his plans for care of the child. On the other hand, there are also those who apparently, out of their discouragement in seeing few school children get adequate medical care, would set up elaborate diagnostic and therapeutic facilities within the school.

The new Education Bill in England includes a clause, for example, which imposes on local authorities the duty of providing for the medical inspection and treatment (other than domiciliary) of all young persons from approximately 5 to 18, such treatment to be provided free of cost, even as school lunches are to be free. How this will be done is not entirely clear now, for educational authorities are waiting to see how the National Health Scheme will be set up. It is clearly recognized there, however, that the job of caring for school children must be done. Inasmuch as in his first 16 years a child spends total days equalling only $2\frac{1}{2}$ years in the school room, the necessity of placing the medical program within the school can be sharply questioned. Moreover, the child cannot accurately be judged except as a member of a family and a community. Certainly the well-trained school physician and nurse with their special knowledge, experience, and interest in problems of school children have much to contribute. The place at which examinations are done matters little if it be clearly understood that the purpose of doing them is to understand as much as possible about the child, to give him the benefit of the best that medical science has to offer to guide him so he will like to live in a healthful manner, and to help all those who work with him to understand what his needs are. How to do this seems to me our hardest job.

A fifth trend I see today—though perhaps I should only say it is a glimpse in that direction—is an interest in health of children in our rural areas. Let us not forget that more than 50 per cent of our school age children live in population centres of 2,500 or less. And with a few exceptions such centres have no school health program. The school buildings are notoriously insanitary. Health education or instruction if recognized at all is fragmentary, and outmoded in both content and method. Children go through their entire school career without seeing a physician or nurse unless acutely ill. Here indeed is a problem of paramount importance.

LEONA BAUMGARTNER, M.D., (From *A.J.P.H.*,—Vol. 36, No. 6)

WATER IN RELATION TO HEALTH

BY

RAO SAHIB

SRI T. N. S. RAGHAVACHARI

PUBLIC Health is the science and art of preventing disease, prolonging life and promoting physical well-being and efficiency through organised effort. Municipal sanitation is the main theme of any Public Health programme. Even before the germ theory of disease was established, it was recognized that an abundance of good water was necessary to promote health in urban areas and it was also known that the spent water required to be transported to a safe distance in order to prevent insanitary conditions.

With the advent of the bacteriologist in the latter half of the last century, preventive medicine became a prominent feature of Environmental Sanitation. Today, the physiologist and the biochemist have given a fresh impetus to the movement of health conservation. The provision of protected water supplies, of efficient sewage disposal, of suitable legal and other enactments for ensuring safe supplies of milk and food and of various amenities that make for comfort and good health looms large in the horizon of modern public health atmosphere.

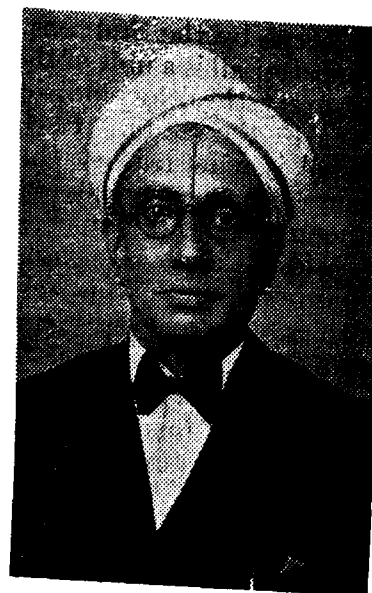
The report of the Bhole Committee which forms the basis of all recent public health programmes under discussion embodies detailed and concrete proposals for achieving the above objects. We, in India, have but just entered the fringe of modern public health development, as judged by western standards and have therefore before us a comparatively

long distance to travel before we reach the desired goal and find that our country's health, as judged by a lowered death rate, a higher expectation of life, and relative freedom from epidemic diseases, has vastly improved and compares favourably with that of the western countries. The war, which has happily ended over a year ago, has made the situation somewhat more difficult and also impossible to foresee all the Nation's peacetime health problems. During the *reconversion* period ahead of us—I prefer to call it post-war reconversion—it will be necessary for the State and local authorities to assume responsibility for the improvement of the Nation's health, and for the planning of peacetime health needs.

RELATIONSHIP OF WATER TO HEALTH.

This theme sounds such an absurdly simple one, and one may well ask what is the wonderfully new aspect that you are going to tell us about which we do not already know. It is indeed, a simple matter but certainly consists of a variety of important and intricate facts, some of which at any rate *must* be interesting to many, if not all of you.

Need I say that "PURE WATER" does not exist in nature and that the common impurities exist either in solution, gases, minerals or salts, organic matter or in suspension—silt, clay, living organisms, algal bacteria. Some of these impurities are of



little or no consequence when present in comparatively small amounts, while others are of such grave and great importance (e.g., the disease producing micro-organisms, insects carrying the intermediate hosts of certain diseases e.g. guinea-worm, etc.) that they must be effectively removed or kept out of our drinking water supplies by every possible means. You have all been taught in your High School classes about the difference between *hard* and *soft* water. I propose now to tell you about the difference between a *safe* and *potable* water, and a *polluted* and a *contaminated* water: A *SAFE* water is one which will *not* cause disease or injury to those who drink it. A *POTABLE* water is one that is suitable for domestic use and therefore safe to drink in addition to being usable for cooking, washing, bathing, watering cattle, laundry and other industrial purposes. A *POLLUTED* water contains organic matter or waste products to an extent which renders it unfit for domestic use. A *CONTAMINATED* water contains germs that would cause disease—Typhoid, cholera, dysentery (bacillary and amoebic) and Guinea-worm are the commonly water borne diseases. During recent years epidemics of acute *Hepatitis* (a liver disorder) have been traced to the ingestion of water contaminated with the *virus* of that disease, from the faeces of infected individuals. None of the known treatments of contaminated water chlorination, hyperchlorination, filtration, have been able to eliminate this virus from contaminated water.

The presence of organic impurities in excess—derived from animal or vegetable sources—apart from the presence of concomitant bacterial contamination can *per se* account, at best, for vague gastric upsets especially in delicate individuals and in persons who are psychologically conscious.

The presence of algae (green unicellular organisms) in considerable amounts has been recently incriminated in the production of Diarrhoeas and has also been reported to have brought about the death of cattle which drank the water of algae infested ponds during summer when the level of the water had gone very low and what remained was only a thick rich emulsion of living green and blue-green algae. There has, however, yet been no adequate and authentic proof of these happenings based on proper scientific research. Convincing proofs are indeed diffi-

cult to adduce in view of the several other factors that go to make up the story.

I believe that our dear old college can now boast of a Natural Science Section—if *now* only in the Intermediate Arts Course—and to my young friends in that section particularly I wish to address the following observations:

The ubiquitous forms of microscopic and macroscopic life known as *algae* occur in all surface waters and show seasonal variations in productivity and preponderance. Several eminent botanists and biologists all the world over have studied and are studying these little creatures from different aspects and points of view. In a recent contribution Dr. Mortimer, chief of the Freshwater Biological Association at Wray Castle London, laid great emphasis on the *NITROGEN* balance in water and also of *phosphates* in algal productivity. This finding has since found its way naturally into Text Books as quite authentic, authoritative and universally true for all algal life in all climes and countries.

We have been taught and obliged to rely so far on Text Books written by English scientists based on their observations under local conditions and environments and we have accepted all the statements made therein as universally true under all conditions.

There can be no doubt that in the vast majority of cases their findings would have been based on observations and laborious research extending over several years and covering a variety of conditions and perhaps also of materials. *But* are they all, therefore, necessarily and universally applicable to every country and type of climate? The answer to this question can be furnished only by the same process which was responsible for the original findings of the Text-Book writers—viz. *Research*.

'*Research*' is not something elusive or fantastic to be used only within the mystic atmosphere of a Laboratory. It is an organised and diligent investigation to discover facts which may be applied with equal facility and assurance to the solution of any problem in any realm of human activity. It is a convenient and ever-ready tool, the wise use of which begets results whose value greatly exceeds the expenditure in money, time and energy. *Research* is in reality an attitude of mind, that attitude which prompts

one to be asking *eternally* the question *WHY?* That attitude which does not permit the closing of the mind or burking of discussion, that attitude which leads one to keep ascertaining what people in other countries and in other walks of life are doing, and adapting only that which is adaptable to one's own work and rejecting what is not applicable, that attitude which warns against the folly of complacency and satisfaction with things as they are, that attitude which expresses itself pithily and eloquently in the short phrases "*What is not yet may be*", and "*what may be should be proved to be*".

Each phase of knowledge is connected by strings, often invisible, to a previous state of knowledge. This connection has, however, to be carefully explored, discovered and *carefully examined* for its suitability or otherwise of application to conditions obtaining in each locality or line of Research. Sometimes the findings and results obtained in particular research problems in the Temperate regions are found to be inapplicable to identical problems in the Tropics: As instances I will mention to you the following:

(i) The behaviour and reactions of certain bacteria (of intestinal origin) found (in contaminated waters) in the Tropics, to certain biochemical and bacteriological tests considered to be specific in the laboratories of the Temperate regions have been shown by carefully controlled research conducted by me for over three years to cover all possible variations, to be different to those recorded in England, approved by the British Ministry of Health and embodied in Text Books as "*standard methods*". After considerable discussions and simultaneous controls and verifications, the sponsors of the "*standard methods*" of bacteriological and chemical examination of water, sewage, and milk" admitted the correctness of my findings and were obliged to incorporate them in their Text-Books and standard methods.

(ii) The classical work of the late Sir Alexander Houston of the London Metropolitan Water Board on the prolonged storage of polluted and contaminated waters as a great safety factor in water treatment, legislated for three months storage of river and upland surface waters for ensuring perfect safety. The results of similar controlled daily observations made by me for four years consecutively on the storage of a river water

showed that storage for more than five days was not helpful under tropical conditions, as there was a tendency to bacterial increase after the fifth day and a liability thenceforth to excessive algal growth and consequent production of tastes and odours. The advantages of prolonged storage for three months have, however, come to be incorporated in the published Blue Books and reports of the Board.

(iii) Again, I referred to the important work done at Wray Castle, London, by Dr. Mortimer on the Etiology and Bionomics of Fresh water algae. Dr. Mortimer both in his published papers and in his letters to me emphasised the absolute dependence of algal productivity and preponderance on the nitrogen balance and presence of nitrates, nitrates and phosphates in fair abundance. The vast majority of impounded surface waters in India contain no nitrates, nitrates or phosphates. Still algal troubles constitute a real and grave menace to filtration and sterilisation of water in our province. Dr. Mortimer was informed by me of these facts and asked for an expression of his opinion and was reminded twice at intervals of three months but there was no answer. Luckily for him or for me the war which broke out saved the situation.

The organic impurities added to the water by the natural death and decay of the green algae often *impart* a pronounced disagreeable odour and funny taste to the water. They add to the cost of filtration and sterilisation processes and so have to be eliminated by suitable algicidal treatment.

Not so however, with inorganic constituents present in water. Since the consumption of water involves all human beings, the majority of whom have had no scientific training, we find that public opinions relating to the physiological effects of the mineral salts in natural waters have been moulded without any consideration of the logic of the conclusions. Many results which have been accepted as truth are found on a closer examination to have been deduced from uncontrolled experiments and lay observations, which can by no means be classified as real scientific research.

To digress a bit, when Louis XIV of France became ill with typhoid fever and when his fate was uncertain for some weeks, his

physicians administered a large dose of *antimony* as a desperate and heroic measure. Soon there was improvement and the king rapidly recovered in a few days. His recovery was ascribed to the antimony on the basis of Plutarch's arguments. They little realized that the king recovered *in spite of* and *not because of* the antimony in the dose in which it was exhibited. The same type of logic exists even today. We often hear it said that the water of the sacred tank in Tirukkalkundram or a well water near Vriddhachalam or Virudhunagar has miraculous healing or medicinal properties, and that all the ills, which the human flesh is heir to, vanish with the drinking of or bathing in this or that water.

It is the considered opinion of distinguished health authorities that human beings in general do not normally drink enough water to meet the daily and hourly needs of the human system. What possibly therefore happens in these magical cures is that people resorting to these watering places alter their modes of living and during the period of treatment, play, rest and drink far more than normal quantities of water and live in entirely different surroundings. We all know that several ailments respond very well to rest, recreation, change of air and that waste materials are flushed from the system by an increased in-take of water. These facts are ignored even by the most cultured and enlightened people in assessing the value of the mineral content and medicinal qualities of waters.

Again, we often hear of people talking of waters being unsuitable, disease producing, unpalatable and so on owing to the presence of one or more inorganic salts in excess. I may however tell you that *only a very few* inorganic mineral substances have been found to affect the public health, in the concentrations in which they are found in natural waters. Some of these may affect the odour, colour, taste and turbidity. But nearly all of these are physiologically harmless to the human system, even in concentrations sufficient to produce intense turbidity, colour, or even taste. No doubt, odour and taste may and probably will affect some persons *psychologically* to the extent that they may even develop and exhibit *physiological* reactions. There is obviously much difference between a pure water and a physiologically safe water.

It is perhaps easier to define safe water than pure water. I wonder if any of you here can give me an accurate definition of pure water. It certainly is not H₂O in the liquid phase.

The data on physiological tolerance to inorganic impurities in potable water, are very conflicting. The problem is very difficult to investigate and reliable information based on accurate laboratory experimental data, is woefully lacking in many cases. Not a year passes but one of the 92 elements is added to the list of those having an important physiological bearing on health, zinc of Flourine being the most recent. The physiological effect of simple metallic ions would probably be different from that of complex ions containing the same element. Hard waters have been blamed for various disorders such as urinary concretions, arteriosclerosis, dyspepsia, constipation, goitre, diarrhoea, rheumatism and what not? There are critics, who are never tired of saying that due to the excess of calcium and magnesium contents in drinking water, our alimentary canals are continually getting coated with lime scabs, as if they were *boiler tubes* of a steam engine. Mortality statistics and experimental research have exonerated the hardness in waters from being the cause of the above disorders. Some European authorities have recorded that in communities who systematically use hard water for drinking, better body weight, better nerves and good teeth were produced. Calcium taken with water supplements that taken with food. The human body as you know requires 0.7 to 1.0 gram per day to maintain a state of health and vigour. Large amounts of calcium salts would certainly affect the palatability of water but that is again a matter of individual taste; as a general rule except for a very few of the metallicous, the taste factor will prevent consumers and even animals from injuring themselves physiologically by drinking such waters.

Text books lay down that drinking water should contain no caustic alkalinity. There are, however, no scientific data or reliable observations which would substantiate the possible deleterious effects resulting from the constant use of waters containing *small amounts* of caustic alkalinity. I have found by actual experiments that as much as 10 parts per 100,000 of Ca (OH)₂ alkalinity would be required to produce a marked alkaline effect and that the border line lay between 5 and

10 p.p. 100,000. Magnesium in public water supplies is really of no public health significance. It affects taste more than calcium. The human body requires about one-third gramme per day of magnesium for normal functioning and natural waters do not contain much less than this quantity in daily intake.

Sodium chloride and sodium nitrate present in drinking waters, pass through the intestinal walls, are absorbed by the kidneys and eliminated in the urine. This produces thirst and by quenching it we flush the salts from the system. Any form of nitrogen in water indicates organic pollution of recent or antecedent origin of nitrites or nitrates.

All metals dissolve in water. Copper has within the last fifteen years assumed a most important role as an essential supplement to iron, for the regeneration of haemoglobin in combating anaemia (or bloodlessness). C4 is an essential constituent of tissue cells. The body requires at least 2 mg. of C4 per day. The treatment given by doctors consists of injections of iron with C4 the latter in traces. In the modern control of algal growths found in impounded surface waters in lakes or tanks, copper sulphate either alone or in combination with chloranine is used. The dose of copper varies with the preponderance of particular types of algae. Some require only 0.05 p.p.m., which others need as much as 1.0 p.p.m. and more. The average safe dose used in tanks and lakes for this algicidal treatment is in the neighbourhood of 0.4 p.p.m. The residual copper that may precipitate as copper carbonate down to the bottom of the tank or lake would be very much less than 0.1 p.p.m., and it has been scientifically proved that a dose of 0.2 p.p.m. is not only harmless to the human system but is actually beneficial as a blood builder.

COPPER.—Practically everything in this world is poisonous and yet nothing is poisonous if used correctly and in moderation. This applies to copper ions. I do expect that the time will soon come when public health authorities would consider it necessary and advantageous biochemically to have traces of added copper in public water supplies. The old time method of cooking in copper and iron vessels was definitely of physiological importance as being beneficial to health. The use of copper vessels in Hindu households for storing water—now unfortunately going or gone out of use in obedience to the dictates

of fashion—had obviously a scientific and hygienic basis. It is only at a concentration of 1.5 mg. per litre of water that copper can normally be tasted and this concentration will not occur under normal conditions of cooking and storage in copper pots.

ALUMINIUM.—*Alum.* A12 (SO4)3 is used as you all know or should know in the purification of water before filtration, for coagulating and sedimenting organic impurities and particulate matter. Some of the alum—a small quantity might get into solution and escape into the water mains. This was at one time considered to be deleterious to health. It is no longer so—as it has definitely been proved that even acid food cooked in aluminum vessels is quite safe and fit for use.

Arsenic is seldom met with in water supplies. The amount getting into a water supply from the galvanized iron pipes used in distribution is negligible.

LEAD.—Lead ions have had a bad reputation though some of it is quite undeserved. If the very small amount of lead which we take in through water and food were as harmful as some people would have us believe, there would be many more cases of lead poisoning than are known to occur. There is however a popular belief which is doubtless erroneous, that lead accumulates steadily and is therefore a cumulative poison. This would mean that none of it is excreted; 0.1 p.p.m. of lead has been laid down as the permissible upper limit in drinking water. Recent controlled researches have shown that the ingestion of lead ions in normal amounts does not result in a steady accumulation of lead in the body and that apparently an equilibrium is reached after a time so that a substantially constant concentration of lead remains in the tissues, the daily output of lead being equal to the daily intake. The *நாய்ச்சொம்பு* (tin pot) for which our town is famous, is really made not of pure tin, as its name would indicate, but is an alloy of tin and lead, the latter preponderating in many cases. The amount of lead dissolved out and going into solution in the process of cooking—*தஸம், கொழும்பு*—(South Indian preparation) and in storage of *தயிர்* (curd) and *மேதி* (buttermilk)—all acid foods is something enormous and you all know how quickly a five-seer *chombu* wears out and weighs only half as much from six months to a year. If lead is a cumulative poison most if not all of us using

those vessels should have ceased to exist at the end of a few years of using these vessels. I am not advocating the use of these vessels. They are best avoided. But people used to the sweetish taste imparted by the lead to *தஸம்* and *கொழும்பு* etc., prepared and stored in such vessels will not care for the same prepared in other vessels—the best being those made of mud or soap-stone (Makkal).

IRON.—Both ferrous and ferric salts are physiologically harmless to the system. The unit of 0.3 p. pm. that has been fixed in text-books is based more on taste and odour considerations than for physiological reasons. Man requires from 5 to 6 m.g. of iron per day and inorganic iron, as found in drinking water (rust) can still be absorbed and utilized. The reason or the necessity for keeping the iron content of waters low is due to the fact that waters containing even traces of iron are unsuitable for certain industrial purposes, particularly textiles, paper, laundry, etc.

ZINC.—A limit of 5 p.p.m. has been fixed for zinc. When the source of zinc contaminating the water, as commonly happens, is the galvanized iron pipe, the compounds of zinc found in the water are usually mixture of the oxide, hydroxide and carbonate, the last one predominating in most cases. When the carbonate is present to the extent of 80 p.p.m., a noticeable milkiness is caused in the water and an astringent taste is imparted to it. While there is no valid reason to consider this harmful, *per se*, nobody will look at such a water as a thirst-quencher. Foods and beverages (with the exception of simple or chlorinated drinking water) should not be stored in zinc lined or galvanized iron containers. And waters with a relatively high Zn ion content should not be used in making acid drinks like lemonade, lime juice, etc., as the resultant zinc citrate is a very powerful protoplasmic poison liable to cause rapid death.

Selenium, Boron, Manganese, Radium, Silver and Barium.—All these have come in for comment and criticism at one time or another in connection with drinking water

supplies—water drawn from a seleniferous soil, in Colorado and grass grown on such a soil, are reported to have produced death in cattle.

Boron ions are very important to plant life and even when present in such considerable excess as to affect plant growth, they are not likely to have any adverse physiological effect on the human system.

Manganese like iron, has a deleterious effect on cloth, paper and other fabrics and has therefore to be removed from water-supplies only for that reason. During recent years, this element has come to be considered essential to normal bodily function.

Radium.—There has been a lot of speculation about radio active waters in recent times but even when infinitesimal doses of radium have been detected in waters, no adverse effects on health have been recorded.

Silver has been used for water sterilization during the past twenty years, particularly in Germany. This was based on the work of Dr. Kranse of Germany who obtained a patent for this process—which he developed on the basis of his experience during the first world war of 1914—1919.

Katadyn was the proprietary name given to the process. Silver containing asbestos pellets and rings were used and a contact of 15 minutes to half-an-hour with water ensured sterilization and also left a residual content of silver in the water that was able to sterilize added water to the extent of one half of the volume of treated water. I carried out some detailed research work with one of the Kranse Katadyn sterilizing flasks and found that the claim made for efficient sterilization—killing of pathogenic disease—producing germs—was justified. Any possible deleterious effect of the residual silver even in dilute solution—on the mucous membrane of the stomach and intestines and the distinct possibility of the silver ions introduced into the water removing the naturally available traces of iodine normally present in water-supplies, by precipitating it as the insoluble silver iodide—are two important factors to reckon with.

(to be concluded)

“Modern conception of the maintenance of the public health find their centre and cardinal point in the provision of a pure and adequate supply of water.”

THE HEALTH OF THE STATE IS THE STATE OF YOUR HEALTH

BY

PURTEJ SINGH, M.S.
(HARVARD)

SEWAGE DISPOSAL— SEPTIC TANK

FOR isolated houses, having an assured supply of water, but not served by a public sewer, a septic tank offers a means of safe disposal of sewage.

Sewerage system in India has not yet been developed to any appreciable extent. Even when such a development is undertaken, our towns will present some special problems. Generally speaking, a town can be divided into two sections, the under-privileged who live in congested localities, and the privileged class who live in isolated bungalows. A sewerage system for the isolated bungalows would be an uneconomical proposition. We have, thus, even in towns a large scope for installation of septic tanks.

It is intended to present to readers a rational approach to the design, function, and operation of a septic tank. To start with, a few definitions may be useful.



Septic.—The term septic when applied to sewage means that all dissolved oxygen in it has been used up.

Scum.—Floating layer of greasy substances.

Effluent.—The supernatant liquid flowing out from the septic tank.

Sludge.—The sediment at the bottom of the septic tank.

Disposal field.—Open jointed pipes laid over a trench filled with broken stones or brick-bats, for secondary treatment of effluent from a septic tank.

Some popular, but erroneous beliefs about a septic tank are:

1. The sewage solids are liquified in the septic tank, by a process termed septic action.
2. The effluent from a septic tank, is free from disease organisms.
3. The capacity of the septic tank per user, is a matter of individual judgment.
4. The septic tank is considered to be complete treatment, and the importance of the disposal field is little realised.

FUNCTION OF A SEPTIC TANK

Recalling the physical analysis of sewage presented in the previous article, our problem is the disposal of settleable and non-settleable organic solids. The septic tank is essentially a combined sedimentation and digestion tank for the settleable organic solids. By providing enough detention time for the sewage, the settleable solids are precipitated. The sediment is termed sludge. As the sludge layer gets thicker, anaerobic conditions are established causing biological decomposition of organic substances into gases, and mineral or more stable organic matter.

Greasy substances float up and form a layer of scum on the surface. Greases are hard to break up, and being at the surface are in touch with fresh incoming sewage. As such no appreciable biological decomposition takes place in the scum. There can, therefore, be no interference in the action of a septic tank by the introduction of soapy bath water, or a little kerosene oil for controlling mosquito breeding.

To sum up, the activities in a septic tank are:—

(1) Sedimentation of settleable solids—a mechanical process.

(2) Digestion of settled organic solids—a biological process. But this is confined to the sludge at the bottom, and therefore introduction of any toxic substances which will not settle to the bottom will not interfere with digestion.

DISPOSAL OF SEPTIC TANK EFFLUENT

The septic tank effluent has still all the non-settleable organic solids. As the removal of organic matter is a measure of purification, the septic tank will effect only 60 per cent purification. It is therefore highly objectionable to discharge the effluent of a septic tank into a public drain or water course, without further treatment.

The non-settleable solids are colloids, and can be brought down only if coagulated to form larger masses. This is most economically done by inducing biological activities. The organisms involved are aerobic, and therefore some suitable aerobic treatment of the effluent is necessary. The usual aerobic treatment for septic tank should be located at a disposal field. It is wrong to think of the disposal field as merely a soak-away trench.

Location of a septic tank.—The septic tank should be located at a site which drains away from all sources of water supply. The elevation of the septic tank should be such that sufficient slope in the house sewer lines is available. A minimum separation of 50 feet should exist between the septic tank and any source of water supply.

In the next article will be presented the design features of a septic tank and disposal field, with necessary drawings and tables.

PEOPLE'S HEALTH AND FOOD

BY

B. NAGARAJAN, B.A. (HONS.)

I read the other day in a recent issue of *Time*, the American Magazine, that 'In India the people are more fertile than the land and the paradoxes are more fertile than the people'. The reference to our pullulating contradictions is a little uncomplimentary perhaps, but none the less justified for that. For, with our population well nigh the four hundred millionth mark we can hardly be said to have given sufficient thought to the provision of adequate and nutritive food for every one of us. And, alas, the problem of food for the hungry has become a problem of compelling topical interest. Urgent and pathetic appeals have gone out for succour from

abroad for import of rice and wheat: even when these arrive, the problem will yet remain, and it's folly—one had almost said, criminal,—to tinker with this clamant demand for food when the wolf is already at our door. Apart from the antisocial elements who made 'profits of death'—to use the classic phrase of the Royal Commission on the Bengal Famine,—our chief obstacle is the absence of vigorous thinking and honest effort for the increase in our foodstocks. It will not do to throw up our hands in despair and let things rip. *What*, then, should we do about it? Blame it on Nature, Government or any one we don't like? No! there is *hardly* the time for it. 'Immediate'



steps must needs be taken to grow all the food we could.

There are methods and methods for increasing the production of crops: one method, better irrigation, is admirable in itself, but it will take time for its benefits to filter down. Another method upon which precious little thought has been bestowed in our predominantly agricultural country relates to the conservation of soil fertility by proper manuring.

It is by no means the purpose of this article to make a plea for one class of manure to the exclusion of another, but rather is it my idea to bring out the significance of recent attempts at increasing soil fertility. Farm-yard manure and green manure have their undoubted uses, and, when all's said and done, experience points to their continued use. There is a third class of manure, artificial manure, and the desirability of its use shall be considered here but no dogmatic judgment laid down.

The wisdom of the application of synthetic fertilisers is doubted by some who consider them an unmitigated curse. They 'are struck with horror at the incalculable harm that it may mean to soil fertility and the health of cattle and man'. Their case has been neatly summarised for us by a leading newspaper in the

country. "They see in their application spectres of soil exhaustion, soil erosion, famine and pestilence, and therefore stress the importance of humus, decomposed vegetable matter, as the controlling factor in soil fertility. They have an emphatic belief in the interdependence of soil fertility and animal and human health, and condemn reliance on artificial manure Inorganic minerals work against Nature and not with her. They kill off Nature's husbandmen, the earthworms, the fungi and the micro-organisms. Finally, not only are crops, stimulated by chemical top-dressing, very susceptible to disease, but so are the animals and humans who eat them".

The critics, to be sure, are well-meaning but err in supposing that the application of artificial fertiliser is recommended to the exclusion of compost and farm manure. Emphatically, that is *not* what is advocated. All the natural manure we can get is certainly welcome: only, it does not seem to be available in the quantities we so badly need.

We had best see the extent to which fertiliser nitrogen has been used in the various parts of the world. Comparative figures for the principal countries for the years 1937-38, 1938-39 and 1945-56 are reproduced below from *The Chemical Age*, 25th January 1947:

METRIC TONS OF NITROGEN.

NAME OF COUNTRY.	1945-46.		1938-39.		1937-1938.	
	Production.	Consumption.	Production.	Consumption.	Production.	Consumption.
Canada	179,000	21,000	49,500	10,000	51,500	9,500
U.S.A.	520,000	611,000	188,000	332,000	185,500	327,000
Chile	254,000	5,000	225,000	5,000	224,000	5,000
America, other and West Indies	1,000	28,000	1,000	38,000	1,000	23,500
Australasia	7,000	17,000	8,000	14,000	4,500	15,000
Japan	80,000	80,000	425,000	419,500	416,500	454,500
China	10,000	10,000	1,000	30,000	1,000	28,500
India Ceylon	8,000	45,000	5,000	29,500	5,000	28,500
Other Asia	..	8,000	..	44,000	..	42,500
Egypt	..	65,000	..	77,500	..	76,500
Other Africa	..	11,000	..	18,500	..	19,500
United Kingdom	248,000	166,000	128,000	68,500	135,000	68,000
Norway	91,000	23,000	85,000	11,000	85,500	10,000
Belgium	87,000	90,000	84,000	53,500	82,500	54,500
Holland	25,000	80,000	105,000	95,000	1,04,500	86,500
France	70,000	220,000	150,000	184,000	148,500	175,000
Other Europe (excluding U.S.S.R.)	300,000	400,000	1,090,000	1,026,000	937,000	975,000
Total (excluding U.S.S.R.)	1,878,000	1,880,000	2,542,500	2,456,000	2,382,000	2,397,000

If the artificials could work the havoc feared by some, these countries so generally using them should be badly off in the matter of their food supply, which they are not today.

In South India field experiments have been made by the Madras Agricultural Department in their research stations at Coimbatore, Pattambi, Aduthurai, Maruteru and Samalkot. The results of these experiments in the decennial period 1930-40 are shown in the following tabular statement.

The tabular statement at the end, reveals the superiority of Ammonium Sulphate to other simple nitrogenous manures. Nitrogen in the ammoniacal form is more suitable to paddy than in the nitrate form which is easily leached away from the soil.

The tabular statement further brings out the maximum yield that could be had by mixing ground-nut cake with Ammonium Sulphate.

We also see from the statement that the increase is greatest when a dose of green leaf is mixed with Ammonium Sulphate.

Lastly, the statement establishes the excellence of Ammonium Sulphate as a fertiliser.

The need for increasing the soil fertility is clear enough, and what with our extensive paddy fields and the area under sugarcane cultivation (155,596 acres in the Madras Presidency), it behoves us to devise effective means of enriching the soil. If our nation is to forge ahead with her citizens having 'minds without fear and heads held high,' we may not be hesitant to profit by the findings of Science. Undeniably, we want

Station.	Treatment and rate of application per acre.	Duration of experiment in years.	Average percentage in increase over control.
Coimbatore—Paddy Breeding Station.	Ammonium Sulphate 150 lb ..	3	27
	Nitrate of Soda 200 ..	1	7
	Groundnut Cake 750 ..	3	20
	Castor cake 750 ..	3	17
	Green Manure 4,500 ..	3	14
	" " 6,000 ..	3	17
Aduthurai	Ammonium Sulphate 75 lb ..	2	22
	Plus Nitrate of Soda 100 ..	2	20
	Ammonium Sulphate 100 ..	2	21
	Plus Nitrate of Soda 67 ..	2	21
	Ammonium Sulphate 50 ..	2	21
Coimbatore—Paddy Breeding Station.	Ammonium Sulphate 75 lb ..	2	19
	Plus Nitrate of Soda 100 ..	2	22
	Ammonium Sulphate 100 ..	2	11
	Plus Nitrate of Soda 67 ..	2	10
	Ammonium Sulphate 50 ..	2	17
	Plus Nitrate of Soda 133 ..	2	31
	Green Leaf 2,000 ..	2	10
	Plus Ammonium Sulphate 100 ..	2	17
	Green Leaf 2,000 ..	2	17
	Plus Ammonium Sulphate 200 ..	2	31
Pattambi	Ammonium Sulphate 75 lb ..	1	26
	Plus Nitrate of Soda 100 ..	1	27
	Ammonium Sulphate 100 ..	1	27
	Plus Nitrate of Soda 67 ..	1	27
	Ammonium sulphate 50 ..	1	27
	Plus Nitrate of Soda 133 ..	1	27
	Green Leaf 4,500 ..	3	60
	Ammonium Sulphate 75 ..	3	60
	Green Leaf 2,500 ..	4	19
	Plus Groundnut Cake 212 ..	4	21
	Cattle Manure 2,500 ..	4	21
	Plus Groundnut Cake 212 ..	4	21
	Castor Cake 750 ..	3	59
	Plus Ammonium Sulphate 75 ..	3	63
	Groundnut Cake 425 ..	3	63
	Plus Ammonium Sulphate 75 ..	3	55
	Neem Cake 500 ..	3	55
	Plus Ammonium Sulphate 75 ..	3	55

leadership of the correct kind from our Popular Governments. Will they bestir themselves and energetically make a survey of Fertiliser Practice, a feature of the fertiliser drive in the United Kingdom? And will our scientists hearken to the nation's call? We need the benefits of their researches, for, only an unfortunate prejudice against fertiliser would result if it was used in the

wrong conditions and the wrong way. Accurate knowledge of the Science of the Soil and the technique of crop production must needs be brought home to our masses by means of lectures illustrated by instructional films and field demonstrations. The inexcusably low crop yields should be sufficient incentive for the bending of our energies in this regard. The work before the nation is so great

and urgent that only an unbending resolve can carry us forward to success. Let us, therefore, put Science in the service of the country: nothing can be saner, nothing nobler. The marriage of Science with Agriculture makes possible the union of fertiliser with the virgin soil and the fruits of that union shall mean the

difference between hunger and its satisfaction. Then, indeed, will the prayer so exquisitely made in the hymn in the Rig Veda be answered:

इन्द्रा याहि तृजान उप ब्रह्मणि हरिवः ।

सुते दधिव नश्नतः ॥

O God give us systems of knowledge and produce

Invigorating food in the fleeting creation.

(We publish the foregoing article with pleasure to rouse interest on the subject. We may add that the results of the experiments of the Agricultural Department tabulated at the end of the article, suffers from a serious defect in that the duration of the experiments is too short to justify any general inference being drawn. Even those very experiments point to the need for applying organic manure if the full benefit of the inorganic manure should be obtained.

We invite special articles of practical interest to produce organic manure in the quantity required to be used in conjunction with inorganic manure.—Ed.—P. H.)

HUMUS AND FERTILISERS.

Apart from such factors as the mechanics of soil handling, or broad policies of crop rotation, the obvious actions towards fertility are additions of manures and fertilisers. Let it be said at once that there is no simple and direct choice between loads of "muck" and bags of fertilisers. To regard manures and fertilisers as optional alternatives, as competitors, is much the same as regarding humus and plant nutrients as alternatives. Manures contain bulky amounts of humus (or potential humus) plus relatively small amounts of the nutrients; fertilisers contain no humus (or only negligible amounts even when the fertilisers are organic in type) and concentrated amounts of the nutrients. Before the era of fertilisers (which began slowly in 1840) the cropping rate was limited by the nutrient supply of manures; the humus level of soils was probably well maintained but little flexibility in regard to nutrient supply was possible. The advent of fertilisers stepped up crop yields by stepping up the supplies of available nutrients, especially of nitrogen; crop rotation, as a method of controlling and building nutrient supply, became less indispensable—the continuous cultivation of the same crop was made possible. Far too readily was it assumed that fertilisers could entirely replace manures. So they might—until the initial humus content of previously well-manured soils declined through non-replacement.

If enough manures are available, excellent yields can be obtained by the exclusive use of manures; for then not only will the humus in the soil be steadily increased but, because so much manure is applied, the total nutrient needs will also be met. Save for occasional deficiencies of one nutrient (easily remedied by an occasional fertiliser application) a farm with plenty of cattle and proportionately few acres of arable ground can effectively follow a predominantly manurial policy. But this, as every farmer knows, is not a general condition. In mixed or balanced farming, the practical policy for fertility is to allocate what manure there is so that the humus level of each arable field is maintained, and to supplement the small supply of nutrients in the manure with concentrated amounts in fertilisers. No policy is more likely to provide high yields and also to keep land constantly in good heart than the conjoint use of manures and fertilisers.

D. P. HOPKINS (*Farming and Mechanized Agriculture*, 1946).

PROBLEMS OF AN AGING POPULATION

BY

THEODORE G. KLUMPP, M.D.

[Recently volleys of questions were shot at the Treasury Benches in the Madras Legislative Assembly regarding the re-employment of retired men in Public Services. The main contention of the opposition was that by the employment of superannuated men, the younger members of the services are denied their rightful promotion in the Public Services. Readers would read with interest the following extract which we have taken from the *American Journal of Public Health*, Vol. 37, No. 2.—Ed. P.H.]

* * * * *

The argument has been advanced that we must clear out the older workers to make room for the younger men so that their progress upward in an organisation will not be unduly retarded. On the face of it, this line of reasoning appears to have some merit. But it is only another way of stating that there are more workers than there are jobs. During the war when there was a man power shortage no one was afraid that the old, the lame, the blind, and the halt, were taking jobs away from younger and more able workers. At other times similar arguments have been applied against the employment of women in business, government, and the professions. Certainly there is no arbitrary age at which older workers begin to repress the advancement of younger individuals. In a sense, every older individual higher on the ladder of advancement, whether he be 65 or 55 or 45 is holding a job that a younger individual aspires to and feels he can fill. That is always true and it will be just as true if we force everyone to retire at 50 or even 45 as we will have to do by 1980 if we do not find a more logical way of reducing the disparity between jobs and workers.

We must not lose sight of the fact that someone must support those that we retire to idleness. The more workers we eliminate, and particularly if we should lower the retirement ages, the greater will be the economic burden we will place on those who do work. They will have to produce enough to support themselves and their families as well as the increased numbers of those who become emeritus workers. The whole problem is the adjustment of the number of workers to the number of jobs available. The attempt to

strike a balance by eliminating all workers over a certain age is an unfair penalty on age and experience. In a refined and delicate way it is a perpetuation of the jungle law of the fang and claw where the leaders of the pack survive only until the younger beasts grow fierce enough to eliminate them. In modern civilization, we are less violent but the end result is approximately the same.

One of the most important steps in solving this problem is the successive reduction in working hours for all workers rather than by reducing more and more older workers to a state of parasitism. I venture to say that you and I will live to see a thirty hour week in industry.

Another view that is widely held is that older individuals become over-conservative, and to make progress we must eliminate these obstacles in the path of progress. Here again there are such wide variations in human reaction patterns that I do not see how one can logically draw generalisations that will fit individual cases. Certainly Bernard Baruch, 76 years of age, is no obstacle in the path of progress, and neither Senator Pepper nor Henry Wallace has become more conservative as he has grown older. As far as the great mass of jobs now subject to compulsory retirement is concerned, it makes no difference at all whether an individual grows more or less conservative. If individuals in key positions become too conservative with age or even too reckless, as they sometimes do, to meet the best interests of the organization a retirement board operating on a selective basis can function to correct this development, as well as any others that may arise.

AN EASY WAY TO GET MORE HOUSES QUICKLY

BY

LORD QUIBELL

(Former Labour M.P. for Brigg, who started as a bricklayer and now runs his own building contractor's business at Scunthorpe)

The Government, having considered the economic and man-power position of the nation, have arrived at the conclusion that further increases in wages cannot be approved unless there is a definite and corresponding increase in production alongside a grant of any further concessions.

This week we have had a claim put forward by the Federation of Building Trade Operatives for an all-round increase of 6d. an hour for the skilled workers and 9d. an hour for the unskilled, which has been refused by the employers' representatives of this industry.

Varying estimates have been made as to what the granting of this increase would mean in cost per house. From my own examination of the claim and of the man hours taken in erection of a house, this claim for a wages increase would result in an approximate rise in price of nearly £100 per house.

No one can guarantee at the present time that any rise in wages would bring a corresponding increase in output, for past experience has proved that the strongest appeals to the men by some of the most respected leaders in the building industry have simply fallen on deaf ears.

How could we meet wage claims of this kind and at the same time bring about that increase in out-put which is so vital? In my opinion there is one answer—the adoption of the bonus system of payment.

An example of this system is to be found operating on the new municipal housing estate at Scunthorpe, a town which needs over 2,000 houses to solve the problem of its homeless.

Here at Scunthorpe the contractors have taken the sum allowed for in the contract as the cost of labour, based as it is on the average output ascertained from present-day figures, and they have said to the men, having included this figure: "Go in and do your best,

and when the brickwork of a pair of houses is completed, the difference between the actual wages you are paid and the estimated cost which the contractor has provided for in his tender will be divided among you in accordance with the hours you have worked."

The men have accepted that challenge, and in doing so they have already been receiving in effect the wage increase the operatives' union has been asking for nationally, while my scheme has speeded up the building of houses.

It also has the merit of helping the man-power position. The men engaged on it stand to win and not to lose because they are guaranteed the minimum trade union rate of wages in any case, and are paid it.

The interests of the local council and community are safe-guarded because the council's engineer and surveyor is in charge, with an architect and, under him, a clerk of works on job from morning until night. The quality of workmanship and materials is continually under supervision.

I can safely say that this bonus scheme has given satisfaction to the men. It has been in operation on this site at Scunthorpe for some time, and I believe it embodies a principle which, if it were generally adopted, would speed up the building of houses in this country immensely.

The adoption of the principle does not in my view amount to the introduction of what we knew in the old days as piecework.

The principle of piece-work was to get a house or a pair of houses built at a fixed rate and the men engaged on the work had a definite price. They either won or lost, and very often worked hard and long hours, on some occasions actually earning less than the proper trade union wage in the long run.

This was an iniquitous system. It led in the old days to "scamped" work and waste of material, and altogether it has a bad effect on everyone engaged in the trade.

I would not approve for a single moment a return to this old system as a method of securing the erection of houses now or at any time.

But the bonus system to which I have referred has resulted in the men at the site earning and receiving something like 9d. per hour over the basic rate, which is actually more than the Federation is claiming nationally for its skilled men.

I consider this is not in complete accord with the announcement of the Government that higher wages must be related to higher output.

On this job the increase of production (the houses) comes first. The bonus is earned before it is paid. This is an extra reward for the men putting their backs into the job to help solve more speedily a vital and pressing problem which is of the gravest concern to Government and local authorities alike.

Payment of bonuses has been in operation for bricklayers in iron and steel works at Scunthorpe and elsewhere for many years. We know that under this system there have been some remarkable performances by bricklayers. Last December local workers created a record for speed in relining a blast furnace.

Surely this carries a lesson for us in our efforts to speed the day when every family has a home of its own.

(Sunday Dispatch, Jan. 26, 1947.)

MUCH ADO ABOUT SOMETHING—HOUSING.

The article comprises a discussion of low-cost housing, covering material and labour costs, contractor's profit, prefabrication, cost of land and improvements, taxes, rental, group housing, and ability to pay.

Fifty per cent of the people cannot afford to pay as much as \$ 25 per month. Subsidized construction by governmental units is indicated if improved housing is to be obtained for this group. The author's conclusions were as follows:

1. Slum clearance is desirable but rarely affords a solution to urban low-cost housing problems. Put legislation with teeth on the statute books to get rid of the slums as unhealthy, but don't build houses or apartments for people of minimum incomes on the same high value land when better opportunities exist elsewhere. Anyway, most slum areas need more open land for recreation.

2. If we want to provide decent housing for workers with incomes of less than \$ 100 a month (permitting payment of less than \$ 25 a month rent, on the average), we must accept the principle of subsidy and charge the cost of subsidy to improved health, lessened crime costs, and a fairer return for low-income worker perhaps recapturing a considerable part over a period of years in saving in government costs for congested residential areas. A generation of acceptance of certain minimum housing standards for the low-income group, and we would probably accept such standards and the cost of getting them as perfectly logical and in keeping with present minimum standards of education and provision for utilities. We do not differentiate between income groups in the water we supply or the brand of schools. We can still continue experimenting to find the \$ 1,000 house—but unless we find ways of reducing our cost of services, even a truly low-cost house doesn't give us the complete answer.

3. Any subsidy for low-cost housing must carry with it some public form of control over land development to stabilize reasonable values and discourage speculative excesses. Without such control, speculative orgies will occur in cities where many new homes must be built. With such control for both low-cost and medium-cost housing, certain municipal costs may be reduced.

O. J. MUEGGE, Earle S. Draper, *The American City*, Vol. 52, No. 12, P.H. Engng. Abts., Vol. XVIII.

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!

We owe our readers an apology. This section was absent in the last two issues. That was the result of "overcrowding". The author was overcrowded with other pre-occupations and the Editor was flooded with material for publication. We hope to abate this 'overcrowding' in future and keep up this feature.

We offered this section to our readers for their benefit. We invited them to put their problems to us. We sought their co-operation. We have now got a response. A field health worker has referred a problem to us. Here it is.

There is a cholera outbreak in a village. The only source of water supply for all purposes is a tank. The tank water is perhaps already infected; any way it may be infected any moment. Protection of water sources and sterilization of water form almost the sheet-anchor of cholera prevention. How is this to be done in the case of this village tank? That is the problem which baffles him.

While stating the problem and asking for a helpful solution, the health worker wants us to remember the limitations of field conditions. He states that he is working under a systematised administration, that somebody else somewhere holds the purse strings, that he has calls from several other places, that his equipment is strictly limited to one sterilizing agent, and so on.

We appreciate the difficult conditions in which he has to discharge his responsible duties.

We are thankful to this health worker. He is the first to respond to our invitation. He has put his practical difficulties before us. He is anxious to learn and secure help. Let

us see what solution we can offer him and how we can make his task easier.

India lives in villages in isolation. None of these can yet boast of a 'Safe' water-supply. Hundreds of them still depend on tanks for all their water needs. Cholera continues to be a periodical visitor; it takes its toll mostly from the villages. The problem which the health worker has presented is not an isolated one. It is bound to arise in many places, and at any moment. Numerous other health workers must have felt the same difficulty. If we hit at a practicable solution, it will help many a harassed man in the field.

We take special note of the limitations mentioned by our enquiring friend. We are aware of the field conditions in our province. We know how our people live and suffer. We are cognizant of the 'health organization' and the facilities they have. We remember the officialdom and the red tape that binds the worker hand and foot. It is with this awareness that we discuss the problem.

Let us take the possible and practicable solutions *seriatim* and see how far they are applicable to a given situation. That is the easiest way to explore the problem. It has another advantage. Situations may differ slightly in different places. One or other of the solutions may be found appropriate in any given place.

1. The first thing that strikes one is to prohibit the use of the tank altogether. It prevents use of infected water and stops future pollution. Drastic and effective, no doubt. But how can the sole source of supply be cut off? How to provide a new supply at a moment's notice? Even if this can be done, how to enforce the prohibition? One thinks

of "watchmen" in all such cases. But they are only partially effective. Their recruitment and payment are not quite easy in the village. So we may drop this idea, as impractical.

We have therefore to allow the use of the tank. In that case, what we have to do depends on whether the water is infected or not. It is not easy to make sure of this. More often than not, it is likely to be infected. If however, we are on the spot in the village when the first case occurred and observe the circumstances closely, we can be reasonably certain that in some cases the tank has not been infected. There will be no need then to sterilize the water or prohibit its use. All that we have to do is to prevent future pollution.

2. Pollution can be prevented if infected persons, vessels or clothing do not come in contact with the tank water. It would be ideal if we can set up a portable pump and pump the tank water and deliver it to the consumers beyond the bund. Or, at least sink a tube well near the bund (provided of course, the soil is suitable) and allow the use of the tube well only and not the tank. These are not likely to be immediately available; nor can they be erected with needed promptitude. One can also think of a temporary wooden platform projecting from the bund over the water surface, supported on posts and provided with a pulley. If the health worker can persuade the villagers to put this up, it can be done in a few hours. A common bucket and rope will enable every villager to draw his water without contaminating the tank. Somebody from the village may have to be deputed by turns to watch and see that the pulley alone is used. For, there will always be the temptation to just get down into the tank and dip the vessel in it, which is easier than baling out with a bucket. Where none of these methods are applicable, we have to trust to nature's purification and adopt a simpler device. Set apart two places in the tank as far away from each other as possible. Do not fail to note the direction of the wind. It has an influence on the movement of the water. Let one be used for washing and other purposes and the other for taking water home for drinking and domestic use. The pollution at one end is seldom likely to permeate the entire body of water in the tank and travel over to the other end. One

can't be however certain of the result. There is another danger of misuse and pollution of the reserved end by the use of infected vessels for taking water.

3. If the water is already polluted, as it is most often likely to be, we have to sterilise it first. Failing the adoption of any of the above measures to prevent future pollution, this sterilization has to be repeated as often as pollution occurs. The only substance supplied to health workers for water sterilization is bleaching powder.

There are three ways in which repeated chlorination can be applied. One is 'pot-chlorination' i.e., addition of a small quantity of standard bleaching solution to each pot of water as soon as it is taken from the tank. Dissolve one ounce of good bleaching powder in two pints of water and add one teaspoonful of this solution to every pot. To do this effectively needs vigilant staff. If a Volunteer Corps of the village can be organized to do this, it will be very helpful.

The second method is to get hold of some water casks, couple of workers, and a bandy. Have the casks filled, chlorinate the water in the cask and distribute it to the villagers. To arrange for such supply for all the needs of an entire village may be a huge task. The villagers have to be highly co-operative and civic-minded if they are to organize it by themselves. It may not be within the means of a poor District Board or Panchayat Board to effect this on a payment basis for every infected area.

The third way is the least effective. It has to be resorted to only when no other way is possible. That is to chlorinate the water in the tank for a limited area at the spot where from water is taken by the villagers. The quantity of water along the length of the steps to distance of about 8 feet from the water margin has to be calculated. The bleaching powder required for this volume of water should be dissolved in a bucket of water. The solution should be stirred into and mixed well with the tank water near the steps. It is safer to add a slightly higher dose to compensate for dilution. About one ounce of good bleaching powder for every 1,000 gallons may be appropriate. This has to be repeated at least once a day; it will be better to do it thrice or four times a day.

One of the difficulties mentioned by our correspondent was the fact that he had many calls to attend. This is true. One Health Inspector is in charge of a taluk. When cholera breaks out as an epidemic, new villages report infection in quick succession. One man has to keep running round to all the places. He naturally cannot spare more than a day or two to each place. Even when additional staff is appointed, they often have several villages to attend to. It will be physically impossible for them to repeat the chlorination even once a day in each village. If prevention of future pollution is difficult and if we do not have enough men to do the daily chlorination in each village, what then are we to do?

There is only one way in which polluted water can be sterilized and further pollution prevented in a tank. And that is by throwing a porous bund in a small portion of the tank. The water from the enclosed portion is to be used for drinking and domestic purposes. The water in the rest of the tank can be used for washing and other purposes. The enclosed portion need not be large in extent. In fact, the smaller it is, the better. About 6' x 6' or an arc of 6' radius is enough. The bund can be so modified that people can go along the top of it and draw water from the enclosed portion by a bucket and rope as from a well. Such bunding is not a difficult task. Bigger bunds are put up in double quick time by the villagers themselves, if a tank or stream breaches its banks. It will be easy to collect enough gunny bags in the village, fill them up with sand and loose earth, and throw them in proper position. This forms the core of the porous bund. This can be strengthened by ordinary earth from the tank bund. The villagers can easily co-operate and finish the task in a few hours and at practically no cost to the local body. At the worst, the cost of the gunnies and the labour is not likely to be high. Once done, it remains a permanent improvement to the tank. It practically forms two sources of supply. One of them can be kept free from pollution and used for drinking.

Having thrown such a bund, let the water in the enclosed portion be chlorinated as in the case of a well. Provided this portion is not polluted, there is no need to repeat the chlorination. Even if it is to be repeated, it is easier to chlorinate this more effectively than the water in the tank itself near the

steps. This has yet another advantage. Even if the rest of the tank water is muddy and polluted, the water which has passed through the porous bund into the enclosed portion will be clearer and less polluted.

Though this is the best method, health workers may not often find it practicable. It takes time to convince the villagers and get them to do a job of this kind for their own benefit. Official decorum may inhibit the adoption of measures not favoured by those above. Unless the best available measure is advocated by the department officially, the field worker cannot feel sure of the backing he needs to go forward in his task.

We have not referred to one measure which is cheap, simple and universal, a measure which will guard against present as well as future pollution. That is boiling all water used; or at least boiling drinking water. Every body is taught the efficacy of this measure in preventing water-borne disease. It is mentioned in every text book. Health staff harp on it in season and out of season in their propaganda. We however feel that the advocacy of boiling betrays our bankruptcy. Does it need on elaborate health organization and so much lip-service of the State to Public Health to merely ask the people to boil their water? If the health worker is unwilling or unable to do anything positive for the tank water of the village, he can salve his conscience by putting the onus on the villager in the shape of the 'boiling advice'!

We feel that we have dealt with the question rather elaborately. It is because we are anxious that the health worker who has a difficulty should know all possible ways and be able to adopt any one, as circumstances permit.

While on this subject, we cannot but put down a few stray thoughts which occur to us. We are sure the same ideas have crossed the mind of many a health worker. Official decorum may enjoin their silence. We are under no such inhibition. We may be doing a distinct service to the health worker, if we voice those ideas on this occasion.

Why should there be such a problem in our villages? Our State consists of villages. Health is the primary concern of the State. Safe water is the first step in the promotion

of health. It does not need much logic to say that safe water to all our villages is almost the first charge and responsibility on the State. It took more than a century of British administration to realise this. It was in 1937 a planned scale by the State. What is the progress in ten years? What is the present policy? Is there any moral justification in delaying this further and setting impossible tasks for the health worker? He cannot make bricks out of straw; why ask him to protect the unprotected?

* * *

Our Province had a clear vision soon after the war of 1914-1918. It organised a separate health department in 1922. It took much pride on this forward step and earned encomiums far and wide. But that vision was shortsighted. Having started well, it has almost stayed put. Although the population has increased by more than a third and the people's needs by a still greater measure, the organisation remains almost the same. Has it expanded sufficiently? If it had, why do we still have the sorry spectacle of one man making vain and superhuman attempts to cater to the needs of two lakhs of people spread over 200 villages? For the mere job of collecting revenue, we have one Inspector for about 20 villages; for safe-guarding health not even a tenth of it!

* * *

We created Local Self-Government, institutions and made them impecunious. We saddled these convenient creatures with all the troublesome task and wearisome burden. Education, communications, health and what

not are all "local" concerns. "Local" in the sense that the "State" has nothing to do with it but to find fault now and then. State responsibility for health is coolly shelved. What Machiavellian tactics? The Britisher who ran the administration hitherto could not have placed himself in a happier position. He runs the State, and the local body—where the people are supreme—takes care of health. If health is bad—well, the local body is at fault, not the State administrator. To give us a bad name, he keeps the local body crippled; but judiciously throws a few crumbs in the shape of grants lest it barks too much. Why not now at least be honest and make public health the first charge on the State? Why not let the people police themselves instead?

* * *

The Army is the most perfectly organised body. It is tuned for mobile work. It is adopted to meet all adverse conditions. It is equipped to fare well and healthily under conditions which are worse than our villages. It has perfect equipment units for temporary water-supply which are portable easy to instal and maintain, and not very costly. Why not get as many of them as possible for each district to serve situations similar to the one discussed above?

* * *

These stray thoughts should not be brushed aside as beyond the scope of this section. The answers to these queries will help the health worker in his chosen task and aid the quick achievement of his objective. We need not say who is to give the answers or what the answers should be.



Pioneers in Public Health

TO OUR YOUNG FRIENDS

BY

A COMRADE

PIONEERS IN PUBLIC HEALTH

May all be healthy and happy!

INTRODUCTION:—Let me first of all thank the Editor for allotting this section to me. In this series, I propose to give you the lives of the great men and women who have done great service towards the promotion of the health of the people. As Longfellow says:

"The lives of great men all remind us
That we can make our lives sublime,
And departing, leave behind us
Foot-prints on the sands of time."

* * * *

"William Harvey! Never heard of him!" I hope this won't be the remark you make when you look at the heading. If you are really ignorant of even the name of this great man, you are not to be complimented on your general knowledge. At any rate, don't confuse him with Harvey Australia's opening batsman. I think the picture ought to show. But even if you think of the Harvey

WILLIAM HARVEY



I speak of, as an opening batsman, you will not be very wrong. Yes, this Harvey has opened. He has opened our eyes to a fact, a fact on which all our knowledge of physiology of today is based—the fact of the circulation of the blood.

This great man was born at the village of Folkestone on the 1st of April in the year 1578. He was born in a well-to-do family and was given the best of education that could be had at the time, in King's School, Canterbury. After completing his school course, Harvey studied at the Caius College, Cambridge. Being interested in Medicine, he was sent to Padua in Italy. This Italian University was far ahead of other Continental Institutes in Medical subjects. After obtaining his medical diploma in 1602, Harvey visited Bologna and Pisa. At these places, he heard Galileo Galilei lecture on the newly discovered laws of mechanics. He also had the privilege of hearing Fabricius speak on the doctrine that veins have valves that force the blood in a certain direction.

Needless to say all these new theories set the mind of Young Harvey a-thinking.

William returned to England in 1603, where he was appointed as a physician in St. Bartholomew's Hospital, London. He was also a lecturer in the College of Physicians and had the honour of serving King James I as a medical attendant. Though Harvey had a lot of work to do, yet his mind was on something else

Thus far, doctors were puzzled at the flow of blood and the heat of the body. They were unable to account for them. Harvey had his own opinion on the matter. But he waited to convince himself by observation and reasoning before he published his view. At last in 1616 when only 38 years of age, he expounded his theory to the College of Physicians. He also elaborated on it in a book which he published in 1628. Harvey showed that it is when the heart contracts that it does its work—that it pumps the blood to all parts of the body.

"The idea that in some blood-vessels (the arteries) the blood is always flowing away from the heart, and in others (the veins) is always flowing back into it, was quite new. Harvey was led to this discovery not only by experiment and careful dissection, but by calculation. By finding how much blood the heart drove out at each beat, and measuring the rate of beat, he showed that in half an hour it must pump as much blood as there is in the whole body." (E. N. Da C. Andrade and Julian Huxley in *More Simple Science—Earth and Man.*)

Harvey's discovery came at a time when Galilei's laws of mechanics were creating a revolution in the scientific world. The conservative medical men of the day—so to say—were unable to keep up with the rapid progress of science and did not like the superstitious old ideas being blasted and newer and truer theories coming into vogue. These men did not greet Harvey's discovery with any regard. Indeed William had to face a great opposition. He came "into acute disfavour with his professional rivals and his income as a doctor seriously declined". Every pioneer has suffered for the good of the people.

Thus far, Harvey the scientist. Let us now look at Harvey the man. He had the peculiar quality of detaching himself from his work for some time and delighting in childish pranks. He would rush from hospital or court to his room where he had hens sitting on eggs for him! He would then take an egg, open it and study the great problem of the development of the embryo within it!

Harvey was a great thinker. He thought every second of his life. Even at night, he would be seized with a frenzy of thought and had to pace up and down the room to calm himself.

Like many great men, Harvey suffered from physical infirmity. He pained under gout. The disease would plague him when he was engaged in serious thought. He would then "sally forth in the same scanty raiment (night-shirt) to the leaded roof of his London Home and sit

there with his legs in a pail of freezing water till he was almost dead with cold; then betake himself to his stove and 'twas gone'.

Harvey had a quick and fearful temper but he was a very benevolent man and could be very affectionate at times. "He was a childless husband, a devoted brother and in proportion to his means, a princely benefactor to the Royal College of Physicians, which still preserves as its richest treasure, the little notebooks from which he quietly and modestly delivered the lectures embodying the greatest of revelations ever made up to this day concerning the human body."

Harvey's discovery is all the more remarkable when we find that he did not possess a really powerful microscope, and it was only four years after his death that an Italian named Malpighi completed Harvey's theory by discovering capillaries, with the aid of a more powerful and compound microscope.

Harvey was also a faithful courtier; he attended on King Charles I during the Civil War at Oxford and Naseby, even when Cromwell's men were clearly having the upper hand. He was made a Warden of Metron College, later.

Harvey died at the ripe age of 79, on the 3rd June, 1657. Though he

is dead, his great discovery will continue to live for many more centuries to come. To "commemorate Harvey's work a HARVEIAN SOCIETY was founded in 1831. The centenary of the Society was celebrated in 1931."

* * * *

So, comrades, I hope this story has set you thinking! You can expect another one next month. I thought I could write on Jenner. But the clever editor has covered the subject giving an extract in the month of April, taken from *Science Broadcasts*. I have nothing more to add to that and therefore I am dropping out Jenner from my list. I shall write on Louis Pasteur next month. If you find anything of interest on the subject, you may send it on to me and I shall try and introduce the points somewhere. I am gathering my information from all sources available to me. The portions within inverted commas are taken from the *Children's Encyclopaedia* written by Mr. Arthur Mee, the popular editor of the widely read *Children's Newspaper*. I have also extracted from other books. Please excuse me if I am not able to quote the authorities from which I have taken extracts here and there.

Your Loving Comrade,
MOHAN.

COUNSEL TO THE YOUNG.

Might I give counsel to my young hearer, I would say—Try to frequent the company of our betters; in books and life that is the most wholesome society; learn to admire rightly—the great pleasure of life is that. Note what the great specially admire; they admire great things: narrow spirits admire basely, and worship meanly.

Thackeray.

READERS' FORUM

MEDICAL PRACTITIONERS' INCOMPETENCE—TRAGIC RESULTS ENSUE!

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.)

DEAR EDITOR,

The dumb people of the country should feel highly grateful to you for exposing the absurdity of the Press Communique of the Government of Madras, which pretends to set out the reasons for preferring 'co-ordination' between Medical Curative and Medical Preventive Health Services to 'amalgamation' which you strongly support. I am specially interested in the argument which you have advanced in support of your stand, namely 'it is idle to expect the curative man to stray from his traditional sphere of cure and to deal with the field aspects of prevention'.

Kindly permit me to narrate two tragic instances which are within my knowledge. They conclusively established your case for giving the top rank of direction to the medical preventive man. Many similar incidents might have occurred; but few dare come with their stories lest they shall offend the concerned medical practitioner who is after all licensed to kill people with impunity. This class of professional men are generally immune from action in Courts of Law in this country. Here, no medical man dare come and give evidence against another member of the Trade Union to which level the so-called 'noble profession of healing' has descended.

Case 1.—A member of my household developed high fever for no apparent reason. As usual the family physician was called in immediately. He visited the patient at least twice a day. He was prescribing mixtures every day if not every time he saw the patient but in spite of all this, the temperature did not abate. The condition remained the same for four long days. On the fourth day, however, some evidence of small-pox was

apparent even to the eyes of a layman. When the medical attendant was specifically asked whether it was not a case of small-pox, he repudiated the suggestion. Eventually it did prove to be a case of small-pox. The medical attendant failed to diagnose a case of this kind. That shows his competence to deal with cases of small-pox. Of course he did not suggest any preventive measure to protect the other members of the family against infection, even when it was brought home to his mind that it was a case of small-pox. This incident would have led to serious complications but for a medical preventive man coming to our aid just at the nick of time.

Case 2.—A girl of 18 was pregnant. This is not uncommon among us, Indians. In due course the girl brought to bed a child. Soon after, she developed temperature. The temperature persisted for quite a long time. The medical attendant in charge of the case was generally averse to calling a consultant even when a suggestion to that effect was thrown. He claimed to be an expert in obstetrics. He also claimed to be all-knowing in all branches of the medical profession! He was 'treating' the case for quite a long time. How many visits he paid cannot be counted. One day it occurred to the mother of the girl that it might be after all a case of tuberculosis. The medical attendant was given all freedom to have the case investigated. Some money was also thrown away in getting an X-Ray. The medical practitioner swore by all the Gods, in whom he had apparently no belief, that it was not a case of tuberculosis at all. The temperature persisted, the medical attendant consoled the relations that the girl would become normal soon and that the thermometer could be broken

thenceforth. In due course the girl with her baby joined her husband. Unfortunately the girl became pregnant again. This is again not quite uncommon among us who do not understand the technique or 'spacing babies'. The poor girl was running a temperature all time. A second baby was born. The same expert medical practitioner was in attendance. He pooh-poohed the idea of the girl running a temperature. He gave explanations which did not appeal to commonsense but the family was in a way bound to retain this medical practitioner as a family physician. The elder members had no alternative but to be guided by this all-knowing medical practitioner. This was going on. The patient was also going down. One day the medical practitioner called aside the elder member of the family and whispered that the girl was suffering from tuberculosis of the 'galloping type' and that she should be removed immediately to a sanatorium. This was a veritable thunderbolt. What happened to the patient and the rest of it are not our concern here. What I wish to stress is the case would have taken a different course with very different results, had the curative man been compelled by law to report such cases to the preventive man immediately the case was suspected to be of tuberculosis. Medical profession has no respect for moral law. Had the medical practitioner been trained with a preventive bias, he would have taken the precaution necessary to protect the patient from what practically threatened to be a disaster. This medical man has not so far to my knowledge taken care to examine whether the tender baby had developed infection. They say that children at the arms of a tubercular mother ever run the risk of contracting the disease. My deliberate conclusion is that such a medical man is not only an imposter but also a fraud of the first water and a public enemy No. 1. This is the mildest form in which I could express my strong feelings in the matter. Those who govern us do so with little wisdom, knowledge or experience.

If the Minister of Health is really a 'people's man' he should straightaway accept your suggestion instead of protecting the interests of exploitation of the medical curative man.

* * *

SITA.

Dated 15-4-1947.

DEAR SIR,

Re: POONDI RESERVOIR—BOATING AND FISHING IN.

The Hon'ble Minister for Local Administration who inspected the Madras City Water-supply including Poondi Reservoir on Sunday last is reported to have suggested among other things:

1. The need for properly exploiting the Poondi Reservoir for Pisciculture and
2. The provision of necessary amenities at the Poondi Reservoir site for week-end parties of visitors from the city, in the shape of hotels and facilities for fishing and boating in the Reservoir itself.

Both would be most useful, valuable and welcome suggestions, if the Poondi Reservoir does not form a link in the chain of the city drinking water-supply system. Before giving effect to these proposals, it would be wise to obtain expert advice on the propriety of permitting Pisciculture, fishing and boating in a drinking-water supply storage Reservoir from the epidemiological and public health points of view, apart from aesthetic considerations.

Drinking-water sources are considered sacred and direct access to the water therein is to be denied to men and animals according to accepted canons of water-supply conservation. The fact that the water as finally supplied to the inhabitants of the city from the Kilpauk end of the water-supply system is heavily doped with chlorine and rendered relatively safe for human consumption, cannot be always relied upon to eliminate all infection and to safeguard and supply against potentially dangerous pollution (from human and other adventitious sources) that is bound to occur when an open storage reservoir is used also for fishing and boating purposes. This is particularly liable to occur when short circuiting has to be resorted to, to meet peak load consideration beforehand.

I believe "Prevention is better than cure" is still the guiding maxim in all matters relating to the public health of the Province.

A Water Bacteriologist of
33 years' standing.

* * *

We wish the Ministers of the State are not as free with their opinions and statements as they seem to be. If they expect that

some importance should be attached to their opinions and statements, they should make them known to the public only after careful consideration beforehand.

From Press reports, it would appear that the Minister for Local Administration enquired as to the reasons why the water supply to the southern parts of the Madras City was at such low pressure. A very pertinent question indeed! The Corporation authorities appear to have told him that if an independent main were laid at a cost of Rs. 20 lakhs the condition could be improved. The Corporation authorities also seem to have taken advantage of the personal contact with the Minister and appealed to him to see that financial assistance is given by Government. The Minister appears to have promised to do his best. The promise may mean anything or nothing; but we would strongly suggest

to the Ministers concerned in the matter, to give a careful study to the history of the distribution system in Madras and ascertain whether the provision of an independent main or mains would form part and parcel of a scheme of distribution of water to every citizen within the City area in adequate quantity and with adequate pressure. We maintain that any financial assistance rendered to the Corporation on piece-meal proposals is good money thrown away on a bad job. Further, we fail to see any justification for large amounts of money being given to the Corporation of Madras when absolutely nothing has been done to give a *chombu* of safe drinking water to the masses. After all it should be remembered, it is the half-naked, half-starved farmer who finds the bulk of the finances of the State and it is from them that the Ministers have acquired their positions of power and authority.—Ed., P.H.]

DISEASES DUE TO IMPURE WATER.

1. *Cholera and Typhoid Fever*.—The most important water-borne diseases are cholera and typhoid fever. The contamination of the water supply at Hamburg, which is obtained from the River Elbe, led to the serious outbreak of cholera in that city in 1892. The pollution of the water supply at Maidstone (1897), at Lincoln (1905), and at Barcelona (1914) gave rise to very serious outbreaks of typhoid fever. The total number of cases in the Lincoln epidemic was 1021, of which 120 were fatal; the Barcelona outbreak caused 1871 deaths. The association of outbreaks of these diseases with polluted water supplies is very frequent. The latest water-borne outbreak of enteric fever in this country was that which occurred at Croydon in 1937. In this case the specific pollution of water supply was attributed to a typhoid carrier working in one of the adits or galleries of a deep well.

2. *Dysentery*.—Several epidemics of this disease have been traced to the use of impure water, especially when impregnated with sewage. An outbreak in the Ogmore Valley in South Wales was due to polluted water finding its way into springs feeding a supply main.

3. *Diarrhoea*.—A high prevalence of diarrhoea has often, in the past, been associated with the use of polluted water supplies, and the improvement of the supply by filtration has been followed by considerable diminution in the incidence of the disease.

4. *Poliomyelitis*.—The virus of infantile paralysis is excreted in the faeces, and there is a good deal of evidence to show that it may be water-borne.

5. *Goitre*.—M'Carrison's researches have shown a connection between endemic goitre and a polluted water supply, although the disease appears to be mainly owing to iodine deficiency.

6. *Entozoa; etc.*—may be conveyed by water, e.g., tapeworm ova.

The spread of glanders in horses was found to be largely caused by the use of public drinking troughs; where these have been abolished the disease has been greatly diminished or extinguished. Tuberculosis and foot and mouth disease are spread among cattle by infected water troughs, etc.

Public and semi-public supplies of drinking water usually take the form of a faucet with a metal cup fastened by a chain. The cup is liable to become infected with the bacteria of a scarlet fever, diphtheria, etc. Such chained cups should be replaced in schools, factories, and elsewhere by bubbling fountains, so arranged that on turning on the supply the water bubbles up in a small jet which can be received into the mouth without risk of infection. A metal guard prevents persons putting their lips directly to the faucet.

(From "Text-Book of Public Health" By W. M. Frazer and C. O. Stallybrass, pages 110-111).

LAW AND PEOPLE'S HEALTH

LEGAL DECISIONS RELATING TO DISTRIBUTION OF PUBLIC WATER SUPPLIES

BY

FRANK A. MARSTON,

Partner, Metcalfe & Eddy,

Boston, Mass.

It is a well-established principle of law that the operation of public works by a municipal corporation, as well as by a private corporation, is a proprietary function; and that the water authority is responsible for damages in the event that neglect is proven. In most of the states it must be established that the municipality or private company did something that it should not have done or neglected to do something that it should have done. (1).

The argument that the operation of water works is vital to maintaining sanitary and healthful conditions in a community, and is therefore a governmental function, has failed to relieve the water authority from responsibility. The argument that the operation of water works is in part for purposes of fire protection and is therefore a governmental function has also failed to shift the burden of responsibility, except where the damage claimed clearly resulted from the service of fire-protection service apart from that of water supply service. (2).

Damage in general may result from:

1. Leakage of water from the distribution system.
2. Water of quality injurious to health.
3. Water of quality injurious to industrial processes, goods, etc.
4. Structural defects in the system.
5. Lack of water pressure or lack of water.
6. Methods of construction contrary to generally accepted methods.
7. Careless work during construction.
8. Negligence in operating and maintaining water works.
9. Hazardous conditions on users' premises.

Negligence, if proven, on the part of an employee or agent makes the municipal corporation as well as private corporation liable for damages.

Leakage from the Distribution system.—

The usual case involving damages due to leakage of water from the distribution system is that resulting from the break of a pipe. To prove negligence in connection with a pipe break, one or more of the following must be shown:

1. The installation of the pipe line was not legally authorized.
2. The design of the system, structure, pipe line or appliance was not in accordance with recognised good practice.
3. The materials used were not in accordance with recognized standard practice or good usage.
4. The method of construction was contrary to generally accepted methods of procedure.
5. The water authority failed to protect its pipe, knowing that work was being done by others that might endanger the pipe.
6. There were other breaks or leaks in the same locality and under similar conditions, which should have warned of probability of a defect. The defect should have been apparent was not concealed.
7. Diligence was not shown in shutting off the flow of water or in repairing a leak.
8. An adequate number of shut-off valves was not provided.
9. Adequate provision was not made for maintenance or for handling emergencies.
10. Sufficient records were not kept as to the location of stop valves and other essential features of the distribution system.

While in most of the states it is necessary to establish negligence, the state of Minnesota seems to be an exception. In that state, the fact that water escaped from a pipe or reservoir seems to be the important fact and it is not necessary to prove negligence. The decision of the Supreme Court of Minnesota in *Bridge-man-Russel Co. v. City of Duluth* (3) discusses this rule in detail and gives a number of citations, (4), including a reference to the English authority (5).

In Massachusetts a municipality supplying water was held responsible for a leak in a stand-pipe which rendered it empty and deprived the service pipes of pressure, where due diligence in discovering the leak and starting the pumping engines was not used. (6).

At Buffalo, N.Y., cellars were flooded by a broken main owned by the city (7). It was testified that a small truck, weighing about 3 tons, crashed through the centre of the asphalt-paved street and caused the break in the main, but the property owners contended that the city maintained the main in a dangerous and unsafe condition and did not take precautions to protect the property owners. The latter also contended that the city employees did not turn off the water promptly when notified of the break. It was further proved that, in the section broken, leakage from joints was washing away the pipe support, leaving the pipe susceptible to breakage from above. The final court found the city was not liable but held that, if a city failed to prove its officers and employees used ordinary care, the property owners were entitled to recover damages.

According to a New York court decision, damages caused by a break in a water main cannot be charged to the city or water corporation, if the employees were not negligent in making the installation, if employees responded promptly when informed of the leaks, and if there were no other breaks in the same locality and under like conditions which should have indicated to the water department employees that this particular main should have been inspected to determine the possibility or probability of a defect (8).

In Massachusetts, however, the city of Boston was not held liable for damages due to a bursting water main, even though it had

previously repaired another break nearby, since the cause of the break in question was unknown (9). The court ruled that, when the city repaired the first break reported, it was not obligated to expose and examine all the pipes at the intersection where the break occurred.

In a western city, a contractor excavating in the street broke a water main, causing damage to a property owner who needed to obtain water but could not (10). Although the contractor had notified the city to make repairs, the court held him liable and the city not liable, because the contractor had interfered in the relationship between the municipality and the inhabitant.

In Richmond, Va., the city owned and installed the mains and accessories, including meters. A company leased a building, where the water for a lavatory and water stand was supplied (11). The service pipe carried the water from the main to a meter, located (about 18 in. below the ground) under the sidewalk and near the curb. After passing through the meter the water continued through the service pipe into the basement of the building, where pipe connections were made to the lavatory and the washstand. One afternoon the manager discovered water running into the basement from numerous openings in the front wall of the building; through which the service pipe entered. He notified the water department which immediately cut off the water at the meter, stopping the flow into the basement. The meter was removed and a new one installed. In the suit it was proved that two of the bolts and washers in the bottom of the meter had given way and allowed the water to escape. The city denied negligence, since the defect was latent and could not have been discovered by the exercise of ordinary care. The court held the city not liable because the defect was not susceptible to discovery.

A similar finding was made in a case involving the city of Grand Rapids, Mich., where a break occurred in an elbow of a lateral main, flooding a basement and causing serious damage to a stock of seeds (12). The owner of the seeds failed to prove that the defect could have been discovered and repaired by the city, and the higher court held the city was not negligent since the defect was concealed. The court ruled that actual notice of the

defective condition of a water system, either by reason of knowledge of a break or an overflow at the point of damage, or by reason of a like occurrence, is pre-requisite to a finding of negligence on the part of the owner in maintaining the system.

Other cases of leakage, in which diligence was not shown in shutting off the flow of water or in repairing the leak, are cited later in a discussion of cases involving negligence in operating and maintaining water works.

Cases involving water leakage usually relate to leaks in water pipes outside the customers' premises. The probable disposition of a case where the leak is in a service pipe on the customers' premises, but outside the building stop-cock, may be expected to follow the general rule that, if the water purveyor is to be held liable, there must be responsible control by the water authority and negligence must be proved.

Water of Quality Injurious to Health.—

The courts have frequently held that water authorities are responsible for the quality of the water delivered to consumers (13, 14). Water may be contaminated either at the source of supply or during distribution, but this discussion relates only to cases of contamination of the water after it enters the distribution system.

Cross-connections in the distribution system between the pure public water supply and an impure private supply may result in pollution of the public supply (15). Polluted water from a sewer or cesspool may leak into a water conduit that is not under pressure (?).

Failure to sterilize new water mains before placing them in use may result in contamination of the water passing through them.

Leakage into under water pipe lines when internal pressure is removed may cause contamination of the water.

In the Pennsylvania Railroad case (16), involving a cross-connection, the court ruled that the city was bound to exercise reasonable care to see that no impure water entered its water main from a connecting railroad main. Since the water in the railroad main was taken from a typhoid-polluted river, both the railroad and city stood charged with notice of the character of the water. The court further held that the evidence sustained a finding

that both railroad and city, in maintaining a check valve in the water main, were negligent and that such negligence was proximate, because of the intestate's death from drinking impure water.

In discussing a case in the state of Washington the court said (17):

"It is sufficient to say that the evidence discloses that on April 11, 1923, a six-inch main was laid to connect two laterals, and that when the connection was so made it permitted free circulation of water to the city users in the district served, and also better service to the Eclipse Mill Company—At the time this connection was made, there was a by-pass which had existed for a great many years. With the making of the connection there was no longer any need for the by-pass. This by-pass had in it what is known as a gate valve A—a valve worked by hand, and which when closed effectually prevented water from passing through the pipe. There was evidence that the city never inspected the valve in the by-pass from the date of its installation. The ease with which the valve could be sealed or the by-pass removed and the imminent danger to be apprehended by failure so to do are strong factors in the question of the city's negligence."

As a result of its finding the court awarded the plaintiff 60,000 dolls.

In a New Hampshire case, negligence was alleged in that the defendant municipal corporation failed to clean out its water pipes or to provide means of cleaning them out (18). Consequently, foreign and decayed matter became lodged in the city's pipes, entered the pipe leading to the plaintiff's dwelling and was there consumed by the plaintiff's intestate, causing him to sicken and die. The court held that the defendant was liable.

Water Of Quality Injurious in Industrial Processing.—

Operations of water works forces in flushing mains, testing the flow capacity of mains, and other works that may cause an unusual circulation of water in the system are likely to stir up sediment, with resulting possible damage to laundries and industrial processes and products. Breaks in main pipes may cause similar conditions. The water authority may be held liable for damage in such cases, but only if negligence can be proven. In the

case of changes in quality of water due to fire flows, the water authority would probably not be liable.

Structural Defects in the System.—

The water authority is responsible for damages resulting from defects in its structures. Cases in this classification commonly involve claims for injuries sustained in falling over projecting curb boxes or meter boxes installed outside the premises of the water taker, in the sidewalk or street. Other cases involve damages because of projecting gate boxes, manhole covers, etc. The following typical cases illustrate the attitude of the courts with respect to the responsibility of water authorities.

The Indianapolis Water Company was held liable by the higher court for damages sustained by a person who tripped over a projecting curb box and suffered severe injuries (20). The water company was deemed to have control over the service line and curb box, because it issued a permit to a plumber, who installed the service line for the property owner, and required the plumber to post a bond of 1,000 dolls. approved by the water company, and because the company retained the right to maintain or replace the service line between the main and the property line. The water company was held responsible to the travelling public, even though the company's rules provided that the water taker should maintain the service pipe and that the water company should not be liable for any damage caused by defects in any of the consumer's pipes or appliances.

A case in Texas also involved injury to a pedestrian from a defective curb box, which had been installed by a private party with the consent of the water consumer (21). In this case the water company exercised no control

whatever over the installation of the private line or curb box, and the higher court held that, under the circumstances, the water company was not liable for injuries to the pedestrian.

A Missouri case is of interest, in that the highest court held that the customer may be required to install the service pipe and curb box and, when he has done so, they become appurtenances to his realty (22). The court further held that it was the duty of the customer to maintain and repair the service pipe and curb box, thus making the customer liable and not the company.

In Iowa a person sued for damages as a result of falling over a defective curb box (23). The higher court held that the curb box was maintained for the common use and convenience of the company and the property owner, and that it was clearly the duty of both to use reasonable care to see that the curb box was maintained in such a condition as not to be a source of danger to the travelling public. This case established that water company and consumer may be jointly liable and that damages may be collected equally from each.

It is possible, however, for a contract to be executed between the water authority and the property owner whereby the property owner can be made to assume full responsibility for damages caused by defective service pipe and appliances, even when the water authority and property owner may be held jointly liable in the first instance.

In Montana, a water company was held liable for the repair of a curb box projecting above the sidewalk, even though the cost of labour and materials used in construction of a connecting box was paid by the property owner (24). (To be concluded.)

Continued from page 441.

forms provided for cumulative school-health record and check the school sanitation and evaluating different phases of health education programme, viz., environmental, nutrition, mental and social practice and general health education. A very valuable bibliography is also given at the end.

One would be tempted to say—"Look at this picture and that" comparing health edu-

cation envisaged in our schools! But nothing prevents beginnings being made in the right direction. "The school and the home should be laboratories where good living can be understood and practised" and in turn shape the life of the community.*

The book is neatly and attractively got up.

L.T.



"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!

**FOOD VALUES AT A GLANCE
AND
HOW TO PLAN A HEALTHY DIET**

Author : Violet G. Plimmer.
Publishers : Longman's Green & Co.,
London, New York,
Toronto.

First published in October, 1935.

Reprinted in February, 1945.

Pages: 190. Size: 6 $\frac{3}{4}$ " x 5 $\frac{1}{4}$ ".

The title of the book "Food values at a glance and how to plan a healthy diet" reveals the objects in view of the author in bringing out this small book of 190 pages. The book gives in a small space all that the lay public should and need know on food and the planning of balanced diets "in a form that is not too technical". Though the author disclaims that she is an expert on Nutrition—she has dealt with the subject for the lay reader in a manner and style of which few experts are capable.

After discussions about the prevailing mal-nutrition, she deals with the nutrients in a "complete diet" briefly outlining the importance of minerals and vitamins in a balanced diet. The food requirements under calories, proteins, calcium, phosphorous vitamins and iron, in five short chapters. She discusses the composition of a standard diet

where the gram values work out at 1:1:4, for proteins, fats and carbohydrates respectively, comprising 100 gms. of proteins, of which 50 per cent should be first class protein derived from animal sources, 100 gms. of fat and 400 gms. of carbohydrate, and providing about 3,400 calories for an average adult doing light work in temperate climates and satisfying the needs of the body for protective (vitamins and minerals) and structure foods. Under vitamin B₁ sufficient stress however, is not laid on the increased needs of this vitamin for people whose staple food grain is "rice" or other cereals. In her great enthusiasm for proper nutrition, she has also been led to make statements which do not stand scientific scrutiny like "war time restrictions (in food) led to a decrease in cancer and diabetes which are associated with over-nutrition." She discusses briefly and succinctly in succeeding chapters "typical day's food" for an adult, catering balanced and economical diets for institutions, and "square meals" for adults, infants, for animals and for slimming. Concise notes on common foodstuffs, meat and meat products, milk and milk products, pulses, fats and oils, fresh fruits, salads, canned foods are given to enable the lay reader to pick and choose what is best for himself or herself. The present day agricultural policy of the Government in England, mal-nutrition in its relation to the cost of living and the methods by which a housewife can balance the food needs of the

family by economical budgeting and selection of cheap but nutritious foods, are discussed. The last chapter "the place of food in the cycle of life" is an admirable review of the ecology of the micro-organisms,—the anaerobes and the aerobes, the nitrifying bacteria, the nitrogen, carbon and sulphur cycles—and their role in nature, in reducing harmful dead nitrogenous and non-nitrogenous organic matter into stable inorganic and organic material—nitrates and Humus—which serve as food for the plant kingdom, which in turn, manufacture proteins, carbohydrates, fats, vitamins, A, B, C and D for human and animal sustenance in Nature's economy. She bewails the use of artificial manures, the impoverishment of soils by the so-called intensive cultivation modern methods and puts in a strong plea for adoption of composting bulky farm wastes and human and animal wastes, for the production of compost manure or humus for enriching agricultural lands and for increased production of food crops.

She furnishes at the end very useful and instructive tables on energy requirements at different ages, biological value of various proteins, comparative protein and energy values of foods, costing a shilling each, comparative Vitamin A₁, B₁, C, D value of foods, average nutrition content per ounce of common foods, etc. Coloured charts are included which graphically visualize known facts and figures on "square meal" (frontispiece), and percentage composition and vitamin indices of meat, fish, milk, cheese and eggs, fats and oils, cereals and starchy foods, dried pulses, nuts, fresh and dried fruits, vegetables and changes in the diet as weekly income rises or increases. The costs of the diets worked out are based on prices prevailing pre-war and of course do not conform to the present prevailing high prices.

The book is a very welcome addition to the literature on food and nutrition for the lay public. It is written primarily for the benefit of the common man and woman in England and hence reviews only the common English foods. It is hoped that nutritionist experts in our country would emulate the author's example and ere-long will bring out a similar volume amply illustrated by tables and graphical representations—which will catch the eyes of the lay reader—dealing with foods commonly consumed in the diverse regions of our vast sub-continent. D. S. R.

VIRUS AS ORGANISM.

Author.—F. M. Burnet, M.D., F.R.S.

Publishers.—Harvard University Press,
Cambridge, Mass., U.S.A.

Pages.—134.

Size.—8 $\frac{3}{4}$ " x 5 $\frac{3}{4}$ ".

First Published in 1945.

Second Printing 1946.

This is one of the Harvard University Monographs in Medicine and Public Health. It represents an expanded version of the Dunham Lectures for the promotion of medical sciences delivered in 1944 at the Harvard University.

Harvard is the premier University in U.S.A. and bids fair to become the premier University of the world. True to its high tradition, it invites the leading men in the field for the numerous lecture endowments and the research and professorial chairs it has. The Dunham Lecturer for 1944 is an Australian research worker of repute and Director of the Walter and Eliza Hall Institute of Research in Melbourne, Australia. Harvard University has been publishing a series of monographs on medical and health subjects recording the researches of its own workers and the productions of its professors and visiting lecturers. The volume in question bears the stamp of high erudition and thought which characterises all the monographs of that University.

The sub-title of the book is "Evolutionary and Ecological Aspects of some Human Virus Diseases". The author says in his preface that his object was to discuss some of the virus diseases of man from a consistently biological angle. In his view, "the development of such a point of view seems to be needed if the great mass of experimental and clinical work is to be brought into a satisfactory relationship with general biological thought". Narrowness of vision and stereotyped thinking has been the characteristic of most of the workers in the field of medicine and public health. Neither in the laboratory, nor at the bed-side, nor in the field is there a tendency to look far, to think deep, and to daringly speculate. Over-specialisation is often a blind alley; it cramps the worker and seldom leads to astounding advances. It cheers and encourages one to meet a worker having the vision to see back and forth, to cogitate, integrate, and speculate. Burnet is

a visionary par excellence. His whole lecture is a speculation. His theme is to see the evolution of virus in relation to man as it was, as it is, and as it is likely to be. Such a view has not been presented so far to any medical student or worker. This view gives one the general background and an overall picture of the nature and action of viruses. The speculative part is the one which is more helpful. It points the way to future possibilities and indicates the lines on which further exploration will prove most fruitful.

The author takes up three important aspects of viruses for a general discussion. Their reproduction, variation and survival is dealt with first. This is a comprehensive and clear survey of the up-to-date knowledge on this aspect. He then proceeds to deal with evolutionary changes in virus diseases of men and animals. Taking up known facts, he delves into their possible causation and speculates as to the future. Thirdly, the host-parasite reaction comes in for a very clear and critical review. The themes in these general discussions are then illustrated by a review of some virus diseases. The wealth of the material cunningly interwoven into the talk is marvellous. More striking is the manner in which facts and thoughts are presented. The audience who heard the lectures must have been fascinated and moved body and soul by the clearness of exposition and the bold and free speculation. Reading it in cold print does not lessen this effect in any way.

The book is one which no medical man, whatever his narrow field, can afford to ignore. Even a surgeon who has little to do with viruses will benefit by the line of thought which is unique. The physician and the health worker must digest the contents of this volume in their own interests. It is a book which not only teaches but also stimulates.

"BELL"

HOUSING AND CITIZENSHIP.

Author.—George Herbert Gray.

Publishers.—Reinhold Publishing Corp., 1946.

Pages.—246.

Size.—11½" x 8½".

The author makes a comprehensive survey of the housing problem in the United States. He has traced the present situation back to its sociological and economic roots, and

analysed the factors which have brought about the present difficult conditions which prevail in most of the American cities. He goes on to survey the problem in Europe in order to draw useful lessons from the methods employed in European countries. His housing survey of Holland, Denmark, Germany, Sweden, France and particularly Russia brings out most salient features which could be applied in any country and draws useful lessons on fundamental principles in regard to the problem of housing throughout the world as an aspect of the objective laid down in the Charter of the United Nations.

He has much valuable knowledge to contribute to us as a Town Planning Consultant. The primary function of the book would appear to be a study of the problem of low cost housing and his analysis of this problem and the suggestions which he has made in Section 6 of the Book should make interesting reading to those connected with 'low cost housing' in any part of the world purely as an indicative of the useful method of approach and analysis to the solution of this problem.

The author has projected his mind into the future and has tried to visualise the 'shape of things' to come in the region of Town Planning and Housing design.

Although the book purports to deal with American standards, the figures given and the conclusions drawn particularly in regard to principles should be of great value to the Town Planning in India.

M. B. CHABLANI,

Chairman,

Madras City Improvement Trust.

Madras, 23-4-47.

HEALTH EDUCATION IN RURAL SCHOOLS AND COMMUNITIES.

Author.—Nina B. Lamkin.

Publishers.—A. S. Barnes & Co., New York. Published in 1946.

Pages.—209.

Size.—9" x 6".

Price.—\$2.50.

This handy book is a very useful and eminently practical guide to teachers, health personnel and in fact to any member of the community who would like to take an intelligent interest in the health of the children and the community. It is a quintessence of the experience of the author and is informed by a deep understanding of the personality of the child and human relations.

The book is divided into five parts. The first part deals with health problems in rural areas. It defines the problems, then goes on to the health services which are important in helping to solve these problems, importance of mental and social aspects of living and about food practice.

"No health education programme in any school can be successful unless it is developed in active co-operation with the home and with interested community agencies", says the author. It is a truism. The author has very ably defined the content of health education in the home, in the school, in the high school and in the community. "Keep in mind" she says, "that the responsibility of the school for health education includes far more than teaching of subject matter concerned with healthful living. The school needs to prepare a boy or girl for life in a democracy and they need to be taught to adjust happily and successfully to a pattern of life."

The importance of mental and social aspects of living is beautifully brought out: "If you teach children, rather than text-books, you will help each one of them through the life situations on each day". This is a profound truth which every teacher should realise just as every doctor should realise that it is a patient he is treating rather than disease.

Part II relates to helping children of the rural areas to understand and practise healthful living. The question is one of teaching children how to live. It is not merely in teaching with material from text-books. The author says "Use the opportunities as they normally occur in the curriculum activities; but don't pull them out and label them 'health'. Leave them in their natural setting". The terms health and healthy are abstract terms for the child. Growing, being well, being ready for the day's work and play are meaningful to young children. This part is sub-divided into eight units, setting out practical exercises such as preparation for the school, safety, organizing the school, health practices, at school and at home, learning about foods, using the playground, physical education programme in a school, keeping well and helping to prevent and control communicable diseases, etc.

Part III of the book deals with helping children to understand life. "It gives helpful advice as how best to approach the problem of

sex education." If the parents (and teachers) consider all phases of living from infancy to adolescence as one continuous and ever-changing pattern, then there is need to isolate sex education; discuss it and put it back again into the total personality of the child.

Section (2) of this part deals with rural High Schools, personal health and human relations. To put it in the author's own words, "Young people need to be prepared for fine citizenship with intelligent social attitudes and habits for the most effective participation in family and community life". But for this purpose, physical health alone is not sufficient. "There must be good mental, emotional and social health, if the individual is to have a well-rounded personality". An excellent outline for a course in personal health and human relations is given. And section (3) deals with community co-operation on community problems and appeals for better school facilities. White House Conference on rural education held in 1944 laid down a charter of education for rural children. "Every rural child has a right through his school to health services, education and vocational guidance, liberal facilities, recreational activities and where needed school lunches and pupil transportation at public expense". The author suggests that without waiting for implementing the programme, a ready start may be made today to improve lighting, seating and ventilation in school buildings, provision of safe water-supply, improved toilet facilities, laying out play fields and promoting general cleanliness.

This section also touches other problems like protective programmes, such as immunization against diphtheria or smallpox, dental programmes, mobile X-ray unit, recreation programme, etc., as country-wide programmes to be adopted by the community.

Part (4) of the book refers to teacher's health and personality. The personal health and personality of the teacher are vital factors in the success of the teacher. Practical hints for pre-service and in-service education of the teacher are given, as for example, study-groups, conferences, extension courses, loan packets, health educational workshops, visual aids, etc.

The fifth part of the book gives additional helps. Worthy of particular mention are the

(Continued on page 487)

FROM EVERY WHERE



WHAT DO THEY SAY ABOUT IT?

Readers can contribute to this section. They are requested to send extracts of current literature which, in their view, would interest the people. (Ed., P.H.)

PYRETHRUM.

More than 150 years ago a woman living in Dalmatia picked a bunch of flowers and threw them into a corner. Some weeks later, sweeping up the withered flowers, she noticed many dead flies around them. The flowers were the common Dalmatian Daisy known to botanists as *CHRYSANTHEMUM CINERARIAEFOLIUM* and to the world in general as Pyrethrum. Now whether this story is true or not, there is no doubt that Pyrethrum industry existed in Dalmatia early in the 19th century. If the story is true, this discovery is similar to that of penicillin, in that we owe the discovery more or less to chance.

Pyrethrum is one of the most efficient insecticides known, and its value both in peace and war is very great. That explains why the Japanese began growing flowers about 1880 and seized the opportunity presented by the cutting off of European supplies during the 1914-1918 war to capture the world market. Largely as a result of trials carried out in Great Britain pyrethrum flowers were introduced into Kenya in 1928, and the flowers produced were of such high quality that in 1939 Kenya superseded Japan as the world's chief source.

The active principles of Pyrethrum—which have been found to be concentrated in the ovaries of the flowers—were called Pyrethrin I and Pyrethrin II, when they were obtained from the flowers for the first time in 1924. They are both of the class of chemical compounds known as esters—an ester is the compound formed by loss of water between an organic acid and an alcohol.

We have recently revised the accepted chemical formulae of the Pyrethrins and their exact structures remain in doubt, but they are rather complex bodies made up of the elements carbon, hydrogen and oxygen.

In spite of the fact that these active principles are probably the most efficient insecticides known, they are not poisonous to man, and Pyrethrum insecticides can be applied safely to food-stuffs and used in confined spaces. This explains the wide peace-time use of mineral oil solutions containing Pyrethrum as household fly sprays and warehouse and dairy sprays. The insecticide which you used for your herbaceous border in peace-time may well have contained Pyrethrum extract.

The exact way in which the Pyrethrins act upon insects is not yet known but there seems little doubt that they bring about

What do they say about it?

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destruction of the central nervous system of the insect. At all events the effect is very spectacular, and flies and mosquitoes when sprayed show immediately violent activity and within about a minute they are on the floor completely immobilised. The immediate irritant effect of Pyrethrum upon insects is one of its great advantages—I have seen the spraying of huts in India followed almost immediately by the appearance of unsuspected mosquitoes in flight.

It's difficult to over-stress the importance of Pyrethrum in the war when troops were much more widely scattered in malarious areas than during any previous conflict. The killing of adult mosquitoes with Pyrethrum sprays is now recognized as a major anti-malaria measure and probably represents the most important advance which has been made in malaria prevention in recent years. Other war-time uses have included the killing of the mosquito which carries yellow fever—especially necessary in these days of increased air travel—and the control of lice which caused serious outbreaks of typhus during the last war.

From what I have said it is clear that the Pyrethrum industry has a bright future and a great part to play in man's fight against insect pests.

(By Dr. T. F. West—From "Science Broadcasts", Vol. 2, Littlebury & Co., Ltd., Worcester.)

MILKBORNE OUTBREAK OF TYPHOID FEVER TRACED TO A CARRIER.

[*Health News*, 1937, March 15. (Summary taken from *United Diaries Central Lab. Library Bull* No. 17, 1937, June 6.) *Bull. of Hyg.* Vol. 12, No. 9, September 1937, p. 629.]

"An outbreak of nine cases of typhoid fever with one death occurred in a small hamlet in Dutoches County in January. All persons affected had used the same raw milk supply. Last year there occurred three cases of typhoid fever attributed to the use of milk from this same dairy farm, but at that time the source of infection could not be determined. During the investigation of the recent outbreak a chronic typhoid carrier was discovered. This man is believed to have been responsible for the cases in both years. It was revealed that

he had been a frequent visitor to the dairy farm involved, both last year and during the current year. While staying at the farm he washed milk utensils."

(By R. E. Tarbett—From "Public Health Engineering Abstracts", Vol. XVIII.)

FEVER OF UNKNOWN ORIGIN.

To the Editor.—A man aged 39 was admitted to the hospital because of nine days of remittent high fever of 105 to 99 F. daily, which did not respond to sulfonamides. The patient had had an occasional non-productive cough and at the start of his illness had had a transient charleyhorse in his right leg, which had not annoyed him since. There were no other symptoms. The patient had not travelled outside of New York City and there was no known contact with illness. The past history was entirely normal. On admission the patient appeared acutely ill and was shivering. Physical examination was entirely normal. The urine was normal. The blood count showed 11,000 white cells with 74 per cent polymorphonuclear cells, 4 per cent monocytes and 22 per cent lymphocytes. Of twelve blood cultures, nine were sterile and three showed *Streptococcus viridans*. On one occasion blood agglutinations showed typhoid positive 1:80, paratyphoid A and B each positive 1:160. A smear for malaria was negative. The temperature curve by days was 105, 98.6, 102, 98.6, 100 F. and normal thereafter. Spinal fluid examination was normal, as was an electrocardiogram and a chest plate. The stools showed no ova or parasites. What significance is attributable to the repeatedly positive culture for *streptococcus viridans* in the absence of any other evidence for bacterial endocarditis? What type of treatment and follow-up are indicated? Can you suggest a diagnosis?

M.D., New York.

Answer.—Cases like the one described in which diagnosis cannot be made are not uncommon. It must be expected that not every case can be diagnosed. There are, no doubt, still some infections whose cause is unknown, and in other instances well known infections may occur without tell-tale evidence by which diagnosis may be made.

Data given in the case in question are incomplete. At what season of the year did it occur? What was the sedimentation rate of the erythrocytes? What was the nature of the "charleyhorse?" Charleyhorse in Gould's Medical Dictionary is described as "a rupture strain of muscle or tendon fibers generally resulting from athletic efforts." If the patient had this condition, the local injury and haemorrhage into the tissue, myositis phlebitis or cellulitis may have served as the source of the trouble, which could begin with a chill, last nine days with remittent fever and not be influenced by sulfonamide therapy. On the other hand, the charleyhorse may have been mistaken for a small embolus, phlebitis or other condition.

The significance of *Streptococcus viridans* in the blood on several occasions is uncertain. This ubiquitous coccus may appear transiently and apparently harmlessly in the blood stream in many febrile diseases, and its presence has caused confusion in mistaking it for the cause rather than as a commensal. On the other hand, the attack described may be the first evidence of subacute bacterial endocarditis. If the patient remains well, no treatment is necessary. The patient should nevertheless be examined at intervals of several weeks for any abnormalities, especially for fever and evidence of cardiac valvular injury.

To suggest further diagnoses would be guesswork, but hidden, symptomless abscess (renal, perirenal prostatic) may be mentioned.

(From *J.A.M.A.*, Vol. 126, No. 11.)

DRUG FOR PREVENTION OF DYSENTERY.

Australia's Contribution to India.

The Commonwealth Minister for Supply and Shipping Mr. Bealey announced that an outstanding contribution from Australia to India this year will be approximately 200 tons of sulpha-guanedine valued at £800,000, a drug that can be used for the prevention of acute dysentery among troops in Burma and also among the civilian population in India where dysentery was most rife.

(From "*The Indian Express*", dated 4-8-'44.)

AN OUTBREAK OF SCARLET FEVER TRACED TO RAW MILK.

(*Health News*, N.Y. State Dept. of Health, 17, 168 (Oct. 7, 1940.)

Six cases of scarlet fever traceable to a dairy farm occurred in the town of Kirkwood during the week of September 16. Investigation showed that all persons affected had consumed milk from one dairy. Just prior to the outbreak one of the persons residing on the farm had a severe sore throat. Examination of the herd disclosed cases of mastitis, and examination of the milk from affected cows showed that one was harboring hemolytic streptococci.

(P. W. Reed—From "*P. H. Engg Abts.*", Vol. XXI.)

THE CONTROL OF PLAGUE IN JAVA.

[J. C. P. Grey, *Malayan Medical Journal*, Vol. II, No. 2, June 1936, pp. 115-116. *Tropical Diseases Bulletin*, Vol. 33, No. 11, November 1936, p. 870. Abstracted by W. F. H.]

"The Views of an outside observer on the important special measures of plague control which have been adopted in thickly populated Java are particularly valuable.

"Measures which have been tried and failed are isolation, fumigation, rat poisoning, prophylactic vaccine. Stress is now laid on the improvement of the houses of the people who live in the country districts with a view to breaking down 'the close association between man and rat'. That association is not so close in the towns. The officers of the Plague Control Service themselves 'take no particular precautions against the disease', as it is considered that they are only at any appreciable risk in the course of their work, if they happen to 'live and sleep (especially on bamboo beds) in the epidemic area.'

"The Javan house is built of bamboo posts, thatch (attap) roofs and is double walled. Improvement of such a house consists in replacing bamboo—including the bamboo of beds—with timber, the roof with tiles and closing the double space between the walls. When this is done, the rats leave the houses 'for more congenial breeding places.' Unfortunately the process of improvement of the dwelling house is costly and the people are

poor. Government loans are needed and are given to the householder. It is the owner who dismantles his own house and reconstructs it 'with the help and advice of the officers.' The reconstructed houses are inspected, passed and again reinspected at intervals 'to ensure they are properly maintained.' The success of these measures is evident. Plague started in East Java, spread to Mid-Java and is now in West Java. Reconstruction of houses naturally followed the same course. It can be shown that East Java is now practically free of plague, plague is disappearing from Central Java and the same thing is happening in those parts of Western Java where the kampongs have been reconstructed. With the reconstruction, the houses become brighter and cleaner; the populace likewise seem to reflect in their lives this brightening up of their homes."

(By H. R. Crohurst—From "*P. H. Engg. Abts.*", Vol. XVII.)

AERATED WATER AS A CURE FOR CHOLERA!

Aerated water may, it is claimed sometimes prove an effective antidote against cholera. Research in this field conducted by the Punjab Epidemiological Bureau has revealed that Carbonic acid gas has a strongly inhibitory effect on the growth of cholera bacilli and that they are more sensitive to this than to try other chemical composition. Further research in this direction and for improving the content of aerated waters manufactured under proper medical advice will prove a handy and effective prophylactic for cholera.

(From "*The Hindu*", July 15th, 1945.)

HOW SHOULD PROPERTY BE VALUED FOR ASSESSMENT TO-DAY?

Although progress has been made in many cities during the last two decades in the administration of the property tax, assessors are more confused to-day than ever before as to the true value of property. This was the theme of a paper presented at the recent twenty-third annual meeting of the American Municipal Association by Kenneth J. McCarren, Member of the Board of Assessors of Detroit, Mich.

"It has been said that the assessor does not make values" said Mr. McCarren, "his duty is to find the value and record it upon the assessment roll, which means using sales or reproduction costs as the basis for the assessment."

"Right here is where the assessor runs into difficulty because the rules, tables, formulae and other scientific procedure that have been adopted cannot be put into operation until he finds a base, which in the past has always been sales or replacement. But, present-day sales do not reflect the true value—at least not true value under a stable economy. We all know that the cost of residential property to-day is out of proportion with the cost of other commodities. It is far beyond the pocket-book of the average working man and, in the opinion of many economists, must be reduced. Families are, in fact, being required to pay a premium for shelter."

"In using reproduction cost as the basis of assessment, allowances should be made, of course, for structural depreciation, obsolescence, and other factors. This is recognised as a more sound and equitable method. But the reproduction cost of homes to-day is also out of proportion to other costs."

The Detroit assessor did not have any ready-made solution for this problem of finding an equitable cost base. Rather, "each assessing officer will have to solve his own problem as he sees it. Because of the complexities or of possible repercussions, it is not an easy task; however, that is no excuse for passing it by . . . Assessments should be increased to the values the assessors believe will remain after our economy has been adjusted to a normal basis."

In conclusion, Mr. McCarren expressed the opinion that the general property tax will continue as the major source of revenue for the support of local government.

"I believe," he added, "that it is possible to overtax both real and personal property. Therefore we should continue to fight for a division of state-collected revenues. But you are going to have a hard time convincing the state and federal levels that you are in dire need and must receive assistance, if it is obvious to both administrators and laymen that property in your city is either escaping taxation or being partially taxed."

(Extract from "*The American City*", January 1947.)

HOW MUCH SHOULD YOU WEIGH?

Are you satisfied with your weight? Strangely very few persons are. Whenever they weigh themselves they wish the figures would indicate a few pounds more or a few pounds less. For the most part, your weight is a personal matter; for, there is no scientific method of determining exactly what you should weigh. Tables have been prepared showing the average weights of persons of different ages and heights, but these tables merely help you see how your weight compares with the weights of others. The important factor which you must consider in connection with your weight is your body type or build. If you naturally are stocky or heavy boned, you may expect to weigh more than if you are of a slight or slender build. Your body type was determined by heredity and consequently is beyond control.

In general young people should keep their weights slightly above the figures show in weight, height and age tables. If an individual's weight is 10 per cent or more below the average shown for his height and age in table, or if it is 20 per cent or more above average, he should consult a physician. Usually the physician will advise modifications in diet and health habits to adjust the weight to normal figures. During the period of growth, it is important that both weight and height increase in each six month period. If an individual's weight changes markedly at any age, he should seek medical advice.

*Extract from "Life and Health" by
Wilson-Bracken-Almack:
Publishers: The Bobbs Merrill Com-
pany, Indianapolis—New York.*

THE FIELD OF PUBLIC HEALTH SERVICE.

In this field of public health service, there are two activities that are of vital importance to all mankind and that cannot be separated. These are: the maintenance of a relatively pure water supply, and the proper disposal of sewage. Throughout human history, the improper disposal of sewage has been the greatest obstacle to providing a supply of good water. Water is absolutely necessary to all terrestrial life, but because water is a great solvent commercially pure water is produced only in laboratories.

We know that the water furnished to a community will affect the vitality, the appearance, and the general health of the

individual from the cradle to the grave; and it is a very important factor in the cost of living, especially when its neglect affects the length of life or reduces the energy and efficiency of the people. It has been demonstrated that a small amount of flourine has a pre-natal effect on teeth, and in some communities, accounts for almost perfect teeth with great resistance to decay; and on the other hand a very slight increase in flourine content results in discoloured teeth and dental difficulties of a very serious nature.

Every waterworks man is aware of the problems in maintaining a satisfactory water supply in his own community, but if he takes a transcontinental air trip by daylight, he will be profoundly impressed by the problems of other water-works men. He will see the clear blue water of the mountain lakes, such as Arrowhead and Tahoe; he will see the brown waters of the Missouri and the Mississippi; the red, green, and yellow waters, and thick, white alkali waters of semi-arid states; the black-waters of the forest states; and he will doubt that there is any colour in the spectrum that cannot be found somewhere in this country in the raw water supply of some community. Because of its abundance, the old alchemists overlooked water as the universal solvent, but we know that sea water contains gold, magnesium, and nearly every known element; and chemicals dissolved in water constitute a great problem for waterworks' men. But chemical problems are no greater than bacteriological, vegetable, and potability problems. Tastes produced by algae are always a problem; and in all chlorinated waters containing phenol, we produce other tastes that are very objectionable, even when they are recognized as necessary to disease prevention.

The operator from the semi-arid states who flies over the Great Lakes may think that Chicago, Detroit, and Buffalo cannot have any water supply problems, but he will learn that they have many problems most of which originated with careless sewage disposal. Millions of dollars are spent to make these waters potable, to remove certain chemicals, to supply other chemicals, and to provide the pressure to put the water where it is wanted. Millions more are required for disposing of waste water; and again, we find we cannot separate sewage disposal from water supply.

Col. Willard F. Rock Well (From "Water Works and Sewerage", Vol. 92, No. 4.)

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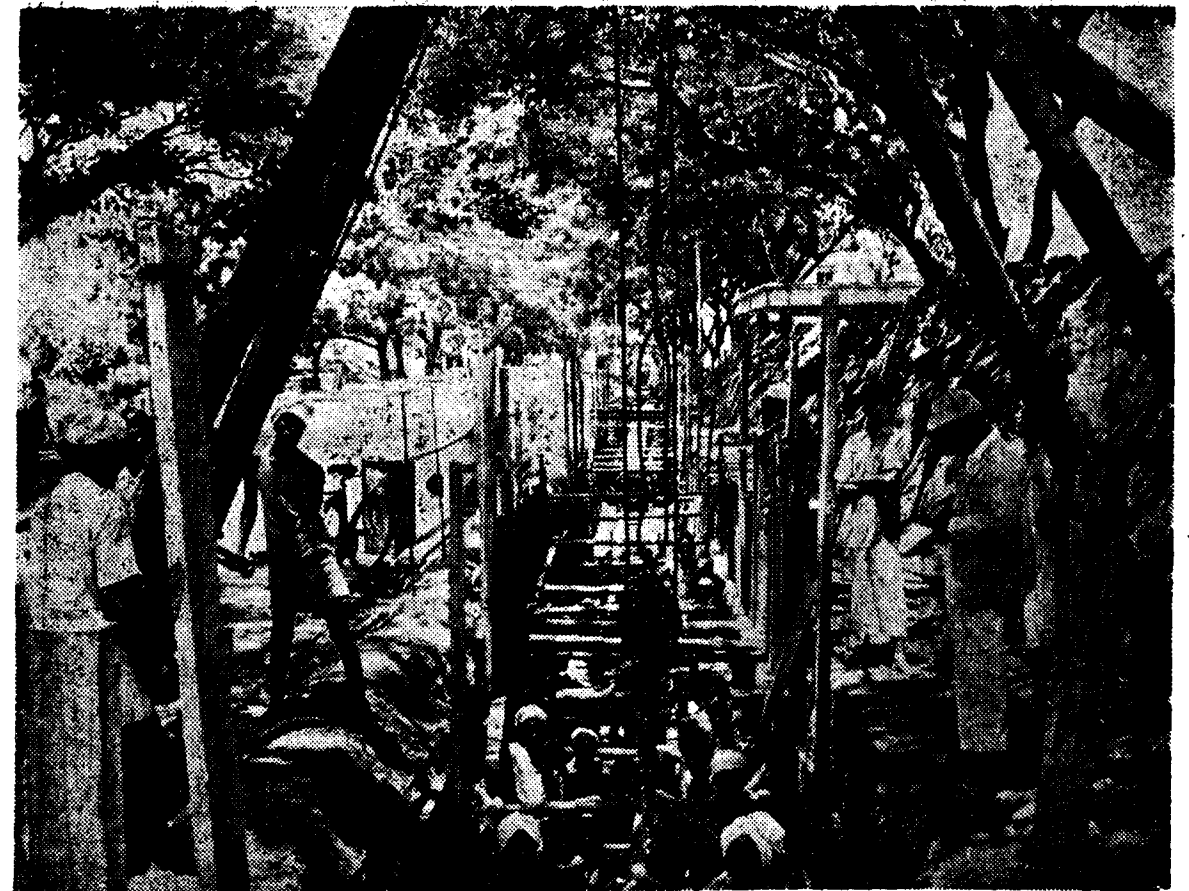
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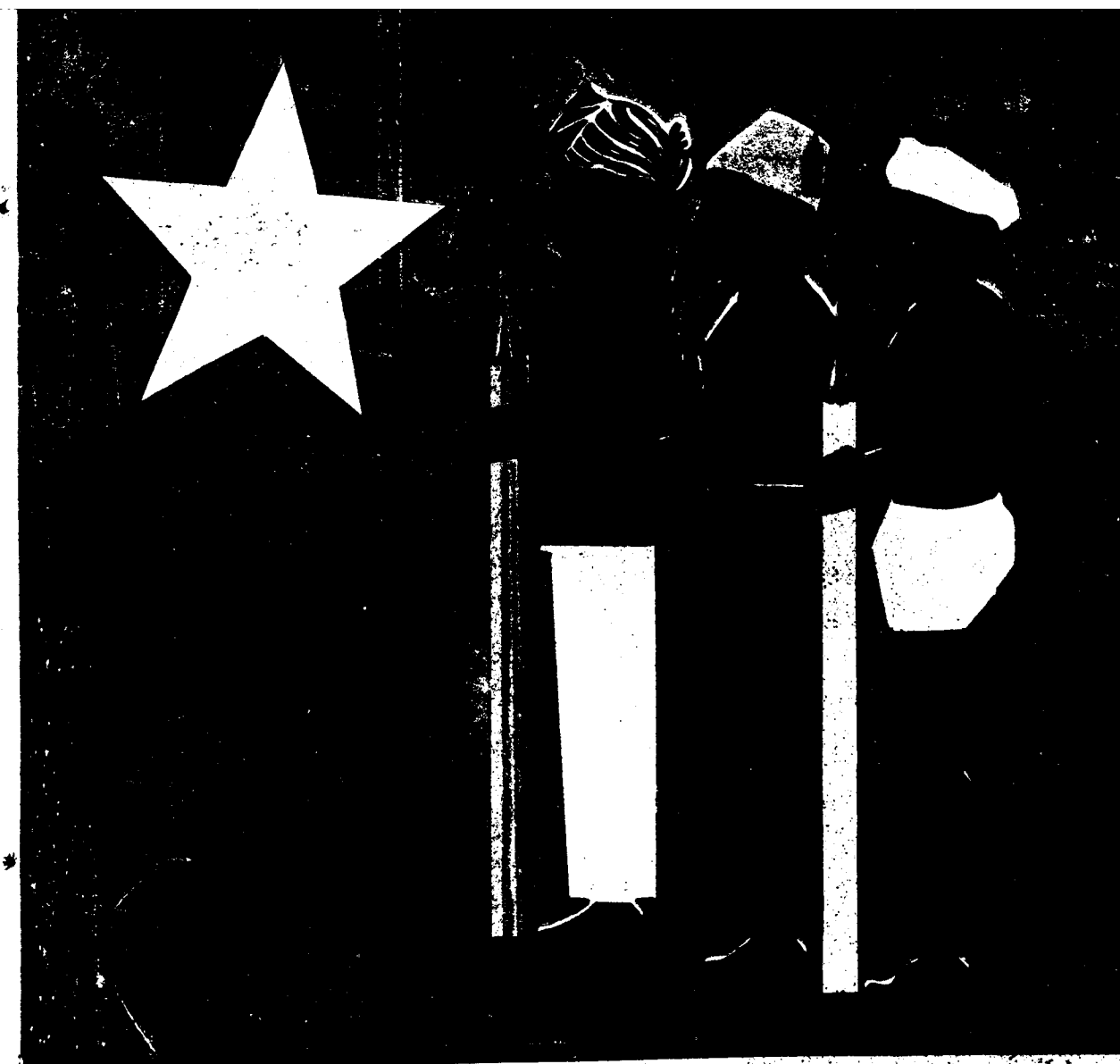
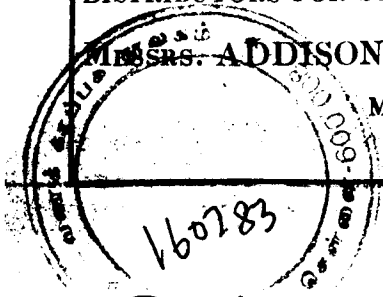
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