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Franklin, Wash

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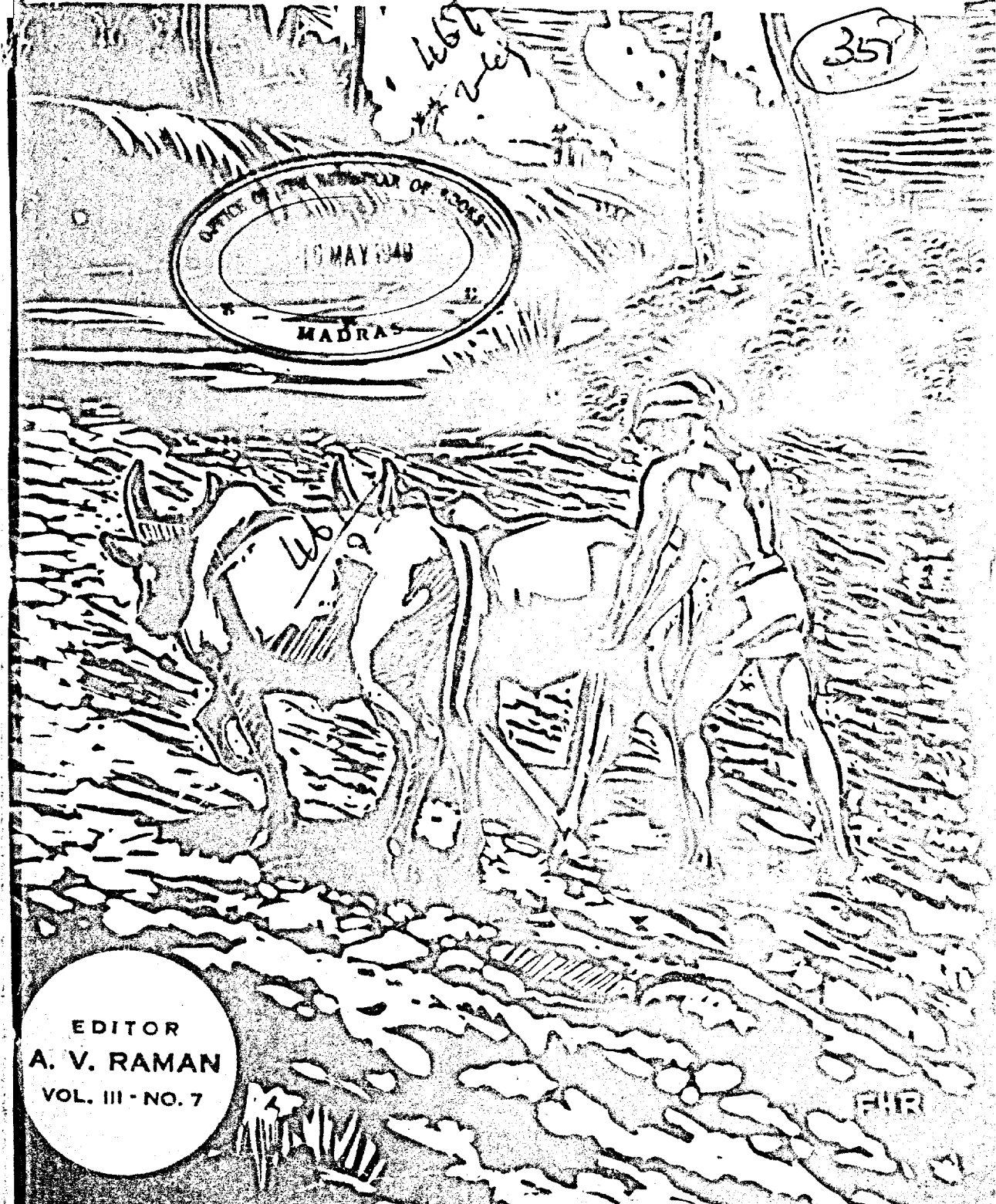
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PEOPLE'S HEALTH



OFFICE OF THE SUPERVISOR OF BOOKS
10 MAY 1948
MADRAS

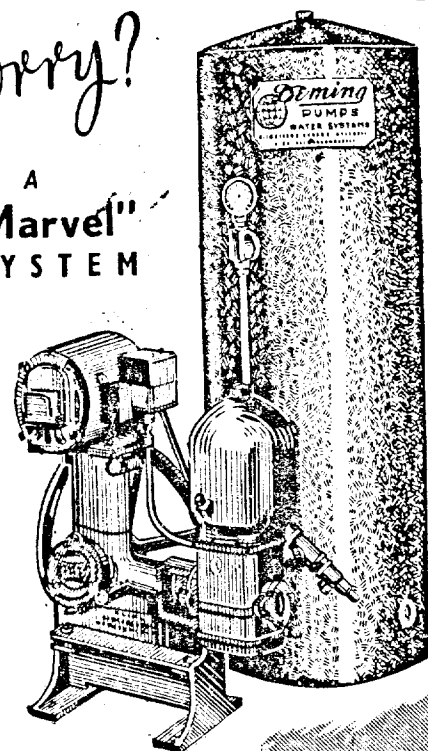
EDITOR
A. V. RAMAN
VOL. III - NO. 7

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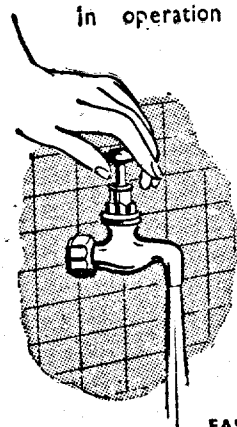
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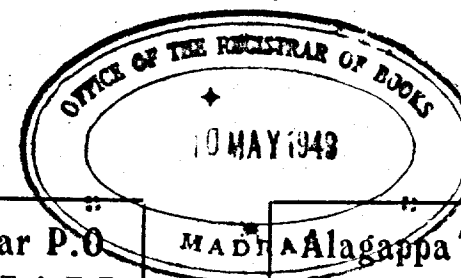
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TO OUR READERS.

Our readers are, doubtless, aware of the fact that *People's Health* is being published at considerable sacrifice of time and labour and above all money. It is primarily a propaganda magazine to educate the lay public and the experts alike on all matters pertaining to the health of the people. As C. R. put it in his message to *People's Health* it is an endeavour on the part of a crusader-spirited ex-permanent servant to help democracy in one of its important functions. *People's Health* is not a commercial venture.

The publishers appeal for assistance and cooperation of one and all. We invite suggestions from our readers to make the magazine more useful.

The annual subscription is only Rs. 12, commencing from October 1948 to September 1949.

ROYAPETTA,
Madras, 14.

MANAGER,
People's Health.

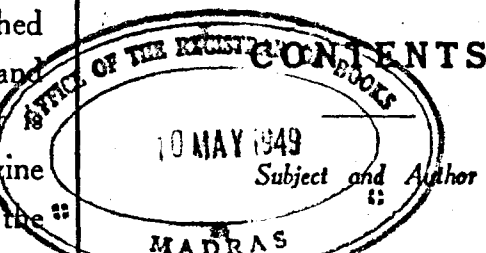
PEOPLE'S HEALTH

A Pioneer in the Field of Public Health

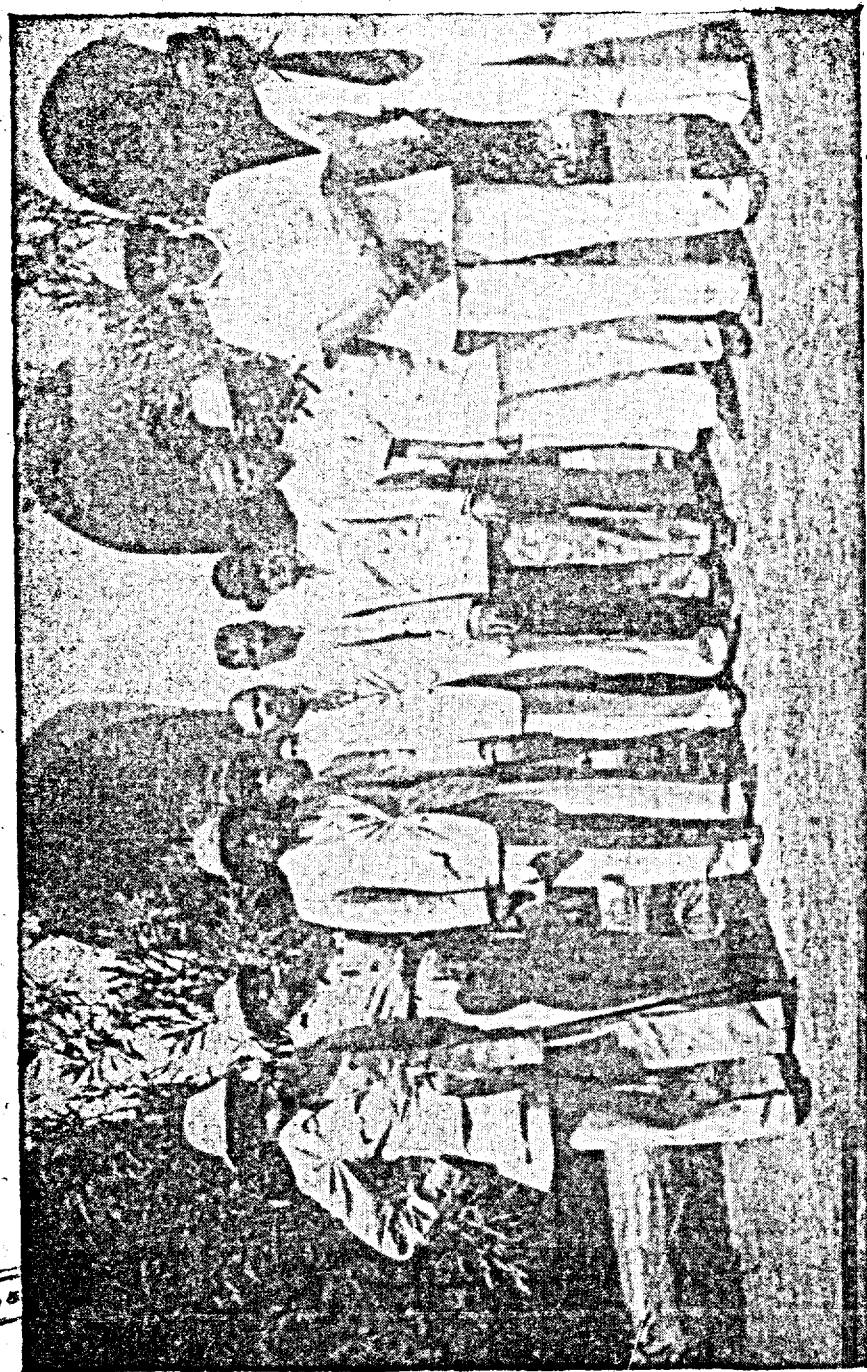
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The Environmental Hygiene Committee of the Government of India, on a visit to the source of Madras City Water-Supply.
(Dr. Das Gupta, the Chairman of the Committee stands 5th from the right.)



VOL. III No. 7

APRIL, 1949

ISSUED MONTHLY

EDITORIAL . . .

No pleasure is comparable to the standing upon the vantage ground of truth.

—BACON.

KANCHEEPURAM WATER SUPPLY YES, IT IS SCANDALOUS

Adverting to our comments on Kancheepuram Water Supply (*vide People's Health*, pp. 235-6, March, 1949), Dr. P. S. Srinivasan, Chairman, Municipal Council, Kancheepuram, has sent us a communication for publication in our pages. With pleasure, we publish it. The communication runs as under :

"The three pump sets in question were permitted long before any failure of monsoon was anticipated and that to help the 'Grow More Food Campaign', which is equally important. The monsoon failed for two years consecutively and the water level was going down. As a matter of precaution, the pump sets were permitted to work only limited hours and the water level was observed from time to time. It has been found out that the pumping of the three sets did not affect the level of water in the

springs of the water works and cannot be injurious to the water supply of the town. As a matter of abundant precaution, action has already been taken to acquire the fields covered by the pump sets and it is hoped ere long, the fields would be acquired and the pumping avoided, if necessary. The very first sentence in your letter can be very well applied in the case of the party who gave you the information. There is absolutely no need for your editorial remarks which are high flown in style and which lack precision and truth. The people's representatives are serving the people quite alright and need no advice from you.

May I request you to kindly publish the above in your esteemed journal?"

TRUTH UNMASKED

Three pumping sets are operating in the neighbourhood of the source of the water-supply to the town.

According to our information, a 7.5 h.p. plant commenced functioning on 19th September, 1946, a 10 h.p. plant from 17th March, 1948 and a 5 h.p. plant from 30th June, 1948. It is therefore, untrue that 'the pumping sets in question were permitted long before any failure of monsoon was anticipated'? The Chairman is obviously oblivious to the facts of the case!

Granting for the purpose of argument, that the pumping sets were permitted to be operated long before the failure of the monsoon, we ask whether it was in the interest of the public water-supply of the town that abstraction of water was permitted from the area. The Municipal Council and its executive ought to be fully alive to the fact that the entire demands of the town are yet to be met; that being so, to permit abstraction of water from this area, tantamounts to selling public interests to vested interests.

It is said that 'the pumps are permitted to work only limited hours'. It is the total quantity of water abstracted and the period in which such abstraction takes place, that really count. Far from easing the situation, the abstraction of water within the 'limited period' would affect more adversely the conservation of the ground-water storage, than what would be the case if the quantity is abstracted over a long period.

The Chairman states that as a matter of abundant precaution, action has already been taken to acquire the fields covered by the pumping sets and it is hoped that ere long the fields would be acquired and the pumping avoided, if necessary.

The Chairman asserts, at the same breath, pumping 'did not affect the level of water in the springs of the water works and cannot be injurious to the water-supply of the town'. If that is so, why then acquire the fields which are now irrigated?

If the authorities had any sense of values, they should have altogether avoided the risks involved in abstracting water from the area. We are told that the 'Grow More Food Campaign' is *equally* important. We may be pardoned for reminding the learned doctor-chairman that drinking water is *more* important than food! What a sense of proportion!

We ask, why is it that the Municipal Council failed to exercise in good time the powers vested in it under the statute. Had it done so, no vested interests could have been created at all. Is it honest and truthful administration which fails to exercise its statutory powers and which thereby creates vested interests and tries thereafter to purchase them at the cost of the rate-payers? We feel that we were perfectly justified in concluding from the circumstances of the case, that the

local authority or at any rate the influential section of the council should have winked at this intrusion, jeopardising a public utility service of vital importance. Mark you, the Council is headed by a Congressman-Chairman!

The Chairman considers that 'there is absolutely no need for our editorial comments which are high flown in style and which lack precision and truth. The boot is on the other leg! Our remarks were calculated to serve *public interests*. We realise our limitation that we are not competent to make any suggestion to the pastmasters in the art of creating and protecting vested interests. Public interests are quite different from vested interests. Our comments were in public interests.

It would be quite clear from the foregoing as to who lacks 'precision and truth'. It is the truth which irritates; it is the truth which makes a man angry; no other passion is fatal to the pursuit of truth, as fanatical partisanship. Dr. P. S. Srinivasan, from all accounts and reports, is reputed to be a good man. When such a person is irritated, as evidenced from the tone of his communication, we are confirmed in our belief that the information we had on the subject is truth and nothing but the truth. God knows the truth and so there let it rest.

MADRAS PREMIER'S EXHORTATION

The other day, the Madras Premier, while opening the Southern Indian Journalists' Conference, said that in giving news, the Press should always aim at correctness and accuracy: each newspaper or journal must establish for itself a name and tradition that any news appearing in its columns could be accepted as authentic.

To the best of our conscience, we have been maintaining this standard all the time. The Madras Premier may just as well appeal to his following to adhere to truth and honesty and to maintain the high prestige of the Congress organisation. As a leader who keeps his hand on the pulse of public opinion, he would have by now understood that the reputation of that organisation is being brought down steadily by the Congressmen themselves by deviating from truth and honesty. The fact that Dr. P. S. Srinivasan was recently returned to the Madras Legislative Council by a comfortable majority of *eight*, is a pointer to the revulsion of public feeling against the Congressmen as a class. We would, therefore, earnestly appeal that Congressmen in authority realise their responsibility in the discharge of their duties to the public.

SERVICE TO THE PEOPLE INDEED!

The Chairman asserts that the people's representatives are serving the

people quite alright and need no advice from us. This is adding insult to injury. One of the accusations against some Congressmen in authority is that the moment they are put in power and authority, they seem to consider that they are the quintessence of all knowledge under the Sun and that they alone know how best to serve the people. Democracy, we are told, is administration by discussion. But, in the present case, it would be apparent that people's representatives in the municipal council of Kancheepuram are not serving public interests. It is this attitude of Congressmen in authority which tends to make democracy unsafe in our country. Wilde says: "It is always a silly thing to give advice; but to give good advice, is absolutely fatal."

PRESS CRITICISM—AN ASSET TO DEMOCRACY

We present with our compliments to Dr. P. S. Srinivasan, the remarks of his leader which run as under:

"A fearless and independent Press, like an independent judiciary, is an infallible index of real democracy. The Press should be the organ bringing home to the Government their acts of commission and omission which require rectification. It is the privilege of the Press to offer criticism of the policies and principles guiding the Government administration. No Government can claim to be perfect. Nothing is perfect under the Sun. By outside criticism alone, one is made conscious of his imperfections which need rectification. So, criticism is conducive

to progress. But it should be in the form of healthy and constructive criticism. The Government cannot ignore the criticism by the Press. On the other hand, the Government should welcome criticism, in the light of which they can proceed with their policies and administrative measures with circumspection and caution."

But for the existence of a few Congressmen in our country who are still impelled by the loftiest ideals of service to our people, the prestige of the Congress would have been buried many fathoms deep and never to be exhumed.

LOOK AT THAT PICTURE AND THIS

In the classic case of *Read vs. Croydon Corporation*, to which we have made reference already in these columns, the Ministry of Health, England, constituted a special committee *immediately* on receipt of information about the prevalence of a few cases of typhoid within the limits of Croydon Corporation. Here at Kancheepuram, the water-supply to the whole town is jeopardised by the action of the local authority! Still, at Government levels, no action seems to have been taken! It is indeed, scandalous.

GOVERNMENT ELECTRICITY DEPARTMENT NOT AT FAULT

We referred to the Electricity Department having permitted operation of these pumping sets. The Government Electricity Department has

nothing to do in this case. The Municipal council is the licensee. It is the municipal council which is responsible for permitting the operation of these pumping sets. The municipal council is, therefore, doubly culpable in that it administratively connived at the installation of these pumping sets and in that as the local licensee for the supply of electricity, it has abused its privileges.

RECOMMENDATIONS OF WATER-SUPPLY AND DRAINAGE COMMITTEE IMPLEMENTATION

The Madras Ministry of Health appointed on 2nd June, 1947, a Committee consisting of five non-officials and three officials to go into the entire problem of water-supply and drainage—urban and rural—and to suggest ways and means to accelerate progress in the execution of these schemes. The Committee submitted its report on 28th August, 1947. In response to our invitation, many public men and administrators have given the benefit of their independent views to our readers (vide *People's Health*, March 1948). The report of the Committee was not only sent to the members of the Madras Legislature but also to all local bodies free of cost. The report had further publicity in the rest of the country.

DEPLORABLE LACK OF INTEREST

It is most unfortunate that the members of our Legislatures, municipal administrators and others did not take as much interest on the subject as was expected of them. It is a notorious fact that whenever our Minister of Health or the Minister for Local Administration tours the country, petitions after petitions are presented to them urging on the *immediate* necessity of introducing water-supply and drainage schemes in the areas covered by their tours. Sufficient agitation had not been kept up to compel the ministry to take effective steps in providing these primary amenities of life. It is usual to look forward for a full-dress debate on the occasion of the presentation of the budget; but the Madras Legislative Assembly, consisting of over 200 members, scarcely thirty were present when the Minister of Health made his budget speech this year! The discussions which followed the presentation of the budget were depressing. Unless the force of public opinion is brought to bear on the Minister of Health, how can one expect pressure to be brought upon his colleagues for securing support for his schemes? If our people continue to suffer for want of water-supply and adequate means of drainage, they have to blame their representatives whom they have elected to represent them in our legislatures.

SUPPORT FOR MINISTER OF HEALTH

The Ministers of Health in the country do not seem to cut much ice with their colleagues in their respective Cabinets. The reason is not far to seek. Unless the pressure of public opinion forces them, they cannot in their turn press for the urgency of providing water-supply and drainage to our towns and villages on their colleagues. We, therefore, urge that public opinion should be mobilised to press on the ministries of health in the country to provide *first* these essential and primary needs of health. Spectacular schemes for industrialisation, intensive agricultural production and other similar ones should not be allowed to be pushed forward to the forefront, before the primary needs of life are provided.

MADRAS MINISTRY OF HEALTH PRODUCES PROVERBIAL MOUSE!

The Madras Ministry of Health has been considering the report of the committee all these long months. The mountain was in labour and brought forth a mouse, they say! That is exactly what has happened as a result of the Madras Ministry's long hibernation! After considering the situation in rural areas in particular, the water-supply and drainage committee recommended as under:

"We are definitely of opinion that the existing priority lists and compendium should

be abandoned, and the approach to the problem made on altogether different lines. We are no doubt alive to the fact that a list of priority is a desirable adjunct to a planned programme. But we should equally emphasise that the principle behind such a list, must fit in with the central idea of our plan. It is our view that with central direction and decentralised execution as proposed in our scheme, the progress of urban and rural water-supply and drainage schemes should proceed simultaneously as far as possible, at each district level, *the priority of the schemes being limited to the district level*. The progress which we visualise will not be possible with the compendium referred to. We have after due consideration of all relevant factors, concluded that the best course to adopt would be to have a compact list of priority for municipal water-supply and drainage schemes only, in the Northern and Southern Circles, leaving the priority of other urban schemes and all rural water-supply schemes to be decided by District Committees to be constituted for the purpose."

DISTRICT COMMITTEES: THEIR PURPOSE

The Government have passed orders early this month directing that priority of water-supply and drainage schemes in respect of non-municipal urban areas be fixed according to the compendium approved in their order dated January 7, 1946, subject to the modifications that schemes on which investigations have been completed or the schemes for which the entire cost is met by the local body concerned, may be

upgraded, irrespective of their position in the compendium. The Government consider that no district water-supply and drainage committee be constituted in each district for the purpose of fixing priority referred to above, as recommended by the Water-Supply and Drainage Committee. The decision would have done credit to a foreign bureaucracy! The popular Ministry has simply underlined the compendium prepared by the Advisors' Government which was then but a caretaker Government. On matters of large policy of this kind, a popular ministry is expected to be guided by popular will. Any one of the non-official authors of the report could have better adorned the chair of the Minister of Health and implemented the recommendations faithfully.

It is depressing to note that popular ministers should have raised any objection to the constitution of district committees. The purpose of constituting such committees is not only to select areas for providing water-supply and drainage, but also to enlist local influence and enthusiasm in the execution of these schemes. Our popular ministers have been appealing at every turn, and on every conceivable occasion, for public co-operation. What do they mean by public co-operation? It is meaningless to appeal for public co-operation when they deny them the opportunity to co-operate with the

Government in their efforts to improve the living conditions of the masses. If the popular ministry distrusts the local M.L.A.'s or M.L.C.'s why then appeal for co-operation? The action of the Ministry of Health should strongly be condemned. We hope the ministry will reopen the question at the earliest opportunity, if they mean to render service to the masses.

REVISED FINANCIAL POLICY

Another order of the Ministry of Health is in respect of their policy regarding financial assistance to local bodies so as to expedite the execution of water-supply and drainage schemes. The committee's recommendations in this behalf are as under:

"1. The entire responsibility for providing protected water-supply and drainage should be taken over by the Government, and local authorities should be divested of it.

2. The Government should constitute a separate fund called the Provincial Water and Drainage Fund into which should be pooled all the local water and drainage revenues of the local bodies and such amounts as may be ear-marked from Provincial revenues annually.

3. The Government should undertake the maintenance of all completed water-supply and drainage schemes.

4. The Government should go in for loans in the open market which are to be ear-marked for expenditure on the water-supply and drainage schemes to be repayable in 50 or 60 years."

It would appear that the Retrenchment and Reorganisation Committee,

Madras, also recommended that the Government might raise loans in open market for the purpose of financing water-supply and drainage schemes and spread the period of repayment over long years, providing a sinking fund in the meantime. A Press note on the subject states :

"The Government after having carefully considered the recommendations have come to the conclusion that these recommendations need not be accepted in their entirety. Having regard to the immensity and urgency of the problem of providing water-supply and drainage as expeditiously as possible, they have, however, decided to revise their policy regarding financial assistance to local authorities as laid down below.

"The urban water-supply and drainage schemes will be taken up for investigation irrespectively of the financial resources of the local authorities.

"(a) in the case of Municipal Schemes in accordance with the priority list drawn up by the Water-Supply and Drainage Committee and :

"(b) in the case of non-municipal urban schemes in accordance with the compendium approved by the Government in G.O. 55-P.H., dated January 7, 1946. The schemes for which the local authorities concerned are able to raise sufficient funds to meet the cost without Government grant, may however be taken up without regard to their position in the priority list or the compendium. Investigation will be followed up by design and execution without interruption. Immediately after the scheme is designed and before orders are passed for execution, the financial aspect of the scheme will be fully investigated including the

quantum of grant to be given from Provincial revenues for the scheme. The completed schemes will be maintained by the local authorities concerned at their own cost. To finance the schemes the local authority concerned will be asked to levy the water and drainage tax at a rate considered suitable by the Government with reference to the cost of the scheme and the resources of the local authority recourse being had if necessary, to the powers vested in the Government to issue a direction to the local authority under Section 81-A of the Madras District Municipalities Act and Section 25 of the Madras Public Health Act to raise the tax. Any accumulations in the water-supply and drainage fund of the local authority that can be counted against the cost will be taken into account. The maximum amount of loan which a local authority can finance will then be worked out on plan of repayment in 40 years where necessary instead of the present period of repayment of 20—30 years. The additional amount required towards the capital cost of the scheme will be borne by the Government."

STATE'S RESPONSIBILITY

A State, which does not accept full responsibility for the provision of the primary necessities of life, namely a safe and abundant water-supply, and the essential amenity of drainage, does not deserve to exist at all as a state. The history of the development of water-supply and drainage schemes in the whole country shows the urgency of the State taking over the entire responsibility to improve the living conditions of the people.

AVAILABLE SERVICES IN INDUSTRIAL HYGIENE

by

Dr. M. N. Gupta,

M.B., B.S. (Pb.), D.P.H. (Lond.), D.I.H. (Eng.),
Deputy Chief Adviser, Factories (Medl.), Govt. of India.



This is the second of the series of articles on the subject. The first one was published in 'People's Health,' March 49, pp. 237—243.

It is not enough to concentrate on the improvement of our industries alone. Industries should be so developed as to ensure the health of the workers. This would inevitably conduce to contentment and efficiency. Ill-health breeds ill-will and ill-will breeds disaffection. It is, therefore, essential that the health of the workers should be the *first* concern of our industrialists. It would necessarily reflect on the efficiency of production. The management, the workers, the State and the people, all alike, are interested in the subject. We would therefore appeal to all concerned to peruse these articles carefully.

EVOLUTION OF INDUSTRY IN INDIA

When one compares the present stage of development in Indian industry with the analogous development in the western countries towards the highly organised industrialism that characterises them today, one is struck by the great similarity that is found in the starting point of industry in all countries which is the self-

sufficing community, be it a clan, estate or village. In the feudal system in the West, which dominated the early mediaeval period, the estate idea early dominated the village. In India, the village is a peculiar unit. The factors which have combined to perpetuate this phase of Indian life have been many. Amongst these, the long absence of roads and transport facilities, the

remoteness of large districts, the little intercourse between the big land-owner and the peasantry, the absorption of industrial life and custom into religious organisation, have played an important part.

In India the sense of belonging to a definite locality survives in spite of all the migration and experiences in modern industrial organisation.

The usual emergences of trades most necessary to ordinary life, e.g., weaving, pottery, working in metal, carpentry, etc., were in the villages. These trades still survive with an almost primeval simplicity in all cottages in the villages.

The guild system of the West, has been singularly lacking in India, with the result that the dynamic power inherent in the guild has been lost to the Indian villager.

For the same reason the advent of protective legislation in India has been slow in comparison to the countries in the West. But India has profited by the experience of other countries and has escaped most of the perils of a new industrial order.

MEDICAL PROVISIONS IN EARLY FACTORIES ACTS

In the story of Indian Factory Legislation one sees a close linkage with the British Factory Legislation. In Great Britain, the Certifying Surgeons were appointed under the Factory Act of 1844 and in India under the Factory Act, 1881. The Factory Act of 1881 made no mention, however, of health and safety provisions.

Mr. Meade King, Chief Inspector of Factories in U.K., made much of the total absence of sanitary provisions in the Factories Act of 1881. In 1884, the Government of Bombay directed a small Medical Committee to investigate the subject of the general health and physical conditions of the mill operatives as compared with other labourers in the City of Bombay. These provisions were introduced in the Factories Act of 1911.

WELFARE PROVISIONS IN FACTORIES

In the beginning of the twentieth century a number of firms voluntarily employed Medical Practitioners to supervise the health of their workers. While Great Britain appointed the first Factory Medical Inspector in 1898 we are still 50 years behind, and have appointed only three Factory Medical Inspectors in the whole country.

The report of the Labour Investigation Committee in 1946, has drawn a grim picture of the welfare provisions in the factories in the country.

There is a conspicuous lack of provision of normal sanitary requirements as laid down in the Factories Act, 1934.

Information in the country regarding occupational diseases is scanty. There are no notifiable diseases mentioned in the Act of 1934.

Time has now come when more emphasis is needed on the preventive aspect of Industrial Medical Service, and greater cooperation between the medical profession and industry. It is also the time when both the medical profession and the employers have to be enlightened on the part played by industrial factories in the causation of ill-health and disease. Though much progress has been made by the employers in the provisions of welfare activities, however, the vast majority of industrialists in India still regard welfare work as a barren liability rather than a wise investment. These welfare activities may be grouped under the following heads: 1. Canteen, 2. Creches, 3. Entertainment, 4. Medical aid, 5. Washing and bathing facilities, 6. Provident fund gratuities, and pension, 7. Educational facilities, and 8. Other facilities.

We are mainly concerned with the provision of medical facilities. In India, the provision of hospitals and dispensaries has been undertaken mainly by the State, including municipalities and local boards as a part of general public health activities of the state and provincial public health departments. While these activities, as

surveyed by the Health Survey and Development Committee, are generally speaking very inadequate, both quantitatively and qualitatively, the corresponding facilities provided by the employers are insufficient and totally lack the provision for facilities for control of environmental hygiene.

The employer can, however, be partly absolved of certain acts of omission and commission. Since, in the absence of a strong opinion of democratic labour force and advice on problems of industrial hygiene and medicine from the State, the employer is not enlightened enough on such provisions.

OBJECT OF INDUSTRIAL MEDICAL SERVICE

The idea of an industrial medical service is not to confine itself to statutory obligations to make certain arrangements for the safety and health of the employees, such as the fencing of machinery, the provision of first-aid boxes, the services of a compounder or a doctor to give first-aid and provide treatment in hospitals of ailments that are really not industrial or occupational in nature. While the provision of such general medical facilities by the employers is supplementary to the general health services provided by the state and is very beneficial to all concerned, the concept of an industrial medical service is totally lacking at the state, provincial or factory level.

An Industrial Medical Service implies the supervision of the health of the individual worker in his industrial environment; the prevention as far as possible of physical and mental illness, initial treatment of injury and sickness, an efficient medical liaison between the factory outside medical services and the public health authority. It is in short, the provision of protection against controllable or preventable health hazards in industry.

In their recommendations for the development of the future health programme in India, the Bhore Committee say "We have accepted the

present position whereby the main health functions for the community are the responsibility of provincial governments. We, therefore, suggest that the industrial health organisation should form an integral part of the provincial health department and that it should work in close association with the provincial general health service." The principle behind these recommendations is that "the worker, in addition to the protection he requires against the hazards to health that arise out of his occupation, must be cared for as a member of the general population among whom he lives for the greater part of each day of his life." The Bhore Committee also lay down that "the creation of centres of teaching and research in industrial health in the medical colleges attached to the Universities will be necessary before such an organisation (as outlined by the Social and Preventive Committee of the Royal College of Physicians while dealing with Industrial Health Service in U.K.) can be developed to any extent in India."

PRESENT-DAY POSITION OF INDUSTRIAL HYGIENE SERVICE

With the coming of the States' Employees' Insurance Act into operation the development of a high level of industrial health service for industrial community is envisaged. The statistical data that the Insurance Corporation will provide in years to come will prove of great value in furthering investigation and research in industry.

Another step in the same direction has been taken by the Indian Research Fund Association in instituting an Industrial Health Research Advisory Committee, to go into the problem of research in Industrial Health. The Association is subsidised by the Government of India and its main object is to conduct research in medicine and allied subjects.

Lately an Industrial Health Research Unit has been formed at the All India Institute of

Hygiene and Public Health to conduct research in problems of industrial hygiene.

SOME OUTSTANDING OBSTACLES

In order that more progress can be made, some of the outstanding obstacles in the organisation and development of industrial hygiene service must be overcome. First and foremost is the great lack of general medical man power which precludes the recruitment and training of personnel. A small attempt of this nature has been made at the All India Institute of Hygiene and Public Health, in starting a short course of three months training leading to the certificate in industrial health, for medical graduates.

The other obstacle is the conduct of demonstration studies in the field in various types of industries in the provinces.

The third difficulty is the lack of administrative and technical advice from the central department.

FUTURE PLANNING

(a) To overcome these obstacles it is necessary, that, as a first step, preliminary surveys in industry, must be carried out to determine the exact problem of industrial hygiene. Such surveys alone can yield information on the potential occupational health hazards and on the extent of the present-day services for the control of such hazards. These surveys can also serve as a means of acquainting industry, labour and industrial hygiene administrators in the aims of an industrial health organisation working for the promotion of health in industry.

(b) It is for consideration if an industrial health division be organised at the central level to carry out the triple functions of:—

1. Field operations.
2. Consultation services to provinces and states in the Indian Dominion.
3. Inspection teams for government plants.

In such an organisation the *Field Operation*

Branch can be entrusted with studies of a laboratory nature, into every type of industrial hygiene problem, especially, those dealing with chemical, biological and physical health hazards.

The *Consultation Services Branch* can have for its main function the promotion of activities designed to put into practical application in industry, the knowledge obtained through Field Operation Branch.

The *Inspection Team Branch* is to form a corporate body of medical man, engineer, chemist, physicist (technical personnel) and statistician, to be assigned specific duties in the form of recruitment, training of personnel and carrying out independent specific duties which are in the nature of services and research investigations. There is a very big number of government and local fund factories of all types which employed on an average of 419,918 and 456,342 people in 1944 and 1945 respectively, widely distributed over the Indian Dominion and varying greatly in the numbers of personnel and in hazards. The head of an inspection team could be made responsible for policy, staff requirements, medical supplies, technical information and post-graduate studies. Refresher Courses with lecture demonstrations can be arranged from time to time and in this way staff, whose duties tend to isolate them from contact with their colleagues, could be kept up-to-date.

At present, advisory work at the centre is in charge of the Ministry of Labour and is accomplished by means of the Chief Adviser of Factories and his four deputies one of whom is medical.

In its broadest sense, industrial health services comprise the provision of healthy working environment, the prevention of illness of workers, the detection of incipient disease, the care of injuries, treatment of illness, and lastly the health education of the worker.

PROVINCIAL HEALTH DEPARTMENTS AND INDUSTRIAL HEALTH SERVICE

It is rather difficult to comprehend the earlier lack of industrial hygiene activity on the part of local public health government departments and industrial establishments, when one sees that labour through its large numbers constitutes a most important part of population for general health promotion work. It is right that prevention of communicable diseases demanded the maximum emphasis and attention of public health departments, but the time has now come when part of this emphasis must be shifted to other health problems of the day.

The public health problems of a tropical country like India are always many. Epidemic diseases like malaria, leprosy, filariasis, guinea-worm infection and hookworm disease, cholera, small-pox and dysenteries are responsible for a considerable amount of morbidity and to a certain extent of mortality also. High rates of mortality among such vulnerable groups as children and women in reproductive ages, do not speak very high of the efficiency of public health organisation in this country, when it is considered by high ranking public health workers that 50 per cent. of this mortality is preventable. If the need for any service is to be guided by the amount of illness present, our efforts should be concentrated on the more important epidemic diseases, since these alone are our major problems in preventive medicine. It would appear, therefore, that industrial hygiene offers a rare opportunity to do something in the field of wider public health work for the community at large.

BHORE COMMITTEE'S RECOMMENDATIONS

In their recommendations, the Bhore Committee say: "We have accepted the present position whereby the main health functions for the community are the responsibility of Provincial Governments. We, therefore, suggest that the

industrial health organisation should form an integral part of the provincial health department and that it should work in close association with the provincial general health service." It is evident now that "the proposed industrial health service will not minister to the general medical needs of the industrial population."

One of the functions of the provincial ministry of health as laid down in the above committee report is, "Provision for services to aid industry in the study and control of health hazards due to occupation." This view strengthens the case for integrating industrial health service with other health services in a health department. In this way, a complete health programme can be brought directly to industry. These services can be classified into two types:

(a) Personal hygiene services.

(b) Environmental hygiene services.

Personal hygiene services include the provision of following services to the industrial worker in common with the general public.

- (1) Control of communicable diseases, including venereal and tuberculosis.
- (2) School health service.
- (3) Maternity and child welfare.
- (4) Nutrition.
- (5) Dental service.
- (6) Vital statistics.
- (7) Public health education.
- (8) Nursing.
- (9) Welfare services.
- (10) Mental health service.
- (11) Rural epidemiology.
- (12) Inter-provincial health relations.

Environmental hygiene services include the following services to the benefit of the industrial worker:—

- (1) Housing—town and village planning.
- (2) Water supply—urban and rural.
- (3) Public cleansing and rural sanitation.
- (4) Drainage, sewerage and sewage disposal—urban and rural.

- (5) Food sanitation.
- (6) Control of working environment—Industrial Hygiene.
- (7) Rodent and insect control.
- (8) Ventilation and air conditioning.

It is not much to impress and emphasise the fact that the industrial population offers unique opportunities for the promotion of public health services by virtue of the fact that the industrial population like the army is an organised body and the introduction of any health schemes together with the assessment of result is easier in an industrial population in comparison with the general community.

In the actual working of such an integrated service, it is, therefore, essential that the public health agency, for the purpose of introducing health programmes in industry, made all initial contacts with the central or provincial industrial health advisory body, the Chief Adviser of Factories or the Provincial Factory Inspectorates.

CENTRAL HEALTH AGENCIES AND INDUSTRIAL HEALTH SERVICES

(a) At the Central level too, it is essential that other departments that are concerned with industrial hygiene problems, like the Ministry of Labour, Ministry of Works, Mines and Power, Ministry of Railways, Ministry of Transport and Communications, Ministry of Industry and Supply made a joint action in the industrial hygiene field.

The same procedure can be repeated at the provincial level.

The Office of the Chief Adviser of Factories has to maintain cooperative relationship with all central and provincial industrial health agencies and with Provincial Inspectorate of Factories. Besides this, there are certain responsibilities that are inherent in this advisory body.

1. *Formulation of Rules and Regulations—designed to prevent and control occupational diseases.* This is in the nature of consultation

services to the provinces and the union of states. These rules are not mandatory and the provinces have a right to formulate, adapt, or institute their own rules.

2. *Investigation and enforcement of Rules.*—Much in this direction is accomplished by persuasive tactics and advice to the provincial inspectorates and guidance in matters requiring legal action or otherwise enforcement of rules.

3. *Reporting of occupational diseases:* (a) By advising the inspectorates and other public health agencies to provide for closer contact between themselves, the physician and the management responsible for reporting. It also helps the provincial inspectorate in investigation of those conditions which give rise to these diseases and advises them on measures for their eradication.

(b) The idea of having an "Industrial Hygiene and Safety Museum" where could be shown by means of plans and photographs methods of occupational disease and accident prevention, has already drawn the attention of the Labour Department and once established, it is considered will do useful service in the field of industrial medical supervision.

(c) The publication of pamphlets and explanatory memoranda on industrial poisons and diseases by the Office of the Chief Adviser of Factories is another little service to help the spread of knowledge about these diseases and poisons and the methods of control recommended to be used in industry.

UNOFFICIAL BODIES AND INDUSTRIAL HEALTH SERVICE

A word or two is necessary for those unofficial agencies also who are interested in problems of industrial health. Their voluntary efforts in the above fields are being slowly recognised and their further cooperation is a thing very much expected by all.

THE ROLE OF THE PHYSICIAN IN INDUSTRIAL HEALTH SERVICE

Lastly, the services of the large body of general practitioners, who alone meet the medical needs of our labour population, must also be taken note of. It is, for this reason, essential that these physicians should be approached through their medical associations, to give their serious consideration to the problem of industrial hygiene. These physicians must be stimulated to contribute to the health of the workers on their medical charge both in industry proper and in private practice. It is worth considering if the state, the medical associations and industrial hygienists could be brought to collaborate to their mutual benefit. In order to ensure a good notification of industrial diseases, a closer working relationship between the medical profession and the industrial hygiene agency should be established. The private physician must be familiarised with the various occupational diseases so that he can detect such diseases very readily amongst his clients. He must always insist on an occupational history taking as an important part of his questioning the patients.

THE ROLE OF THE "FACTORY DOCTOR"

The present day industrial "doctor" for the same reason needs to learn a lot about the working environment of the workers, who are under his medical care, and then only one can expect a more efficient and intelligent medical service. The need to report occupational disease must be stressed on him.

THE ROLE OF THE MANAGEMENT IN INDUSTRIAL HEALTH SERVICE

In conclusion, the management must be familiarised with the aims and purpose of an industrial health service, with a view to develop in them a new concept of industrial philosophy, that is "To keep the worker well on the Job." The art of personnel management, requires interest in such problems as general health

provisions, home and community facilities, medical care, proper nutrition and factors which keep the worker healthy and fit for the job.

SOME SUGGESTIONS

(1) It is hoped, that, in the future, voluntary health agencies and labour unions, will, by the establishment of clinics and by including health provision in labour contracts and by programmes of health education, greatly strengthen the movement for improved health among workers.

(2) Most important, however, is the work of education authorities to improve and provide for the professional education of physicians, nurses and public health workers in the field of industrial health in Universities, in under-graduate and graduate courses. It is important that the generation of doctors now growing up should be given training in regard to occupational diseases which might well be included in their ordinary curriculum.

The medical faculty needs to develop an attitude of keeping pace with the developments in modern social legislation and especially factory legislation in regard to the demands of hygiene and medical aid in industry.

(3) The Central Health Services Agency should conduct research and provide funds and personnel for development of industrial medicine. It is a well known fact that industry solves its own problems with the help of official agencies and others. In other words, the function of an official agency is to render help to industry to demarcate its problems, to recommend methods for their control, to develop and act standards of good practice and to provide technical guidance and advice. In short, such official health agency is required to provide, for the purpose of industrial health, to the public such services as:—

- (a) evaluation of environmental factors detrimental to health and the necessary recommendations and remedies therefor.
- (b) evaluation of toxicological hazards of various processes and materials

especially new materials prior to their use in industry,

- (c) evaluation of problems of illnesses amongst workers in order to be able to advise medical inspectors, physicians, compensation authorities, and other agencies,
 - (d) evaluation of methods of promotion of hygiene programmes in industry,
 - (e) evaluation of the problem of industrial absenteeism due to industrial diseases and toxic hazards,
 - (f) provision of necessary clinical and other type of research facilities.
- (4) To be able to carry out such an extensive range of functions, a nucleus of industrial medical officers, industrial hygienists (Chemical and Engineer personnel) and industrial nursing personnel has to be formed.
- A start could be made by the organisation of a *Society of Industrial Medical Officers*. Once a nucleus of trained industrial hygiene personnel is formed, this nucleus can be utilised to give its advice on the control of occupational diseases and advise industry on the necessity for other services in the health department directly concerned with the problems of community health services. Such a nucleus can help to stimulate industry to report all types of industrial diseases to authorities concerned, at the same time can advise private physicians on various occupational diseases.
- (5) Other personnel in the nucleus, like the engineer, the chemist and the physicist can help to conduct surveys for the determination of existing health hazards from exposure to dusts, fumes, vapours, gases, physical hazards like poor and bad ventilation, lighting, excess of noise, plant safety, general sanitation, water supply, disposal of trade waste, etc.
- (6) It must, however, be noted that all divisions of a central, provincial or local health department must coordinate and cooperate in the work. The industrial health department of any

form of health service should not do all adult health work but should confine itself to the control of the occupational environment since its personnel will be specialised in a particular field of public health. The importance of integration of industrial hygiene with other health services in a health agency cannot be over-emphasised.

(7) Another source of great information regarding occupational diseases is the sickness statistics in industry. There is a wealth of material which if properly analysed can reveal the amount of occupational mortality and morbidity and which information, if made available to those who are directly concerned with occupational disease investigations, can help in devising plans for the development of the right type of industrial hygiene service in the country.

(8) The trade unions, provided they adopted statistical methods and realised the importance of the subject of disease in industry, through their experience analysed from the medical point of view, can do a lot to cooperate with industrial hygiene administrator in the development of an industrial hygiene service. If health-injurious conditions are to be removed, they must be dealt with in a highly specialised manner. The field which requires thorough investigation by the trade unions is enormous.

(9) The management in industry has also to make a large contribution in the development of industrial hygiene service. Continuous records of sickness-absence for each employee afford a valuable piece for scientific research. Sickness records are a dependable measure of health, and special sickness investigations can easily be derived from these fundamental sources.

(10) Hospital statistics which have the advantage of certain diagnosis can give a general idea of the occupations which are liable to serious poisoning. Hospitals in industrial areas can help in evaluation of hygiene problems in cases of poisoning or disease.

CITIZENS' ROLE IN THE PREVENTION OF SMALL-POX

by

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Our knowledge in preventive medicine, as in any other branches of science, is far in advance of actual practice, particularly in this country; and what is needed therefore is not more knowledge but wider use of the knowledge we possess in the matter of prevention of diseases which are preventable and preventive measures cannot be carried out efficiently without the willing co-operation of the public and public cooperation can only be expected if the citizens have some knowledge of and interest in the subject. The effectiveness of any public health work depends in a large measure upon the public's understanding of the end in view; and it is the responsibility of the health services to instruct the citizens regarding the general principles of prevention and control of preventable diseases, using all appropriate means of public education; and the final test of health education is not how much information is distributed but how behaviour is influenced.

The object of the present article is to present a few essential facts about vaccination which should be known to all and ignorance and misconstruction of which have been responsible for much anti-vaccination sentiment.

The dreadful disease known as smallpox is regarded as one of incredible antiquity. Prevention against this loathsome disease by a method called smallpox inoculation was in vogue in the Eastern countries for many years

before it was introduced into Europe by Lady Mary Montague (1689—1762), the wife of the British Ambassador at Constantinople. Indeed, in India, this preventive inoculation is said to have been carried on from time immemorial. But unfortunately the practice, despite its advantages to the individual, was a danger to the community and was therefore later given up universally in favour of a method of protection called "Vaccination" which was first put to a scientific test in England by Edward Jenner (1796). And it was in 1802 that vaccination was introduced into India. The smallpox vaccination, unlike smallpox inoculation, produces a mild local disease, cowpox or vaccinia, which effectually protects the vaccinated individual against human smallpox and is moreover without danger to others. Further, unlike smallpox inoculation, smallpox vaccination reduces the prevalence and mortality of smallpox in a remarkable manner.

AGE FOR VACCINATION

This is a very important consideration.

(a) *Primary Vaccination in infants* should be done before the age of six so as to avoid the constitutional disturbances during the periods of teething and artificial feeding. Besides, the general discomforts from first vaccinations are usually milder in infants than in older children and adults and complications do not arise. These

are important reasons for parents to ensure that primary vaccination in infants are performed early in life. The best age is four months. Summer months should be avoided.

(b) *Primary vaccination in School children, adolescents and adults* should not be undertaken except in those exposed to smallpox infection.

(c) *Re-vaccination of children and adults*.—The necessity for routine re-vaccinations varies with circumstances, thus

(i) for children first vaccinated in infancy, re-vaccination should be done when the child goes to school (5—7 years) and again on leaving school (14—16 years).

(ii) If there is a danger of exposure to smallpox, re-vaccination is essential regardless of any prior vaccination.

(iii) Doctors, nurses, sanitary inspectors and others who are likely to deal with cases of smallpox need regular re-vaccinations at yearly intervals.

It is not proposed to deal with the question of the technique and the various methods of vaccination in vogue and with the time for inspection of vaccinations and interpretations of the reactions of vaccination, etc., as these are matters more concerning the technical persons performing the operation of vaccination. But one fact is worth mentioning here and that is that the modern tendency in vaccination is towards smaller insertions (not exceeding 1/8th of an inch in any direction) and more frequent vaccinations (*vide para 3 (c) above*). Persons requiring vaccination may therefore elect to have vaccinations in single insertions unless they desire maximum protection obtainable at one operation in which case multiple insertions may be given. It should be remembered, however, that even a single vesicle affords sufficient protection.

Vaccination of persons exposed to smallpox infection.—This is a question which is very frequently put to medical men and vaccinators

by the public. It is therefore essential that the citizens are correctly informed in the matter: Immunity develops about the eighth day of vaccination and the average incubation period of smallpox is twelve days. The operation of vaccination performed within three days of the period of incubation will usually prevent or abhor the disease; if done about the sixth or eighth day of the incubation period, the vaccination takes and may modify the severity of smallpox; cases vaccinated during the last stage of the incubation period or just before the onset of symptoms have hardly any chance of benefiting by the vaccination. As there is no means of judging in what stage in the period of incubation a given case may be, it is advisable for the exposed persons to get vaccinated. Little harm will be done if it is too late.

Contra-indications to vaccination.—There are no known contra-indications. Even infants may be vaccinated immediately after birth if exposed to infection, although it is wise and customary not to undertake routine vaccination of infants during the first few weeks of life before nutrition under breast or artificial feeding is well established. It is also unwise to vaccinate the weak, the sick and those with fever and skin diseases such as eczema, unless exposed to infection. Vaccination should also be withheld if there is whooping in other members of a family.

Pregnancy and vaccination.—Pregnancy is not a contra-indication. There is no evidence to suggest that vaccination during pregnancy interrupts the normal course of events.

Risks of vaccination.—Complications are the exception at present owing to the improved quality of the vaccine and modern asepsis.

(i) *Septic complications* of the vaccinated area may arise if vaccination is done without aseptic precautions and if the after care of the wound is neglected.

(ii) *Tetanus*.—Tetanus following vaccination is, fortunately, a rare complication and is a

secondary wound infection and therefore largely preventable. It is due to the neglect of the wound and not to the vaccine lymph. The tetanus bacillus and its spores are so widely spread in nature that opportunity presents itself for contamination of the vaccinal wound and the virus itself. But the lymph prepared according to modern methods and with recognised precautions is safe.

(iii) *Generalised vaccinia* is liable in persons with chronic skin disease.

(iv) *Foot - and - mouth disease*.—The likelihood of this disease virus-gaining access to vaccine lymph at institutes where calves are subjected to quarantine and veterinary inspection before use is exceedingly remote. Further, it is impossible to convey this disease through cutaneous inoculation.

(v) *Syphilis*.—Since the use of calf virus such an accident is absolutely impossible, as calves are not susceptible to this disease.

(vi) *Tuberculosis*

(vii) *Leprosy*

Chances of these diseases are also eliminated by the use of the calf virus.

(viii) *Post vaccinal encephalitis*.—The incubation period is ten to twelve days after vaccination. It usually follows primary vaccination and not revaccination. The condition rarely occurs in infants under one year of age, the bulk of the cases occurring in children over two years of age. Prevention lies in primary vaccination in the first year of life.

All the complications mentioned above are so exceedingly rare in occurrence that they should never be regarded as arguments to be used against vaccination. The writer has personally performed several thousands of vaccination both among the civil population and in the army and have not come across a single case of untoward happenings following vaccination properly carried out with pure, potent lymph.

Duration of the period of protection.—This is another important question so frequently asked by persons desiring vaccination. The highest resistance to infection lasts only a short time, following a primary vaccination in infancy; the period of the greatest protection in childhood probably does not even last more than three to five years and after this the absolute preventive power of vaccination rapidly diminishes and cases of smallpox begin to appear among the vaccinated. Protection afforded to adults by revaccination lasts much longer than the same operation in children; this restored protection again diminishes but much more slowly. In many individuals one primary take protects for life usually however only when supplemented by revaccinations. It is also worth remembering in this connection that successful revaccination indicates loss of immunity to cowpox, not necessarily to smallpox, for vaccination gives stronger protection against smallpox than against cowpox.

Protective value of vaccination.—Of the protective value of vaccination there can be no doubt. The history of the world before the days of universal vaccination shows the wide prevalence of smallpox and its fearful mortality. Reports from every part of the globe now indicate that the incidence of smallpox has always been the lowest among those members of the population who have been vaccinated. Even in this country where smallpox is still an ever present scourge among the civil population where preventive measures are difficult to carry out, its incidence in the army, in India has been so remarkably reduced by vaccination that the disease is not an important cause of sick wastage both in peace and war.

In Germany, where vaccination is compulsory, small-pox is comparatively a rare disease. The protective value of vaccination is also shown by the state of immunity of the personnel of smallpox hospitals. The doctors, nurses and attendants in intimate contact with the infection are

uniformly spared, because they are well protected by vaccination. All these facts show that a thoroughly vaccinated population can solve the problem of exterminating smallpox as an epidemic. Both the state and the citizens have an equally important role to play in the matter of prevention of this disease which, when uncontrolled, causes the wreck of a nation in a manner more formidable and ruthless than the most terrible of wars.

WITH pleasure, we publish the foregoing article. We would, however, desire to draw attention to the fact that in spite of vaccination against smallpox having been practised in this country for over seventy-five years, still, the waves of smallpox epidemics sweep through the land, without the hand of man checking or mitigating their ravages. Indeed, every epidemic is now considered seasonal like seasonal monsoon! Even today India occupies the pride of place as a country where the rate of incidence of smallpox is the highest in all countries for which statistics are available.

We furnish hereunder a comparative statement showing deaths from smallpox in British India and England:

PERIOD	BRITISH INDIA		ENGLAND & WALES	
	Annual Average No. of deaths.	Ratio per million of population.	Annual Average No. of deaths.	Ratio per million of population.
1878—1887	146,089	772	1,425	54.0
1888—1897	96,142	466	461	15.6
1898—1907	83,216	374	475	14.3
1908—1917	85,199	363	13.2	0.37
1918—1927	83,247	337	18.2	0.48
1928—1937	76,327	270	14.0	0.35
1938—1945 (8 years)	81,641	255	0.8	0.02

It gives an astounding results of vaccination and revaccination which have been considered as indispensable remedies for the prevention of smallpox epidemics.

England, on the other hand (especially since the passing of the 1907 conscience clause, which reduced the percentage of vaccinations to about one-third of the children born), has relied on improvements in sanitation and well recognised the factors that influence public health, also on the administrative control of infectious diseases. This development has resulted in the striking reduction of smallpox as shown in the table given above and also in an equally impressive reduction of all the grosser forms of zymotic disease. So much so, England has now abandoned compulsory vaccination against smallpox.

We maintain that vaccination against smallpox without an improvement in environmental sanitation cannot yield results. Vaccination is the anæsthetic and not the operation itself. Our administrators are out for cheap remedies. Instead of providing a wholesome water-supply to our people, they rely upon inoculation against cholera. Instead of improving the housing conditions of the masses, they resort to BCG vaccination, despite the sharp difference of opinion as to its efficacy or utility on a mass scale.

Much is made about the eradication of smallpox in the Phillippines. If the history relating to smallpox and vaccination in the Phillippines is looked into, one would readily recognise that the good results there were more due to the sanitary standards of the community having been raised rather than to mere vaccination. Indeed, we may even go to the extent of challenging our public health authorities to show whether vaccination alone has tended to liquidate smallpox without improving the living conditions of the people, any where in the world.

Lemuel Shattuck of America and Edwin Chadwick of England, who were the first great pioneers in public health ploughed their lone furrows in their days. They agitated for an improvement of the living conditions of the people. The ill-treatment meted out to them by an apathetic public should have depressed even crusaders like these great pioneers; but undaunted they fought and fought. Vested interests are always a bar to progress in any sphere and public health is no exception. The pioneers who fought for environmental sanitation were always opposed, more particularly by the medical profession. Fortunately, to-day lip service at least is being done to environmental hygiene by the medical profession!

Euclid told his king that there is no royal road to geometry. We now tell our ministers of health that there is no chord line to public health. The surest foundation for the nation's health is the improvement of environmental sanitation.

—Ed., P.H.



COMPOST MANUFACTURE AT LALUR TRICHUR MUNICIPALITY (COCHIN)

by

Dr. P. K. George,
Health Officer, Trichur.

One of the most serious evils of the recent world war has been the acute scarcity of food and India which was menaced by famine even during the pre-war days is paying heavily for the sin of neglecting agriculture and relying on other countries for the supply of food materials. It is, however, gratifying to note that the Government have realised that the best method of solving the food problem is to increase the yield of our own land and to make our country self-supporting rather than to beg of other countries for food.

For improving agricultural yield, good manure is necessary. India has been an agricultural country for the past thousands of years and manure value of the soil has been tapped to the maximum without sufficiently replenishing it with the result that the agricultural yield is decreasing every year. Healthy body can be made up and maintained only by good nourishing food and good food can be grown only by cultivation with scientific manuring.

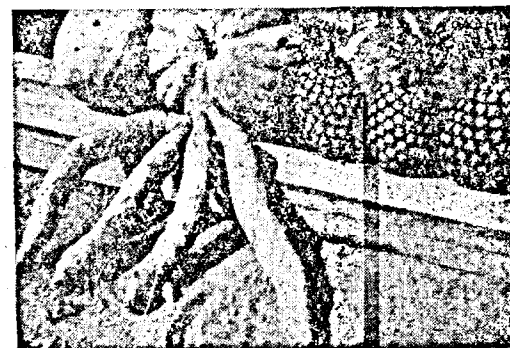
Whereas the yield can be admirably increased by the application of chemical manures, the natural food of the soil is organic manure.

Our grandfathers were wiser than us in agriculture and paid greater attention to manure their

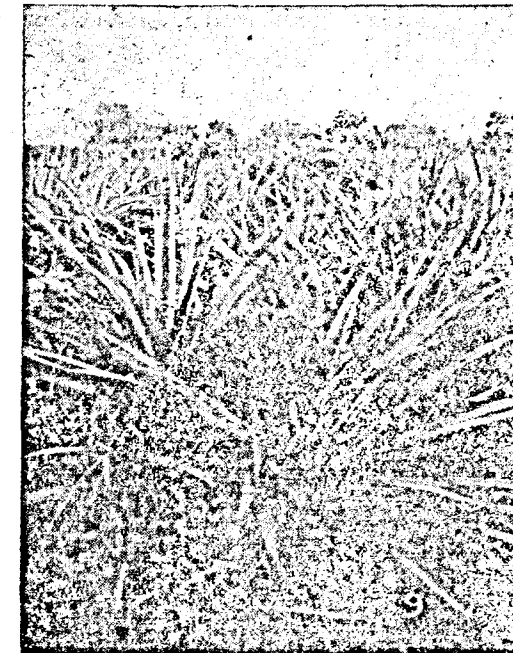
lands by organic manure. In short, they had realised the value of manure in agriculture by practical experience long before our scientists were able to establish it by laboratory experiment.

The chief sources of organic manure are the animal and vegetable waste such as excreta, urine, weeds, crop-waste, etc. The disposal of these items has been a problem of public health authorities, while at the same time, the adequate supply of these for manure was the problem for agriculturists.

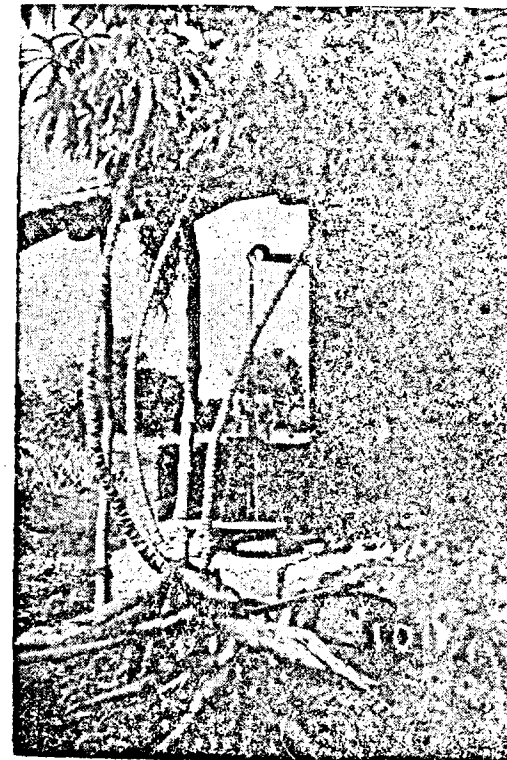
Manufacture of compost was evolved after much scientific research and it has been made



Fruits and tubers picked up from gardens, manured by compost.



Pineapple gardens manured by compost.



Tapioca plant with tubers manured by compost.

possible by this method to dispose of the animal and vegetable wastes most unobjectionably and to the utmost benefit to the agriculturists.

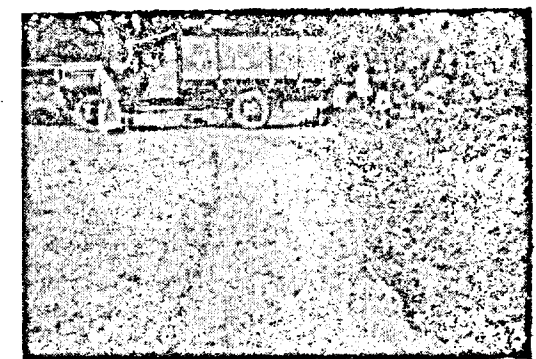
The manufacture of compost was started in the Trichur Municipality as early as 1940. The method adopted was as follows :—

In trenches made on the heaps of rubbish, nightsoil emulsion is applied and covered with rubbish. Five to seven weekly applications of nightsoil will make the rubbish heaps saturated and in the eighth week, the compost is matured and ready for sale.

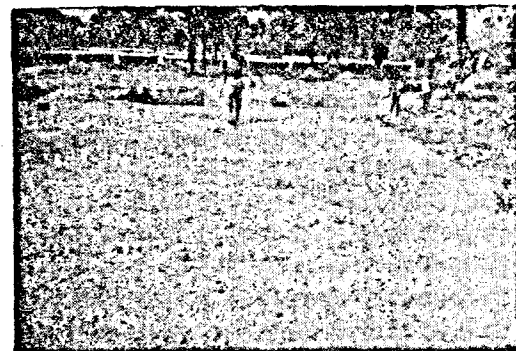
In the beginning, the sale of compost was very poor, but gradually, the agriculturists realised the value of compost as manure and now the compost is purchased by them in advance, that is, before it is matured. About Rs. 7,000 was collected last year by the sale of compost in this municipality. On analysis of the compost manufactured at Lalur by the Trichur Municipality, it has been found that it contains the essential principles of manure in the following proportions :—

Nitrogen	.. 1.613
Potassium	.. 0.181
Phosphorus	.. 1.002
Calcium	.. 0.756

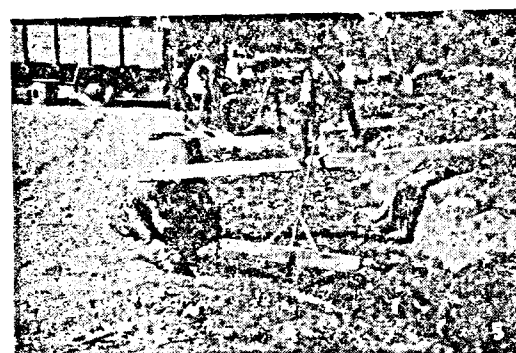
One of the defects of this method was that the slightest neglect on the part of the workers at the disposal grounds would give room for fly breeding.



Rubbish application.



Trench filled up to-day.



Night-soil application and spreading.



View of compost heaps.

Owing to the general labour unrest and want of good labour in these days, the condition of disposal grounds was not as perfect as it ought to be and gave rise to complaints of nuisance.

To remedy these evils, Major P. Muhamad Ali, Assistant Director of Public Health, recommended and the Government accepted the manufacture of compost by the hot fermentation method.

In this method, fly breeding is controlled by covering the filled up trenches with tarpaulin from the 5th day of filling up to the 12th day.

The Trichur Municipality has started the manufacture of compost by this method on 15-11-'48 with very satisfying results.

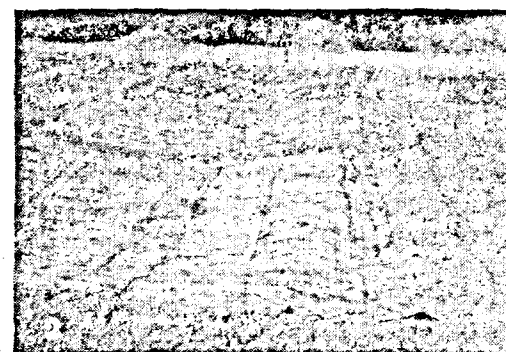
Two trenches of 35' x 8' x 3½' are being filled up in 3 days with a staff consisting of 1 Maistry and 8 scavengers. If everything goes on well, we expect 12 tons of compost in each trench or 8 tons daily. This compost may easily be disposed of at the rate of Rs. 5 per ton. So we expect a total collection of Rs. 40 per day. The recurring expenses may come to Rs. 13 daily, i.e.

	Rs.	A.	P.
Maistry per day	1	12	0
Scavengers @ Re. 1-6-0 daily ..	11	0	0
Contingencies such as baskets, etc., daily	0	4	0
Total ..	13	0	0

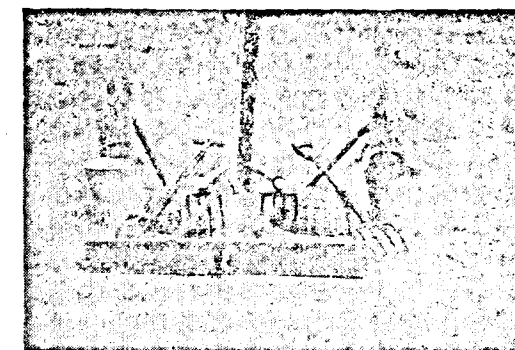


View of compost manufacture (Hot fermentation method) grounds.

Rs. 7 may be set apart to recoupe initial expenses such as trenches, tarpaulin, etc.



Tarpaulin covered trench.



Implements.

Rs.	Amount set apart to recoupe initial expenses	2,555
Rs. 20	The Government of Cochin has sanctioned a scheme of compost manufacture on an All-Cochin basis which will come into practice shortly.	
Rs. 7,300	So, the anticipated nett profit from compost per annum	

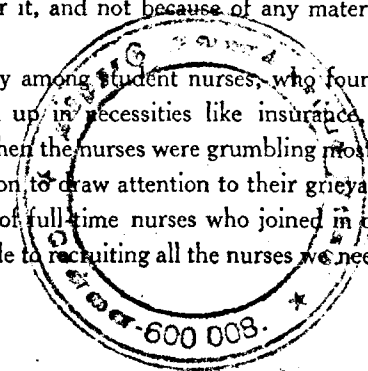
TRAINING OF NURSES IN BRITAIN

A few weeks ago changes in salary for student nurses in Britain were announced which will make them better off than they have been. From next January student nurses, instead of being given board, lodging and tuition and receiving a salary which was little more than pocket money, will have handed to them the whole of their salary—£200 (Rs. 2,662) for the first year—of which, if they are resident-students, they will hand back £100 (Rs. 1,331), leaving them about £2 (Rs. 26-8-0) a week for personal expenses.

There is no profession in which a rise in salary would cause such universal satisfaction as has been caused by the rise for the nurses. The war gave many people a glimpse of the hard and devoted work they did and the peace has not allowed them any relaxation. Girls who take up nursing do so because they want to, because they have a vocation for it, and not because of any material benefits it offers.

There had been a good deal of grumbling recently among student nurses, who found that the pocket money which was left to them was swallowed up in necessities like insurance, bus fares and so on. Yet it is significant that at the moment when the nurses were grumbling most, and had even organised a march through the streets of London to draw attention to their grievances, there was an increase of as much as 2,000 in the number of full-time nurses who joined in one month. Now that their grievances have been met, the last obstacle to recruiting all the nurses we need ought to have been removed.

143145



FIGHTING TUBERCULOSIS AT SOURCE

Britain To Check Infection From Milk

by

John Farmingham

So far as our country is concerned, infection from milk is impossible, in view of the fact that milk is consumed in this country only after boiling. However, this article would be of general interest to show how bovine tuberculosis spreads in countries where milk is consumed raw or defectively pasteurised.

—Ed., P. H.

The war against tuberculosis is a true world war, for there is no country where it is not being waged, though with varying skill, energy and success.

As is well known, one frequent source of the human disease is infection from milk. Britain, in particular, has for many years been pursuing a policy of cleaning up her dairy herds.

Pasteurisation is, of course, effective in sterilising infected milk, but it has the drawback of altering flavour besides being under suspicion of destroying certain of the vitamins. A better method of eliminating infection is to use only milk from attested herds.

Under a new regulation the only raw milk sold in England for human consumption after Oct. 1, 1954, will have to be of this "tuberculin-tested" variety. In this connection experiments are being made by the Wiltshire Agricultural Committee who are rearing 500 calves, taken from non-attested herds, in surroundings where they can qualify for attestation.

Most calves, even though from tuberculous mothers, are born free of the disease and rearing them away from a tuberculous environment should ensure their remaining healthy. In fact a number of tuberculin-tested herds have actually been built up by this method.

HOW IT SPREADS

Bovine tuberculosis is generally spread by contact between healthy and infected animals but there is always the danger that germs may enter the milk during or after milking, owing to organism being excreted from some part of the body. Incidentally, tuberculosis of the udder alone is very rare, but cases have been found where it existed without being discoverable otherwise than by microscopic examination.

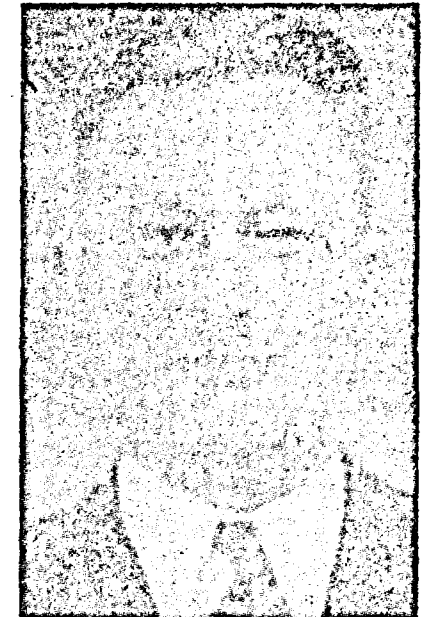
It is hoped in time entirely to eliminate bovine tuberculosis in Britain. When this end has been attained, a sharp fall in the incidence of the human variety may confidently be expected.

STORY OF WATER

by

Fred. E. Smith

Chemist, Water Purification Plant, Cambridge, Mass.



Few appreciate the labours involved in providing water-supply to a community. The author of this article presents in a non-technical language the unadvertised labours of the water works profession.

—Ed., P.H.

The struggle to obtain food, provide shelter, and procure sufficient water has existed since mankind has inhabited the earth; and the standards of these necessities of life have been constantly raised throughout the centuries.

Methods of food production had their beginning in the individual efforts of prehistoric man to kill game and to use whatever vegetation was available in his section of the earth. Utilization of nature's resources has enabled housing conditions to rise from those of the cave-dweller.

In similar trend, standards of domestic water quality have been raised. A significant difference is noted, however, in the distribution of this necessity of life. In a large city standards of living vary considerably according to the financial resources of individuals. But standard quality

of drinking water is supplied to all inhabitants of a city irrespective of personal economic status.

EARLY WATER SUPPLY

Early man made use of streams, springs and lakes as sources of drinking water. The unknown individual who dug a hole in the ground and found to his surprise that water entered the excavation should be credited with the development of the first artificial source of water-supply, namely wells. Ancient history records several famous wells such as Joseph's well in Cairo. Centuries ago in China there were in use wells several hundred feet deep. The extensive water-works of the Romans conveyed water long distances to their cities. One aqueduct erected in

Spain in the year 109 A.D. was still in use in recent years.

In the United States the first settlers obtained drinking water from flowing streams or ponds. There is a report that the Pilgrims in 1620 rejected the site of Province-town as a settlement because of the difficulty of securing water. Plymouth instead was selected.

The first attempt to provide a municipal water-supply was made in Boston in 1652. Springs served as the source of supply. The number of public water-supplies had increased to 17 in the year 1800. To-day there are more than 12,000 public water-supplies in this country, some of which serve more than one community.

It is a question whether many inhabitants of a community are aware of the extent of the water-works organisation which delivers drinking water to the home. In like manner, people have no knowledge of the numerous safeguards employed to maintain the quality of drinking water demanded by present-day standards.

PUBLIC LACKS KNOWLEDGE OF WATER

There are reasons for the lack of knowledge on the part of the public concerning the community water-supply and its complementing divisions. Water-sheds, storage reservoirs, and areas from which well water is obtained are often located at a distance from the city in which the water is consumed. Pipe lines which distribute water to the homes of consumers are buried underground. In the home pipes which deliver water to the several outlets are concealed within the walls. The fixture from which water flows at the turn of the valve alone indicates the presence of ample water on the premises.

As a result of the public's matter-of-fact acceptance of water-supply, interruption of water service is a matter of concern in the homes of consumers. Household routine is considerably deranged by a brief period without water service.

A little thought upon the consequences which would result from a serious failure of a community water-supply reveals the extent of such a catastrophe.

Sewerage facilities depend upon the availability of water to remove city wastes. Disease would become rampant if it were impossible to remove these wastes. Central heating units would be unable to operate without water for steam production. If a conflagration occurred the entire community might be destroyed without water to fight the flames. The impossibility of life existing in a modern city without adequate water is readily apparent. During the disastrous floods of 1936, which crippled the water supplies of many communities, restoration of safe water even on a restricted basis was one of the first efforts of the authorities.

WATER-BORNE DISEASE

The necessity of maintaining standards of drinking water quality became evident when scientific studies showed that intestinal disease, such as typhoid fever, could be transmitted by impure water. Application of the new principles of sanitary water analysis indicated that many waters of original purity had been rendered of questionable quality. This condition had been caused by residential or industrial developments from which wastes were permitted to enter the water-supply. An illustration is seen in a situation where cities use the same river for water supply and sewage disposal. Abandonment of an unsatisfactory source of water-supply and securing a new supply became increasingly difficult as development of this country progressed with industrial and community expansion.

The solution of the water-supply problem was achieved in many instances by purification of the existing supply. The result of water purification in the United States has been the sharp reduction in the typhoid fever toll of cases and deaths. Older people living to-day can recall

the time when typhoid epidemics were of frequent occurrence in many communities. To-day with the principle of safe water-supplies firmly established, the rate of water-borne typhoid fever cases per unit of population has nearly reached the vanishing point.

SAFEGUARDS

The operation of a public water-supply in such manner that disease will not afflict a community through the medium of its drinking water is a serious responsibility. Safeguards to protect water quality are in operation throughout the extent of the water-supply system.

Sanitary protective measures are instituted on the water shed over which regular inspections are conducted. Unfavourable conditions in this area are corrected or removed. Storage of water in reservoirs requires the enforcement of sanitary regulations in adjacent areas. Re-forestation programs have often made reservoir sites into places of natural beauty with consequent appeal to the picnicker and automobile party.

The purification of a water-supply by means of filtration requires scientific control of the treatment as an absolute necessity if successful results of operation are to be obtained. The system of pipes through which water is distributed to consumers is carefully guarded against breaks and failure of water service. The repair of old pipes or construction of new mains requires sterilization of the new sections before the line is placed in service. Constant vigilance in the application of safety measures is necessary for the production of drinking water which is pure at all times.

IMPROVED WATER QUALITY

In recent years standards of water quality have been broadened to include conditions other than safety, always the first requisite. Formerly, if a supply were safe, or was rendered wholesome by adequate treatment, little considera-

tion was given to other qualities of the water. This is no longer true. Examples of conditions encountered in water treatment which in the past were ignored are colour, turbidity, hardness, corrosive powers, unpleasant odour and taste, and excessive iron content.

High colour detracts considerably from the appearance of water used for domestic purposes. The colouring water is extracted from grass leaves and vegetation. It is perfectly harmless. Filtration of the water-supply, however, will remove or reduce the colour. The appearance of drinking water is most attractive in communities provided with filtration plants.

Turbidity may be responsible for the unfavourable appearance of water-supply. This condition is caused by the presence in the water of finely divided particles of earth or clay in suspension. The effect in a glass of water is a cloudy appearance when the water is viewed toward the light. After a heavy rain, the "roily" appearance of a brook or stream is caused by the high turbidity which resulted from material added to the water by the surface runoff. Filtration of water removes turbidity and delivers a brilliant water to consumers.

Rising standards of water quality require that the hardness or soap-consuming power of a water be reduced. A hard water not only increases household soap consumption, but also minimises the efficiency of heat production. The life of fabrics is lessened by repeated washings with hard water. Modern methods of treatment can materially reduce the excessive hardness of a water supply, and many cities have erected water-softening plants for this purpose.

The corrosive power of a water-supply is of importance to consumers. The life of household plumbing is materially shortened if the water-supply is capable of attacking the metals in the pipe. The corrective treatment applied to many waters in order to reduce corrosion of pipes directly benefits all water users.

TASTE AND ODOUR PROBLEMS

The problem of unpleasant odour and taste in drinking water has received considerable attention in recent years. Odour and taste are sometimes the result of decaying organic matter in water. Microscopic growths which occur in many supply reservoirs are able to impart odour and taste to the water. Careful exercise of control measures is conducted to remedy conditions which might render drinking water unpalatable. A serious result of unpleasant odour and taste in a safe drinking water is the utilization by consumers of other sources of supply, the safety of which is often questionable.

Some waters extract from the earth's crust contain objectionable elements, for example, iron. If a domestic water contains an excessive amount of iron, pipe deposits are formed. When these are flushed from the pipe, staining of cloths and utensils will result. Many water supplies are treated in iron-removal plants to supply consumers with water of unobjectionable iron content.

In order to maintain present standards of quality, water treatment has been extended to a scope scarcely recognizable when compared with that used to meet standards of past years. It is a question, however, whether the public is aware of this fact.

WATER FOR INDUSTRIES

Industrial water treatment has become of increased importance. The time has passed when water of inferior quality can be considered satisfactory for many industrial purposes and it is not generally known that the community water-supply has considerable influence in the selection of a city for the location of an industrial establishment which requires large quantities of process water. A city or town provided with purification facilities has an added advantage

to extend to industry, which few industries overlook.

WATER CONSUMPTION GROWS

Provision for the quantity of water required for a community is of equal importance with maintenance of standards of water quality. Plans to fulfil the water needs of a growing city extending over a period of years are not uncommon. These provide for the orderly enlargement of existing supply facilities or the procurement of new supplies in a manner that the financial burden will not bear too heavily on the taxpayers in a single year. Although industrial curtailment reduced water consumption during the depression, many cities to day are faced with increased demands for water. The modern city with its homes encourages the use of water.

Bathroom appointments invite the use of water, and the general health of the people is benefited by the greater cleanliness made possible by ample water-supply. Carefully tended lawns and gardens require sprinkling, and consumption of water for this purpose is a matter of concern in some communities provided with little excess water over normal demands in summer months. New building projects, in particular, huge apartment blocks, increase the volume of water consumed per unit of ground area.

Finally, it is noted that accompanying rising standards of water quality and quantity, there has been in many communities a progressive reduction in the water rates. Cambridge, Massachusetts, charges ten cents per hundred cubic feet of filtered water. A cubic yard, or twenty-seven cubic feet, of loam for the garden or lawn costs approximately three dollars. The expression "Cheaper than Dirt," in fact, applies to water, prime necessity of life often too little appreciated by all of us.

(Water & Sewage Works)

BCG WILL FAIL IN INDIA WITHOUT PROPER HEALTH MEASURES

WHO EXPERT'S WARNING

We have been told by Dr. Edgar Mayer, the Tuberculosis expert of the WHO, South-east Asia Region, that the conclusions of the world tuberculosis experts at present are, *inter alia*, that BCG vaccination should be used on a *mass scale* as one of the most potent agents against fresh tuberculosis infection in non-infected people. (*Vide People's Health*, March '49, page 267).

It would be interesting to our readers to peruse the views expressed by Dr. J. B. McDougall of the Tuberculosis section of the WHO, which we publish hereunder. We have already pointed out in these columns that the protagonists of BCG do not seem to have any respect for precision and truth. The people in authority and their associates who back up BCG propaganda repeatedly say that BCG is but *one of the weapons* in the war against tuberculosis. Why is it that those in authority do not take steps to improve the environmental conditions of the masses? Experience has shown that the improvement of the living conditions of the people has yielded excellent results. We are convinced that the BCG propaganda is an eyewash with a view to giving an impression to the people that the State is doing something cheap and effective to liquidate tuberculosis from our midst. If the authorities really mean business, they should *first* take up the improvement of the living conditions of the people.

—Ed., P.H.

LONDON (By Air).

The need for undertaking health measures complementary to BCG vaccination if the campaign is to prove successful in any measure in India was stressed by Dr. J. B. McDougall of the Tuberculosis Section of the World Health Organisation in an interview to the "*Indian Express*" correspondent.

Dr. McDougall said, "It is unlikely that the success which has attended BCG vaccination in many countries in Western Europe can also be achieved at once in India, because in Western Europe, in particular, there have been other and equally important measures taken for the control of tuberculosis, and these measures have been

complementary to BCG vaccination and have unquestionably added to the excellent results achieved."

He felt that in India, where resources were meagre for the development of a *comprehensive* tuberculosis control programme, and where personnel available for the enormous amount of work to be done was limited and where also the infection rates were high, "any effort which will reduce the incidence of the disease should be adopted." BCG was merely one aspect of TB control and while it was being pursued every effort should be made to continue with the development of dispensaries, institutions and education of the population to the limits which may be permitted by the financial resources and personnel available.

Dr. McDougall described the BCG campaign as "one of the largest clinical experiences in modern medical work."

Answering specific points of criticism which have been raised in India and other countries, Dr. McDougall said that the justification for the vaccination of individuals who did not react to tuberculin and who were, therefore, specially susceptible was based on the vast amount of work which had been done, more particularly in Scandinavian countries under conditions which were as accurately controlled as were possible.

"The real criticism which has been given in the past is that there has been a lack of adequate statistical evidence as to the value of the vaccine." He explained to me. "It is, however, the view of most workers in this field that adequate statistical evidence is well nigh impossible to obtain since human beings vary in such factors as natural resistance, the degree to which they may develop acquired resistance, their environmental factors, and so on.

"In other words, it is not possible to carry out a complete control of ALL the factors which enter the tuberculous infection and disease in

human beings, as is possible in the case of laboratory animals."

He maintained that an examination of the work that had already been done in Denmark, Norway, Sweden, Canada and certain parts of America "showed conclusively that there are marked beneficial effects to be obtained in selected groups of the population."

THREE MAIN DIFFICULTIES

Prof. C. O. Stallybrass, Chief Medical Officer of Health, Liverpool, who favours a limited programme of vaccination in Britain, told me that he was "not prepared to be categorical about the practicability of applying a general scheme of BCG vaccination in a given part of India now." There were three main difficulties: (1) The vast population; (2) The question of organisation; (3) The acceptability of BCG on religious or other grounds.

"The application of BCG vaccine to persons above the age of early infancy in India who have not been Mantoux-tested (for tubercle reaction) might, as a whole, be beneficial," he said, "but any failures or untoward reactions might mitigate against its eventual acceptability."

The need for segregation after inoculation was for statistical reasons only. Persons vaccinated with BCG and infected simultaneously would presumably behave like unprotected persons.

Prof. Stallybrass felt that if appropriate controls were maintained "it does not appear to be undesirable for general use in India, but *I think that the only persons who have a right to pronounce on the subject are those with actual experience in India.*"

Next June, he pointed out, there would be a conference on Tuberculosis in London, and it was to be hoped that the problem would then be fully discussed.

European experts on the subject are emphatic that there is absolutely no reason to fear dangerous results in applying BCG to people with very low

living standards. Because malnutrition is the cause of particularly low resistance to tuberculosis and results in a much higher percentage of the infected persons contracting a tuberculous disease, there is every reason, they maintain, for using BCG vaccine in the very countries with undernourished populations.

For the same reason in Denmark, Norway and Sweden they have for many years tried to vaccinate all diabetics with BCG because it is known that diabetics have an especially low general resistance to tuberculosis.

PROGRESS OF CAMPAIGN

Tuberculosis, "The White Plague" has been on the march for thousands of years, but it was largely because of the staggering increase in deaths which it caused, and is still causing, immediately following the war that a mass campaign in many countries has been undertaken. Crowded living conditions and poor hygienic facilities in ruined cities and displaced persons' camps made a rich breeding-ground for the tubercle bacilli and for the spread of infection. In many countries the situation was made more disastrous because of the wartime destruction of hospitals and clinics, the disruption of public health services, and the drastic wartime curtailment in the number of doctors and nurses available.

(*The Indian Express*, March 29, 1949.)

BCG VACCINATION

My attention has been drawn to an article in your daily in which there appears a report on the inauguration of the BCG vaccination campaign. The report lays some emphasis on the

environmental and economic factors which are the fundamental causes of tuberculosis, but the speakers at the inauguration ceremony are also insistent that vaccination confers protection and is harmless.

India, having freed herself from the physical bondage of the West, has yet retained modern western medical notions. She insists on vaccination against smallpox (now dropped in Britain), on inoculations against typhoid and other diseases; and now she adopts, though at present on a voluntary basis, BCG vaccination against tuberculosis.

Yet there is no evidence that BCG prevents this scourge. The death-rate from tuberculosis in Britain dropped steadily as the standard of living improved, until it became a fraction of the former figure without any aid from vaccination; and that is, in fact, the only means of combating the disease so far as prevention is concerned. The introduction of vaccination will only divert attention from the real issue. If the standard of living improves in due course, as one hopes it will, the tuberculosis rate will diminish, and the vaccine will get the credit as has happened in other countries.

This vaccine is not without its dangers. It has been responsible for a number of deaths in the past; and one of its tendencies is to "light up" latent tuberculosis, which means that it may awaken the disease it is intended to prevent. The only sure way to deal with this disease is to abolish the conditions that give rise to it.

WILFRID TYLDESLEY, Secretary,
British Union for the Abolition of Vivisection, London.
(*The Hindu*, March 13, 1949.)

POISONED WATERS

by

Bill Davidson

In Rochester, N. Y., on December 11, 1940, a repair job was being done on two huge water mains. One pipe carried water from the grossly contaminated Genesee River to the city's fire hydrants; the other conveyed the purified domestic water-supply. A workman turned an emergency valve which connected the two. Before the mistake could be rectified, five million gallons of river water poured into the drinking supply. Within a short time 35,000 people had been stricken with gastro-enteritis. One brilliant emergency medical work prevented fatalities.

Such incidents can, and do, happen because of the shocking extent to which the waters have been poisoned.

In 1942, Governor (now Senator) Edward Martin of Pennsylvania, asked to address his old Pennsylvania National guard outfit as it embarked for Europe, was amazed to learn that the port of embarkation was New York.

"Why," thundered the Governor to the War Department, "cannot a Pennsylvania outfit leave from a Pennsylvania port?"

"Because," the War Department answered, "the Navy refused to bring its ships into the Delaware River. They say that the smell is unbearable and the water corrodes the ships' sides."

From this water, laden with acid industrial wastes, deadly bacteria and human excreta, Philadelphia derives part of its drinking water. Similar pollution exists in many other cities. Many bath-rooms and factories still empty their wastes directly into streams. In olden days, such practice resulted in cholera, typhoid and dysentery epidemics that wiped out millions of people. Today, people are protected from the same fate by filtering and chlorinating plants which render the water from open-sewer rivers, unappetizing but bacteria-free. Though mis-

takes in filtering or chlorinating are rare, they did happen 327 times between 1938 and 1945, resulting in 111,320 cases of disease.

The coasts and inland waterways are dotted with the rotting bath-houses of once-beautiful beaches, now marked with signs reading, "Polluted water. No swimming." Bridges are corroded by the acids. Shell fish suck in typhoid bacteria from human wastes. As a result hundreds of oyster and clam beds have been shut down by order of the U. S. Public Health Service.

In the course of investigation for this article, I saw shad and herring by the hundreds, dead from lack of oxygen due to pollution, cast up on the shores of the Delaware River. In Pennsylvania, I saw streams running bright yellow with sulphur content from abandoned coal mines. In Southern California, human wastes lay underfoot on the beaches. I saw the Illinois River, once the source of the biggest inland fishing industry in the country, now almost devoid of marine life.

It frequently takes an epidemic to bestir the people from their lethargy. Up until ten years ago, for instance, Milwaukee, like most cities, was pouring its sewage into its water supply, Lake Michigan, then drawing the water into its purification plant. But one day in 1938 something went wrong; the chlorine suddenly failed to kill the bacteria in the water. Thirty thousand people fell violently ill with diarrhoea, vomiting and crippling stomach pains. A loud outcry went up.

Today, all of Milwaukee's sewage is funnelled into a modern treatment plant where harmless bacteria convert the virulent organic matter into gases, solids and clean water. The clean water pours out into Lake Michigan. The solids

(called sludge) are dehydrated under great heat to kill any remaining germs, and sold as fertilizer. These sales are paying for the new plant. Many other cities are now selling such fertilizer. Chicago even uses its sludge as fuel; it burns like peat.

Maine, with no more logging wastes pouring into the Penobscot, Narraguagus and Dennys rivers, is trying with the help of the Federal Government to replant the nearly extinct Atlantic salmon that once ran by the millions in all East Coast Rivers north of the Hudson. In Pennsylvania the clean-up is also in high gear. In Illinois a strict law calling for fines of \$100 a day for polluters has helped to clean up nearly 80 per cent. of industrial and domestic sewage wastes.

Although the filth in rivers does not stop at State boundaries it took 51 years to push the first Federal Control Legislation through Congress. This happened last June, when the Senate and House passed a watered-down version of the Taft-Barkley Water Pollution Control Bill.

The new legislation provides for Federal loans to States and communities to build sewage treatment plants. It leaves police powers against polluters with the States, and it allows the U. S. Surgeon-General to take action against a violator, but only if the State consents. The U. S. Public Health Service's pollution-research laboratory at Cincinnati is given funds to assist industries in working out new methods of eliminating wastes.

People are beginning to realize that money can be saved on pollution control. Wheeling, W. Va., currently spends a small fortune in super-chlorinating, de-chlorinating, double-coagulating and double-sedimenting its drinking water. When the Ohio River is cleaned up, much of this money can be saved. In 1938, an engineer at Springfield, Ill., discovered that the methane gas produced by the bacteria in sewage-treatment plants could be burned as fuel.

Today, the treatment plants in dozens of municipalities are run on sewage gas alone, and Cedar Rapids, Iowa, generates so much electricity from its sewage gas engines that it sells the power.

Distillers used to dump the polluting slops from their stills into the nearest river. In 1930, the Hiram Walker plant in Peoria, Illinois, hired a young state employee, Dr. C. S. Boruff, to work out the problem. Boruff discovered that the grains, having absorbed great quantities of yeast and vitamins in the whisky-making process, possessed three times the food value for cattle that ordinary grains did; and that another by-product made baby chickens grow to boiler size in two weeks less time than usual. Hiram Walker erected a factory to convert the slops into feed, and within a comparatively short time was making a million dollar annual profit on material it formerly dumped into the river. The rest of the distilling industry rushed to follow suit.

In the same way two Illinois steel plants came up with a process whereby they can reclaim waste acid. Elsewhere, a brewery developed a bouillon cube from its beer-making wastes; a paper mill made \$30,000 in royalties on a process it had to develop to save paper fibre instead of dumping it into the river; and a popular breakfast cereal on the market today is fortified with Vitamin B1, from a waste that formerly went into innumerable streams and killed millions of fish.

So, at long last, a clean-up of the poisoned waters is under way. It's not going to be an easy job. As former Surgeon-General Thomas Parran told Congress, "the organic pollution alone is the equivalent of eight million dead and disintegrating mules dumped into the waterways every year."

That leaves America with about 7,900,000 mules to go.

(Condensed from Collier's, by Bill Davidson "The Reader's Digest" December, 1948)

PUBLIC HEALTH NEW PLANT AND PRODUCTS

by

J. L. Robinson,

Editor of Municipal Engineering, London.

Britain's manufacturers in the public health field have produced a wide range of new plant and products since the war. A recent exhibition in London included the displays of some 200 firms. While the main emphasis was on the public health services provided by municipal authorities, such as street cleansing and refuse disposal, water purification, sewage disposal, and sanitation, there was also a good display of mechanical plant used in these essential services, including bulldozers, scrapers, excavators and cranes.

A great deal of progress has been made in recent years in the design of motor vehicles for street cleansing, refuse disposal, and gully emptying. Essential features, such as manoeuvrability—for operating in side streets and confined space—and economy in running, have been retained, and the modern tendency is to give easier loading under "dustless" conditions.

ELIMINATING DUST

Six types of vehicle, including cesspool emptier, fitted with street-washing equipment, various models of refuse collectors, and the "Paxit," a mechanically operated refuse-collecting vehicle, which practically eliminates the dust nuisance, are produced by Dennis Bros., Ltd., Guildford, Surrey. The Eagle Engineering Co., Ltd., Warwick, among their various refuse-collection models, include the "Compress-more," which compresses refuse as it is loaded. Refuse collectors with the "moving-floor" system were shown by Glover, Webb & Liversidge, Ltd., 561, Old Kent Road, London, while Scammell Lorries, Ltd., Watford, Herts, demonstrated

their "mechanical horse" motive unit, recently redesigned as the "Scarab," for use with refuse-collecting and street-washing trailers.

Some municipalities in Britain have recently been making use of small electric trucks for the collection of domestic wastes, and this trend was seen in the exhibits of Treece (Birmingham), Ltd., Richard Street, Birmingham, 7, main interest centring on the "Pony", a Brush electric vehicle fitted with a Treece body. A similar vehicle, only petrol driven, was shown by the Mercury Truck and Tractor Co., Ltd., 19, London Road, Gloucester

AUTOMATIC DOSAGE CONTROL

In the field of water purification and sterilisation, filters of various types, including the mechanical filter, the mechanically agitated filter, and the gravity air-scoured type are produced by Bell Brothers (Manchester, 1927), Ltd., Denton, Manchester. Another of their products is the "Bell" chlorinator, which can, if necessary, be fitted with automatic dosage control, to enable the dose of chlorine to be varied automatically in proportion with the flow of water being treated.

Latest developments in chlorination technique were also demonstrated by Wallace and Tiernan, Ltd., Power Road, London, W. 4. Emphasising that the ideal system of chlorine control is one where feed follows both the flow variations and the changes in chlorine demand, this firm points out that this has been achieved by their method of electrometric measurements of chlorine residual and subsequent automatic adjustment of feed rate.

AUTOMATIC EJECTOR

Among equipment and materials for sewage purification and disposal, Hughes and Lancaster, Ltd., 16, Victoria Street, London, S.W. 1, showed their "Shone" pneumatic automatic ejector for dealing with sewage, sludge, and trade wastes, which has a discharging capacity of 20 gallons per minute. Other products of this firm are a small water ejector for draining underground chambers and sumps, a three-inch diameter "Clearway" centrifugal sewage pump, and a vertical single-cylinder air compressor. Instruments for measuring sewage, storm water, etc., were displayed by the Lea Recorder Co., Ltd., Cornbrook Park Road, Manchester 15, and included electrically operated recorders and integrators, river level recorders, and sewer flow recorders of various types.

Attracting attention among the wide range of plant and machines for earth-moving, road construction, mechanical handling, etc., was the "Dumpling"—a pedestrian controlled three-wheel, machine produced by Aveling-Barford, Ltd., Grantham, and capable of carrying half a cubic yard of earth. Another miniature was the "Calf-dozer", a small bulldozer with a 4 ft. 6 in. blade, powered by an 8 h.p. four-stroke petrol engine.

HAULS 15 TONS AT 20 M.P.H.

One of the biggest pieces of equipment was the earthmoving team displayed by Jack Olding & Co., Ltd., Hatfield, Herts. This comprised the "Caterpillar D.W. 10" wheeled tractor with the "Athey P.D. 10" side-dump trailer. This massive combination is powered by a diesel engine of 115 h.p., hauls 15 tons at speeds of 20 m.p.h. and is said to average more than five one-mile trips an hour over rough ground.

A newcomer to the range of W. E. Bray & Co., Ltd., Isleworth, is a loading shovel of 5/8 cubic

yard capacity, called the "Brayloader." Features include efficient operation on low-cost fuels, steering brakes, and high road speed. The whole of the display of George Cohen Sons & Co., Ltd., Wood Lane, London, W. 12, was devoted to their Jones mobile cranes. Latest model is the KL 44, which has a maximum lifting capacity of 2 tons. Smallest in the range is the KL 15, ideal for use where medium loads have to be moved over an extensive site.

DEVELOPMENT IN SURFACE DRESSING

A machine which represents the latest development in the application of tar compounds or bitumens for surface dressing, a 500 gallon oil-fired Weir boiler, was shown by Johnston Bros., (Contractors), Ltd., Ibex House, Minorities, London, E.C. 3. The new mobile asphalt and tarmacadam plant of Millars' Machinery Co., Ltd., Bishop's Stortford, Herts, has a capacity of 10 tons per hour. Among the road sprayers shown by Bristoes Machinery, Ltd., Montagu Road, Angel Road, Edmonton, London, N. 18, was the 250 gallon "Cantar" patent bitumen sprayer, engine operated and oil-fired. The bitumen spraying unit was another exhibit. This is attached to a motor chassis, and gives a complete spraying outfit which can be removed from the chassis during winter months.

Vibrating equipment for the consolidation of concrete in road work was exhibited by E.P. Allam & Co., Ltd., and Wallis & Steevens, Ltd., Basingstoke, Hants, showed machines for spraying emulsion direct from the drum to the road surface.

It will be realised, of course, that the foregoing account only touches briefly on a small proportion of the very wide range of equipment now being produced by Britain's manufacturers.

NEW HOPE FOR RHEUMATICS

Britain Intensifies Campaign Against Disease

by

Joseph Kalmer

After the common cold, rheumatism is the worst endemic disease in Britain, where its high incidence is helped by the climate. There are about 2,000,000 rheumatism victims in Britain and through the ravages of this disease 3,000,000 working weeks are lost to the nation annually. The loss in wages and the sick pay and cost of medical treatment reach the high figure of some £25,000,000 (Rs. 33.28 crores).

Much is, therefore, being done in Britain to discover the cause of rheumatism, and a number of private and public institutions have been waging an intensive campaign against it.

Amongst these are the Empire Rheumatism Council under Lord Horder, the National Medical Research Council, and some of the larger infirmaries and a special hospital, all of whom have their own research units. There are also four special centres in Britain—Leeds, Liverpool, London and Manchester—dedicated exclusively to rheumatism research. In 1946, the Nuffield Foundation gave £100,000 (Rs. 13.31 lakhs) to the Manchester Centre, administered by the local University, to cover the cost of research during the next 10 years.

14 NEW CENTRES

The Minister of Health, Mr. Aneurin Bevan, has had plans worked out for the founding of diagnostic and research centres in the 14 areas into which Britain is divided for the purposes of the health scheme. These 14 new centres will work in conjunction with universities, training hospitals and young doctors, who will thereby obtain a chance of training as specialists. Each

centre will be equipped with the latest technical apparatus so that it will be able to cope with 50 to 250 out-patients per day.

This research work does not deal merely with the painful outward symptoms of the disease, but also with such important factors as climate, heredity, diet, nutrition and glandular secretion. Although few details of the results have so far been published, one can, nevertheless, say at this stage that in most cases rheumatism may be considered dependent on the presence of a virus, which has been found capable of producing rheumatic symptoms in rabbits.

The campaign against rheumatism is progressing. Different varieties of the disease are being treated with different remedies: penicillin, glandular extracts, gold salts, lactic acid and certain phosphatic compounds. The two last-named remedies reduce pain in osteo-arthritis joints. Then there are irradiation treatments, medicated baths, X-rays, long and short wave diathermy and high-frequency treatment, all pressed into service against this scourge.

RHEUMATIC FEVER

Special attention is being devoted to rheumatic fever also, which causes permanent injury to the heart, but other forms of acute or chronic rheumatism are not being neglected.

Above all, research workers are anxious to remove rheumatism from the list of incurable diseases. The general offensive which they have begun will be continued until its final results are achieved—relief of rheumatism for many more sufferers than those in Britain alone.

MUSIC FOR HEALTH

NEUROSIS is the disease of the age! The greater the civilization—civilization in the modern concept of the term—the more the neurotics. People are literally racing against time. Their nerves are kept in high tension all the time. Meditation at intervals has a soothing effect on mind and body. We are fast giving up the practice. Music is a kind of *Yoga* and *Yogis* enjoy *Shanti*. It enables them to keep their mind and body in a healthy state. Music is the medicine of the mind, especially of the troubled mind.

Our educational authorities owe a duty in this respect. Although music is now supposed to be taught in all elementary schools, yet, in practice, far from developing a taste for it among children, it instils in their minds an aversion for music. Why? There is something wrong in the method of teaching it. This should be looked into by a competent man.

It is not at all difficult to provide music for patients in our hospitals. The industrialists should also consider why music should not be provided to the workers at least during the interval for their meals.

The All India Radio provides a variety of music, classic and popular styles. If our educational, medical and industrial institutions decide to instal loud speakers in them, the All India Radio may possibly arrange to provide even special class of music to suit such institutions.

*Music the fiercest grief can charm,
And fate's severest range disarm ;
Music can soften pain to ease,
And make despair and madness please :
Our joys below it can improve,
And antedate the bliss above—Pope*

—Ed., P.H.

Current medical literature continually stresses the interdependence between mind and body. Every one knows how pain and sickness affect the spirits. Physicians are finding out more and more about the opposite process, the influence of emotional states upon the functioning of various bodily organs as well as the general health. A pleasant frame of mind helps to keep away illness and helps to cure it. Hence it is quite logical that soothing music should be a powerful agency in checking bodily disturbances. Peace

and contentment shut out disorders arising from worry, fear, frustration and other distressing emotions.

The physical effect of melodious sounds is by no means a recent discovery. Dr. Edward Podolsky, in his book, "Music for your Health," has gathered a wealth of material showing how the ancients understood this principle and applied it. The Greeks especially gave music an important place in their educational system and in their lives. A striking example of musico-therapy

is given in the Bible: "When the evil spirit from God was upon Saul, then David took up the harp and played with his hands so that Saul was refreshed and well, and the evil spirit departed from him."

Many are the stories about the magical effects produced by sweet harmonies. Some of them are hardly convincing in this sceptical age. For instance, that of curing snake-bite; and another of warding off the plague by this means. One Italian writer of the seventeenth century even gave the bars of music which would heal persons bitten by a tarantella. The explanation was that the strains must be accompanied by violent dancing kept up for a long time. This exertion brought on profuse sweating, which eliminated some of the poison. To this day, the tarantella is a familiar dance in Italy.

Elaborate studies have been made of the effect of music on the pulse, respiration, blood pressure, and glands. The pleasurable sensation and consequent relaxation of some types of tunes, the invigorating effects of martial airs, are known to all. This knowledge does not need to be backed up by laboratory tests.

It is to be expected that this method of soothing disturbed minds would be of greatest value in treating mental patients. It has, in fact, been employed in many institutions for the care of such persons. Many thousands of unfortunates have been subjected to this benign influence with highly favourable results.

Dr. Emmett Dent, for many years superintendent of Manhattan State Hospital, after extended experience, declared: "Music is responsible for cures among the insane and improvements of patients seemingly in a hopeless condition that are little short of marvellous." At the State Hospital at Middletown, Connecticut, an orchestra was organised to play to the fourteen hundred patients at meal-time. The results have been so good that the authorities would not consider the idea of discontinuing it.

All this was more or less on a hit-or-miss basis, but the procedure was scientifically planned at the Phipps Psychiatric Clinic John Hopkins Hospital, Baltimore. Ample funds made this possible. At the Eloise Hospital, near Detroit, a half-hour programme is given in the wards five times a week. The programme is varied to suit the condition of the audience. Where the violent inmates are segregated, soothing strains are chosen. To the depressed and lethargic groups, lively and stimulating airs give a lift. Indeed, lists have been drawn up of compositions especially fitted to gain certain effects.

Normal persons may likewise benefit by music therapy. Some surgeons have found it desirable in the operating room. One of them cited that it created a better atmosphere for all patients coming into the amphitheatre, where it drowned out the usual noises, such as the jingle of instruments. Furthermore, it diverted the attention of patients during operations under local or spinal anaesthesia. Dr. Edward L. Cornell tells of performing a Caesarian operation on a woman to deliver her a five-pound boy. The mother had ear-phones to listen to a radio. To the strains of Victor Herbert and Johann Strauss, the youngster made his appearance in the world, the mother declaring that she derived so much pleasure from the music that she felt almost no pain. This plan, however, has not been widely followed.

Several dentists report that the pain which they are sometimes compelled to inflict is lessened by appropriate music. Music is of far greater value where there is no physical suffering, but merely a need for a cheering, diverting influence. Pavlov, the Russian Physiologist, found that pleasurable emotions promoted the flow of digestive juices. On the other hand, violent outbreaks of anger or fear closed the outlet of the stomach and thus halted digestion. This is an argument for music with meals. In many restaurants it is supplied. At formal banquets an orchestra is a necessary accompaniment.

So far in this story, the patients have been merely listeners. If they can also become participants, the benefits may be greatly increased. People in hospitals and rehabilitation centres may feel a new interest in life if their idleness is replaced with actual making of music. They get the idea that they are no longer entirely useless. They have the joy of accomplishment as they learn to play an instrument or acquire new skill and training. It gives them a sensation of importance to get before an audience and entertain it for perhaps an hour. The proceeding may be classed under occupational therapy, which has sufficiently demonstrated its merits as to be installed in mental and other hospitals. Inmates of tuberculosis institutions respond to such a programme.

Singing has value as exercise. It involves deep breathing and this brings about oxidation of body tissue. It increases appetite. Professional singers are less likely to suffer from pulmonary and chest complaints than the average person. Singing is declared by one physician to be of marked value in jaundice, liver complaints and indigestion. Choral or community singing can give a great uplift. Many persons whose voices are so poor that they would not dare to give a solo performance, except in the bath tub, feel free to burst forth in all their vigour when part of large crowd. To judge from current humour, bathtub singing is a common practice. From one point of view, it is a favourable sign of sleep enjoyed. From another, it starts the day off on a joyous mood, it dissipates the familiar breakfast "grouch" and indicates a brisk attack on the tasks of the day.

Perhaps the greatest health value of music is its wide use as a hobby. Psychiatrists believe that there would be far fewer break-downs in health, fewer frustrated and maladjusted individuals, if more people made a habit of listening to music, or better still, engaged regularly in its production. This wholesome interest would help

to banish undue dwelling on the cares of business and family life and would aid in procuring sound, restful sleep. The active pleasure enjoyed is a powerful stimulant to well-being and happiness.

A vast number of persons derive benefit from music. There are several hundred symphony orchestras, most of them composed of amateurs who find relaxation in the rehearsals and a sense of triumph in the occasional concerts. Children are not taught to play the piano or other instruments in such numbers as they were before the day of the phonograph and the radio, but such instruction is still widely given. Einstein is a skilled violinist and many other prominent men delight in music-making, even if their performances are not always a joy to others.

Melodious strains have been found to speed up industrial production. No less than five thousand plants have proved that this is true. In some factories there are concerts at meal hours. A continuous programme has seemed to give the best results in some places, while other employers provide two-hour concerts, morning and afternoon. "Music while you work" has been developed into a regular business. RCA Victor provides a definite programme which has been thoroughly tested. The day starts off with a lively selection lasting fifteen minutes. "Fatigue" music is played for twenty-four minutes at about an hour and a quarter before meal and quitting time. Appropriate airs are chosen for the dinner hour. It has been found that vocal selections tend to distract attention from work and thus cause delay. Hymns slow up production.

Music is recognised as of prime importance in the Army. The drum and fife make marching less wearisome; the bugle sounds the charge. When Napoleon was making his historic journey across the Alps in midwinter, the cannon could not be moved on wheels. So they were placed in hollow logs and thus dragged by horses and

men. At times, the going was so hard that the cannon resisted all efforts to move them. Napoleon would order a great outburst of stirring music, and the job was done. A similar instance of the stimulating power of inspiring strains was given at a six-day bicycle race in Madison

Square Garden, New York. Plodding along in silence, the contestants averaged 18.6 miles per hour. When the band struck up, the speed was increased to 19.6 miles.

(ACK: "Good Health.")

(Food and Nutrition, Bulletin No. 48)

NOISE AND THE HUMANS

How do programmes like "Music While You Work" speed up industrial production? Dr. Jean Fumiere, 40 year-old French sound engineer, announced the other day that he had found a partial explanation, reports *News Review*.

Cows are easier to milk when listening to music. Ancient Greeks and Oriental peoples realised the importance of sound and perfected their own musical modes. African Natives use wailing, discordant tones to help them in their work.

In modern life, improvements in sound-proofing cannot keep up with the nerve-racking noise of traffic and machinery. But man finds silence almost as intolerable. The silence of the countryside can become oppressive, considers Dr. Fumiere, and even the trickle of a brook is welcome. Hermits who live in silence are often "queer."

Following up these findings, he discovered some two years ago that blood pressure changed when different musical records were played on a gramophone. He has since evolved a picturesque theory that "nuclear filaments" in each living cell oscillate at a very high frequency under the influence of cosmic rays given off by the stars.

Dr. Fumiere tried to discover what happens when a wave of exactly the same length as those put out by a human cell is emitted by an apparatus he has invented. He found that cells of different organs give off different waves. "The wave length are so small," he explained, "that I have no real method of measuring them. I have ascertained, however, that waves about a millimetre in length give stomach pains to all in the vicinity of the instrument, while others give headaches."

(*The Indian Review*).

NEW DRUG DEFEATS THE TSETSE

A sensational news item of the day is the discovery, announced recently by Britain's Colonial Under-Secretary, Mr. Rees Williams, of the new drug Antrycide, which is expected literally to revolutionise agriculture over vast areas of Africa by protecting cattle from the tsetse fly pest. The area, thus made possible to be reclaimed for cultivation, includes much of the British African possessions, French Equatorial Africa, the Belgian Congo, Portuguese West Africa and Abyssinia—a total of over 4,500,000 square miles.

The tsetse fly has driven the population of vast areas in Africa, with their animals, into narrow areas that have neither the greatest rainfall nor the greatest fertility. The pest is still encroaching over extensive regions of Uganda, Kenya, the Sudan and Nigeria. Not only has cattle-rearing been impossible in affected areas but agricultural production as a whole has suffered from the prevention of properly-balanced farming and the consequent loss of soil fertility.

Now, in the worst areas, Antrycide has cured all the forms of trypanosomiasis (the group of tsetse-carried diseases) encountered. Proved to have preventive as well as curative powers, the drug has shown no undesirable reactions. Treat-

ment is by hypodermic injection and trained veterinary attention is not necessary. Immunisation from one injection has proved effective for four to six months.

Research started in 1944 under the late Dr. F. H. S. Curd and Dr. D. G. Davey in the Manchester Laboratories of Imperial Chemical Industries. In collaboration with the Colonial Office, they later began field experiments based on laboratories in Khartoum, Nairobi and Entebbe. The same team was responsible for the discovery of the war-time anti-malarial drug, "Paludrine."

Sufficient Antrycide to treat two million animals will be made available for the Governments of Sudan, Kenya and Uganda during 1949.

THE DOCTOR, HIS OWN GUINEA PIG

Before the days of controlled experimentation in the medical sciences, many physicians performed more or less random experiments on themselves and on their friends.

John Hunter, in 1767, confused medical knowledge by supposedly inoculating himself with gonorrhea from a patient. The inoculum produced both gonorrhea and syphilis, which convinced Hunter that the diseases were the same.

Purkinje, in 1790, gave himself a large overdose of digitalis in order to study the changes in vision produced by the drug in his patients. The dose, which by modern standards would have killed nine cats, produced cardiac pain and caused him to vomit for a week.

In the nineteenth century, E. Hale of Boston, enthusiastic about the intravenous injection of drugs,

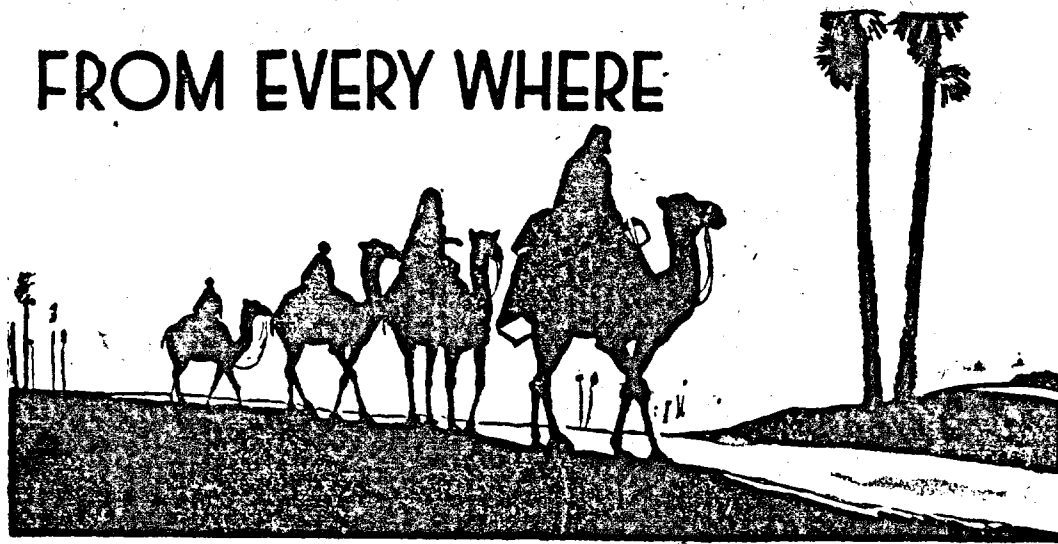
had himself injected intravenously with 0.5 ounce of castor oil, and fortunately lived to describe his marked reaction.

Tonery, in 1830, demonstrated the capacity of charcoal to absorb alkaloids by taking an otherwise lethal dose of strychnine.

About 1900, Pierre Curie, when told that radium would produce skin burns, bandaged some radium bromide onto his forearm, and allowed it to remain for several hours.—(From a paper by Dr. A. C. Ivy, University of Chicago College of Medicine, read to the Federation of American Societies for Experimental Biology.)

(*"Science Digest"*, March 1949).

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.

SOME FACTORS WHICH AFFECT THE RELATIONSHIP BETWEEN HOUSING AND HEALTH

—J. M. Dalla Valle

Public Health Reports, Vol. 52, No. 30, July 1937.

An extremely interesting, concise outline of some fundamental factors affecting the relationship between housing and health. A flow chart or figure shows that three inherent weaknesses in the general population result in a constant sifting action which tends to reduce those who cannot meet the forces of competitive existence to a low economic status, and that the resulting low incomes are responsible for decreased opportunities for self-improvement and for environmental conditions in which low income groups live.

Three weaknesses mentioned in the figure are: (a) biological unfitness, (b) mental deficiencies and (c) chronic ill-health. The author then discusses the factors intimately associated with the housing problem, namely: (1) the casual factors (sanitation and overcrowding), (2) malnutrition,

(3) lack of medical care, and (4) unhealthful occupations.

The need for a knowledge of the characteristics of slum populations on one hand, and for the development of suitable yardsticks for determining housing and health relationships on the other, is emphasized.

It is a most excellent statement of the factors which affect the relationship between housing and health and should be read by all sanitarians, especially those responsible for any housing sanitation inspection activities.

—(ALFRED H. FLETCHER)
(*P. H. Engng. Absts.* Vol. XVIII)

THE COMMON COLD WHAT IS A COLD?

Federal Security Agency, Health Education Series, No. 29.

The common cold, commonest of all human illnesses, is a disorder of the nose, throat and respiratory tract. Simple and harmless in itself, the cold can be dangerous because it so often

precedes more serious diseases. The flu or grip, tonsillitis, ear and sinus infections, or pneumonia may follow what starts out to be a simple cold. Children's diseases—measles, whooping cough, scarlet fever, and diphtheria—are usually heralded by symptoms similar to those of the common cold.

Who Has Colds? Practically everyone! The cold is no respecter of persons. Most of us have at least one cold a winter. Some of us have two or three a year. Young children catch more colds than do older ones; in fact, as we get older, the number of colds we catch gets less. There are a few lucky people who seem to have a natural resistance to colds.

Colds are not confined to one country or one climate. You can't avoid colds by moving from one part of the country to another. However, in the tropics people have fewer colds and the colds seem to be less severe. In isolated places, such as Greenland and Labrador, the natives go through an entire winter without a single cold, but in the spring, just as soon as ships from the outside world reach these countries, passengers and crew bring the cold virus in with them. In no time at all, the natives are infected with the cold.

WHAT CAUSES COLDS?

The common cold is probably caused by a tiny germ or germs so small that they cannot be seen with a high-powered microscope. Investigations suggest that these germs are present in discharges from the nose and throat and that they can pass through filters which hold ordinary bacteria. That is why they are called filterable virus.

The cold lasts from 2 to 7 days, but you can infect others with it only during the first day or two of the disease. The first day is the most infectious, but you may actually infect others from 4 to 6 hours before developing symptoms yourself. The cold germs are passed from person

to person by sneezing and coughing, even perhaps by contact with any article, such as a drinking glass, which has just been used by a person with a cold.

How to Identify A Cold? If your nose feels stuffed up, you sneeze frequently, your throat feels harsh and dry, and your head aches, you are probably coming down with a cold. If you have a fever, severe headache, chest pains, general achiness of the limbs, or coughing spells, the wisest thing to do is to call a doctor. The doctor alone can determine the meaning of these symptoms. If called soon enough, he can keep you from becoming more seriously ill.

CAN WE PREVENT COLDS?

Cold preventives and cures make extravagant claims. All of them have been proved worthless. They not only fail to prevent or cure colds, but many of them are harmful as they contain drugs, alcohol, and sometimes strong cathartics.

As a result of careful investigation, we know that the vaccines, or so-called "serums," given by mouth or as "cold shots," have failed to prevent colds. They have not even lessened complications, except when given repeatedly over a long period of time. Vitamins in tablets, oils, treated foods, cough syrups or cough drops have no effect on either the number of colds you may catch, or their severity. It is important, however, to maintain good bodily resistance by eating a properly balanced diet, one which contains the vitamins necessary to good health.

Cold baths, the use of sleeping porches, and similar "hardening processes" are not recommended, as they have been found to be of no real benefit as cold preventives.

There are a few simple things you can do to lessen the chance of taking cold:

- (1) Avoid people with colds whenever possible.
- (2) Wash your hands often, especially before eating and after touching a person sick with cold.

- (3) Avoid chilling and wet feet. Change to dry clothing quickly after exposure to inclement weather.
- (4) Eat well-balanced meals. A good diet should include milk and fats, plenty of green vegetables, fruit and some amount of meat or meat substitutes.
- (5) Get plenty of rest. Children require more sleep than do grown-ups.
- (6) Keep rooms well ventilated. A healthful room temperature is not higher than 68° to 70°; bedrooms should be even cooler.

HOW TO TREAT A COLD?

There is as yet no medicine that will "cure" a cold. Medicine prescribed by doctors does make you more comfortable but it does not act on the cold virus. It is the body's own machinery which best fights the virus. If you have not already been overfatigued, exposed to harsh temperatures, or undernourished, you can throw off a cold easily with rest and proper diet.

Be cautious about taking sedatives and using nose drops. Overdosing with either may be dangerous. Some commercial nose drops are too strong so that they irritate and injure the delicate tissues, and the virus then has a better chance than ever to operate and spread. Sedatives may be dangerous because they mask the symptoms and conceal the real damage the virus is doing. It is best, therefore, to play safe by consulting your doctor who knows what medicine you should have.

Briefly then, this is the best way for you to treat a cold:

- (1) Rest, at home in bed.
- (2) Keep comfortably warm and protected from drafts.
- (3) Drink plenty of liquids—water, soups, milk and fruit drinks.
- (4) Eat a light but nourishing, appetizing diet.

- (5) See your physician if your cold "just won't go away" after a few days.

(U.S. Public Health Service)

LAND MARKS

1774. Priestly recognizes that "spoilt" air (spoilt by mice) was made "good" by the presence of green plants. In 1780, Ingenhousz shows that this action was due to the presence of green plants which acted only under the influence of light; in the same year Senebier demonstrates the change to be one from carbon dioxide to oxygen, and in 1804 de Saussure proves the quantitative nature of the conversion.

1784. Lavoisier demonstrates the indestructibility of matter. Quantitative chemistry begins; respiration is recognized as akin to combustion.

1812. Kirchhoff finds that starch can be converted into glucose by dilute sulphuric acid, without being itself changed. This may be regarded as the first clue to the understanding of catalytic processes, leading to Berzelius's conception of a new force, in which he saw a powerful factor in the explanation of the chemical processes of the living body.

1821. Cuvier lays the foundation of palaeontology.

1824. Synthesis of an organic compound (urea) by Wohler.

1828. Discovery of the mammalian ovum by von Baer. The birth of modern embryology and the first great forward step in this direction since Harvey.

1838-1839. Schleiden demonstrates the cell structure of plants, and Schwann the cell structure of animals.

1838. Cagniard de la Tour proves that fermentation is dependent on yeast cells.

1838. Von Mohl describes protoplasm.

1840. Max Schultze conceives of it as the "physical basis of life."

1842. Mayer suggests the first ideas concerning the conservation of energy, later developed

in an orderly manner by von Helmholtz in 1847 (*Abhandlung uber die Erhaltung der Kraft*), the eventful consequences of, which were the thermodynamic laws.

1842. Birth of bio-chemistry with Leibig's volume, *Die Thierchemie*, and so forth, on the application of chemical methods to animal tissues; also containing the important conception of animal heat as combustion.

1857. Claude Bernard lays the foundation of modern physiology and discovers the production of glycogen by the liver. The beginning of the application of bio-chemical and physiological methods to the living animal.

1859. Darwin and Wallace advance the ideas of organic evolution, bringing in their train the energetic development of comparative anatomy, embryology, and rational systematology.

1860. Final refutation of the experiments on spontaneous generation by Pasteur.

1861. Recognition of differences in the laws of behaviour of the so-called "crystalloids and matter in particles larger than molecules". The birth of colloidal chemistry by the studies of Graham.

1862. Pasteur defines the dependence of fermentation and putrefaction upon living organisms.

1865. Mendel's work on the crossbreeding of sweet peas. This work, which would probably have materially modified Darwin's original hypotheses, was completely buried in a local scientific journal until 1900, when it was discovered, confirmed, and extended by de Vries and others. It was the foundation of the science of genetics.

1867. Traube's work on semi-permeable membranes.

1877. Discovery of osmosis by Pfeffer.

1880-1900. Development of modern bacteriology and immunology, with the growth of technique for the study of life in its simplest available form.

1885. The correlation of osmotic pressures with their chemical and physical properties of solutions, by Van't Hoff.

1885. Rubner applies quantitative methods to the study of the heat value of food materials.

1887. Beginning of the syntheses of organic matter by Emil Fischer—glucose, fructose, and finally polypeptide, which is one of the higher cleavage products of protein. With the era of Fischer begins the true structural knowledge of the proteins.

1888. Elucidation of the carbon-nitrogen cycle by Hellriegel and Wilfarth.

1889. First discovery of an ultra-virus (mosaic disease of planets), by Beijerinck.

1893. First discovery of ultra-virus causing disease in animals (foot and mouth disease), by Löffler and Frosch.

1900. Beginning of knowledge of the effect of radiant energy (X-ray, ultra violet) on life processes.

1902. Sutton first pointed out that chromosome segregation furnished the mechanism by which Mendelian laws could be explained.

1904. Discovery of hormones or physiological messengers; internal secretions defined by Bayliss and Starling.

1910. The significant beginning of the application of physico-chemical methods to protein and to living tissues; acid base equilibrium; hydrogen ion concentrations; membrane potentials; Doman's equilibrium; oxidation reduction phenomena; surface phenomena and electrophysics of cells and fluids of living complexes. Those responsible Sorensen, Loeb, Henderson, Clark, and many others.

1912. Vitamins discovered by Hopkins and Funk.

1915. Discovery of the bacteriophage phenomenon by Twort and d'Herelle, with the suggestion of the possibility that they may be intermediate substances between the enzyme and the formed cell, having the power of reproduction

only in the presence of specific living cells, upon which they act. Whether these substances are alive or dead is at present almost an academic question.

1925. Discovery of the relationship between radiant energy and the accessory food factors; the activation of fats to vitamin functions by radiation with ultra violet light. Based on experiments of Steenboek and of Hess.

1930. The crystallization of enzymes, the credit for which goes to Northrop.

("Rats, Lice and History" by Zinsser)

THE BED-BUG

The original habitat of the bed-bug (*Cimex lectularius*) is unknown, but other species of *Cimex* are parasitic on both bats and birds, and it has been conjectured that its association with man dated from the time when bats and men both lived in caves.

The word "bug" was originally used in the sense of boggy, hobgoblin or "terror by night." It appears in this sense in Shakespeare, in the Coverdale Bible (1535) and in many other early writings. At what time it became a term specifically used for the bed-bug is unknown. Humphrey Llwyd (c. 1550) in a translation of Pope John XXI's "Thesaurus Pauperum," refers to "small stynkinge wormes which live in paper and wood, called Comices," being placed in a hollow bean and then swallowed in order to cure fever. Judging by this and the references of other writers, "Comices" appears to have been the common name at that time. Other early names or the bed-bug were "wall louse" and "house bug." In America they have been called the "mahogany flat" and "B. flat" and Norfolk Howard were humorous descriptions in the nineteenth century, while a more modern term, "the red army" is used in certain parts of the country to describe the hosts of red blood-filled bugs.

The bed-bug has been carried by commerce throughout the world, and is now a cosmopoli-

tan insect. It is at the present time exceedingly prevalent in this country (England) in all our large cities, and many areas are infested to such a degree that it would be difficult to find one house in which bed-bugs do not appear at some period of the year.

During the past few years the expenditure of time and money on the eradication of the bed-bug has increased considerably. This is due partly to the fact that public attention has been directed to the prevalence of these insects, the presence of which has been disclosed through slum clearance and the subsequent dissemination of the pest to new housing estates, and also in part to the growing conviction that in the present age of health propaganda such insanitary creatures are not to be tolerated.

The bed-bug is certainly the most unpleasant pest in houses.

(From "The Bed-Bug," British Museum Natural History)

PLAGUE

"Plague has a strange history, not elucidated until this century. It is caused by a bacterium, *Pasteurella pestis*, which Kitasato discovered in 1894. Its mortality is very great, varying from 34—99 per cent. It seems likely that there is a permanent reservoir of plague bacteria in certain rodents, notably the tarbagahs, which inhabit parts of eastern Asia, such as Mongolia. These rodents are periodically decimated by plague; their fleas become infected, and migrate from the dead tarbagans to living rats. Rats are constantly on the move and frequently infest ships; they thus migrate from east to west bringing plague with them. When the plague-stricken rat dies, its infected fleas may migrate to man and bite him, so causing bubonic plague. Plague can also be carried from man to man by droplet infection, when it assumes the even deadlier form of pneumonic plague.

Plague does not invade countries where the populations do not live in intimate contact with

rats and fleas. It is therefore unknown in modern Europe; but in India it killed four million people between 1896 and 1906. A rising of the standard of cleanliness can eliminate plague, but considering the traditional habits of the east, it might be simpler to pay £1 a head for tarbagans and eliminate infection at the source. But unfortunately, the wealthy West does not really care how many folks in the far-off East lose their lives. If the plague were in Europe, it would be a different matter."

"The Century of Science"—By Sherwood Taylor

SUNSHINE

The ultraviolet component of the sunshine can cause a skin burn which makes one ill; yet in limited dosage these rays are valuable for the Vitamin D they form in the skin. Many tropical climates are very sunny and rich in ultraviolet. One must therefore be careful of sunburn until a tan is acquired, and even then sun sickness is readily possible. Many tropical residents deliberately dodge much sun exposure thus acquiring the familiar tropical pallor. A tan is desirable, however, if it can be acquired, as it prevents much of the ultraviolet from penetrating too deep into the skin. A good tan is regarded as a sign of good constitutional powers in the case of tuberculosis patients. Though heliotherapy, or sun treatment, is widely used for tuberculosis, the sunny Tropics have a very high incidence of that disease. This apparent anomaly is explained by the fact that tuberculosis flourishes most where crowding, malnutrition, and lack of hygiene is worst.

From "Climate and Man" Yearbook of Agriculture—U.S. Dept. of Agriculture

THE AGING OF RESERVOIR WATERS

—L. T. Purcell.

Jour. Amer. Water Works Assoc., 31, 1775—1806 (Oct. 1939).

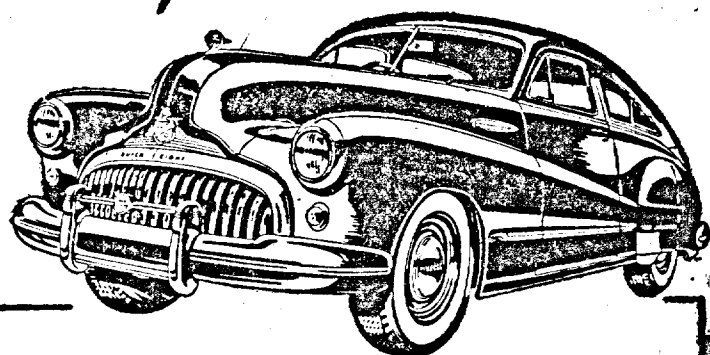
Reservoir "aging" is the terms applied to the chemical and physical changes which take place

following impoundment of a surface supply. These changes have been found to affect such characteristics as color, turbidity, density of micro-organisms, and content of dissolved oxygen, carbon dioxide, hydrogen sulfide, and salts of iron and manganese. The author's study of the Wanaque Reservoir and other reservoirs in Northern New Jersey indicates that color aging (progressive reduction of color in the bottom waters until a stable condition is attained) is dependent upon the bottom characteristics and the storage ratio of the reservoir. "The color aging time of an unused reservoir of low storage ratio may be as low as 4 years in a reservoir from which the top soil has not been stripped. When a reservoir flooded area has been stripped and swamp areas removed, maximum color reduction may take place in a shorter time." Concerning other physico-chemical changes, the author states:

"From the standpoint of mineral salts, such as iron and manganese, in the bottom water there is a vast improvement during the first three years. The carbon dioxide in the Wanaque Reservoir appears to have reached a nearly stable minimum in the bottom water in the sixth year. The dissolved oxygen content in the Wanaque Reservoir was zero in the bottom water during the fall seasons of each of the first 3 years. After the first 3 years dissolved oxygen was always present even in the bottom water. Following the first year there was no hydrogen sulfide at the surface. There has been no hydrogen sulfide present even in the bottom water since 1932. The numbers of micro-organisms may be excessive at times even in old reservoirs. During the first year of filling, if filling takes place during a growing season, a large reservoir may have excessive growths of Chlorophyceae and Cyanophyceae and in succeeding years that reservoir may not again experience troublesome green or blue green algae conditions except in the more shallow coves."

—P. J. COFFEY
(P. H. Engng. Abstrs.)

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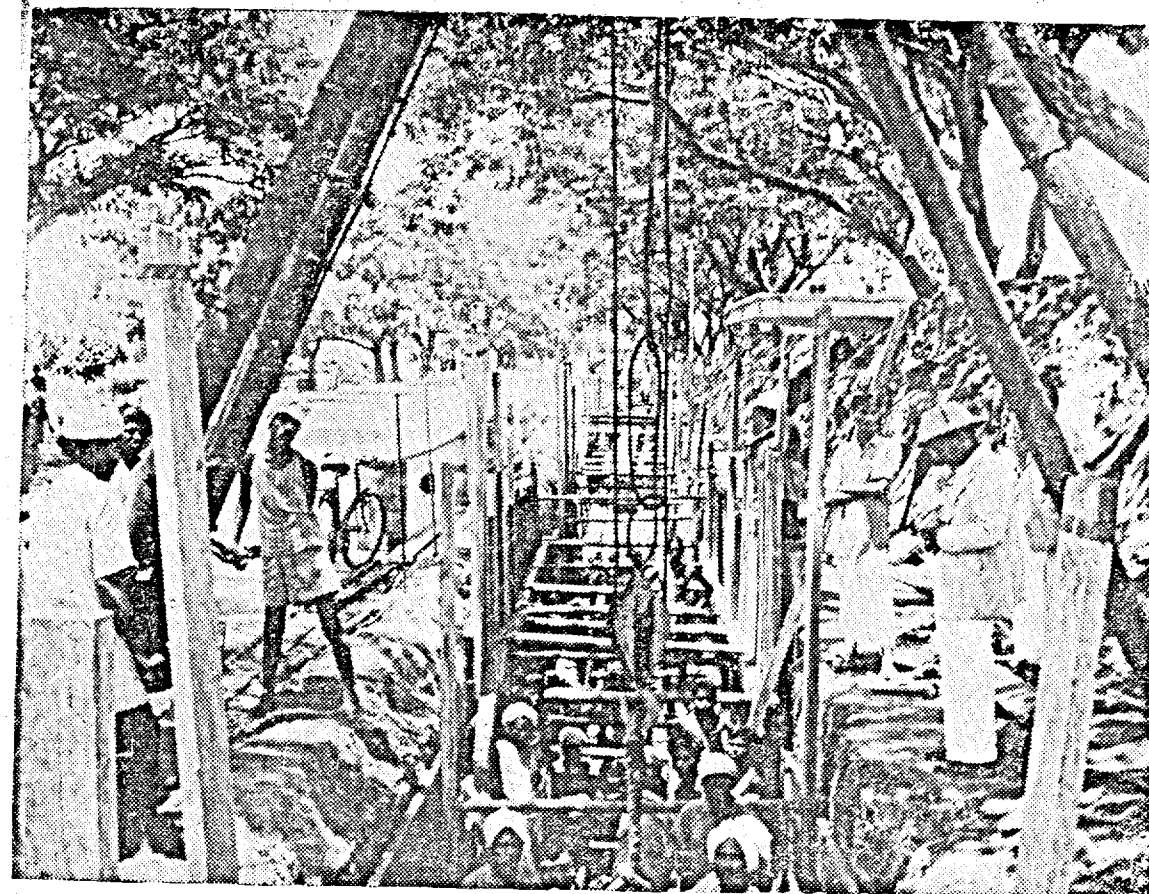
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