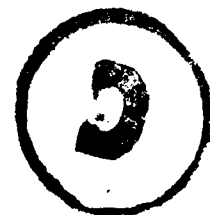


Peckles health

August 1928

Vol II

Vol II



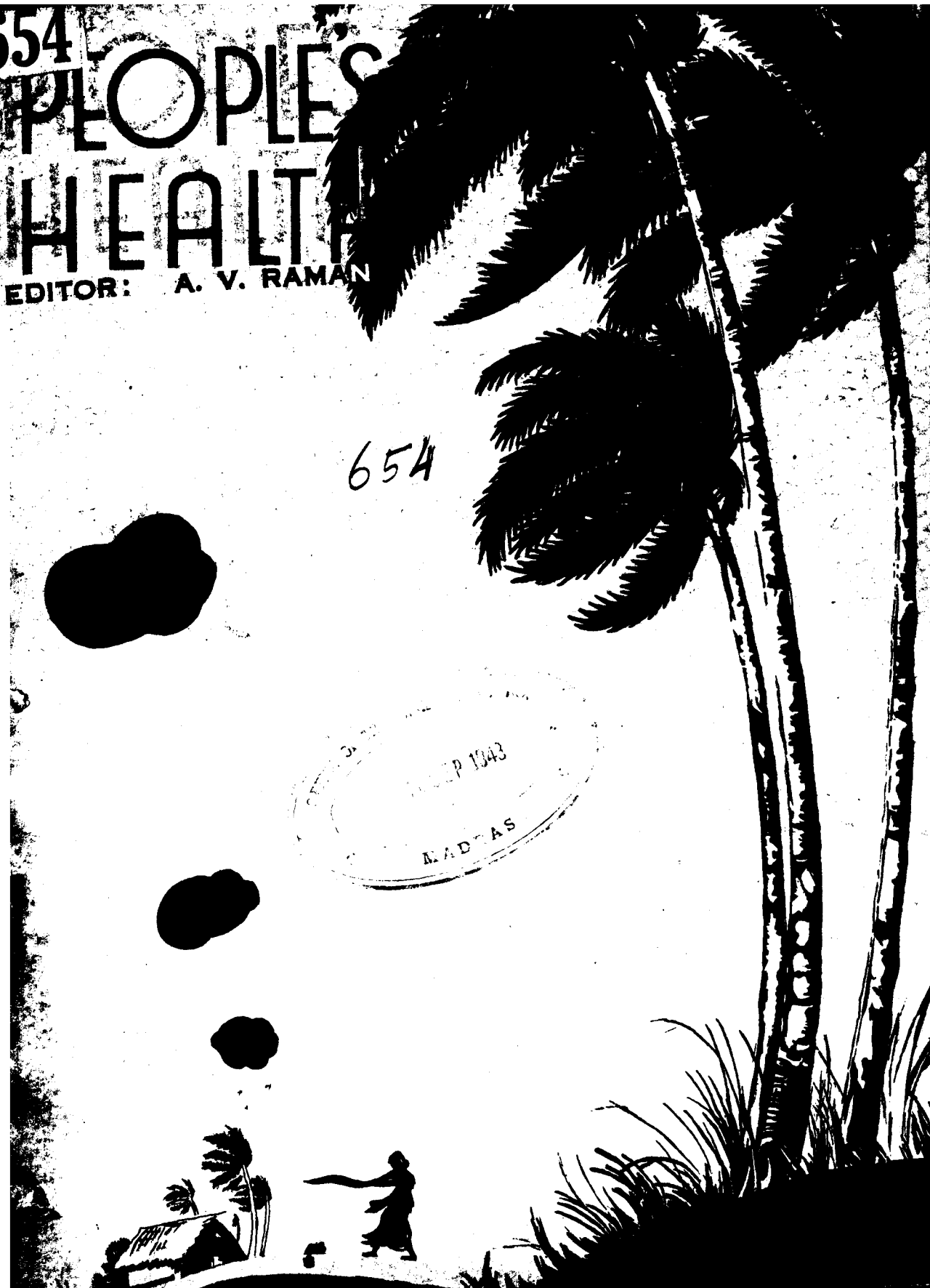
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PEOPLES HEALTH

EDITOR: A. V. RAMAN

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PEOPLE'S HEALTH

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Vol. II

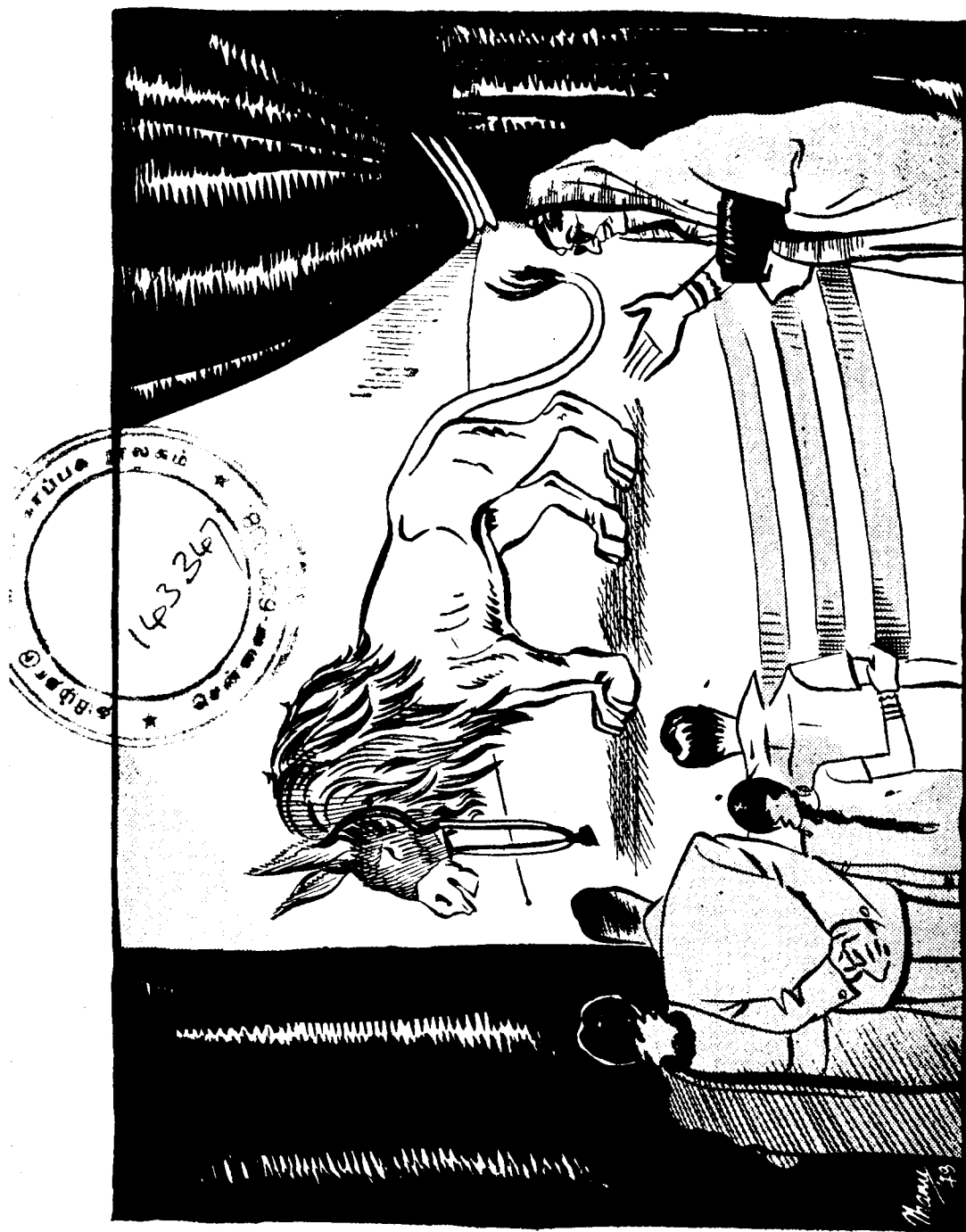
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Environmental Hygiene Committee.
"Queer Beast.....may be ! But Quite Capable. Wait and See."



VOL. II No. II

AUGUST, 1948

ISSUED MONTHLY

EDITORIAL . . .

The question is not to be trifled with. It is a sheer dallying with death and scoffing with a raging epidemic.

CHOLERA OFFICIAL MUDDLING

Epidemics like the poor are always with us. And like the poor, they are the result of callousness, incompetence or negligence of our so-called *experts*. In proof of which we should like to draw the attention of our readers to the following distressing instance of official muddling.

BARKING UP THE WRONG TREE

Recently, it was reported in the Press that Salem town suffered from a sudden and wide-spread epidemic of cholera. The local Health Officer was alleged to have made a detailed investigation of all the cases, and to have come to the remarkable conclusion that all the cases of cholera were due to the fact that some 'fatal' *bondas*

were consumed in a particular *cafe* by all the victims. Granting this conclusion to be correct for the moment, it never struck the Health Officer to make an elementary distinction between *food-poisoning* which would have been a scientific conclusion of his diagnosis and *cholera*, which is altogether a different proposition.

EXPERTS' IGNORANCE

A note, which appeared in the Press [*The Hindu*, dated 2-8-48, page 6, column 6], under the authority of the Director of Public Health, further stated that *v-Cholerae* were isolated from eight of the reported cases. The intrusion of the Director of Public Health with his *expert opinion* only

tended to confuse the public mind with a show of learning which in reality conceals lamentable ignorance. specially in positions of great public responsibility involving high technical knowledge.

How the Director of Public Health could mix up *cholera* and *food-poisoning* passes our comprehension. Anyone who is conversant with the mode of preparation of *bondas* knows that they are cooked in hot oil at a temperature of about 160 degrees centigrade and allowed to remain in contact with the oil at this temperature for a period infinitely longer than the syringes which are sterilised in oil before inoculation even by temporary Health Inspectors. If, on the other hand, it is held that they might have been subsequently infected by flies, here again we have to suppose that the flies must have sat on *all the bondas* consumed in a particular day in a hotel. Worst of all is the implication that the people who took these *bondas* in the hotel took nothing else, not even water to wash the *bondas* down their throats! There are any number of such missing links which can be enumerated to expose the smug pretensions of the Director himself. Suffice it to say, that the explanation given is so unscientific and the so-called detailed investigation of the epidemic such a bogus affair that, if such a story had been put forth anywhere west of Aden, the officers responsible would have been cashiered on the spot. But, in our unfortunate land, incompetence is still at a pre-

BONDAS AND TOMATO CHOPS

After the manner in which *bondas* as mentioned above have achieved notoriety, it is high time our health department does something to retrieve its fast dwindling prestige. In the immortal trial of Mr. Pickwick for breach of promise, Sergeant Buzfuz made capital of the incriminating dish "*Tomato chops and sauce*" and secured damages on the strength of it. The *bondas* await a historian to achieve similar immortality. We half feel like asking 'Who the dickens will do it'? But, speaking seriously, is it not the height of the ridiculous that a department, presumably staffed with scientific experts, should indulge in such a fairy tale or grandmother's story, and palm off their laziness and incompetence as a unique and valuable addition to the sum of human knowledge concerning the malevolent potentialities of *bondas*? The occasion would be farcical were not the consequence of it prove tragic to the masses at large. The best method in which the efficiency of the service and the coordination of work going on in it can be promoted, is that the Curative and Preventive branches of public health should be immediately amalgamated and brought under a single and unified control and direction.

With the two branches so moulded and remodelled, the experiences of both may be fully utilised for promoting the common good.

HOW TO FIGHT CHOLERA?

The Director of Public Health is further reported to have stated in the course of the interview to the representatives of the *Hindu* that he would leave nothing to chance! Very brave words indeed! But they sound hollow in view of the illustration we have given of the manner in which the particular enquiry was conducted and the *continued prevalence of the epidemic in the Province*.

On the other hand, let us present him with an instance of how a similar emergency was tackled without anything being left to chance in Egypt. In 1947, a few cases of cholera were reported on the eastern bank of the Nile Delta, but the outbreak was brought under control by the end of the year, i.e., in less than four months. During the height of the epidemic which raged for 10 days, there were in all 20,000 cases and 10,000 deaths, but the point to be noticed is that the epidemic as a whole was not only brought under control after ten days but also its spread was effectively checked. How was this remarkable result achieved? A special article in the *Lancet* describes how an all-out and heroic attempt was made to

inoculate the entire population of the Nile Delta comprising nearly 20 millions, and how it made possible the epidemic being brought under control within a period of 4 months. That was an instance of leaving nothing to chance, and not the saying of the Director from his comfortable seat from headquarters while the epidemic goes on raging unchecked, untraced and in some areas unguessed at.

Let these Figures tell the tale

Week ending	No. of Attacks	No. of Deaths
(1)	(2)	(3)
19-6-48	317	162
26-6-48	405	220
3-7-48	577	273
10-7-48	866	436
17-7-48	885	405
24-7-48	1,069	546
31-7-48	1,349	609
7-8-48	1,856	878

THE SOVIET WAY

Next to Soviet Russia, such an attempt at mass inoculation does not seem to have been in hand in any other part of the world and the result was another wonder, for we are told that after the curve of mortality reached a maximum in the 4th week of October 1947, it began to register an equally rapid decline before the 4th week of

November. We readily admit that there were two other factors also at work, *viz.*, the preventive measures taken by the Health Department, and the course of Nature itself. But in our country alone the bad old habits still persist of the department taking credit for Nature's own processes without the department lifting its little finger so to speak! This is but one of the instances of supineness in our Health Department, which waits on disease and has no integrated plan to forestall it, or to break its back by preventing it by seasonable prophylactic measures.

FORESTALL: NOT FOLLOW IT

In this connection we think it as well to draw further attention to our repeated demand that the Health Department should arm itself well in advance to tackle the problem of any epidemic of cholera in any part of the Province before it threatens to break out rather than pant after it attempting to stamp out its expanding ravages. As early as November 1946 we offered our cooperation to Government in educating public opinion with a view to avert or minimise the anticipated outbreaks of the epidemic of cholera. In due course, an Assistant Director of Public Health contributed to these columns (*vide* No. 4 of vol. II) an article on prevention and control of cholera. This led to some very inter-

esting points for elucidation being raised by a reader. We forwarded that letter to the Director of Public Health requesting him to comment on it so that we might publish the letter with his comments in a subsequent issue. But, much to our surprise, the official informed us that if any reader required any further information or elucidation, he was at liberty to address him *direct*. This seemed to us (and will certainly seem so to our readers) a most amazing instance of inconsequence, if not irresponsibility on the part of the official. The purpose of the original article was to stimulate public interest in matters of health and ensure public cooperation in fighting epidemics. We, therefore, could not understand the sudden access of shyness which prevented the official in question from following up the original article with such further elucidations and comments as seemed called for again *in public interest*. Surely, it cannot be contended that it would amount to entering into a controversy in the Press. If the Government really cares for public cooperation, it is hard to understand the reason for such a supercilious attitude on the part of the officials. Cooperation is a two-way passage. If the public should cooperate with the Government officials, the Government officials must come forward to secure it and not look askance at it, when it is offered in good faith.

Periodically, we have been urging the desirability of paying sustained and seasonable attention to the recurrence of cholera in an epidemic form for the reasons that such periodical outbreaks are almost obvious or foreseeable. We know the conditions that favour outbreaks of these epidemics; if our public health service is properly organised, and the system of supervision and field work is reasonably conscientious and efficient, we ought to know where conditions are drifting towards an imminent outbreak of the epidemic and where preventive action is called for urgently. There has been no instance of field work properly carried out or enforced by superior direction or intelligent instruction or helpful collation. Our officials, unlike Caesars, go, see but come back beaten! For the cholera takes its course and Nature herself in her infinite mercy takes periods of rest. Why then maintain an expensive and incompetent department, burdening the tax-payer and burdening files with unrealistic, if not, dishonest rubbish? We appeal to the Ministry of Health not to lock our doors after the horse is stolen.

"HEALTH REPORTS"

It may be recalled that in No. 8, Vol. II (May 1948 issue) of *People's Health*, we questioned the rationale of the weekly 'Health Reports'. We suggested that they should be really

called 'Reports of Epidemics', for, they deal only with the incidence of epidemic diseases. It is high time that the Ministry of Health, Government of India, issue instructions to the Provincial Governments that these weekly or fortnightly reports should be henceforth called 'Reports of Epidemics' and not 'Health Reports'. Why shelter under euphemism? The figures supplied should be correlated with the total population *in each of the areas affected*, showing the percentage or proportion of the people affected. The object of the report should not be to cater to the morbid interest which man has in the death of man. The report should clearly show the reader that he was fortunate in not being one of those attacked, and convince him of the necessity of taking necessary precautions lest he should add to the number in the succeeding report.

THEIR PURPOSE

What do these fortnightly or weekly *Health Reports* give? They give figures of morbidity and mortality due to the three epidemic diseases—cholera, plague and smallpox. Bombay reports contain an additional item of information, *viz.*, the corresponding figures during the previous year. What would obviously be more useful is the *progressive total figures under each head from the commencement of the trend of*

the epidemic and a gist of the specific control measures adopted. Is it not likely that the absence of these items of information will engender in the minds of the public an impression of departmental slackness, although the Public Health Department personnel might have taken the control and preventive measures according to their light?

A PLAN OF CAMPAIGN

The field work done by some obscure and usually low paid official, undergoes no correction or amendment or check upon the spot by knowledgeable higher-paid and higher-placed authorities. Unless this is done then and there, its value for purposes of drawing final conclusions disappears entirely.

Environmental hygiene must be intelligently organised and workers in both fields must be made conscious of it, as the major factor in promoting public health. If the Ministry are really serious, as we believe they are, in tackling the problem of public health, early steps should be taken to effect the above suggested merger and reorganisation of the Preventive and Curative branches of public health without any delay.

Investigations of present outbreaks of cholera must be immediately undertaken and such reports must also be published, both to rouse public cons-

ciousness to the seriousness of the impending danger as well as to prepare them to render more hearty cooperation to the Government. After all, it cannot be too strongly emphasised that there can be no hush-hush methods in regard to public health. There is no room for diplomacy either, or for slurring over facts because they are unpalatable.

ABUSE OF POWERS

One of the untoward consequences of the department's proneness to cook up reports from headquarters or from "travellers' bungalows, is to create evidence in support of its own preconceived conclusions by arbitrary or irresponsible action. For instance, it is not infrequent for officers touring infected areas to get into their heads that the cause of infection is a particular objectionable tea-shop or hotel or eating-house, and immediately thereafter, to take the law into their hands and destroy such preparations by the acts of individual zoolum and thus causing damage to the inoffensive, ignorant, but well-meaning vendors! In many such cases we know of (note the case of *Bondas* cited above) there would not be even *prima facie* evidence of an established connection between the disease and the offending preparations. Local officials run amok more often than the public are aware of and they get away with it.

A WORD OF CAUTION

To the officials of the department in general, we should, therefore, like to utter a word of caution. Section 143, of the Madras Public Health Act, 1939, lays down in specific terms that:

"Any executive authority of a local authority or any officer or servant of a local authority or of the Government, or any person appointed under section 12 of this Act, who maliciously abuses any powers conferred on him by or under this Act, shall be punished with imprisonment which may extend to one year or with fine which may extend to one thousand rupees or with both."

If no case has been registered so far, it is because the injured private party has, in most cases, neither a clear appreciation of his rights nor the means to bring the offending official to book. This is another matter in which the officials must behave better towards the public, whom he is called upon to serve, instead of tyrannising over them.

Pre-fabricated Houses

During the current session of the Indian Parliament, certain information on the proposed pre-fabrication of houses was elucidated by some members of the House. From the trend of

the replies given by the Ministry, it would appear that the Government are forging ahead towards the establishment of a factory in this country for pre-fabricating houses. The questions put to the Ministry did not, however, cover some of the important aspects of the proposal. Whatever be the materials or the mode of construction, the most important point is the design—the design of the dwelling proper. At present every housing authority has its own standard design. There is wide diversity as to the minimal requirements of a building intended for human habitation.

The Environmental Hygiene Committee, recently constituted by the Government of India, is expected to lay down the minimal standards of convenience, health and sanitation. The Committee may take sometime before submitting its full report covering the wide terms of reference to them, but, in the meanwhile, it would seem advisable to issue a directive to the Committee to give its report on this aspect at an early date. The Government would then be in a position to consider the proposals and issue orders to every authority to construct buildings complying with these requirements. This is important.

HURRY SLOWLY

We have expressed grave doubt whether pre-fabrication of the shell

of the house would satisfy our climatic and living conditions. We reiterate it. It is essential that the shell of the house should afford reasonable protection against the influences of the weather. Pre-fabricated shell cannot be expected to satisfy this requirement. Pending actual experience, we would appeal to the Ministry to hurry slowly. On the other hand, pre-fabrication of fittings, such as doors, and windows may prove a practical and economical proposition. Doubts have been expressed by eminent authorities as to the utility of pre-fabrication of the entire unit. We should take note of such opinion before launching upon large schemes.

If housing is to be undertaken on a grand scale, local materials should be utilised to the fullest extent. For instance, clay can be successfully utilised for rearing the shell of the house. Researches have been done elsewhere to prove its possibility. Further researches should be conducted as to how best thatch and other combustible roof covering could be made fire-proof. In Australia sea-weeds are being pressed into boards and rendered fire-proof, though not dust-proof. There is a wide field for research. Priority should be given for doing research on materials of construction.

PRIORITIES

We are glad that the Government of India have issued a circular to Provin-

cial Governments requesting them to take steps to enforce stricter control over the use of building materials in general, and cement, steel and bricks in particular.

May we suggest that the construction of palatial palaces should be prevented altogether at least for a limited period. The urgency now is to provide houses for the low income groups. It is therefore essential to concentrate attention on this class of buildings. Another method in which the conservation of these materials can be made is *not* to utilise these materials for executing works, which can be put off for sometime to come. For instance, do we not see cement being lavishly used for the formation of foot-paths and road margins? Can these not wait for sometime more?

A WELCOME CHANGE

We are glad that *Housing* is now brought under the direction and control of the Ministry of Health. We hope the Central Government would issue instructions to the Provincial Governments as well, to bring housing, town-planning, local administration and other allied subjects under the Ministry of Health. Unless this important change is effected, coordinated activities would be impossible. What little technical talent and finance we may have, are likely to be frittered away.

MEDICAL PROFESSION AND PUBLIC HEALTH

by

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CURATIVE Versus PREVENTIVE MEDICINE

Public health and preventive medicine have not been a great concern of the medical profession as a whole in the past. Indeed the Public Health Officer is often the result of either disappointment or failure in the curative profession. The curative profession has not infrequently shown a feeling of apathy, if not antipathy, in the field of preventive medicine. But times are changed vastly and the spectacular results which have followed the application of the laws of public health and preventive medicine by way of great reduction in the crude and specific death rates, the saving of mothers at child birth and all infants at least after their neonatal life is complete, the remarkable freedom from tuberculosis in some of the western countries, the great strides made in the control of malaria, of typhoid fever, of venereal diseases, have all shown that there is at least as much thrill in the application of medical science to the community as a whole as when it is applied to an individual. Indeed one may go further and say that in a world, replete with democratic ideals in every walk of life with an inherent mediocrity as the badge of the majority

of workers, the results when knowledge is applied to a community are still of a far greater order than when the intelligent few apply their close and specialised knowledge to a few individuals who come within their purview. The terms "Preventive medicine" and "Public Health" require some elucidation. They do not differ in purpose nor in results that are achieved, but only in the allocation of responsibility for carrying out the activities that are required for the conservation of a satisfactory community, province and nation-wide health programme. Public health activities are undertaken by the State or by voluntary health agencies. The individual physician should be thoroughly familiar with the need for activities. He should participate in them. But they are not his direct responsibilities. Preventive medicine on the other hand is the direct responsibility of the individual practitioner of medicine.

HEALTH ACTIVITIES AND POLITICS

Public health activities in all countries of the world have always shown an ebb and a flow

sometimes without any bearing on the capability of the administrators. On the whole it has followed the fortunes of the general political framework. To quote a concrete example in our country, with the advent of independence, when every administrator is naturally anxious to lay special emphasis on all nation building activities, but the refugee problem and its attendant communal disorders which are the direct result of the political partition, make security the most primary concern of the State and subordinate every other consideration for the moment. Hence all that one can hope to do at the present moment is to consolidate the progress so far made and to maintain it until better times dawn for its further improvement.

In the United States of America, prior to 1800 the concept of medical attention restricted itself to the individual providing for himself and his family food, shelter, clothing and such care as he can secure in case of illness. The principle of communicability of disease was understood imperfectly and the measures for the prevention of spread of disease were confined to isolation of the sick, quarantine of the family and even quarantine of one country from another through ship quarantine. During this period, epidemics of smallpox and yellow fever dominated the country. From 1800 to 1850 there was no progress whatever. Diseases were attributed to remote causes such as the storm dust or earthquakes or decaying animal and vegetable matter. From 1850 to 1875 there was some awakening of public health activity but the period 1875-1900 represents the golden era of communicable disease control in the United States. For a short while after 1900 public health administration languished. At this time a new philosophy of community responsibility developed, that is, the growth of voluntary health agencies. The theory behind such voluntary work was that these agencies should develop by the experimental method certain procedures in a special field to

prevent illness and improve health more or less on a demonstration basis so that when its value was demonstrated official agencies would appreciate results and assume the task so necessary for satisfactory community life. Without in any way minimising the splendid work of voluntary health agencies there are certain inherent dangers in this type of philanthropy such as an unbalanced programme, the development of vested interests, the unwillingness to surrender successful work to governmental agencies and sometimes unintelligent leadership in the U.S.A. Beginning from 1925, however, there is a trend towards nationalisation of public health.

SOCIAL SECURITY PLAN

Without going into details of public health evolution in Great Britain, one may refer to the present day controversy about the practicability of the social security plan in relation to medical service. Time alone will show whether the proposed conscription of medical profession for community service is best calculated for human happiness or whether without any corresponding good it has only tended to curb the liberty of the individual medical practitioner and his relationship to families which have their own choice of selecting their family physician.

Having traced the evolution of public health, I now turn attention to the role of the independent medical practitioner in preventive medicine. In that connection, the example of Dehri city comes to my mind. Dr. Henry Vanghu who was the Commissioner of Health of the city when I visited it in 1936-37 is incidentally not even a medical man although he is a Doctor of Public Health. His father was a great authority on public health and preventive medicine. Dr. Vanghu has such a thorough grasp of the public health problems of the city that you could listen for hours to his exposition of the same without feeling the least bored or being aware of the passage of time. In this city, at all events when

I visited it, the City Health Department utilise the service of 2,000 independent medical practitioners in providing preventive health service to the two million citizens living in the city. There were different bureaux attached to the City Health Department, such as Bureau of Communicable diseases, Bureau of Statistics, Bureau of Industrial Hygiene, etc., but there was, above all, one interesting member of the staff whose designation was the Director of Medical Relations. His duty was to meet the 2,000 medical practitioners in social contact on a planned basis, to ascertain their interest in their profession, to find out the lacunae in their medical knowledge and its application and provide the requisite literature to fill up that lacuna and by dint of his personality to see that this supply of medical literature is actually utilised by the medical practitioner.

This plan provides for a division of the city virtually into 2,000 circles and for the provision of all preventive medical service through the agency of one private medical practitioner in each circle. A Public Health Nurse appointed by the City Health Department for a number of these circles, works in liaison with the independent medical practitioners of each circle. Diphtheria immunisations are, as a routine, carried out by these medical practitioners. Again, as a general programme in tuberculosis work, each practitioner is allowed to perform a Manton test on every citizen in his circle to read the results of the test and where the result is positive the public health nurse is to be informed to arrange for an X-ray examination, also by a private practitioner, and the X-ray picture is taken to the original medical practitioner for interpretation of the actual condition of the lungs. School health service is also provided through the agency of these practitioners. Immunisations against pertussis and occasional vaccination against smallpox are also carried out. Maternity service is likewise conducted by these practitioners with

respect to those who do not seek the aid of established maternity homes and hospitals. For all these services, the City Health Department pays each practitioner every month on receipt of a return showing the work turned out quantitatively under each head and the City Municipality has laid down fixed rates for each type of preventive medical service to be performed. It cannot be said that this type of utilisation of the independent medical practitioners is the most economic to the City Health Department. The employment of full-time medical personnel with the right of private practice completely debarred and the payment of adequate wages would perhaps be more economical to the City Health Department. On the other hand this is an attempt to combine the role of clinical and preventive medicine in one agency, an agency which is generally acceptable both to the medical practitioners and to the community as a whole. The public health nurses employed by the City Health Department visit the homes not as the agents of the City Health Department but as the emissaries of the independent medical practitioners. Sometimes these practitioners may not even be aware of the visits paid by the public health nurses for the purpose of arranging for a concomitant disinfection in the case of typhoid fever, or in the case of tuberculosis receiving ambulatory treatment in their own homes and when the public health nurses are enjoined to impress upon the housewife that all these preventive measures are being carried out under the advice of the independent medical practitioner of that circle.

Let us apply the above plan to an imaginary city of, say, 300,000 population with about 200 members of the medical profession. Each member will thus be entrusted with responsibility for providing preventive medical service for 1,500 persons. There will be roughly about 50 births and 30 to 40 deaths in each circle every year. There should be no difficulty whatever

in arranging for the medical practitioner visiting the homes where deaths have occurred in each circle and by a post-mortem examination of the memory of the relatives of the deceased he should arrive at a reasonably correct estimate of the cause of death and have it properly recorded in the urban death registers. While institutional midwifery is most desirable and must be provided for in any city of some size, the independent medical practitioner can also be utilised for such cases of labour as do not come for institutional treatment in his circle. Secondly, there will be, say, about 60 cases of primary vaccination against smallpox which will have to be performed in each circle per year and even if re-vaccinations are to be performed every five years, there will be not more than 300 revaccinations to be done per year bringing the total of vaccination operations to about 360. It is not difficult for a medical practitioner to do about 50 to 60 vaccinations in one morning if he allotted, say, about 3 to 4 hours. Thus he will have to allot only about 5 to 6 days during the whole year for purpose of vaccinating against smallpox. His services will also be utilised for all preventive immunisation campaigns in his circle including cholera, plague, typhoid fever and even diphtheria if necessary. With a change in outlook and a greater degree of approximation between preventive and clinical medicine, the independent medical practitioner will be most able to arrange for the early reporting of cases of communicable diseases from his circle. When this City Health Department undertakes community services such as prevention of tuberculosis and leprosy, venereal diseases or school health service when they may have a competent trained supervisory and exploratory staff for the city as a whole, the individual attention which has to be paid to the patient as well as close familial contacts may safely be left to the independent medical practitioner.

It may not be necessary to define the areas of operation under each individual practitioner in

terms of geographical units. Some latitude for selection may be left to the mutual satisfaction of the physician and the family.

IMPORTANCE OF ENVIRONMENTAL HYGIENE

In evolving plans for the promotion of the health of the people, one is apt to overlook the importance of environmental hygiene. As the Bhore Committee has put it :

"But the creation and maintenance of an environment conducive to healthful living may be considered to be of even greater importance, because, in the absence of such provision, the services rendered by the doctor, nurse and other members of the health organisation will largely fail to produce the desired results. In the campaign for improved health, drugs, vaccines and sera can in no way replace such essentials as a hygienic home, good food, fresh air and a safe water supply."

But unfortunately the subject is so complex as to justify special investigation. According to the Bhore Committee, "the subjects under consideration are of such importance and some of them raise issues of such complexity as would seem to justify special investigation before decision can be reached in respect of them." The Committee had neither the time nor the opportunities for detailed consideration of this problem. It is gratifying to note that recently the Government of India have appointed an expert committee called the Environmental Hygiene Committee to investigate the entire field of environmental hygiene. But in the meanwhile it should be prominently borne in mind that in any plan calculated to promote the health of the people, the importance of environmental hygiene should be given a prominent place.

INDIAN MEDICINE & PUBLIC HEALTH

It is apposite in this connection to refer to the role of the practitioners of the Indian schools of medicine in this scheme of things. It is not my purpose to enter into any controversy but I should merely present a point of view that whatever the future reform may be in order to elevate the Indian schools of medicine to the much vaunted ancient glory or to the satisfaction of the modern scientific mind, such practitioners may in the interim period be certainly usefully utilised for the purpose of providing preventive health service so long as they are agreeable to abide by the general rules of procedure and to maintain and furnish prescribed records.

FUTURE OF MEDICAL PROFESSION

Altogether, the future of the medical profession seems intimately bound up with a combined role on the part of each individual medical practitioner in clinical as well as preventive medicine. Whether we call such a medical practitioner as the officer-in-charge of the health centre, a health unit, a combined medical and

public health unit or a primary health unit, they all have the same basic idea of a combination of the roles of clinical and preventive medicine. The teaching of medicine should no doubt be suitably attuned to this changed outlook and more than all, the medical professions should cultivate an even greater degree of self-sacrifice in the interest of communal welfare than ever before. Suffering and sacrifice have been taught by our leaders to be immensely utilitarian in the field of politics. Most leaders of the same school of thought are still happily at the helm of affairs in guiding the destinies of this nation. National health is national asset and in the gathering of this gain the entire profession should emulate the leaders of this country and meet the challenge fairly and squarely. The future student of social medicine should forsake the shadow of sickness and the shades of the dying and should embark upon his voyage for the conservation of positive health of the individual, of the family and of the community, weathering during the process a storm of environment which is ceaselessly at play.

Public Health is now recognized within the broad field of medicine as a definite speciality for which specialized training is not only available but necessary. A community has the right to a trained public health officer and staff. The requisite training takes time and is expensive. One problem that must be solved is how to attract to a career in this specialized public service the right kind of personnel—health officers, nurses, engineers, laboratory workers, health educators, clerical and administrative staff. The community and its officials must be willing to establish the right kind of service with an opportunity to do a satisfying job. Adequate facilities for work, proper salary levels, proper use of professional time and talents, community support and participation are all necessary.

Without these, Public Health may limp along doing a mediocre job as long as no great strain is put on it. With these, Public Health will move forward to offer not only sound health protection but increasing opportunity for real and positive health.

*Public Health Planning, By Margaret Witter Barnard.
(From New Architecture and City Planning, Philosophical Library, New York.)*

ALL ABOUT COMPOST MANURE

by

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It is gratifying to note that the utilization of 'waste' from urban and rural areas is receiving some attention in the recent past. The author of this article has a missionary zeal and enthusiasm for the subject. He has devoted considerable thought and attention to the subject. We, therefore, invited him through official channels to contribute an article on the subject for the benefit of the readers of 'People's Health'. We are indebted to all authorities concerned for their cooperation. The article deserves a careful study by the common man and technical experts alike.

—Ed., P.H.

It is well known that the progress of any country in all its aspects has its firm basis in the sufficiency of food supply for the use of its inhabitants. India's progress has been seriously affected due to the deficiency of foodstuffs needed for the sustenance of 400 millions of her population. It is estimated that, under Indian conditions, the total requirements of food grains (cereals and pulses put together) is about 20 ozs. per head per day on the average and on this basis the total quantity required for all the population amounts to about 80 million tons per year, while the average total annual output in India has never exceeded 75 million tons. The deficiency of 5 million tons are to be imported from outside at an enormous cost of 50 crores of rupees at

pre-war rates and three times as much at the present rates. As this forms a very heavy drain on our national wealth deeply affecting the progress of our homeland, an immediate solution to make up this deficiency is the urgent need. India, being mainly an Agricultural country with more than 75% of her population depending upon Agriculture, has, at present, 300 millions of acres of land under cultivation which would give an average of $\frac{3}{4}$ acre per capita and yields of crop are very low being only $\frac{1}{2}$ or even less than the average yield obtained in the agriculturally more advanced countries. (To wit: while the average yield of rice per acre in Spain is 5,600 lbs., in Italy 4,230 lbs., in Japan 3,720 lbs., that in India is only 825 lbs. Similarly, the average yield of wheat per acre in India is about 672 lbs. while it is 2,720 lbs. in Netherlands, 2,650 lbs. in Denmark and 2,154 lbs. in Germany). This food shortage can be made up either (a) by bringing more lands under cultivation, or (b) by increasing the yield per acre of the present area under cultivation by way of better manuring, using better seeds, etc. (a) is not practicable especially in an emergency since it involves heavy initial outlay and patient effort in bringing the waste land under cultivation and progress also in this regard would be very slow as more than 80% of the cultivable land are already under cultivation. So, the only promising way to fight the food shortage is to increase the production of good quality manure to be applied to the area under cultivation. The quantity of manure required for the above purpose is very large and in terms of artificial manures it would exceed one million tons of ammonium sulphate and thrice its quantity of superphosphate which would involve very heavy outlay too big for the Indian purse. Production of artificials being much less than one lakh of tons in India per annum, we must have recourse only to the production of organic manures on a large scale to meet the present demand.

MANURE POSITION IN INDIA

The organic manure in the largest use in India is the farmyard manure and this has been found to be quite inadequate owing to the defective methods adopted by our ryots in preparing the same. Statistics show that out of about 320 millions of livestock in India, 220 millions form the head of cattle. Of these about 75 millions are found in the urban areas and their wastes are not used for the agricultural purposes at all, as their dung is converted into cakes and used as fuel and their urine wasted. Of the remaining, found in the rural parts, about 200 million tons of manure are being prepared as only half of their excreta is being collected in practice and used for manure and this could supply only a little above $\frac{1}{2}$ ton per acre of land under cultivation, while the required quantity is about 5 to 10 tons for irrigated crops and half its quantity for the dryland ones. The supply of other organic or inorganic manures, such as oilcakes, bonemeal, fish manure, mineral fertilizers, such as ammonium sulphate, etc., is quite inadequate to make up the deficiency in the supply of manure.

METHODS OF INCREASING ORGANIC MANURES

A very good source from which a huge quantity of superior quality manure could be produced lies in the refuse of the urban areas managed by the local bodies, such as municipalities and bigger village panchayats, maintaining a sanitary staff for the collection of town wastes, such as dustbin refuse, street sweepings, night-soil, slaughter-house wastes, sewage, sullage, sludge, etc. As these waste materials contain large quantities of plant nutrients, they can be converted into good manure by a proper system of biological fermentation called *Compost process*. The habitation wastes of urban population which is increasing in India at a rapid rate (125 millions in 1941 is expected to

go up to 150 millions in 1951) at present not being utilized for agricultural purposes represent a very heavy drain on the fertility of our soil due to the fact that these wastes are the outcome of the crops raised on the soils and imported into the urban areas. These alone, if properly converted into useful manure, would be able to return 2 crores of tons of good manure containing about 1.2 to 1.5% of nitrogen, 1 to 1.2% of phosphoric acid, 1.4 to 1.6% of potash and about 3 to 4% of calcium oxide, in addition to the enormous quantities of organic matter to our soils every year. Bigger village panchayats which contain about 180 millions of human population would also be able to supply more than the above quantity. From the analysis of the mixed human excreta made by Wolff in Europe and Kelner in Java, it is found that 10,000 lbs. of these carry 64 lbs. of nitrogen and 20 lbs. of potassium and 9 lbs. of phosphorus. According to Carpenter, the quantity of wastes per adult per day being 40 ozs., the annual production per million population is 5,749,300 lbs. of nitrogen, 1,825,000 lbs. of potassium and 775,600 lbs. of phosphorus carried in 456,250 tons of excreta. On the above calculation 400 millions of our population can send back to the fields annually about 150,000 tons of phosphorus, 376,000 tons of potassium, and 1,158,000 tons of nitrogen in about 182 million tons of human wastes collected from every house in the country and town alike. The introduction of compost process for the disposal of habitation wastes is of invaluable help in as much as it improves the sanitary and hygienic conditions of most of our towns and villages.

METHODS OF COMPOSTING

Composting could be defined as a process of biological fermentation of bulky organic refuse to yield a manure of agricultural value and this practice has been in use among our ryots for several centuries though not being conducted

in an efficient manner. This has been popular in China where the fertility of the soil is maintained at a high level for the last forty centuries as she, by her fine example, has taught the lesson to the world, that every agricultural country could grow enough of food for the use of its inhabitants by systematically returning all the wastes (both urban and rural) after duly converting them into compost. Hutchinson and Richard, during their investigations at Rothomsted, were the first to enunciate the scientific principles underlying the composting process, and this resulted in the development of ADCO process. Later, scientific researches conducted in India on the question of compost-making have resulted in the elaboration of the INDORE PROCESS by Sir Howard (1930), the ACTIVATED PROCESS by Dr. G. Fowler (1930) and THE BANGALORE HOT FERMENTATION PROCESS by Dr. C. N. Acharya (1940).

The different methods suggested from time to time for composting agree in the matter of materials used and their proportions such as the maintenance of C : N ratio and the moisture conditions, but they vary in the modifications introduced to hasten the decomposition by means of increased aeration and the repeated turnings given to the mass as in the case of THE INDORE PROCESS and the ACTIVATED PROCESS. Though these modifications may help to break down the mass quickly, yet they are attended with several drawbacks, such as (a) considerable increase in the cost of preparation owing to the extra labour required for giving the necessary turnings, (b) rapid drying up of the mass requiring repeated waterings, and (c) heavy losses of nitrogen and organic matter due to the increased aeration which lowers both the quality and the quantity of the finished product. As the Indian farmer, in general, is too poor to pay a high price for his manure or spend much labour in its preparation, it is most essential that

the method of composting, to gain popularity in this country, could be simple, cheap in production and designed to yield large quantity of good manure when the need for it is felt, i.e., once or twice a year. As almost all these conditions are satisfied by Dr. Acharya's BANGALORE PROCESS carried out in trenches, this method has accordingly been accepted and adopted by the I.C.A.R. in their present All-India Compost Scheme. Instances are many in which several municipalities in different Provinces and Native States (Mysore in particular) in India are enjoying the benefits in various aspects such as economical, sanitary and agricultural owing to the introduction of the compost scheme in their respective urban units.

THE BANGALORE HOT FERMENTATION PROCESS

According to Dr. Acharya, the most essential requirements for successful composting are : (1) the presence of bulky organic refuse which may be either the town refuse (dustbin collections and street sweepings) or mixed vegetable farm wastes (such as litter, weeds, crop wastes, stubbles, hedge clippings, etc.), (2) the application of suitable nitrogenous material known as STARTER (as it helps to start decomposition), such as market wastes, cattledung, urine or any inorganic nitrogenous fertilizers, such as ammonium sulphate, calcium cyanamide, etc., in sufficient quantities, (3) the addition of adequate quantity of water to maintain the optimum moisture condition, i.e., 50% on the total weight of the materials used, and (4) the free supply of air at the early stages.

The refuse materials listed under (1) and (2) above are not in a fit condition for direct application to the land as the former having a wide C : N ratio affect the crop-growth by decreasing the supply of nitrogen available in the soil and the latter often possess serious sanitary and

hygienic objections in the matter of smell, fly-breeding, development of pathogenic organisms, etc. When the materials grouped under (1) and (2) are suitably admixed so as to bring the initial C : N ratio to 30 : 1, moisture and aeration adjusted, very rapid development of microflora (fungi in the early stages and bacteria in the after stages) takes place with the steep rise in temperature (up to 65 to 70°C.) of the mass. This temperature which may be taken as a measure of microbial activity which reaches the maximum within the first week and then tends to fall down very slowly over a period of 5 to 6 months at the end of which the mass will have been completely composted. The test of maturity is that the mass should exhibit neither temperature nor smell of the materials originally used. The matured stuff will be in a fit condition for application to the land when its C : N ratio narrows down to a level of 12 : 1 or even less. In the main, composting consists in the conversion of undesirable organic waste materials into a new substance called humus whose C : N ratio is about 12 : 1 as a result of biological fermentation.

The details of working this method are as under :—

PROCEDURE FOR COMPOSTING MUNICIPAL WASTES

(a) The site selected for the compost yard may not be more than two furlongs from the outskirts of the town though it is possible to carry on composting work in trenches even in the midst of the town (as in the case of Shimoga Town in the Mysore State) without causing any nuisance when work is done under proper supervision and in accordance with the directions given. Having the yard beyond two furlongs is inadvisable as transport of the town wastes becomes difficult and costly. The location of the yard should preferably not on the western side of the town as the wind direction in

India is from west to east during many months in the year.

(b) For a unit of population of 10,000 about 800 to 1,000 tons of refuse and 500 to 600 tons of night-soil could be collected on the average per year and this calculation is based upon the estimate that each individual contributes about half to three-fourths pound of refuse and $\frac{1}{2}$ to $\frac{1}{4}$ lb. of night-soil per day on the average though this quantity varies with several local factors. The above quantity of wastes would give rise to about 1,000 tons of well decomposed compost though the production capacity varies from place to place.

(c) Composting is properly carried out in trenches arranged in rows such that the longer sides are parallel and the shorter ones in a line, leaving a space of 6 to 7 feet between successive trenches for heaping up the soil excavated. A cart track of 20 feet in width is to be provided between the rows of trenches to facilitate easy movement of the carts carrying the refuse and emptying the same into the trenches direct. The size of the trenches would vary with the population and the quantity of refuse to be dealt with. Roughly about one cubic foot of trench space is required for every unit of 40 population. Recommended dimensions are as below :—

Population.	Length.	Breadth.	Depth.
Below 10,000	15 ft.	5 ft.	2½ ft.
10,000 to 20,000	20 ft.	6 ft.	3 ft.
20,000 to 50,000	30 ft.	7 ft.	3 ft.
Above 50,000	35 ft.	8 ft.	3½ ft.

Trenches of bigger size are not advisable as manipulation of the materials in the trenches becomes difficult. The capacity of trenches is so adjusted that each trench is filled up in two or three days with all the daily collections of the town wastes. It is advisable to have the number of trenches sufficient to take in 8 or 12 months' refuse, the empty trenches being used over again after the matured stuff is disposed off. In a big town it is better to have compost yards in

different sides of the towns to facilitate easy transport of the wastes collected from the neighbouring zones.

(d) The actual composting procedure is as detailed below :—First, a layer of refuse about 6 inches thick is spread evenly at the bottom of the trench with the help of a long handled metal (four-pronged) fork after removing all the undecomposable materials, such as glass pieces, porcelain bits, shells, etc., and over this a calculated quantity of night-soil brought to the yard either in headloads or drumcarts is spread uniformly by means of a long handled wooden or metal rake corresponding to a thickness of about 1½ to 2 inches, taking care that the night-soil does not touch the sides. This should immediately be covered with another layer of refuse to a thickness of 2 inches as before. Knowing the area of the trench, it is possible to estimate the number of cartloads of refuse and night-soil that should be used for the respective layers. (For a trench of the size of 25' × 6' × 3', 5 cartloads of the capacity of 15 cft. each will suffice to give a layer of 6" thick and 150 gallons of night-soil being equal to the area 25' × 6' sq. ft. of the trench). This process of filling the trench in alternate layers of refuse and night-soil is repeated till the level of the mass rises about one foot or two above the ground level. The topmost layer must be of 9" in thickness of refuse and this is covered over with a layer of loose earth to a thickness of one inch, since this effectively suppresses the smell and the fly nuisance, conserves moisture and prevents losses of nitrogen and organic matter. The proportion of 3 : 1 by volume of refuse of 6 inches thick and night-soil of 2 inches thick corresponds to the equal weights of the respective materials as this brings the initial C : N ratio approximately to 30 : 1. Maintenance of the proper proportion of *katchara* and night-soil can be tested by the observation that a man's legs do not sink when he walks over the layers of refuse

at the end of each day. After about a month or so when shrinkage of the mass is observed due to the rapid decomposition set in, further layers of night-soil and refuse should be added to raise the level as before. Subsequent to this, the trenches need not be disturbed for about 5 to 6 months at the end of which period a well-decomposed odourless innocuous material of high manurial value, which bears no resemblance to the materials originally used, is obtained and it will be in a fit condition for application to the land.

ECONOMICS OF THE COMPOST PROCESS

Cost of production of compost may be estimated from the fact that a labourer can handle about 120 c. ft. (one ton) of refuse and about 200 to 250 gallons (one ton) of night-soil per day and this yields a final product of about 75 c.ft. or one and half tons of well-decomposed manure. Taking the wages of a labourer to be about a rupee per day, the cost per ton of 50 c.ft. of finished compost will be about 10 to 12 annas. Compost manure easily sells at Rs. 2 to 2-8-0 per ton so that the nett profit per ton amounts to Rs. 1-4-0 to 1-8-0. Since the capacity of each trench of the above dimensions is about 8 to 10 tons, the profits realised out of the sales of the first year's production of compost will more than repay the initial outlay expended on the trench excavation. Since the same trenches could be used year after year when the finished product gets disposed off, all further incomes will be profits to the local municipality taking up the compost scheme. The introduction of this scheme in several municipalities of the Mysore State and elsewhere has thus come to their rescue in improving the sanitation of their towns on the one hand and enhancing their revenue through this source on the other. Davanagere municipality in the Mysore State, for example, has been realising a nett profit of Rs. 8,000 to 10,000 annually by this means.

PREPARATION OF COMPOST FROM FARMYARD WASTES

The principle underlying this is the same as in the case of town wastes but some modifications are introduced to suit the circumstances. The methods described below claim to be improvements over those followed by our ryots at present. The advantages of the methods recommended lie in the fact that the operation is simple, cheap in production and a large quantity of superior quality manure is produced, as conservation of organic matter, nitrogen and other plant nutrients together with the requisite amount of moisture necessary for decomposition is effected. The methods followed by ryots at present are very defective as the farm wastes, collected incompletely by them, are thrown into hollows or heaps irregularly thereby exposing the mass to the ravages of sun, wind and rain with the consequent out-put of low quality manure in comparatively small quantities.

To overcome these defects two methods are suggested : (1) The trench method, (2) the plastered heap method, of which the latter is recommended for adoption in places of heavy rainfall and high water table. As each head of cattle is estimated to supply waste materials to produce about 2 to 3 tons per year, size of trenches should be adjusted according to the number of animals maintained in the farm. Up to 6 animals trenches of the size of 20' × 5' × 3', from 6 to 12, 25' × 6' × 3½', and above this number 30' × 7' × 4' are recommended. It is advisable to have the sides of the trenches sloping inwards and the bottom sloping to one end as this helps to preserve the form of the trench and to return the solvent portion of the manure likely to be washed off by rain water and collected at the deeper end of the trench. Two such trenches will suffice for the whole year as, while the manure gets matured in one, the other gets filled up. It is also advisable to have the earth bunds raised all-round the trench by about one or two feet above the ground level

out of the excavated earth as this increases the capacity of the trench, prevents the entry of stormwater into the trench and supplies loose earth for the final cover of the mass. Trench-filling should be commenced from the shallower end by taking the first 3-ft. length. This can be easily marked by introducing a *thatti* or a partition screen made of split bamboos just to cover the entire depth and the width of the trench. Into this small compartment the day's collections of all the farm refuse, such as dung, urine, litter, cattle-bedding, urine-earth of the cattle shed, etc., are loosely deposited after they are well mixed together. Care should be taken not to permit the cattle excreta touch the bottom or the sides of the trench lest the plant nutrients in the materials used may be absorbed by them. This can be prevented by first forming a bedding of green leaves or any organic refuse before the day's collections are deposited. The top is levelled every day and covered with a thin layer of earth which effects the conservation of moisture, nitrogen, etc., helps the development of heat necessary for the decomposition, kills harmful organisms and weed seeds and prevents fly and smell nuisance. This procedure is repeated till the mass rises to one or two feet above the ground level and the top, after making it dome-shaped, is given a mud plaster of about 1" in thickness. After this is done, the partition screen is to be shifted to a further length of 3 feet and the same operation repeated till the whole length of the trench is filled up. When marked shrinkage is observed in the first few sections, refilling should be undertaken to bring the mass to the original level. In this process neither turnings nor waterings will be necessary and a well decomposed mass will generally be ready in about 5 or 6 months.

PLASTERED HEAP METHOD

First, a bed of 4 feet in square and 6 inches in thickness is to be formed out of any bulky

organic refuse or green leaves on a level ground in the yard. Over this the well-mixed daily cattle-shed collections are to be deposited and levelled. This is covered with a thin layer of earth (urine-soaked or dry) and subsequent days' collections are to be dealt with in the same manner till the heap rises to a height of 4 feet. A second heap of equal dimensions is raised adjoining to the first heap so that one side is common to both. Similarly the 3rd and the 4th heaps are built up so that one large heap of 8 feet square is formed. The outer sides of this large heap is drawn up to form a dome-shaped mound and this is plastered with a paste of cowdung and earth. No turnings need be given to this mass except in cases when large proportions of resistant materials as sugarcane trash, cotton stubbles etc., are used. In such cases, the mass is treated with cowdung emulsion and the heap is properly formed as before and plastered.

In the preparation of the farmyard manure emphasis has been laid on the utilisation of cattle urine which has the highest proportion of plant nutrients. Taking one per cent as nitrogen content, in the cattle urine the total nitrogen content out of the annual out-put of urine per head of cattle is about 40 lbs. taking the quantity which each head of cattle voids to be about 10 to 12 lbs. per day. On this computation 200 millions of India's cattlewealth would be able to contribute about 4 million tons of nitrogen. It is also found that one pound of nitrogen would increase the yield by about 10 lbs. Thus, if half of the urine excreta of all our cattle population is utilized, it would be possible to increase our yield of food grains by 20 million tons while our deficiency is only 5 million tons per year.

BENEFICIAL EFFECTS OF ORGANIC MANURES

Bulky organic manures such as composts and farmyard manures play a special role in

improving the soil, then the crop and finally the people. These are of great value particularly in tropical soils such as those in India where the destruction of the soil organic matter necessary to maintain the fertility of the soil, proceed at a high speed. Periodical application of the organic manures to the soil in sufficient quantities improve the texture of the soil, preserves its tilth, secures the proper root aeration and drainage conditions, maintains the permeability, waterholding capacity, base exchange and the thermal properties of the soil and minimises the soil-erosion due to the surface wash off by rain water. All kinds of soils such as sandy, clayey, etc., are improved in texture by such addition and alkaline and saline soils are benefited by lowering the reaction to a more optimum range for crop growth. Further, composts supply large quantities of plant nutrients such as nitrogen, phosphoric acid, potash, calcium, etc., in organic combinations, help to supply the rare elements such as boron, manganese, zinc, copper, etc., which play a significant role in regulating the metabolism and the plant growth. They play a further role biologically giving actini and varyta microflora in the soil which exert beneficial effects on the crop by way of releasing plant nutrients and the production of special plant-growth factors (auximones) which stimulate the vigorous and healthy plant growth. Organic manures exert an influence on the nutrition of the food products raised on the farm. Crops grown on the soil heavily manured with composts are rich in vitamins and thus possess superior nutritive value to those raised on the poor soils or those manured with chemical fertilizers. Of late, Sir Howard revealed the beneficial effects exerted on the plant growth due to the development of a kind of fungi called 'mycorrhiza' growing on the roots of the plants and trees raised on the soils treated liberally with organic manures as they are supposed to play an important part

in transferring essential plant nutrients and other food factors from soil to the plant. Further, on account of the proper balance of the various plant nutrients and the organic matter in the town wastes, manures prepared out of them act as balanced manures in pushing up the healthy vegetative growth as well as the grain formation. This clearly explains the superior ability of organic manures to maintain soil fertility undiminished over a period of several centuries as in the case of China.

ORGANIC MANURES SUPERIOR TO INORGANIC FERTILIZERS

Field experiments (organic *vs.* inorganic manures) conducted in Canada and other places have revealed the fact that the exclusive use of chemical fertilizers to the land should be discouraged, as this results in the exhaustion of the soil, accelerates soil erosion, causes crust formation, reduces the living organisms thus diminishing the yield and exposes the soil to the 'dust storms' owing to the lack of moisture retentivity in the soil. Scientific researches have shown that the fertility of the soil is determined by the quality and the amount of humus present and the presence of purely mineral components deeply affects the fertility of the soil. Soil is a living organism requiring culture and care and soil bacteria and earth-works are the chief factors in the formation of humus wherein the presence of the former helps the liberation of phosphoric acid in organic combinations and nitrogen fixation and the latter helps to maintain the proper tilth. While composts, being themselves alive, assist in the rejuvenation of the soil the chemical fertilizers only stimulate it. While the artificials directly feed the plant, the composts feed the soil, which in turn feeds the plants through the agency of the bacteria. In short, the plants raised on the soil treated with organic manures such as compost can be compared to the babes fed by the mothers' milk and those raised with

the treatment of artificials compare themselves to the babies artificially fed without the help of their mothers. In the former case the mother is fed to feed her young one and in the latter the child is directly fed.

NATURE OF CROP

Almost all cereals, pulses, root and fodder crops and sugarcane show marked response to the application of compost manure. It is stated that tea, which thrives well in acid soils (pH. 4.5 to 5.5) does not answer well to the composts which are alkaline (pH. 7 to 8 and even higher) increase the pH. of the soil. Cotton is another crop which does not respond well to the application of compost and this conclusion is based upon the evidence collected from the field experiments conducted in the line. High level of fertility can be maintained in the soil if composts are used as the main organic manures and supplemented by regulated small doses of selected artificials mainly nitrogenous and phosphatic administered at suitable periods in the life of the plant.

NATURE'S LAW OF CYCLE

Nature maintains the vitality of the soil by humus-developing activity such as bacteria, earth-worms and roots that break up the soil and weathering. Well decomposed composts supply additional quantity of humus developers, bacteria and earth-works in an active living organic form. These merge in the soil and help nature in the maintenance of its vitality. The idea behind it is that the Nature's cyclic law can be kept up by way of returning to the soil everything that is derived out of it in the form of crops. It does not fail to appeal to a thinking mind that Nature, while bringing the animal and the plant worlds into existence, has specifically made them interdependent for their mutual and simultaneous subsistence. As the animal world derives its food supply from the plant

world, the latter should naturally depend upon the former for its continued life. In other words, plants supply food to the animals in the form of crops and the animals in their turn should send back to the soil all their wastes after duly converting the same into plant food (*i.e.*, in the form of manure), thus obeying the Nature's law of cycle. Composting process is only a device to obey this law as it helps to prevent one way drain resulting in the destruction of both the animal and the plant life. The searching mind of the great scientists, philosophers and seers of both the East and the West have enunciated the fact that the secret of success in life lies in obeying the law of Nature. Space does not permit to quote their wise sayings but enough if it is stated that all of them agree in emphasising the fact that, if man does not find ways and means to obey the Nature's cyclic law designed to keep life going on for ever, he, though being the best of Nature's creation, would hasten the destruction of the world in which he is living. Needless to emphasise that composting of the organic wastes and returning the same to the soil is the best way to obey the Nature's Law. Then, man will have done his duty towards his fellowmen as well as all living things, *i.e.*, both plants and animals.

ACKNOWLEDGEMENT

In this connection I have no hesitation to state that the above article has nothing original in nature but is based upon the materials collected from various books, pamphlets, journals, etc., published on the subject from time to time both here and elsewhere. My gratitude is due to the authors of these in general and to Dr. C. N. Acharya in particular whose instructions, in this direction, I have followed very closely in working up the Town Compost Scheme in various urban centres of the Mysore State for the last four years and more to a successful conclusion.

MINISTER OF HEALTH ON MADRAS CITY WATER-SUPPLY

We publish hereunder the questions put to the Minister of Health on the floor of the Madras Legislative Assembly on Madras City water-supply and his replies thereto. We are sure that readers would be *amused* to peruse the questions and answers. We have a feeling that the Minister of Health should be laughing in his sleeves all the time at the colossal ignorance exhibited by those members who interested themselves in the matter. We have pointed out already in these columns, how the debates in our Houses of Legislature have degenerated. In so vital a matter as the supply of safe drinking water to the people, our representatives exhibit not only ignorance but positive flippancy. Wherein lies our hope?

On the authority of the Minister of Health, we have the assurance that the water-supply to the City is '*quite pure and bacteriologically safe.*' If that be so, we fail to understand why Rs. 77.50 lakhs of tax-payers' money should be thrown away in improving the filtration plant, when money is badly needed for providing water-supply to places which are in dire need of it. It is amusing to hear that the water-supply is not responsible for the prevalence of cholera in the city as also other intestinal disorders. It would be interesting to know what has contributed to the prevalence of cholera in the city.

As regards the reply of the Minister of Health that the Government had referred the question of introducing mechanical filters to a Committee consisting of the Sanitary Engineer to Government, the Director of Public Health and the Director, King Institute, and that they recommended rapid mechanical filters, we invite the Minister to make a full statement of the genesis, development and the present state of the proposal. In a leading article (*vide pp. 381-384 of Vol. II, No. 8, 'People's Health'*) we commented at some considerable length on the question. We contended that an expert committee constituted by Government had carried out a long series of experiments *to condition the raw water of the Red Hills tank to befit it for treatment through sand filters.* Several reports should have been submitted to Government on the investigation. What happened to them and what orders were passed by Government on them? The 'experts' referred to by the Minister were also members of the Water-Purification Committee. Are we to understand that these experts were blowing hot and cold at the same breath? If full information is given to the public, they will be in a position to assess the value of the opinion of our "experts." We still maintain that we are prepared to lead expert evidence before any impartial committee in support of the stand which we took. Will the Government be pleased to give careful consideration to the subject before throwing away public funds '*on catalogue engineering schemes?*'

—Ed., P.H.

352. Q.—Sri K. T. Kosalram :—Will the Hon. the Minister for Public Health be pleased to state—

(a) whether the Government are aware of the fact that the drinking water in the City is full of dirt, worms and dead fish; and

(b) if so, what steps the Government propose to take to protect the citizens of Madras from disease, etc., as a result of using the dirty water?

A.—The Hon'ble Sri A. B. Shetty :—

(a) No. The water supplied by the Corporation of Madras to the City is quite pure and bacteriologically safe.

(b) Does not arise.

SUPPLEMENTARY QUESTIONS

Abdul Hamid Khan Sahib Bahadur :—Is the Hon'ble Minister aware that at least 50 per cent of the people in the City of Madras are suffering from some kind of diarrhoea; may I know whether it is not due to some contamination of water in the Red Hills, due to the fact that Government is housing their recruits in that area?

The Hon'ble Sri A. B. Shetty :—The water analyst employed by the Madras Corporation analyses samples of water every day in order to ensure that it is quite pure and safe.

M. Muhammad Ismail Sahib Bahadur :—Is the Government aware that at least in the Mylapore area, water contains a lot of dirt and impurity, and moreover it has got a very bad smell approaching to that of drainage water?

The Hon'ble Sri A. B. Shetty :—Yes, Sir, there have been complaints of bad smell emanating from the water. It is due to the reduced volume of water in the Red Hills Lake owing to the failure of the monsoon last year and concentration of organic matter on account of that reduced water-supply. A gas is produced called hydrogen sulphide out of this organic matter and the smell is that of that gas.

M. Muhammad Ismail Sahib Bahadur :—May I know what the Government has done to remove

this defect? Does the Government think that this bad smell has not any deleterious effect on the health of the people?

The Hon'ble Sri A. B. Shetty :—It has no deleterious effect on health. There is a proposal to introduce rapid mechanical filters costing 77.05 lakhs (Rs. 77.50?) instead of the present slow sand filters.

Abdul Hamid Khan Sahib Bahadur :—Is it not a fact that the water level in the Red Hills went down even below what it is today some years back and the effect now experienced did not obtain then?

The Hon'ble Sri A. B. Shetty :—I have no information.

Dr. S. Subramaniam :—Does Government admit that fifty per cent of the population of the City are suffering from diarrhoea, and if so, will they investigate into it?

The Hon'ble Sri A. B. Shetty :—I am not aware of any statistics showing that diarrhoea is prevailing in the city to that extent.

Mohamed Abdul Salaam Sahib Bahadur :—Arising out of the first part of the question, namely, there is dead fish in tap water, since there is food value in dead fish, will Government consider to divert that water from the Mylapore area to other places where there are non-vegetarians? (Laughter).

The Hon'ble Sri A. B. Shetty :—As far as I am informed, there is some organic matter in water, but no dead fish.

Sri N. S. Varadachari :—Will Government take expert advice in this matter of organic impurities being removed by mechanical filters? Will Government also take note of the criticism that appeared recently in the journal called "Public Health" about the shaping of the city water-supply?

The Hon. Sri A. B. Shetty :—There is no journal called 'Public Health', but there is a journal called 'People's Health' (Laughter).

Sri N. S. Varadachari :—I am sorry. I meant 'People's Health.'

The Hon. Sri A. B. Shetty :—Government referred this matter to a committee. It consisted of the Sanitary Engineer to Government, the Director of Public Health and the Director of King Institute. They recommended that we should have rapid mechanical filters instead of sand filters we now have.

Sri Guntur Narasimha Rao :—Is the water now fully chlorinated?

The Hon'ble Sri A. B. Shetty :—Yes, it is sterilized by an adequate dose of liquid chlorine.

M. Muhammad Ismail Sahib Bahadur :—Is not cholera now prevailing in the city considerably attributed to the impurities in the water.

The Hon'ble Sri A. B. Shetty :—No, that has nothing to do with this; for this is protected water-supply.

Sri K. Rajaram Naidu :—Is the Hon'ble Minister aware of the fact that the water analyst of the Corporation, referred to by him a little while ago, does only chemical analysis, and he does not state what kind of foreign bodies are there in water?

The Hon'ble Sri A. B. Shetty :—He has said the water is chemically pure and bacteriologically safe.

Abdul Hamid Khan Sahib Bahadur :—In view of the fact that mechanical filters are urgently required, will Government expedite the grant to be given to the Corporation so that mechanical filters may be brought into existence soon?

The Hon'ble Sri A. B. Shetty :—The matter is awaiting Government sanction.

Mr. Speaker :—Question time over.

QUALITY OF WATER DESIRED BY PUBLIC

There is only one kind of water which is desired by the public, and that is water which is *always clear, pure and palatable*. If the water works complied with the wishes of the public, there would not be a single instance in which water of inferior quality would be supplied for drinking purposes. *Palatability should be regarded as being of equal importance to the clarity of the water*. Water with a disagreeable taste or odor may drive many of the consumers to obtain their drinking water from sources other than the public supply, and in some instances to sources where the water is not safe bacterially. *A water supply which frequently has a bad taste or odor may produce a health hazard nearly equal to that of polluted water occasionally getting into the system.*

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The operators of water-purification plants should have the treatment so far in excess of that just necessary to produce good results that there will be no danger of fluctuations in the quality of the raw water causing water of inferior quality to be supplied to the public *even for periods of very short duration*. This is the kind of service which the public now expects of those engaged in the treatment of water and which it will soon demand. The engineer who designs a plant, or the chemist who employs a treatment, which will not give *perfectly palatable water all the time* is not complying with the wishes of those who consume the water.

(Italics are ours).

(From 'Elimination of Taste and Odor in water' By John R. Baylis.)

COMPOSTING FROM HEALTH POINT OF VIEW

by
Dr. W. S. BARLINGAY
Minister of Health, Government of Central
Provinces & Berar



We publish with pleasure the speech delivered by the Hon. Dr. W. S. Barlingay on 5th July 1948 inaugurating the Central Manure Compost Development Committee. The subject-matter is of general interest from health point of view. Public education on the subject is deplorably lacking. So much so, valuable manure is wasted to the prejudice of food production in the country.

—E.L., P.H.

As a Minister in charge of Public Health, you would naturally expect me to say something about the composting schemes from the point of view of public health. But, before I do so, let me whole-heartedly associate myself with the observations of His Excellency and the Honourable Shri. Patil that the real solution of the food problem of this country lies in making everyone of us manure-minded. The Agriculturist must do his utmost not to waste the so-called wastes, but utilise them for the purposes of food production by turning them into good

manure. The principle obviously is that we must restore unto this good old earth, in some shape or form, all that grows out of her whether they be animals or trees or plants or matter which they throw out. We have been exploiting this mother earth for ages, but we have never yet cared for her primary needs and this sin has returned upon us in the shape of poverty, disease and starvation. Till now we have been wasting both of the two main sources of good manure, namely the cow-dung and the human excreta. The one we have been using as fuel

and burning it into ashes, thus turning it out unto the heavens and the other we spread on the surface of this earth, anywhere and everywhere, and pollute her in every possible way. The result has been misery, disease and death to the children of the soil that we are. Not only so, we find that ultimately this good source of manure is turned out into the sea due to floods and erosive processes.

MANURE AS GOOD AS GOLD

Not that we have been completely ignorant of the value of the cow-dung and human excreta as sources of manure. So far as the human excreta is concerned, we have been calling it *sonkhat* which means manure which is as good as gold. The Malgujar in this part of the country has always coveted the 'khari' in the village-field, namely which is ordinarily used by the villagers for easing themselves. But, somehow or other, due no doubt partly to social prejudice and partly to ignorance, we have never fully utilised these two main sources of manure. The result has been disastrous both from the point of view of food production and public health.

A SOLUTION FOR HEALTH AND FOOD PROBLEMS

The solution both of the problem of public health and that of food production lies in one and the same thing, namely the proper disposal or utilisation of all these so-called wastes of all kinds. The human excreta, especially, if not properly disposed of as is now unfortunately the case, is the source of several epidemics and diseases in the village like cholera, dysentery, hookworm, typhoid and so on. The germs which have their breeding place primarily in the intestinal matter of the human beings have till now been playing a havoc in our midst. They, partly because of our bad habits and partly because of the want of proper sanitary structures which we have sadly failed to devise on scientific

lines, somehow get into our food and water resources; and we know how much human energy is being wasted in combating the various diseases that they produce. It is obvious that if all this could be stopped, so much human energy would be released for other productive activities and I take it that in substance at any rate this is the main problem that this Conference is called upon to tackle.

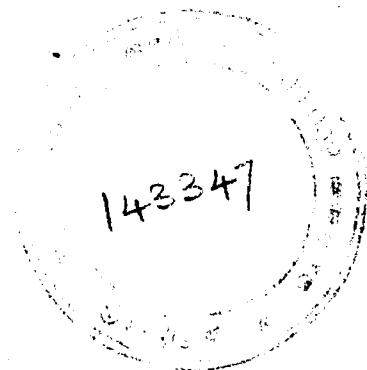
COMPOSTING

I have no doubt in my mind that composting is a tremendous improvement on the present state of things, which, as I have stated above, have been the source of disaster in this country, and perhaps in our present circumstances, we can go only thus far and no further. But I am, of course, far from saying that at any rate, so far as the human excreta is concerned, these schemes satisfy even the minimum requirements of a sound public health policy. So far as the composting of the town night-soil and refuse is concerned, it is obvious that where the night-soil is removed by the sweepers in pails and carts to places outside the town, the whole process is open to serious objection. A sound public health policy requires that no human being should handle the night-soil except only in a thoroughly disintegrated and innocuous form. Not only so, I shall go as far as to say that the sanitary structures whether in towns or in the villages ought to be altered in such a manner that ultimately we could do away with the sweepers as a class altogether. It is obvious that between the water-carriage system and the present composting methods, the former is to be preferred from the point of view of sanitation. But I know at the same time that is an impossible proposition at present and even if we take to composting, that would, to some extent, if not wholly, satisfy the requirements of public health in this country.

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CHOLERA

How to combat it?



by

Major General A. C. CHATTERJI

Director of Health Services, Government of West Bengal



Without public co-operation, it would be well nigh impossible to put down any epidemic. Every responsible health department should realize that the public should be constantly educated as to how best they could cooperate with public health authorities in their own interest. Major General A. C. Chatterji made an appeal in May last to the citizens of Calcutta when that great city was in the grips of cholera. He has done so in the interest of public safety. We reproduce his appeal, as also emergency regulations hereunder for general information. The time is opportune inasmuch as the Madras Province is seriously threatened with an epidemic of cholera.

—Ed., P.H.

Cholera is a preventible disease. Mass inoculation, use of filtered water for drinking and culinary purposes, avoiding taking food and drink in cheap restaurants, hotels and teashops and prompt disposal of refuse are the principal weapons to combat this formidable disease whenever and wherever it breaks out in an epidemic form. It will interest you to know, during a widespread and severe epidemic of cholera in Madras in 1942-43, with inoculation there were only 1,118 cases of attack in an area of 709,977 population whereas without inoculation 34,336 fell easy victims to this pestilential disease in another area of 2,119,568. This amply illustrates the efficacy of cholera inoculation as a preventive measure as in a protected

area, 1,57 persons out of 1,000 were affected against 16,20 out of 1,000 persons in an unprotected area. Inoculation is the sufficient security against cholera incidence and the Government and the Corporation authorities have extended utmost facilities to that effect. Government are also making a house to house inoculation drive for the facility of the public. What is desired most is your whole-hearted co-operation in fighting the disease.

Another most important point I want to impress is about removal of refuse and keeping the city clean. Authorities are now doing all that are within their power at present and the public are earnestly requested to join hands with them by scrupulously maintaining tidiness of their homes and seeing that refuse, garbage, etc., are not left indiscriminately on the streets but kept in covered receptacles until they are emptied in Corporation carts or lorries. This will effectively prevent flies from spreading the infection.

In fine, I earnestly request you to observe the following rules with a view to combat the growing menace of cholera:

DOS.

1. Do protect yourself and your family by taking inoculation to-day.
2. Do use filtered or tubewell water for drinking and cooking purposes.
3. Do protect your food and drink from flies and dirt.
4. Do keep your premises clean. Put all garbage and food refuse in a covered bucket or tin until these are emptied in the Corporation carts or lorries.
5. Do disinfect the place or articles soiled by the stool or vomit of a cholera patient with a disinfectant.
6. Do wash your hands and mouth before and after taking food.

7. Do fully disinfect yourself before taking anything after you have attended a cholera patient.
8. Do take juice of citrus fruits, such as lemon at least once a day.
9. Do consult your doctor at once if your stomach is upset.
10. Do send a cholera patient to hospital if you cannot isolate at home properly.

DON'T'S.

1. Don't avoid cholera inoculation. It does not cause any incapacity.
2. Don't drink or wash your utensils in unclean or unfiltered water.
3. Don't eat uncovered food and cut-fruits sold in the streets.
4. Don't take food or drink of any kind from restaurants, hotels and teashops.
5. Don't handle carelessly the stool and vomit or clothes of cholera patients. Always disinfect your hands afterwards.
6. Don't throw stools, urine and clothing on the street.
7. Don't wash infected clothing in tanks and ponds. Disinfect and wash them in your home.
8. Don't fail to report to the nearest health office, Calcutta Corporation, if there is any incidence or indication thereof in the locality.
9. Don't take over-ripe fruits, stale fish, or meat, unwashed vegetables or salads.
10. Don't keep your stomach empty for more than four hours.

REGULATIONS TO PREVENT SPREAD OF CHOLERA IN CALCUTTA IMPORTANT POINTS FOR PUBLIC GUIDANCE

Temporary Regulations to prevent the spread of cholera in Calcutta have been issued under the Epidemic Diseases Act, which will remain in force upto July 22.

The following are some of the important points under the Regulations :

In case of cholera or suspected case of cholera in a house, the nearest male relative in attendance or the occupier of the house or any senior male inmate of the house should intimate of the onset of disease to the District Health Officer personally or in writing within 24 hours ; the medical practitioner called to attend should give notice of this within 12 hours and the incharge of a hospital or dispensary where a patient is taken should give notice of this within 12 hours.

The Deputy Director of Health Services and the Health Officer, Calcutta Corporation, or a person authorised on their behalf (subsequently referred to as Authorised Officers) may examine any person who is, or is suspected to be, suffering from cholera or may be infected with or is likely to spread cholera and order isolation of such a patient as a precaution for the protection of the neighbouring population and may restrict the entry of persons to such a place of isolation except under a permit.

Any premises in the occupation of a patient may be ordered to be disinfected and his personal effects ordered to be destroyed ; any person who has been a patient or has been in contact with a patient be forbidden to act as a vendor of food or drink for a specified period and any person may be forbidden from selling any article which may have come in contact with a patient unless it has been disinfected to the satisfaction of the authorised officers.

Any well, tank, pool or other source of domestic water supply, if found contaminated or likely to be contaminated, may be closed or ordered to be closed or disinfected or ordered to be disinfected in a specified manner with specified quantities of specified disinfectants ; and, any person may be prohibited from easing themselves or throwing rubbish, sewage or offensive matter into any well, tank, pool or other source of water supply within a specified distance of such a

source and any privy, urinal, drain or sewer or cesspool which may be in a condition as to cause the spread of cholera may be ordered to be disinfected.

Any market, shop or public place may be ordered to remain closed for a specified time and a gathering within the Corporation area forbidden to be held.

Clothes taken from the bodies of persons who have died of cholera may be prohibited from being retained or sold and may be ordered to be destroyed and corpses of persons dying of cholera and all clothes and other articles brought with such corpses shall be reduced to ashes.

The authorised officers may call for any persons who may appear to possess any information relevant to the occurrence of any case of cholera or suspected cholera ; may by serving a notice in writing of two hours enter upon a land or premises or building used for human habitation at any time between sunrise and sunset for carrying out measures or making any enquiries authorised under these regulations ; these regulations will also be applicable to the crew of any inland steam vessel or boat plying in any canal or river within the areas to which these regulations apply.

All inoculations given under these regulations shall be given gratuitously.

No person shall sell or offer for sale or expose, keep, store or hawk about any milk, breadstuffs, cake, pastry, sweetmeats, confectionery, ice-cream, cut or slice fruit, or any other article of food or drink commonly, used for human consumption, without further preparation by boiling or cooking, unless such articles are kept properly covered in a closed container of glass, wood or metal to protect it from the risk of infection by dust, dirt or flies and an authorised officer may destroy on the spot or remove for destroying subsequently any food exposed to the risk of infection and no compensation may be paid in this respect and the owner shall be liable to penalty for the breach of these regulations.

Between sunrise and sunset an authorised officer would be entitled to enter any premises to inspect any articles of food or drink being sold, exposed, offered for sale, stored or kept in any public place or any market, shop or stall.

No person other than an employee of the Corporation or a person or class of persons authorised in this behalf by the Corporation shall touch, remove or otherwise deal with the contents of any dustbins or other receptacles provided in any street or public place for the deposit of rubbish or offensive matter, or any

rubbish or offensive matter lying deposited in lump in any street or public place.

No hotel, restaurant, cafe, lodging house or other place of public resort, shall serve for consumption on the premises any article of food or drink in which ice has been placed or serve any ice to any person for consumption on the premises and no vendor of aerated water, *sharbat*, beverage or other article of drink shall sell to any person any article of drink in which ice has been placed or sell ice to any person to whom any such article of drink is sold.

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RURAL SANITATION

The problem of sanitation in rural areas is somewhat more difficult. There, the sweepers are not available to remove the excreta and other foul matter from the village, and here, I believe, the ultimate solution both of the manurial requirements and sanitation lies in devising proper sanitary structures such that the night-soil could, on the very site itself which is used, be turned into manure and the whole process could be unobjectionable from the strictly sanitary and even æsthetic point of view. This latter problem has been engaging my attention for some time in the past. In a minute which I wrote a year ago for the guidance of my department, I observed as follows : " One of the conditions which the village latrine must fulfil is that as far as possible the night-soil will ultimately be turned into manure. The second condition is that as far as possible there should be no necessity for the existence of sweepers in the village. The class of sweepers is likely to dwindle in the near future and, in fact, our social policy must be so framed that such a class should dwindle. The third condition, which must be fulfilled is that the structure of the latrine should

be as simple as possible, so that it could be repaired or put into order whenever necessary by the villagers themselves." Proceeding on these lines, I consulted my experts in the Medical and Public Health Departments and I have produced what I have termed " A Report of the Rural Sanitation Committee ". I commend this report to the experts in this Conference for consideration. I ought perhaps to observe that as far as I can see, there is no conflict between the sanitary structures that I have sought to devise and the *compost-in-situ* method, which Dr. K. G. Joshi of the Agricultural Department is advocating. But, instead of going into the details about all these, I would rather leave it to the experts.

I am extremely happy that this whole question, namely the proper and sanitary disposal of wastes, is now engaging the attention of the experts in this country and I have no doubt that a solution will be found which will harmonise the points of view of both the Public Health and the Agriculture Departments.

Gentlemen, I have done. I wish your Conference every success and I promise on behalf of my Departments that we will give you every kind of cooperation that you may need.

THE SANITARY ENGINEER IN HOSPITAL CONSTRUCTION AND MAINTENANCE

by

A. H. WIETERS, F.A.P.H.A.

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This article should open the eyes of authorities who are responsible for the location, design, construction and maintenance of our hospitals. Instances are not wanting where the elementary principles of sanitation have been ignored in the design of our massive and expensive hospital buildings. It is unfortunate that, in our country, we are strangers to team work. The experts in any specific field do not hesitate to come forward to tender 'expert advice' in fields to which they are but strangers!

The countersignature of a Medical Superintendent of a hospital or the Surgeon-General with the Government is presumed to satisfy the requirements of the Medical Department. But, in the course of construction, they realise the obvious inconveniences of the designs which they have countersigned and make proposals for modifications. This procedure is expensive and inefficient. Our administrations also do not believe in bringing together the experts in the several fields to evolve a scheme complete in every respect *before* sanctioning it for execution.

—Ed., P.H.

The greatest hospital construction program in the history of this country was launched with the passage (by the 79th Congress) of the Hospital Survey and Construction Act (P.L. 725). This Act authorizes an annual appropriation of \$75,000,000 for each of five years for grants-in-aid for the construction of hospital facilities. The program is to be administered largely by the states under the general supervision of the U. S. Public Health Service. One of the provisions in the Act requires the

states participating in the program to regulate the operation and maintenance of the hospitals built with federal aid.

Only a few states previously regulated construction and operation of hospitals, but now, for the first time, the construction, maintenance, and operation of most hospitals will be under state regulation. In about three-fourths of the states, the health department will be the administering agency.

A comprehensive nation-wide inventory of existing hospitals and survey of needs for hospitals in the United States in 1945 revealed not only a great shortage of adequate hospital facilities, but also a serious maldistribution of existing facilities. Thus, a large segment of the total population finds itself with no hospital facilities readily available. Furthermore, the inventory revealed that many of the existing services failed to provide acceptable hospital care by any reasonable modern standard because of grossly inadequate physical plants and staffs. Consequently another large segment of our population lacks satisfactory hospital facilities.

Time will not permit, nor is it within the scope of this paper, to discuss these needs. Suffice it to say that the objective of the present program is to assist the several states to survey their needs for hospitals, to develop plans for construction of facilities for furnishing adequate hospital services for all the people, and to construct such hospitals.

Many professional skills must be combined in the development of construction plans for a modern hospital. The hospital is more than a building. It is a workshop and, as such, the building layout and the type and arrangement of equipment must be carefully planned so that the entire facility will function effectively and economically. The hospital and its equipment are the tools used by the physicians, the nurses, and allied technical hospital personnel in caring for the sick.

Obviously, those responsible for operating the hospital must have a voice in the functional planning. Equally important are the engineers and architects who translate the functional plan into a working drawing and a finished facility. The final plan must be the result of close teamwork of those representing the various and highly technical skills involved.

In the operation and maintenance of a hospital, again teamwork is essential for successful and

economical service. All of the engineering problems encountered in ordinary building operation, plus many additional ones, must be solved. These are made the more difficult in that even short lapses in operation of any of the equipment or appurtenances cannot be tolerated and much maintenance must be carried out while the plant is in full operation.

The sanitary engineer should be a member of such a team. While sanitary engineering principles have long been applied in hospital construction and maintenance, the sanitary engineer has not been closely identified with hospitals to any great extent in the past. A few large architectural firms specializing in hospital design have formerly employed sanitary engineers; however, most architects do not have sanitary engineers on their staffs. In only a few of the states have architectural plans been subject to review by sanitary engineers. Likewise, in but few of the states and larger cities has the sanitary engineer been called upon to contribute his services in the operation and maintenance of hospitals.

Most of the principles of hospital sanitation are the same as are applied to other types of buildings; however, the hospital is unique in that many of the occupants are potential, if not known, active carriers of disease. Therefore, faulty design, breakdown, or lapse in proper use and operation of equipment is fraught with greater danger of spread of disease than would be the case in other buildings. Also the occupants are, for the most part, in a weakened condition and thus are more susceptible to ill-effects from faulty environment than are occupants of other buildings.

As previously stated, in both the design and operation of a hospital, the functional as well as the architectural and engineering phases must be co-ordinated for efficiency and economy. The sanitary engineer is in a unique position by training and experience to serve in a liaison

capacity between those doctors, nurses, hospital administrators, and others responsible, on the one hand, for operating the hospital, and the engineers and architects responsible for design, construction, and equipping of the hospital on the other.

What is the extent of the sanitation problems in hospitals? Complete morbidity statistics would be the best criterion for the evaluation of sanitation problems. Unfortunately such data are very incomplete. It is known that there are numerous recurring outbreaks of diarrhoea and skin infections among infants in hospitals, of food poisoning, and of cases of cross-infections which are never reported to health authorities. It is also known that many of these cases of disease result from faulty environment. That potential hazards, readily recognized by sanitary engineers, are commonly found in hospitals is indicated by many surveys that have been made. In existing buildings, serious defects in plumbing have been very common. According to a recently published report, food sanitation in the hospitals in one of our largest cities was rated lower than in the public restaurants in the same city, and in the latter was far from satisfactory. Crowding, lack of sufficient good equipment, and unsatisfactory working spaces and equipment are known in many cases to be more responsible for breaks in technique which result in spread of disease than incompetence of employees.

The sanitary engineer is largely concerned with the sanitary features of structures and equipment and their maintenance and operation. However, these are so closely related to functional and other features of design that a distinct line of demarcation cannot be drawn. The layman, and even other professional engineers, too often do not seem to realize that the sanitary engineer is basically trained in fundamental engineering principles in common with other professional engineers in addition to his training in public health.

Many phases of professional engineering are involved in hospital design, construction, maintenance, and operation, and more than one speciality is frequently required in the design of a piece of equipment. For example, a dish-washing machine may be designed by a mechanical engineer. However, there are important sanitary implications in the design, the installation, and the operation of such a machine which must be considered in the interest of public health.

The services of the sanitary engineer in hospitals should be utilized in two ways: (1) in design, maintenance, and operation of facilities and equipment which comes more or less within the scope of his usual activities, many of which, however, have special significance in the hospital; (2) in co-operating with the medical and allied professions, in further study of potential health hazards in the environment of the patient about which little is known.

In the first category, the following items may be enumerated:

Site—Many future sanitary problems of maintenance and operation can be avoided by proper site selection. Availability of an adequate, safe water supply, proper drainage, and means of safe and economical disposal of sewage and wastes are very important factors in site selection. Insect breeding areas, sources of noise, smoke, and dust in the immediate area must be given careful consideration.

Sewage disposal—Where no sewer system is available, sewage disposal may be a particularly troublesome problem. Because of the potentially infectious nature of the sewage from a hospital, a high degree of treatment and special precautions are necessary. Large volumes of laundry and cleaning wastes may complicate the treatment problem. Operation and maintenance of these facilities likewise require special knowledge, usually not possessed by hospital operating personnel.

Plumbing—Because of a relatively large quantity of infection material which is introduced into the drain system, plumbing is of special importance. Many special fixtures used in hospitals, and which are not in common use elsewhere, are inherently dangerous unless adequately protected. These factors make precautions against backflow doubly important. Relatively large amounts of water are used in hospitals and peak demands are high. To assure adequate and uninterrupted pressures in all parts of the building under all operating conditions requires very careful design. For the same reason, drains must be carefully planned.

Food Handling—While general sanitary principles in the storage, preparation, and handling of food and the cleansing and disinfection of utensils apply, opportunity for contamination is so great and effects may be so disastrous that unusual precautions are necessary.

Garbage and Waste Disposal—The hospital has the usual problem of the proper disposal of ordinary kitchen garbage and rubbish. Also the handling and sanitary disposal of contaminated and infectious material, which is peculiar to hospitals, presents a problem.

Lighting—In addition to the hygienic and safety aspects of general lighting, special lighting in certain areas, such as surgery, dispensary, formula room, etc., is imperative. Uninterrupted lighting in certain areas is a must item.

Heating and Ventilation—In addition to general heating and ventilation, several areas within a hospital require special consideration.

Laundry—Although commercial laundering practices are quite well standardized, and in modern practice effective germicidal action is incidental to thorough cleansing, the handling of soiled laundry requires special attention.

Sterilization Equipment—Possibility of contamination of the water supply or of the contents of sterilizers is extremely important and

the very nature of this equipment makes it difficult to construct sterilizing equipment which is fully protected. Also unless the equipment is meticulously operated and maintained, complete sterilization results will not be uniformly obtained.

General Sanitation—There are many other considerations which will facilitate general cleanliness and good housekeeping, such as floor and wall construction of durable, easily cleaned material, and adequate and conveniently located hand washing and toilet facilities for employees. Insects and rodents often constitute serious problems in hospitals, and control measures, both as to construction and operation, are of great importance.

In a second category, of first importance is the study of the spread of disease from patient to patient, from patient to employee, or the reverse, within the hospital. While this is primarily the function of a trained epidemiologist, the services of a sanitary engineer should be used to a greater extent. In the past, to the writer's best knowledge, sanitary engineers have had little opportunity to assist in such investigations, although it has been common practice for many years to utilize the services of the sanitary engineer in other epidemiological studies where environmental factors were involved.

There are other items on which further information is needed. While perhaps some of these studies should primarily be conducted by professional personnel other than sanitary engineers, it is believed that sanitary engineers could render valuable assistance. No attempt is made to enumerate all such items, but the following will illustrate some of the needs:

Is general ventilation (including temperatures, humidity, and air movement control) indicated in the hospital? Is it permissible to recirculate air in the surgery, the nursery, the labor and delivery rooms, and contagious wards? Is

it ever permissible to recirculate air from any one patient area to another?

In view of the limited studies that have been reported, and of the lack of conclusive evidence of substantial benefit, what policy should be adopted on use of ultra-violet ray air sterilization in surgery, nursery, contagious wards, formula room, etc.? On use of aerosols?

Should completely separate dishwashing facilities be required for a contagious section or tuberculosis section? If so, is it permissible to return clean dishes from this section to the general kitchen for serving?

Should linens from the contagious section, tuberculosis section, etc., be laundered separately from the general laundry? Should linens receive germicidal treatment before being removed from these sections to the hospital or a commercial laundry? If given no such treatment, what special precautions should be taken by personnel who handle such linen in the laundry?

Should feces and urine from known or suspected cases of intestinal infection or other infectious material be germicidally treated before discharge into a public sewer? Or into a private sewer?

What special precautions should be taken in handling and storage of patients' clothing?

Should mattresses in the contagious section be sterilized after discharge of each patient? Does laundering at low temperatures (wool 120 F.), particularly from the contagious section, provide ample protection?

Is it permissible to include food left on plates from the contagious or the tuberculosis section in garbage which is fed to hogs?

Adequate information is not available on peak water usages on which to base intelligent design of water piping and drain systems.

No public laboratory now exists where hospital plumbing fixtures and appurtenances can be tested.

These and many other questions remain to be answered.

One of the requirements for federal aid under the Hospital Survey and Construction Act is that States must regulate the operation and maintenance of hospitals receiving such aid. Under this stimulus, many of the States already have, and most of the others probably will make, provisions for licensing of all hospitals. Sanitation should play a prominent part in any such regulation and thus for the first time in many States the sanitary engineer will have an opportunity to participate in hospital planning, operation, and maintenance.

In most hospitals, various individuals have responsibility for some phase of sanitation with little correlation or general direction. Probably very few hospitals are large enough to justify employment of a full-time sanitary engineer, yet sanitation problems are of sufficient importance in hospitals of all sizes to warrant more attention than has been accorded them in the past.

It would be desirable, wherever feasible, to have one person on the hospital staff, preferably with sanitation training, who is responsible for all phases of sanitation, with such assistance and guidance of local or State Health Department sanitation personnel as may be needed.

The State and local health department sanitary engineers should be available to review plans and specifications, from a sanitation standpoint, for new construction and for revamping existing structures; to make sanitary surveys of existing hospitals and advise as to physical changes and operation procedures which would improve sanitary conditions; to advise and guide personnel who are responsible for operation and maintenance of equipment; to participate in in-service training of employees; and to study means of improving hospital sanitation.

With the advent of a huge hospital construction programme, coupled with the control of

operation and maintenance of most hospitals field with which he has not been closely identified in the past, an opportunity to extend his services into a

(Courtesy—American Journal of Public Health.)

PLANNERS' QUALIFICATIONS

If we are to plan on a scale and of a quality that will meet the problems of our time, we must have planners who are equal to the magnitude and complexity of the task. I shall merely record my conception of what it takes:

1. The planner must, of course, have technical competence. He must know the facts of life and he must have mastered the techniques of analysis and synthesis.

2. He must have courage and steadfastness of purpose.

3. He must have personal integrity and be able to resist the temptation to prostitute himself by the lure of gold or fame or power to the wiles of those who happen to possess gold or fame or power.

4. He must be responsible to himself, to his profession and to the community.

5. He must love his fellow-men, not merely the rich and the great, but all his fellow-men regardless of race, creed or station in life and he must consider the equal claims of all.

6. He must cultivate humility and be willing to acknowledge what he doesn't know and let others take credit for what he does.

7. He must believe in progress. He must be a conservative in the sense of seeking to conserve the best of what is a radical in the sense of daring to transcend the limitations and frustrations of the present.

8. He must be patient without being supine. He must have an appreciation of social values without blithely accepting established dogmas.

9. He must have a disciplined imagination which leads him continuously to push out the frontiers of the possible without losing himself in the pursuit of the end of the rainbow.

10. He must learn to see farther and deeper than those who have not presumed, as he has, to play the responsible and dangerous role of counsellor of men, of communities, of states and nations, and he must see things in their togetherness. He must sense and be willing and able to trace the longer-range and less obvious implications of trends and of actions, and he must be constantly aware that a change in any part of this complex world will have repercussions upon the whole.

These are some of the qualities that must become a part of planners and of planning.—Louis Wirth.

(From *Planning*, 1947, American Society of Planning Officials.)

PHYSICIANS AND SCHOOLS

This is the third of the series of articles which we have been able to publish in these columns by the courtesy of the *Journal of Health and Physical Education*. The first two appeared in the issue of *People's Health* for May and June 1948 (Vol. 2, Nos. 8 & 9, pp. 405-408 and 471-474). A perusal of these articles would be of considerable assistance in organizing our school health services to suit our own peculiar conditions.

—Ed., P.H.

In preparation for the Conference, the consultants of Section III suggested four chief problems and forty or more related sub-questions for consideration. This material was used merely as a guide for discussion which centered around the following four problems:

1. The Physician's Relationship to Classification of Students for Physical Education.
2. Medical Supervision of Individual and Adapted Physical Education.
3. The "Excuse Problem" in Physical Education.
4. Medical Guidance in Inter-scholastic Athletics.

OBJECTIVES OR PURPOSES OF PHYSICAL EDUCATION

Before these problems could be discussed effectively it was evident that mutual understanding of the basic concepts underlying physical education was essential. Purposes of a worthwhile program, it was agreed, must extend beyond exercise. Opportunities for social and recreational learnings as well as for improved mental and emotional health are equally important. The physician will have these broad objectives in mind in advising activities for each child. Correspondingly the curriculum in physical education must be flexible enough to allow for such prescription.

There seemed to be rather general accord among the physicians that leaders in the medical profession who understand modern concepts of physical education thoroughly believe in its importance for growing children and youth and are willing and anxious to give enthusiastic support to programs that are well conducted.

THE PHYSICIAN'S RELATIONSHIP TO CLASSIFICATION OF STUDENTS' PHYSICAL EDUCATION

It was emphasized that adequate information about each pupil is a requisite to proper adjustment of the total school program to the individual needs of children. In order to determine the nature and extent of physical education activity, knowledge of the child's physical condition is needed. The question of securing such information from the physician and properly recording it, was defined as an important problem.

It was pointed out that while relatively good cumulative health records are available in most elementary schools, they are very often inadequate on the secondary level. Administrative measures which will assure uninterrupted development of cumulative health records for grades 1 through 12 were recommended. Such records should be forwarded from one grade to another or from school to school as a part of the child's total school record. Findings, where properly

interpreted may be of real help to all teachers and in the case of physical education result in suitable adaptation of the program to the health status of the individual pupil.

It was agreed that the physician, the physical education teacher, and the pupils should all play an appropriate part in determining the content of the physical education program. Through visits to physical education classes the physician can acquaint himself with the basic physical education concepts, gain an understanding of the entire program and learn more about the individual activity needs of the children. The physical educators, in turn, should consult with the physician, learn his views, and seek advice and co-operation. The point was made, however, that in many schools it was impossible, because of lack of personnel, equipment, and facilities, to carry out the suggestions of the physician, but in situations of this kind, physicians, because of their professional prestige, can often be of immeasurable aid to school authorities in securing improved conditions.

In some instances, physicians cannot ethically acquaint teachers with certain medical information. While this practice is largely traditional it does have legal aspects; parents might take to the courts a violation of what they considered to be their rights of privacy. Since the schools are interested in promoting the welfare of students rather than in seeking information to discredit them, it was pointed out that a useful interpretation could be made to the schools by the physician without divulging technical details. In this connection it was recommended by the group that ways and means of transmitting needed information be determined by a committee made up of representatives of medicine, education, and other groups involved.

Segregation of Boys and Girls for Physical Education.—A rather general practice has been to keep the sexes together for physical education through the first four or six grades, segregate

them in the 7th, 8th, and 9th grades, and bring them together again for certain co-recreational and co-educational activities in senior high school.

In expressing approval of the practice of separating the sexes for physical education at certain age levels and for certain activities several points were stressed.

There seemed to be general agreement that, while there may well be physiological and anatomical grounds for segregating sexes in competitive activities, other reasons are even more cogent. Among these are emotional differences, safety factors, and even the differences in the case with which sport skills are acquired. Moreover, the interests of the two sexes, unless artificially stimulated, are not the same, and the outcomes desired for girls differ somewhat from those sought for boys. No one, for example, would advocate the development of girl Amazons. Rather, it was thought that emphasis should be placed on activities which develop grace and poise among girls and help them to develop and maintain their femininity.

The need for and desirability of co-recreation in certain activities was emphasized. It has been the custom in the past in some schools to erect fences between the sexes. It has become so rare for family groups to play together that the teacher of physical education often can pick out those children who have had co-recreational experiences in the home. Activities such as golf, tennis, volley-ball, and swimming, to mention only a few, are suitable activities for co-recreation.

It was recommended that a film be prepared which could be used to interpret an effective program of physical education to parents, physicians, and other interested individuals and groups.

It was further recommended that local and state medical societies give a prominent place to the study of physical education. In co-operation with physical educators, they were urged

to schedule talks, panel discussions, and working conferences at local meetings. In fact, the importance of co-operative action on the local level was emphasized repeatedly in Section III. Reciprocal meetings between the physicians and the physical educators at which there would be opportunity for interchange of information were believed to be mutually desirable.

MEDICAL SUPERVISION OF INDIVIDUAL AND ADOPTED PHYSICAL EDUCATION

It was suggested that the term "individual and adopted physical education" be used instead of "modified" or "corrective and restricted" physical education. Both education and medicine, it was felt, should give more emphasis to this phase of the program.

Questions considered in this connection included the following:

1. How many physical educators secure the co-operation of the physician; will the doctor welcome calls by the teacher regarding special cases?
2. Is it necessary to have a physician trained in orthopedics or physical medicine supervise these programs?

The consensus seemed to be that most doctors would welcome a request for help and advice. It was pointed out, however, that since physicians are busy people they should not be expected to respond enthusiastically or in detail to a call which comes in the middle of a trying day. An appointment should be made in advance or a personal note sent in place of a routine form which the physician may not find time to fill out or which he may fill out hurriedly at best. Better still would be a meeting or a series of meetings of the school administrator, physical educator, and small groups of local doctors to promote understanding of the problem and to agree upon procedures.

Some members of the Conference believed it desirable to have an orthopedist or a doctor of physical medicine supervise the individual and adapted physical education program. An example was given of a situation where an orthopedist, as a member of an examining board of specialists, found many abnormalities. It was believed that many of these may have been caused by faulty body mechanics. When this proves to be true, the case may then be turned over to the physical educator with a prescription for activity from the physician. Unfortunately, however, several difficulties are involved.

1. Few physical educators are qualified to do this work.
2. Many doctors feel that they are not qualified to prescribe this program.
3. There are too few orthopedists and doctors of physical medicine to do the job.
4. The time to discover and correct these special cases is in elementary school, where physical education is weakest or in some cases even non-existent.

5. The program of correction includes many other factors in addition to prescribed individual activity: nutrition, daily living habits, in fact, the total health program of the child is involved. Several recommendations were made regarding the individual and adapted program of physical education.

1. It was urged that the American Medical Association strongly recommend improvement and expansion of physical education programs in elementary schools.

2. The previously cited recommendation that physicians and physical educators on the local level arrange reciprocal meetings at which this particular problem could be discussed was again endorsed.

3. Finally, it was strongly recommended that the American Medical Association, the American Association for Health, Physical Education, and Recreation, and other interested national groups

appoint representatives to a joint committee to work out procedures in relation to this problem and publish a guide for use of local physicians and teachers.

THE "EXCUSE PROBLEM" IN PHYSICAL EDUCATION

Two principal questions were raised relevant to this problem:

1. What causes physicians, if they really believe in physical education for young people, to give excuses so freely?
2. Why do pupils, with the help of their parents, so often seek excuses from physical education?

Several reasons were advanced. Many physicians do not fully understand the purposes or nature of the program of physical education and therefore do not see its importance. On the other hand, many programs of physical education are so poor that they do not deserve the respect or support of the physician. Some doctors seek to please their patients, thereby putting themselves in the position of family servants rather than family advisers.

A number of suggestions were made to improve present conditions:

First, it was agreed that permanent and blanket excuses should be discarded by both physician and educators. Such a policy can operate only when the curriculum in physical education includes graded types of activities adapted to the varying needs of pupils. The physician appropriately shares in planning such a program. It was agreed that every child involved should have a periodic recheck and that the doctor might be asked for more details as to the child's needs and the reason for the excuse. It was suggested that this policy might reduce the number of excuses by as much as 50 percent. The physician may be asked if the excuse was actually signed by him or was a forgery by the pupil. The duration of the excuse may be a

matter demanding further contact between the school authorities and the physician. There seemed to be general agreement that there should be a *limit on the time* of the excuse and a *definite reason for it*. Here again the importance of conferences between the physician and the physical educator on the local level was emphasized. Local medical societies may be urged to agree upon uniform policies regarding excuses from physical education. All physicians should share in the policy making for, if even one doctor grants excuses indiscriminately, he virtually forces all the other physicians to do likewise. Where there is a school medical advisor he should discuss the problem with family physicians and attempt to arrive at a satisfactory solution.

If it is true that 99 per cent of the excuses originate with the pupil or parent, it indicates the necessity of discussion between the teacher on the one hand and the pupil and parent on the other as to the importance of the program in the present and future life of the individual. This problem, too, needs to be tied up with the total guidance program of the school. It was repeatedly emphasized that the physical education program should be carefully studied to discover inadequacies which may invite an "excuse problem." It was strongly felt that the whole issue is closely tied up with facilities, equipment, staff, and other program factors. The point was again made that if physical education was more effective in elementary school, fewer "excuse" cases would ever reach high school.

MEDICAL GUIDANCE IN INTERNATIONAL ATHLETICS

Some of the questions commanding most interest are as follows:

1. Is it feasible to develop a standardized health examination for athletes: is a special kind of examination for athletes needed beyond that given to all pupils?

2. Is it possible to develop an examination which will serve for high school athletes, Boy Scouts, the YMCA, the ROTC, and others?

3. How frequently should participants in inter-scholastic athletics be given a medical examination?

4. Is any form of inter-scholastic athletic competition for girls justifiable?

5. What are the effects upon participants of vigorous physical activity?

In some states a certain examination procedure is mandatory as a requisite to participation in the insurance plan. In the few schools where the general examination is of high quality it may fit the needs of athletes as well as other pupils. It was agreed, however, that in most school systems the general examination is too limited to serve for athletes. A more thorough examination is needed for moral, and in some instances even for legal reasons, than is at present generally available for all pupils.

It was pointed out that local doctors probably were not in a position to change the pattern of procedure now prevailing where special examinations must be made for the several groups and organizations mentioned above. This procedure, it is believed, must be changed from above, i.e., on the national level. The desirability of improving the quality of the examination was stressed and of standardizing it to a degree where it would be acceptable to all groups.

It was recommended, therefore, that a joint committee composed of representatives of the American Medical Association, the American Association for Health, Physical Education, and Recreation, and other interested and qualified groups be organized to prepare such an examination form and procedures or to adopt and

endorse present available forms and procedures if such exist.

Ideally, athletes should be examined before each season of participation and checked periodically during the season. While this is not the usual procedure at the present time, it was believed that it can become a practical goal. Stress was also placed on the necessity of re-examination of athletes before they return to competition following illness or injury.

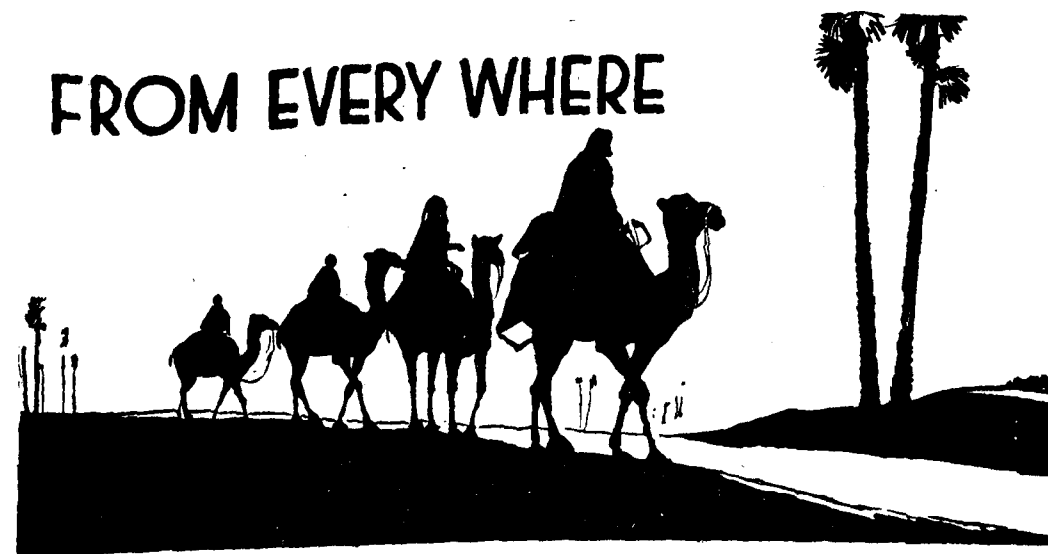
The group felt that there was no reason to permit the special examinations of athletes to interfere with the general examinations of all pupils. Discussants strongly favoured having athletes secure the required examinations from the family physician with the responsibility for obtaining them resting on the boy and his family.

It was decided that the reasons mentioned in the foregoing in reference to segregation of boys and girls for certain physical education activities beginning at the upper elementary level could in a large measure be applied with equal force to the participation of girls in some forms of inter-scholastic sports.

After considering the possibilities of recommending no inter-scholastic competition for girls, competition under certain conditions, or ignoring the problem altogether, it was decided to endorse the statement on page 35 of the report *Suggested School Health Policies* which is as follows:

Inter-scholastic competition for girls should be limited to invitational events, chiefly in the form of sport days or playdays where mass participation is emphasized. All girls' athletic activities should be taught, coached, and referred by professionally prepared women leaders, and should be divorced entirely from any inter-scholastic athletic contests for boys.

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.

THE HEART IN STARVATION DONHOFFER AND VONOTZKY

American Journal of Physiology, 1947.

IT is no secret that the experience of doctors and research teams, both in occupied Europe and in the rehabilitation of those who had been in Japanese prisoner-of-war camps, resulted in a good deal of new information about the behaviour of the body under near-starvation conditions, and also during rehabilitation. In addition, many of the results are now available of an experiment which was carried out in the Laboratory of Physiological Hygiene of the University of Minnesota, which fit young Americans as volunteer subjects.

The most general point which has emerged is that the body can balance food intake and energy consumption at a considerably lower level than had before been realised, and when this position has been reached no further loss of weight takes place. Loss of weight in itself reduces the amount of fuel—from food or fat

reserves—which must be 'burnt' to maintain normal bodily processes. In addition, the individual learns to keep his avoidable output of muscular energy to the lowest level possible. Both factors help towards the attainment of a new balance, and both in the Minnesota experiment and in the Hong Kong civilian internment camp this was reached when weight had fallen by one quarter from its original level. Equally, it was found during rehabilitation that time was needed for a normal balance of chemical activity to be re-established. Professor Beattie, for example, of the Royal College of Surgeons, has pointed out that during the first stages of rehabilitation, practically the whole of the protein eaten as food, which one would normally expect to be largely utilized in tissue replacement and 'building up,' was in fact burnt as 'fuel'—even although enough calories to meet energy requirements were being otherwise supplied.

The most detailed and interesting findings are, however, those at Minnesota on the response

of the heart. The traditional assumption in the past has been that, during starvation or near-starvation, the heart and other vital organs were 'protected' from damage for as long as a necessary minimum of nourishment was available. The experience of 32 fit young men who went through the Minnesota experiment shows clearly that this is not the case. The outline of the test was that they were observed first through three months of normal diet, during which period they required on the average 3,200 calories for energy balance; then for six months with a food intake of 1,700 calories, by which time they had lost 24% of their original weight; and finally, during rehabilitation, for three months of controlled diet, and a further five during which they could eat what they liked. X-ray photographs, taken from different angles, were used to record the physical volume of the heart at all stages, and other measurements enabled the output of work by the heart to be calculated. It was found that, when adjustment to semi-starvation had been completed, the volume of the heart had been reduced by 16%, the number of strokes per minute by 32%, and the heart's output of physical work by as much as 49%. Also, the margin of safety represented by unused oxygen, still left in the blood after circulation, had been brought down by one half. With such drastic changes, a quick return to normal would scarcely be expected. In practice three months of controlled feeding sufficed only to get the heart nearly, but not quite back to normal in size, with practically no improvement in its capacity for work. Nor did the inclusion of extra vitamins and protein in the diet make any noticeable difference. By the end of five months, of which the last two had been on unlimited diet, the heart size was slightly greater than it had been originally, but capacity for work was still 10% below normal and only half of the lost margin of oxygen safety had been made good. Finally, at the end of 32 weeks,

only very slight signs of abnormality could be detected.

A. W. HASLETT.

(*Penguin Books—Science News 7.*)

ANTI-MALARIA MEASURES SHOW GOOD RESULTS

The following is a brief summary of the Annual Report of the Malaria Institute of India for 1946:—

The Malaria Institute of India was considerably expanded by additional staff and laboratory accommodation during 1946, states the annual report for that year.

The Research Section which was previously financed by the Indian Research Fund Association was taken over by the Government of India.

In actual control work, the most notable results were achieved in the Delhi urban area where intensive anti-mosquito measures reduced the percentage of malaria cases in relation to the population to the lowest figures so far recorded (2.66 per cent.)

A malaria control scheme was inaugurated in the rural section of Delhi province with good results while in the other centrally Administered Areas of Coorg and Baluchistan, anti-malaria organisation commenced functioning towards the end of the year.

Malaria control measures in coalfields conducted under the direction of the Institute continued to show progressive reduction in malaria.

Most of the Provincial Governments formulated comprehensive anti-malaria schemes based on the Health Survey and Development Committee's report. The Institute actively co-operated with these Governments in securing the services of suitable released defence service personnel with previous experience of malaria control during the war.

RESEARCH WORK

Researches undertaken during the year included the testing of new anti-malarial synthetic

drugs and the various formulations of DDT. For this purpose, extensive laboratory and field trials were undertaken on paludrine, resochin, aphacrine, metachlrodine and Cam Aqi to determine their relative value.

As regards DDT, efforts were chiefly concentrated on evolving a most effective and economic spray. Experiments carried out so far show that DDT suspension concentrate prepared with cheap and locally available ingredients is likely to prove very satisfactory.

With the cessation of hostilities, the 4-week instructional courses for personnel of the defence services were discontinued, and the peace time 6-week course for civilian medical officers and an intensive one-week instructional course for engineers were revived. A 4-week course was also held for malaria inspectors. Candidates for these courses were selected from amongst those nominated by different Provincial Governments, Railways and Indian States.

A number of publications on various branches of malariology were published; these include *the Journal of the Malaria Institute of India*, which deals mainly with research work on malaria, and health bulletins which give information regarding malaria control measures.

The Malaria Institute has a well-equipped museum for demonstration purposes in all branches of malariology. During the year under review the exhibits in the museum were added to. The posters and charts of the museum have proved extremely popular and useful.

(*Press Information Bureau, Government of India.*)

HERE ARE A FEW DEFINITIONS

Apothecary .. The physician's accomplice, undertaker's benefactor and grave worm's provider.

Diagnosis .. A physician's forecast of disease by the patient's pulse and purse.

Prescription .. A physician's guess, at what will best prolong the situation with least harm to the patient.

From—Ambrose Bierce in his *Devil's Dictionary*.

(*Extracted by S. V. A.*)

DDT AND HOUSEFLIES

"A strain of DDT-resistant houseflies requiring nearly twice as much of the chemical to kill them as ordinary flies has been developed for experimental purposes by entomologists of the U. S. Department of Agriculture's Bureau of Entomology and Plant Quarantine laboratory. . . . These flies resist the effect of other insecticides such as chlorodan, chlorinated camphene and certain thiocyanate compounds as well as rotenone and pyrethrum. No such DDT-resistant strains of houseflies are known to occur in nature so far as the entomologists know. It has been reported, however, that houseflies are becoming more difficult to kill with recommended applications of DDT in several parts of U.S. and in some foreign countries."

(*From "Chemical and Engineering News" of the American Chemical Society.*)

(*Extracted by S. V. A.*)

POETIC REMOVAL

An insurance man recently moved into a new house in Oklahoma City. He arranged for refuse collection too late for the pick-up that week. Boxes and other refuse began piling up.

One morning the new resident decided it was time for action, and sent the following telegram to the City Manager.

Roses are red,
Violets are blue,
Garbage pick-up,
Ten days overdue.

When he returned home from work that afternoon, he found that the city could rise to

the occasion. A telegram signed by City Manager William Gill, Jr., went as follows:—

Garbage smells.

Your rhyme does too.

But I've sent for your hog feed.

P.D.Q.

The poet went to his backdoor and looked out.
His refuse was gone.

(The American City, April 1948.)

DIABETICS CAUTION

A diabetic patient beginning to show unusual features, and particularly to our experience recurrent colds, or persistent head colds, should be submitted to X-ray examination of the chest; a search for tubercle bacillus in sputum and fasting-stomach contents should be made, and the blood sedimentation rate ascertained.

(W. R. Gauld, M.D. and A. Lyall, M.D., *British Medical Journal*, May 17, 1947.)

DIET FOR TUBERCULOUS PATIENT

The tuberculous patient should receive more than one gram of protein per day, and the diet must supply enough calories to balance his energy requirements. The calories supplied by carbohydrates and fats must contribute to the total fuel value, in such a proportion that the calories from fats should not fall below 30% or exceed 40%. If the patient receives a diet adequate in all respects and supplying a sufficient amount of protein, it is very probable that his body will store proteins for his repairing needs, just as would be the case in an ordinary individual. (J. D. Adamson, M.D., *Canad. Tuberc. A. Tr.*, 1947.)

PLAGUE & CHOLERA INOCULATION

Enquiries have been received by the Directorate of Health, Government of West Bengal, if

inoculations against cholera and plague may be taken at the same time. It is stated for public information that inoculations against plague and cholera can be safely taken by any one at an interval of four days.

Since cholera is on an increase in the City, public are advised to get inoculated against cholera without delay. Arrangements have been made for free inoculation by Government, and apart from the 40 mobile units, 40 more centres have been opened all over the city in the Sub-Area Rationing Offices, City Markets, Railway Stations, etc., where inoculation can be taken.

Press notes, Government of West Bengal.

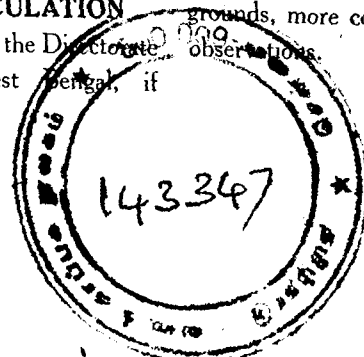
METHODS OF SPREAD OF SMALLPOX

Stallybrass, C. O.

(From *Public Health* 1947, v. 60, No. 7.)

It is now generally agreed that smallpox infection may be conveyed (a) by contact, direct or indirect, with known or missed human cases of the disease; (b) by inanimate objects (fomites); (c) by flies; (d) by scabs; (e) by droplets or droplet nuclei, through which the high potential infectivity of the virus is sometimes dramatically demonstrated. The theory of aerial convection of smallpox (recently revived by Killic Millard, this *Bulletin*, 1944, v. 19, 579) was propounded to explain the spread of infection, over distances considerably greater than the normal range of (e) at a time when smallpox was epidemic in England and when Health Authorities lacked many of the facilities which are available to them today. Many of the occurrences which the aerial convection theory was invoked to explain are now known to be explicable on other grounds, more consonant with well-documented observations.

Bulletin of Hygiene, Vol. 22 No. 8.



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