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PEOPLE'S HEALTH

EDITOR
A. V. RAMAN
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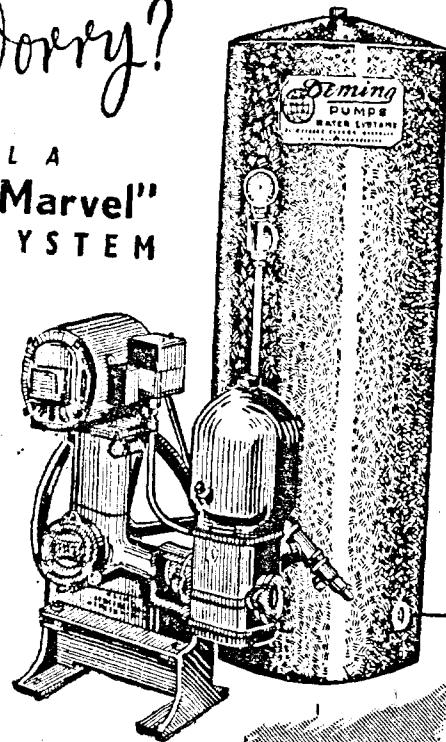
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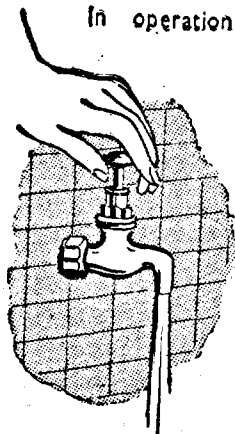


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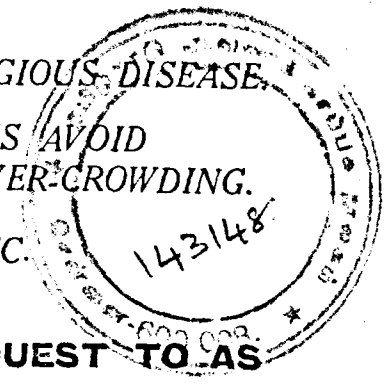
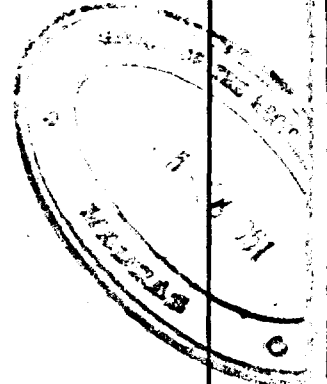
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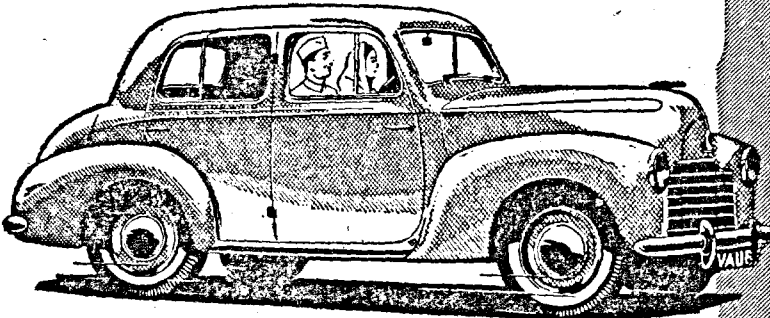
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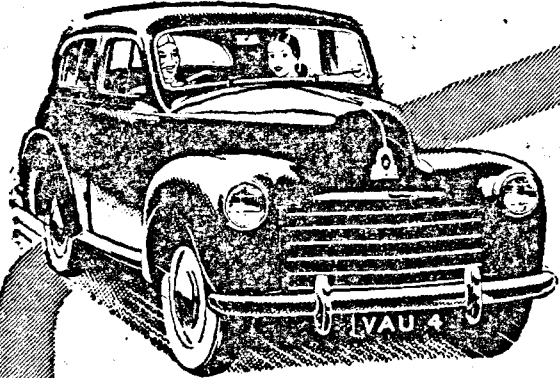
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TO OUR READERS

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

The Publishers appeal for assistance and co-operation of one and all. We invite suggestions from our readers to make the magazine more useful.

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

ROYAPETTA,
Madras, 14.

MANAGER,
People's Health.

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A Pioneer in the Field of Public Health

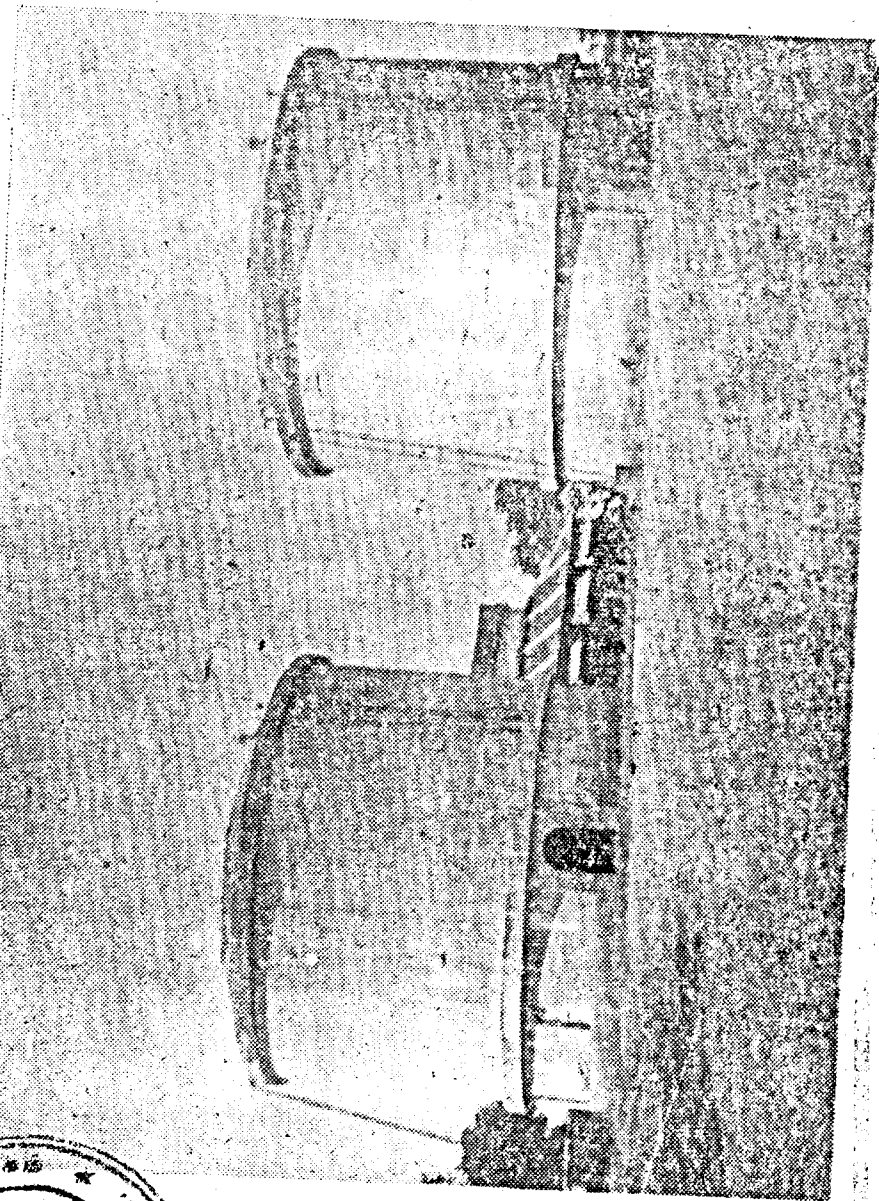
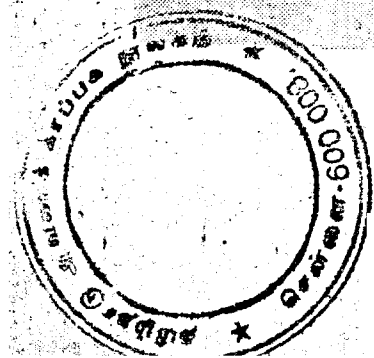
Vol. III

JULY, 1949

No. 10

CONTENTS

Subject and Author	PAGE
Photo - First Concrete Reservoir ..	436
Editorial	437
Self-Sufficiency in Two Years— By M. S. SIVARAMAN ..	440
Organisation of a Health Service in Industry— By DR. M. N. GUPTA ..	445
Rural Water Supply in West Bengal— By P. C. BOSE ..	452
Physical Education and Nutrition of School Children— By DR. V. N. PATWARDHAN ..	456
Malaria Control in Bombay Province— By OUR STAFF SPECIALIST ..	462
Planning a Pedigree Cow Research on Fodders— By PRESS INFORMATION BUREAU, GOVT. OF INDIA ..	468
Sanitary Quality of Ground-water Supplies— By H. E. THOMAS ..	470
Free Eye Care for all in Britain Optical Services in National Health Scheme— By LAURENCE DOPSON ..	476
What Do They Say About It ..	480



First Concrete Reservoir



VOL. III No. 10

JULY, 1949

ISSUED MONTHLY

EDITORIAL . . .

*Firmness belongs to the will, and prevents it from yieldings.
Without it, man has no character—no will of his own.*

—Dr. WEBSTER.

HEARTY CONGRATULATIONS

The Hon. Dr. T. S. S. Rajan, Minister of Health, Madras, deserves to be congratulated on the successful conclusion of the 'Kumbabhishekam' at Tirupparankundram, Madura district. The event went off without any ill-effect on the health of a hundred-thousand people who gathered there. This is a unique instance; for, in our Province, such large congregations and cholera invariably went hand-in-hand. This festival has proved to be an exception to the general rule. And why?

India is a land of fairs and festivals and Madras is especially so. The Public Health Department is expected to take note of such festivals and see that effective steps are taken to forestall

outbreaks of epidemics. Sad to say, our Public Health Department was blissfully ignorant of the *Kumbabhishekam* festival till the Health Minister himself enlightened the hibernating officials of the Public Health Department. Till the eleventh hour, no arrangements were made to protect the health of the people, let alone, snatching the opportunity for health publicity. The Minister did not throw his hands up in despair, cursing within himself the lack of interest among the officials. He stepped in and demanded that the Public Health Department should make adequate provisions within the short time left for the zero-hour. He was himself present on the occasion to see for himself whether the indolent

department had carried out his directives faithfully. Right enough, the department knew the nature of the man they were dealing with. The department had put its shoulder to the wheel and narrowly winning the race against time, made necessary arrangements. A satisfied grunt from the Minister is sufficient reward to the department. But should we not offer our hearty congrats to the Hon. Minister? This instance shows that the department could be whipped up to activity and effective activity too. It all depends upon who wields the whip. Hitherto, it was the department; now, it is the Minister of Health. It makes all the difference.

UTILISATION OF SEWAGE

It may be recalled that some months back a suggestion was put to the Ministry of Food by us for utilising the Madras City sewage for agricultural purposes. A committee was appointed to go into the question and to submit definite proposals with estimates. The chairman of the committee was the then Director of Agriculture. It was pleaded in these columns that the Government should meet the entire cost of the scheme for reasons set out already. The Ministry, instead of facing the situation squarely, sought the assistance of the Government of India for a grant under the "Grow More Food Campaign."

The Government of India have in their staff a plethora of experts, experts in compost, experts in sewage utilisation, experts in this and experts in that. One such expert paid a visit recently to Madras and interviewed the officers of the concerned departments and representatives of Madras Government. The expert in sewage chemistry has outlined a scheme for utilising city's sewage. His scheme was considered by the Minister of Agriculture and certain other officials. They have decided to accept the scheme with a view to getting a moiety of cost from the Government of India.

At the outset, we would like to impress on all concerned, whether the money comes from the Government of India or from the provincial exchequer, it is the *people's money*. Because the Government of India are willing to dole out the funds, it does not necessarily follow that any scheme put forward by the sewage chemist of the Government of India should be accepted without the concurrence of the local specialists in the respective fields. We are not at the moment concerned with the details of the scheme proposed by the sewage chemist. From information available to us, it is clear that fundamentally, this proposal is faulty in that no preliminary treatment of any kind should be adopted excepting perhaps screening, when sewage is to be utilised for farming. It is a notorious

fact that our soils lack humus and humus is as important as any fertiliser. The scheme proposed by the Government of India's expert should be knocked on the head on this score alone.

Coming to the engineering aspect of the proposals, it is altogether wrong for a sewage chemist to put forward proposals which involve technicalities of engineering details. Some engineers might have given him a detail of engineering here and there. It is presumptuous on his part to assume the role of an engineering expert in sewerage and put forward a scheme in the manner in which he has done. It is to be hoped that the Madras Ministry, while considering the subject, will call for a report from their chief engineering adviser on the engineering aspect of the scheme. In our anxiety to secure a grant from the Central Government, we should not commit ourselves to schemes which are inherently defective. In good time, we strike this note of caution.

MADRAS RURAL WATER-SUPPLY

It will be remembered that the first Congress Ministry, 1937—39, (in which Hon. Dr. T. S. S. Rajan was Minister of Health) was responsible for the creation of the rural water supply fund to get over budgetary uncertainties. But the World War No. II intervened and upset many matters including rural water-supply. Even the primary necessity of man, namely, a protected water-

supply, had also to be sacrificed in the all-out effort to win the war. The war has been won. But the rural water supply is left where it was. Even when the Congress Ministry took office after the world conflagration, it is an irony of fate that the Ministry should have thought fit to wind up the rural water supply fund. A very un-motherly attitude, indeed.

It is needless to discuss at any great length the imperative and immediate necessity to provide abundant and safe drinking water supply to the people. It was the vision and wisdom of both Rajaji and Dr. Rajan that took up the task of implementing this primary necessity of the common man in this Province. Now that Hon. Dr. Rajan has again taken up the public health portfolio, we feel almost certain that he will take up this question immediately and put it on such a firm footing that it will not only make up for the past lapses but will also automatically implement itself irrespective of whatever be the future government. We are glad to say that already there is some evidence of a big push being given in this respect. Recently, the Madras Ministry have committed themselves to provide twenty lakhs of rupees in the current year, forty lakhs in the next two years, eighty lakhs in the subsequent two years, subject to the availability of funds. The proviso is a

(Continued on page 469)

SELF-SUFFICIENCY IN TWO YEARS

by

M. S. Sivaraman, I.C.S.
Provincial Textile Commissioner, Madras.



Nature shows the way to prosperity. But the men in power do not see it. They get giddy. Their vision is eclipsed. They do not see reason. Do we not see frantic efforts are being made to instal expensive processes for purification of our drinking water-supplies ignoring Nature's own methods?

Why import fertilisers when Nature provides manures? Matters not whether we import food directly as such, or fertilisers. In either case, the country's economy is not improved.

The sole aim seems to be to impress on the masses that the state is contemplating to do something grand at some indefinite future time, leaving the present to take care of itself.

The author is not a visionary. He has put forward a simple, practical and inexpensive method of increasing the production of food to meet the immediate demands of this presidency. He has reiterated what has been achieved in some places in this very province. What is required is a vigorous drive to grow more and yet more green-leaf manure.

—Ed., P.H.

Can Madras become self-sufficient in the matter of cereal supplies before 1951?

Yes. It can, provided an earnest attempt is made to utilise the vast potentialities of Nature for solving the fundamental defect of tropical soils, viz., lack of humus. Even with the existing agricultural set up, production can be sufficiently increased in two years if a successful mass effort is made to tackle the problem in the light of known knowledge.

The Madras Province depends for its cereal supplies very largely on about 12 million acres of millets and about 10 million acres of paddy. There is no immediate scope for any appreciable extension of the area under foodgrains. Millets are mainly raised on rain-fed lands and the area in any year depends on seasonal factors and the price levels of competing crops. The chances of improving millet production by intensive cultivation are strictly limited. Paddy will therefore continue to be the mainstay of the Province and fortunately, paddy is the one cereal crop, the yield of which can be stepped up through simple means.

THE SECRET OF SUCCESS

Instances are not lacking where phenomenal yields of paddy are obtained in South India by the systematic adoption of proper methods of cultivation. For instance, the paddy yields range from 3,000 to 5,000 pounds to an acre per crop in the Tambaraparni valley in Tirunelveli district, nearly three times the average for Madras. And this is not due to any inherent superiority of the land cultivated: for such yields are realised even on very shallow soils. Two and sometimes three crops of paddy are raised in a year. The secret of the success of the Tirunelveli ryot is that he has applied heavy doses of organic manure, mainly green leaves transported over long distances from dry areas and thereby systematically built up the productive

capacity of his soil which is in no way better than that found elsewhere.

Again, in many Agricultural Experiments Stations in Madras the present yields are more than double and sometimes three times of what they were when the Stations were started and this has been entirely due to the application of green leaves to the fields from year to year supplemented by suitable doses of inorganic fertilisers.

Experiments all over Madras have shown that the yield of irrigated paddy can be increased from 10 to 40 per cent in one year by merely puddling 4,000 to 6,000 pounds of green leaves per acre before the transplantation of paddy. On an average every 15 pounds of leaves when applied to the paddy field will produce an extra pound of paddy. When nearly 70 per cent of the paddy area is cultivated year after year without using any manure, the problem of increasing food production in Madras reduces itself into the problem of providing adequate supply of green leaves for the paddy fields.

PRODUCE GREEN LEAVES ON BUNDS OF FIELDS

Large stretches of paddy fields are not accessible from roads or cart-tracks and transport of green leaves to the fields by carts is therefore impossible after water is let in. Unless green leaves are produced on the bunds of the fields or on the fields themselves wherever possible, green manuring will never be popular as a general measure. With a view to tackle this problem of production of leaves on the spot, various quick-growing shrubs like *Glyricidia maculata*, *Calatropis gigantea*, and *Adathoda vasica* were planted on some of the bunds of paddy fields in the Agricultural Research Stations in Madras in 1947. *Glyricidia* plants raised every six feet apart on half the total length of bunds of double-crop lands in the Paddy Breeding Station

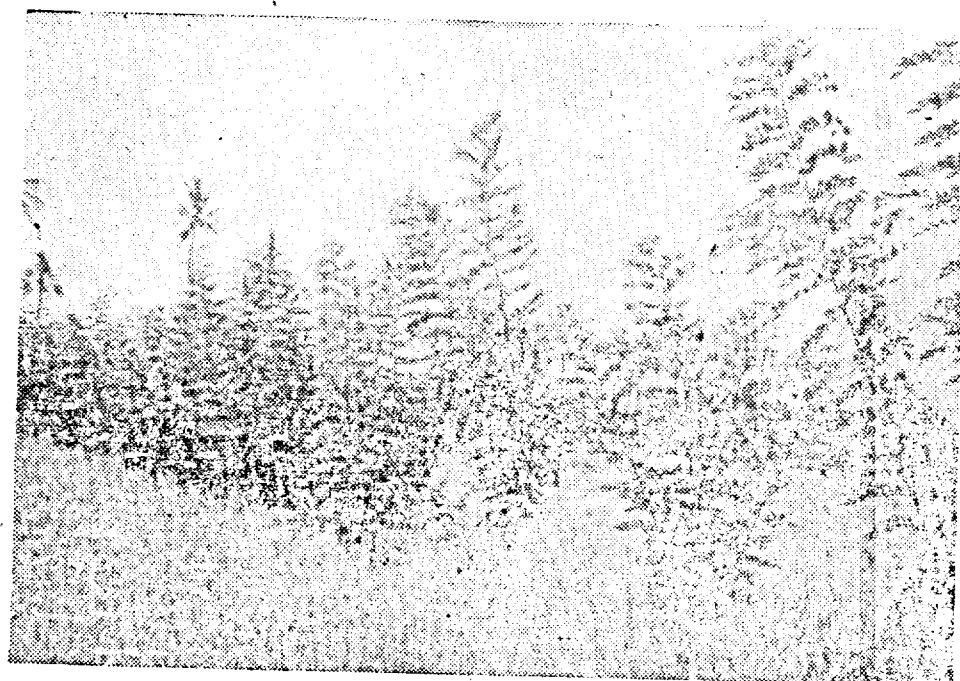


Fig. I. *Glycidia Maculata* planted on alternate paddy field bunds yields in 18 months sufficient green leaves for all future crops.

at Coimbatore (Fig. I) have within two years produced over 4,000 pounds of leaves per cutting per acre! The bunds are 15" broad and 12" high. No adverse root or shade effect was noticed from these plants and a study of the root system showed that the roots penetrate deep into the soil leaving the shallow paddy plants quite unaffected.

A paddy field divided into 10 cent plots contains over 500 yards of bunds in an acre and even allowing for the use of some of the bunds for walking and other purposes, there will be enough length of bunds to produce the leaf requirements in every acre. Coimbatore is a place of only 20" rainfall and what has been achieved there can be repeated nearly all over the Province. *Glycidia* is a legume and as such it fixes Nitrogen from the air. It should not be a difficult matter for even an easy going ryot to raise *Glycidia* seedlings and transplant about 100 plants on the bunds at the time of transplantation of paddy

from July to September as a more or less permanent solution to providing manure on the spot for his paddy crop. The plants will grow beyond the reach of goats and cattle by the time the paddy is harvested and yield enough leaves for manure in two years time.

Every pound of *Glycidia* contains about 6,000 seeds of which nearly 75 per cent will germinate. Instances are known where a single plant of *Glycidia* has produced 300 pounds of leaves from the third year. Thus, it is even possible to develop the green leaves for three hundred acres of paddy lands from the third year from every pound of *Glycidia* seeds provided the plants are systematically raised on suitable bunds! The rapid development of *Glycidia* in the Province with a view to increase the production of available seeds was initiated in 1947 and already some of these plants have produced seeds this year. The collection and distribution of these seeds and further spread of this shrub

will certainly achieve spectacular results in due course.

Glycidia withstands frequent lopping and it is an ideal plant to grow on the bunds of paddy fields where two crops of paddy are raised in a year, as it will not be possible to raise any green manure crop on such lands during the short interval between the harvest of the second crop and the transplantation of the first crop. It should also be grown on the bunds of single crop wet-lands where, for any reason, it is difficult to raise a successful green manure crop.

On most single-crop wet lands, the raising or green manure crops like *Grotolaria juncea* (Sannhemp), *Sesbania aculeata* (Dhaincha), *Sesbania speciosa*, *Tephrosia purpurea* (wild indigo), *Indigofera Tinctoria* (Indigo), etc. is possible depending on the type of soil and local factors: but so far only about two million acres are under such green manure crops in Madras and further progress is being made slowly. It is, however possible to bring nearly six more million acre under green manure crops if seeds are made available, if factors that discourage the raising of green manure crops are rigorously eliminated and the ryots are compelled to adopt green manuring of paddy.

SEED SUPPLY: A BOTTLE-NECK

As seed supply is an important bottle-neck, the problem of producing green manure seeds on the bunds of the paddy fields while the paddy crop is growing was studied and it was found that of all the green manure crops, *Sesbania speciosa* is the most outstanding from the point of view of facility of production of seeds, comparative immunity from grazing, greater freedom from insect pests and the larger quantity of green manure that can be produced. *Sesbania speciosa* can be raised along with the paddy crop by transplanting it along the margins of the bund at the time of transplantation of paddy from July to September (Fig. II). A pound of *Sesbania*



Fig. II. 5-month-old *Sesbania speciosa* plant grown on the margin of a paddy field bund

speciosa contains over 32,000 seeds of which nearly 80 per cent will germinate and each plant may produce about a quarter pound of seeds if given a spacing of about six feet. The seeds will be ready before the paddy is harvested and all that a ryot should do is to collect the seeds from the plants growing along the bunds and sow about 10 pounds of seeds per acre before the paddy is harvested. Under favourable conditions an acre of *Sesbania speciosa* sown in January has been known to produce by July nearly a lakh of pounds of green manure sufficient to manure 20 acres. *Sesbania speciosa* is highly drought resistant and it thrives well on all types of paddy soils. The moisture in the paddy field in the early stages of its growth and the summer showers help to produce on an average about 30,000 to



Fig. III. A full grown crop *Sesbania Speciosa* plant grown from the seeds raised along the field bunds.

50,000 pounds (Fig. III). The crop raised on one acre will on an average provide sufficient green manure for six acres. It will not therefore compete with the pulses which can still be raised on other lands. To green manure 6 million acres, *Sesbania speciosa* should be raised on one million acres: 60 million plants will be more than sufficient to produce the seeds required for the purpose. If seedlings are raised from 2,400 lbs. of seeds in August 1949, we should be in a position to provide the requisite seeds in January 1950 for raising the crop on a million acres.

WANTED VIGOROUS DRIVE

The Madras Agricultural Department had in its possession a few pounds of seeds of *Sesbania speciosa* in 1947 and active measures were taken to develop these seeds. It should therefore not be a difficult matter now to distribute a pound or two of seeds to every village officer and Agricultural maistry and insist on the plants being raised along the margins of the paddy fields

with the help of the ryots. The existence of this marvellous plant has to be brought home to all those who are interested in the agricultural prosperity of the country. Attention may be focussed by raising the plant in the compounds of public offices, schools, places of public resort. Incessant propaganda may rouse enthusiasm among the ryots and compulsion may be resorted to if adequate supply of seeds for distribution in small quantities all over the Province is available.

The present food shortage of 10 per cent is really a minor problem compared with the difficulties we shall have to face in the future. With a steadily mounting population and stationary area of profitable cultivation, the problem of providing adequate food according to proper nutritional standards will become more and more difficult to solve in the near future unless very rapid progress is made in the development of organic manures and inorganic fertilisers. Nature has shown the way and it is up to us to follow it if we want to survive.

ORGANISATION OF A HEALTH SERVICE IN INDUSTRY

I. MODERN TRENDS IN PUBLIC HEALTH

by

Dr. M. N. Gupta,

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



This is the fifth of a series of articles by the author. The previous articles appeared in *People's Health* regularly from March, 1949 onwards. We have already commended these articles to our readers. A perusal of these articles clearly indicate the study and vision of the author, who is a specialist in the field. Our readers may look forward for a few more articles on the subject.

—Ed., P.H.

INTRODUCTION

The concept and scope of Industrial Hygiene and general public health activity are continually broadening. As their area of service has been widened the common ground occupied by the two fields has naturally been extended. At this point it is probably fair to say that there is hardly any phase of the modern programme of public health services that is without its application to industrial health.

A recapitulation of the main services offered by a health agency will reveal their inter-relationship with the industrial health field. First and most fundamental are services in environmental sanitation. These particularly lend themselves to the working environment, problems of

assuring a potable water supply to industrial plants is a constant requirement placed on the city health department. In the same way the disposal of trade waste and the determination of toxicity of trade waste is another problem facing the health department.

In the general field of communicable disease control, the community health services can make other contributions to industrial health. The health department can supervise control measures in out-breaks, especially in infectious diseases as cholera, plague, small-pox.

Among the chronic infections pulmonary tuberculosis is highly important. Mass radiography to uncover cases of tuberculosis can also be performed in certain trades. The health

department can assure the follow-up and treatment of any cases detected and help in tracing the sources and contacts.

Other services of a health department, which can aid industry is investigation in Cancer problem in industry.

Certain activities of the health department help the industrial worker indirectly, in that they help his family. The programme of maternity and child welfare, infant and pre school hygiene, nurseries, nursery schools and nursery classes, school health service, dental health, nutrition, can be of great service to the dependents of the industrial worker.

Problems which are purely in the sphere of occupational disease control usually call for consultation from industrial hygiene specialists in the country.

Over and above these services that a public health department can render to industry it can take pride in rendering in-plant medical facilities in small factories in which an industrial health organisation is not existing.

The ultimate objective of health department, however, should be the encouragement of plant medical facilities in every plant within its jurisdiction. The health officer can replace the industrial physician or can act as a middleman in the development of an industrial health service that might serve two or three smaller plants. The key-stone of such an arrangement is the industrial health nurse, who can serve part time in each of the plants, also helping to acquaint the workers with all the preventive health resources of the area for themselves and their families.

The health department can play another important role in working as adviser to industry in other respects. Nutrition, housing, recreation, are subjects on which the health department can offer its advice. Another important function it can perform is as a unifying or co-ordinating agency.

PUBLIC HEALTH AND THE INDIVIDUAL

The present day concept of Public Health work, has grown from the early attempts to removal of environmental evils, and an attack on insanitation, war against the bacteriological agents, fight against notifiable diseases, to the present day concept of health campaign for the attainment of optimum health. The present day aim of public health work is not only to prevent spread of communicable diseases but to aim at the promotion of good health. No more now public health work aims at laying down minimum conditions necessary to ward off disease and preserve health; now the emphasis is on optimum conditions. The important change in the scope of public health work is to include not merely the physical but the whole health of man is emphasised. Public opinion in favour of better health has also undergone striking change. The public has begun to realise the great cost of ill-health and are willing to invest money, time and energy to be able to reap rich dividends of health for the future.

There is an increasing stress now on the causes of morbidity and those of mortality. The present day aim is not only to save life but health. The principal duty of the public health agency is prevention and co-operative work of health personnel with the public.

The family, and not the individual is the target of public health work. The home and the social environments are the present day field of investigation of the public health department.

The family as a unit is being investigated for the proper ascertainment, prevention and treatment of many diseases. Such social diseases like tuberculosis, require investigation of the family and social environment for proper treatment and prevention of spread of tuberculosis. The present day aim of public health work is to build better family life to achieve better health for the individual.

The achievements of social psychology and other investigation into the realm of "happiness of man", is a source from which modern public health work has derived great inspiration in its modern concept of total health for the individual. The social psychologist has done much to sharpen the social consciousness of the public with the result that public health evils are being appreciated more keenly than before. As a result of this one finds a great change in the public in its attitude towards the care of the expectant mother and the new born babe. Even this little change has untold potentialities and with the advance of literacy one expects that a literate public will become more and more conscious of the existence of other public health evils.

Modern public health work is taking keener interest on such other environmental factors as social, psychological and economic, which are contributory agents in the giving of total health for the individual.

There is an increasing recognition of the need for creches in industrial establishments in India and most employers have provided admirable arrangements. The need to keep the babies well is a happy augury seeing the condition of the children in general in the country.

We in this country have progressed much but there is lot more room for further improvement and provision of public health services. The Committee on Environmental Hygiene as envisaged in the Bhore Committee Report has been assigned those duties which though called "impersonal health services", have an important bearing on his physical environment as an essential part of the campaign for promoting the public health. An environment which is not conducive to healthful living is not only a great menace but a positive factor in the production of ill-health in man, for in the absence of such an environment, the curative services of the doctor, the nurse and other members of the health organisation will fail. A hygiene home, good food,

fresh air and safe water supply can never be replaced by drugs, vaccines and sera.

The Environmental Hygiene Committee has been entrusted with the problem of National planning for town and country, including housing and problems of public health engineering. Housing conditions in our country present a deplorable picture and the bad effects of housing in our larger towns are noticed in the great variety and number of social evils present amongst us.

Every social improvement has helpful influence and in trying to eradicate social evils we are neglecting no means for the acquirement of better public health. Social pathology is coming to be recognised as a special subject for study of the etiology of diseases. The importance of medico-social workers and psychologists and their co-operation with public health departments is a recognised need felt in the countries in the West.

Last but not least is the introduction of public health nursing as an aid to public health activities. A public health nurse is a medical woman in a social setting. She is the one public health worker charged with the duty of collecting valuable social data which is required for the needs of the community and which data helps the public health department to formulate its policy and services.

A well recognised and an indispensable part of the frame work of preventive medicine is an ante-natal clinic. John Burns has said "First, concentrate on the mother. What the mother is, the children are. Let us glorify, dignify, purify motherhood by every means in our power. Let us see to the nursing mother in every way; nourish the mother and you feed the child."

In India we say "यत्र नारीस्तु पूज्यन्ते रमन्ते तत्र देवता" (where women are worshipped there reside the Gods).

It is horrifying to note that about 200,000 women die from causes arising out of childbirth in India excluding the States, and that for every woman who dies as a result of pregnancy or

childbirth, 20 suffer from impaired health and lowered efficiency. Imagine the adverse effect on home life by the continued illness of the mother or by her death at a comparatively early age, particularly from the point of view of the health of the surviving children. The working mother in our industrial employment carries a double burden in that she combines with outside employment the duties of running a home. We have no data if maternal mortality is higher among working class women, but the general opinion is that maternal death-rates, the neonatal death-rate and the premature deaths-rates are definitely higher in working class women.

In the development of the idea of antenatal clinics the domiciliary midwifery service has great usefulness when combined with a maternity hospital unit.

The Chief Medical Officer of the Board of Education in U.K. said in his Annual Report for the year 1938, "These children are fed not only for their present good but also, for their development as men and women and parents of this nation." Provision in the school health service of school-meals or milk has given indirect benefits to Public health and the parents of such children who are provided free meals and milk are realising the benefits of this scheme in many ways.

School canteens are a radial point of social improvement and the need of such services on a wider scale in this country is a necessary provision which the education authorities must devote their attention to.

With the increase of literacy and the idea of educating the public quite a number of noticeable trends in modern health education are observed. The increasing use of cinema film, museum, exhibitions, radio, colourful posters, have made much public health propaganda.

We in India have not as yet started the practice of prevention of mental ill-health in the course of the employment of general public health mea-

sures—measures which go to lessen the mental ill-health, such as establishment of social justice, encouragement of proper sense of security, adjustment of working conditions, insurance against contingencies, better housing, improved nutrition are conspicuous by their absence. The psychiatric social worker will take a long time to appear on the scene.

Another major advance in public services in the West has been the development of services for the various categories of handicapped children, the blind, the partially sighted, deaf, partially deaf, delicate, diabetic, educationally subnormal, epileptic, maladjusted, physically handicapped, and pupils suffering from speech defects. Though these services come under the purview of the school health service of the education authorities, the vast majority of these children can become self-supporting if appropriate public health service and education is provided to them.

In the census for 1931, 601,370 and 230,895 people have been labelled as blind and deaf respectively. What a colossal waste of man power? The ratio of blindness to population is the highest in India. The census for 1931 showed 601,370 blind in a population of 350 millions, which is considered a considerable underestimate. It is likely that the incidence of blindness is 10—15 times that of England and Wales and on that basis the blind in India number between 10 to 15 millions. No accurate assessment of the causes of blindness in India is available. Keratomalacia, cataract, optic atrophy and corneal scarring from a variety of conjunctive infections appear to be the most significant factors. These reflect unsatisfactory public health conditions and inadequate facilities for treatment.

Another subject of great public health importance in the West is the welfare of the aged. David Lloyd George in his foreword to "Old Age in the New World" has remarked: "How we treat our old people is a crucial test

of our national quality. A nation that lacks gratitude to those who have honestly worked for her in the past while they had strength to do so does not deserve a future, for she has lost her sense of justice and her instinct of mercy."

Countries with a higher average expectation of life are increasingly being faced with the problem of their aged people. It is in the realm of public health to provide for the welfare of the aged, in the form of hospitals, hostels, institutions home helps, housing, etc.

The chief problem of the aged is loneliness and boredom and he needs care without undue disturbance in his life.

PUBLIC HEALTH AND THE COMMUNITY

Sir William Beveridge once said "The restoration of a sick person to health is the duty of the state and of the sick person, prior to any other consideration." If it is the aim of public health to remove misery from the family which is a consequence of poverty and idleness it is essential that a sick man should be restored to full fitness for life. This can be done if proper Rehabilitation Services are provided, which alone are likely to lead to all round physical health and peace of mind—good food and living conditions, fresh air, long periods of sleep, mental and physical recreation and interesting and useful work. Most of the development in the provision of State Rehabilitation Services has been after the experience of Armed Forces' Rehabilitation Centres, Convalescent Depots, Rehabilitation Hospital, Remedial exercises, occupational therapy. It is a people suffering from a complex of physio-psycho-socio-economic stresses with debility and sub-normal health who really need rehabilitation services.

In the West, industrial rehabilitation service is a recognised need to help production by gainful employment during rehabilitation.

The resettlement of the thousands of disabled persons led to the passing of the "Disabled

Persons Act of 1944" in U.K. The main object of this Act was to provide—

(a) Vocational training courses for disabled persons of 16 years and over who need such training in order to start work.

(b) Industrial rehabilitation courses for disabled workers of 16 years and over who need restorative treatment and training in order to return to their work or take up work better suited to their condition.

In the West the state, the large industrial companies, and industry in general are all coming to realise that the provision of resettlement services is a joint concern of all and a matter of importance to future national economy.

Rehabilitation services, many of which have been born in the stress and need of war in the west can be applied in peace time to the debilitated mother and child; the citizen suffering from half-health, and thereby to look after the health of the whole man, considered in all respects, including his mind and body, his work and wages, his home and social background.

Another important community health service is the "Health Centre" which is considered as the embodiment of the new conception regarding health and disease. For the Health Centre in Peckham, Dr. Scott Williamson claims, "is an organic cultural and educational organisation for the development of human faculties and in no sense then can it be compared with a therapeutic and diagnostic institution for dealing with disorders and diseases."

Everybody knows that the loss of health happiness and effective living due to preventable diseases is enormous in this country. The health centre takes the family as a unit and includes in its study social behaviour, provides a regular and complete health overhaul, makes its members to want to act and gives them opportunities for physical, mental and social life, and affords the family facilities and environments in which to assume such responsibility. These centres provide a

full range of services required by a modern maternity and child welfare and school health department including ante-natal and post-natal, gynaecological, infant welfare dental, artificial sunlight, orthopaedic and remedial exercises, eye, ear, nose and throat immunisation, rheumatism, speech therapy and child guidance clinics. In addition, facilities for health education, by visual methods, and for parentcraft teaching.

In India we have 700,000 villages but it is strange that when so much of our land consists of rural communities, we have no knowledge about rural epidemiology or the natural history of the commoner diseases present in the villages. We do not even have the knowledge of the type of diseases prevalent in our villages where a majority of the population of this country resides. In the West where the villages are being denuded of all population owing to rapid industrialisation study of rural epidemiology is becoming an important field of investigation for certain type of diseases common in the villages.

Another subject of great public health importance is the problem of ensuring a supply of safe and clean indoor air by methods devised to attack what are called "airborne infections", which have become prominent owing to increasing urbanisation, crowded cinemas, communal feeding, travel in crowded buses and railway carriages, crowded homes owing to housing shortage, infections like cerebrospinal fever, respiratory tuberculosis, pneumonia, influenza, measles, whooping cough, diphtheria are all characterised as "airborne infections," besides a host of other infections. Community public health services must provide antidotes to the spread of these diseases. Nowhere, but in the field of prevention of "airborne infections," is seen the great value of the application of simple fundamental principles of better ventilation, dust-laying and the reduction of overcrowding.

For the prevention of communicable diseases like small-pox, cholera, typhoid, the public

health authorities have a special duty to perform. The rate of incidence of small-pox in India is the highest for all countries in the world. In the two ten-year periods 1902-11 and 1932-41, the rates of mortality from small-pox per 100,000 of the population were 40 and 25 respectively. The average number of deaths per year from certain diseases for the period 1932-42 was as follows:—

Cholera	144,924	2.4
Small-pox	69,474	1.1
Plague	30,932	0.5
Dysentery and Diarrhoea	261,924	4.2
Respiratory diseases ..	471,802	7.6
Fevers	3,622,869	58.4
Other causes	1,599,490	25.8
Total	6,201,434	100.0

That the large amount of suffering and mortality for which small-pox is responsible should be permitted to continue is all the more regrettable because we have in vaccination a powerful weapon with which the disease can be kept under effective control.

Compulsory vaccination and vaccination on a mass scale is one way in which the public health authorities safeguard the health of the community.

Another such activity carried out on a mass scale is Mass Miniature Radiography for tuberculosis service, the function of which is not so much for final diagnosis as the sifting out from a number of apparently normal persons those whose condition requires individual and intensive study. A number of non-tuberculosis conditions are also discovered by miniature radiography. These include cardio-vascular abnormalities, bronchiectasis, neoplasms, both benign and malignant, pneumoconiosis and pneumonitis. Three population groups are specially worthy of periodical attention.

- (1) Those suspected of chest disease.
- (2) Contacts of open cases of tuberculosis.

- (3) Those in occupations carrying special hazards of disease.

Another recognised field work for public health services is the venereal disease service, which aims at not only providing adequate diagnostic and treatment facilities, but is mainly concerned with the causes of prevalence of venereal diseases, their frequency, their effect on the social set-up and the implications to the society, and the setting up of social and administrative measures for their eradication. In syphilis, as in tuberculosis the family is the unit to be investigated. It is said that "congenital syphilis is a disgrace of modern medicine". The problem of prevention is, at the root, the problem of prevention of pre-marital and extra-marital exposure. How to lessen promiscuity is a community problem, and the public health service aims at the investigation of the social background of venereal disease, and treatment at welfare centres, venereal clinics, prophylactorea institutions, health education, etc.

In the field of parasitic infections, like scabies and verminous infestations, like bed bugs and louse, public health departments have provided disinfection services. No curative method, however brilliant, can equal the efficacy of sound public health measures in the eradication of these vermins. The public health department does this by a re-orientation of attitude of the public by stressing their social responsibility for hygiene in their own houses. The U.K. "Public Health Act" of 1936 provides remedy for filthy or verminous premises or articles and verminous persons.

Another service in which the local health departments in the West take justified pride is the provision of municipal ambulance service for every purpose including the removal of patients to and from general or infectious disease hospitals, or street accidents, industrial accidents.

In the field of Environmental Hygiene the Public Health Department has important duties to perform in respect of—

- (1) Provision of clean, safe drinking water.
- (2) Abatement of smoke (industrial and domestic).
- (3) Provision of pasteurised milk.
- (4) Control over articles of food and maintaining their standard and purity through the Food and Drugs Act.
- (5) Safe disposal of domestic and street refuse.

In America great energy is being displayed on measures for the prevention of accidents in the home and on the farm. The division of Public Health Education of the Health Department of the State of New York has set up a Home and Farm Safety Advisory Committee. It works through a number of sub-committees covering research and statistics, legislation, household safety, personal health, and safety finance, farm safety, safety in housing and safety to children in farm work.

The Public Health Officers in the West are concerned with all factors causing death or damage to health as such they are interested and assist in the campaign for increasing road safety. Education, health and police authorities get together and plan a programme of consistent education for all, from the nursery school through school, club, college, cinema and town hall.

Last of all, the public health officer has lot to do with the "Disposal of the Dead." It is said that, "Homage to the dead can be paid just as fully in comfort as in self-denying exposure to climatic rigours and fatigue, so dangerous to those already weakened by grief and nursing." How far the public health authorities can help the general public in paying this silent homage in this country is yet to be seen.

RURAL WATER SUPPLY IN WEST BENGAL

by

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The author of this article is an extremely busy man. We are indebted to him for finding time to give a resume of the work on rural water-supply in West Bengal. It will be read with considerable interest in the country.

One noteworthy fact is, in the matter of providing so vital a requirement as drinking water-supply to the people, appreciable progress has not been made in any part of the country. Lack of technical personnel, lack of materials, lack of funds and above all lack of enthusiasm on the part of our administrators, have jointly and severally contributed to the deplorable poor progress. We feel that all these bottle-necks can be readily got over, provided there is a determined effort on the part of all concerned to go forward with the schemes for providing drinking water-supply to our people. Excuses can always be found to explain away delays. But what people want is drinking water.

Mr. Bose, as the head of the department of Public Health Engineering, has been striving hard to get over the bottle-necks but administrative handicaps still confront him as they do in other Provinces also.

—Ed., P.H.

It is a well-known fact that for a long time past, the provision of drinking water-supply to our rural population has been neglected. No wonder, therefore, water-borne epidemics have been sweeping the country from time to time, taking tolls of lives in tens of thousands. Inoculation, segregation and the like might have proved to be a palliative. These can never be considered a remedy. The root cause of the epidemics can be removed only, when safe and abundant drinking water-supply is provided for our rural people and their living conditions improved.

In the pre-partition days, the Government of West Bengal, worked out an elaborate scheme for providing safe water-supply to our rural population to protect them effectively against the ravages of water-borne diseases. The scheme was to sink tube wells $1\frac{1}{2}$ inches in diameter in those areas, where the sub-soil water conditions would admit of this being done at a reasonably moderate cost. It was also intended to construct masonry wells or *reserved tanks* in other areas. Recognising the fact that the development of safe water alone will not meet the requirements unless the sources are properly protected against a contamination, the scheme included provision for maintenance also.

A RESUME

The original scheme was drawn up before the World War No. II. The basis of design was one source for every 400 people. Unfortunately the World War necessitated the scheme being kept in abeyance. After the termination of the war, the scheme was taken into consideration as a post-war development measure to be financed from grants received from the Government of India. Getting over the financial hurdle alone did not help progress being made. Due to the abnormal rise in prices of materials and labour, the cost of scheme has to be estimated again, taking the current rates into account. The estimates were accordingly revised, providing

post-war prices. While doing so, certain modifications were also effected. The provision for resinking 25 per cent of the existing tube wells and for sinking $12\frac{1}{2}$ per cent new wells were made. This modification was found essential as it was anticipated that by the time the new wells are completed, a large number of the existing ones which had already become derelict should be replaced and in some cases more new wells would also become derelict. The revised estimate went up to Rs. 12.66 crores as against Rs. 5.75 crores as originally estimated. The estimated annual maintenance was Rs. 25 lakhs. It was proposed to complete the scheme in two instalments of a five-year plan.

A further modification was found necessary and a Public Health Sub-committee which scrutinised the scheme expressed the view that there should be one source for every 200 persons. This basis of design increased the estimate two-fold.

Again the Post-War Committee after considering all points of view and recommendations made so far, considered that one source for every 500 people should be the basis of design. Working out the scheme on this basis, on 1941 census (55 millions), ten thousand new sources had to be provided as detailed below :

Total number of sources required	
at 1 source for every 500 people..	1,10,000
Total number of existing sources	1,00,000
New sources to be provided	10,000

The committee also sanctioned resinking of 4,000 derelict tube wells every year, i.e., 20,000 in all in 5 years which is approximately 19.5% of the total number of wells including the new wells as they are added during the execution of the scheme. Taking an average estimated cost of Rs. 1,000 for sinking as well as resinking, the committee sanctioned Rs. 60 lakhs ($6,000 \times 1000$) a year. The committee further sanctioned an

amount of Rs. 20 lakhs a year for maintenance work.

The scheme was started in April 1946 but due to the dearth of qualified technical personnel and scarcity of materials, especially pipes (which are controlled), the work could not be proceeded with as expeditiously as was expected before, with the result that the progress so far has been rather poor. Conditions regarding supply of materials and their movement have not improved since; but as the organization for carrying out the work has somewhat settled by this time, it is expected that the progress henceforth will improve.

EXTENT OF WORK

Due to the partition of the province, the extent of the work should undergo corresponding curtailment; but unfortunately the reverse is the case as shown in the statement below. This is attributed to the following reasons:

1. Number of existing sources as computed in the original scheme was based on meagre information and exceeds the actual as ascertained subsequently by detailed survey of the existing sources district by district. Total number of tube wells in the undivided Bengal is 60,000 and not 100,000 as was estimated previously.

2. Previously, one source was allowed for every 500 persons. In the proposed scheme it is suggested that there should be one source for every 400 persons. Total number of tubewells required for the province of West Bengal excluding the areas where tubewells are not successful on this basis is 35,375 (*vide* statement herewith) out of which 18,413 already exist (this does not include 3,032 tubewells which are in excess of the requirement on the above basis in some areas). The entire number of new tubewells required will be sunk in a course of 4½ years (from 15-8-'47 to 28-2-'52) i.e., at the rate of 4,100 tubewells per year. It is also proposed to withdraw and resunk 4,073 tubewells out of the

existing sources which are choked up. It is expected that a further number of tubewells say 5% of the tubewells working including those newly sunk will go out of order during the course of execution of the present scheme. These tubewells estimated at 1,769 numbers will also be set right and have been included in the present scheme. These further provide for construction of 1,000 masonry wells in several areas where tubewells are not successful. The above works will involve an expenditure of about Rs. 64 lakhs a year as per rough estimate below.

Maintenance of the existing sources and of the new and repaired sources which will be brought into service each year and the supervision of the new sinking and resinking will cost nearly 25 lakhs a year as shown below. Besides superior supervising staff,—one mechanic with a helper have been provided for each thana and one additional khalasi (helper) for every union for maintenance of sources.

BRIEF DETAILS OF THE STAFF REQUIRED

Eleven district supervisors, 32 sub-overseers 22 *chowkidars* and peons, 306 mechanics and 2,050 *khalasis* or helpers.

Rough Estimate of Cost in thousand rupees.

	1st half year	2nd year	3rd year	4th year	5th year	Total
	Rs.	Rs.	Rs.	Rs.	Rs.	Rs.
Capital ..	3,418	6,400	6,400	6,400	6,400	29,018
Running ..	1,380	2,500	2,500	2,500	2,500	11,300

For timely completion of the scheme, G.I. pipes, steel brass and wire gauge for tubewell strainers have to be imported from abroad. Hand pump and country made strainers will be locally available. Labour force required will be arranged through contractors. Government of India's assistance is essential in securing materials from abroad specially G.I. pipes.

The Public Health Sub-committee on P.W.R. gave its opinion that there should be one source to every two hundred persons. Even after the 17,962 new sources proposed under the plan have been constructed, there will be only one source for every 400 people; so there is endless scope for further work in continuation of the present proposal.

A statement showing the works completed since the scheme was taken up is given below:—

[*Vide details districtwise.—Appendix—I*]

WEST BENGAL:

(a) Tubewell Areas:

New Tubewells	
Total population living in rural areas (1941) census ..	1,41,50,000
Number of tubewells required at 1 source for 400 people ..	35,375
Tubewells in existence (derelict and in order) ..	21,445

New tubewells required ..	13,930
say ..	14,000
Derelict Tubewells	
Number of derelict tubewells to resunk ..	4,700
Add those that are likely to be derelict during the continuance of the scheme ..	800
	5,500

(b) Non-Tubewell Areas:

Total population living in these areas ..	24,58,000
Number of existing wells in existence.	Not known.
Number of existing reserved tanks in existence.	To be surveyed and programme of new works to be drawn up accordingly.

APPENDIX I.

NAME OF DISTRICT.	Rural population of T.W. areas.	No. of T.Ws. required (1 well for 400 persons).	No. of T.Ws. in existence.	Additional T.W. required.	T.Ws. in excess of requirement.	Remarks.
1. Burdwan ..	11,93,232	2,983	4,151	Nil	1,168	
2. Birbhum ..	5,49,375	1,373	290	1,083	Nil	
3. Bankura ..	3,07,959	769	235	534	Nil	
4. Midnapore ..	26,19,268	6,548	2,903	3,645	Nil	
5. Hooghly ..	10,94,827	2,737	4,607	Nil	1,870	
6. Howrah ..	10,60,615	2,651	1,366	1,285	Nil	
7. Murshidabad ..	17,90,613	4,476	1,746	2,730	Nil	
8. 24 Parganas ..	26,73,315	6,683	4,210	2,473	Nil	
9. Nabadwip ..	7,45,263	1,863	1,370	493	Nil	
10. West Dinajpur and West Maldah ..	12,21,222	3,053	537	2,516	Nil	
11. Jalpaiguri ..	8,93,117	2,232	30	2,202	Nil	
Total ..	1,41,48,806	35,373	21,445	16,961	3,038	

PHYSICAL EDUCATION AND NUTRITION OF SCHOOL CHILDREN

by

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We are indebted to the organisers of the First Bombay Provincial Physical Educational Conference as also to the author as the Chairman of the Nutrition Section, for the facilities afforded for publishing this in these columns. This article is one which ought to be read by all those who are interested in the future of Independent India. Ministries of Education and Public Health should co-ordinate and take steps to rear a virile India. Needless to add that the subject deserves a top priority.

—Ed., P.H.

Nutrition surveys carried out during the last twenty years in various parts of the country have indicated beyond doubt that the health of the average child of school-going age is far from satisfactory. In this respect there seems to be hardly any difference between the school children of the urban and the rural areas. If anything, in the urban areas the effects of under- and mal-nutrition have been accentuated by overcrowding and unhygienic conditions of life amidst which a majority of children are forced to live. There is also evidence to show that the chronic food shortage, high prices and the

increasing economic distress have all caused further deterioration in the health of school children. Apart from the fact that specific nutritional deficiencies have been encountered in almost all the parts of the country, far more evident has been the accumulated effect of mal-nutrition as seen in the stunted growth and abnormally low body weights recorded in almost all the surveys. The evidence with regard to this particular province has been recently documented by the Physical Education Committee appointed by the Government of Bombay in 1946.

Thus the fact that the health of the Indian school child is far below the normal hardly needs additional proof. It is probable that the main underlying reason for this state of affairs is to be found in the poor economic condition of the average parent. It is all the more important therefore that the powers devise ways and means to remedy the unsatisfactory situation; for, there is little doubt that if it is allowed to drift much longer, the country will be faced with the problem of dealing with a generation of citizens physically unfit for the arduous tasks which it is sure to be called upon to perform. Having thus admitted the gravity and therefore the urgency of the problem it becomes our duty to find a solution or solutions. Like most problems facing us at the moment this is also one where an all-out effort will be necessary on the part of those concerned, viz., the state, local bodies, private school authorities, and the guardians of the children, if any substantial improvement is to be expected within a reasonable time. I hope I shall not be considered unduly optimistic if I say that given the will, a considerable improvement can be brought about even within the present limitations.

The three important steps which may be necessary to improve the health of children would be (a) the provision of hygienic surroundings in the home and outside, (b) a nutritious diet and (c) the creation of the love for sports and out-door life. This is neither the place nor the time to describe in detail the implementation of these suggestions. I trust that in the other sections of this conference the improvement of environmental hygiene and inculcation of the love of sport through physical education would be effectively dealt with by the respective experts. I shall attempt only to indicate how the medium of physical education can be utilized to improve the nutritional status of the children within the existing limitations.

The importance of physical education as a means of improving the general level of health of the population has been realized by those responsible for the national educational policy in India and attempts are being made to place the subject on a systematic footing. Till recently however physical education in schools consisted in setting apart so many periods per week for drill or Indian gymnastics. Some provision was also made for the modern European games. Apart from the fact however that all the students were periodically put through the drill, there was little care taken about the extent to which most of the children were able to take part in the games, Indian or European, which they really liked to play. Naturally it is no wonder that the system proved neither popular nor successful.

What is needed therefore is the development of a system which would succeed not only in taking care of the child's physical health while he is in school but also in imparting knowledge about the subject in such a way as to leave a lasting impression on the mind for his guidance and benefit throughout life.

Reverting to my own subject I might mention that two methods can be adopted to improve the nutrition of the school children, (a) teaching of the fundamentals of nutrition and dietetics and (b) the implementation of the school meal programmes. Both appear to me to be practicable. It is true however, that in their adoption additional expenditure will be involved, but that is a consideration which has to be faced and proper provision made if we are really serious about the matter.

(a) *Teaching of Nutrition and Dietetics.*—Education imparted by lectures alone can hardly be considered the best way when children are concerned. It is a pity that circumstances have not permitted the use of demonstrations on a much wider scale than they are resorted to in schools at the moment. It cannot be denied that in children as in adults, but much more so

in the former, one hour's demonstration proves more effective than lectures on the same subject spread over a number of hours. Different methods of demonstration have to be used in teaching different subjects. It is a judicious combination of the two that leaves a lasting impression on the mind of the child and it should be our aim to find this ideal combination. In the teaching of nutrition and dietetics as well, much can be achieved by adopting suitable means. I will therefore attempt to place before you some ideas on the subject with suggestions for putting them into practice.

Provision should be made in the schools for the teaching of the fundamentals of nutrition and dietetics. I feel that it is possible to do so in a manner which would appeal to children and would not involve recourse to unnecessarily complicated technical language. There are already, I understand, courses existing in which physiology and hygiene are being taught in schools; probably nutrition is also included. My own impression, however, is that the teaching of these subjects through lectures and poorly illustrated books is mere waste of time. They are capable of being taught in a far more effective manner with the use of easy and inexpensive demonstrations alone. The school authorities should pay careful attention to this aspect and make the period devoted to the study of physiology and hygiene a period fully as entertaining as it should be instructive. It should not be difficult to arrange demonstrations to illustrate the subject not only with inanimate models but also with the use of examples and conditions of the living world which the children can see and feel for themselves. There are numerous possibilities in this direction which I am afraid have not at all been explored.

If the teaching of physiology and hygiene is combined with that of nutrition and dietetics and the method of teaching revolutionised, I feel that it will not further encumber the already

overburdened curriculum in the schools. I would also suggest that these subjects should be introduced fairly early in the schools. Given the right type of teacher and the proper approach there is little likelihood of unduly taxing the capacity of the juvenile mind.

In order to make the teaching of nutrition and dietetics a success, it would be necessary to have suitably trained personnel. It is possible to train the physical education instructor in the subject. In my opinion, however, the work should be entrusted to the teacher of the subjects of physiology and hygiene.

In the girls' schools and for younger boys in the boys' schools this duty can be discharged by women teachers who are trained in the subject. There already exist in certain Universities, degree courses in domestic or home science. In both of these the subjects of physiology, hygiene, nutrition and dietetics are taught in some detail. It should not be difficult therefore to recruit such persons as have taken the degree in these subjects for the purposes of teaching in schools.

In the teaching of nutrition, it is not necessary to delve deeply into technicalities of the subject. The children should learn more about what, when and how much to eat than to remember which foods are rich proteins, minerals or vitamins. They should also know what one eats food for, what is the benefit of eating nutritious foods and the dangers of bad food, etc. In the girls' schools additional emphasis should be laid on teaching the methods of preparation of varied and attractive dishes from simple foodstuffs. The advantages of scrupulous cleanliness of handling food and the dangers of unclean habits where food is concerned can also suitably be conveyed in the teaching and demonstrated by example wherever mid-day meal programmes are in existence.

Mid-day Meals in Schools.—This brings me to the second suggestion which would certainly improve the health of the school child. There

can hardly be two opinions on this subject. It is imperative therefore that projects for providing mid-day meals in schools on as wide a basis as is possible are taken in hand at an early date.

The institution of the school meal programmes like all other development schemes will involve quite a good deal of annual expenditure. In the schools run by private organisations this would be almost impossible. Even in the schools entirely run by government finances mid-day meals cannot be given, unless additional funds are provided. During the last ten years, mid-day meals in schools either in the form of milk or a made up meal had been introduced in various parts of the country with or without state help. In some places these attempts have been given up on account of financial stringency and in others they are still being continued in a more or less attenuated form. The government cannot entirely escape responsibility for the failure of these half-hearted attempts. I must use this opportunity to state that the problem is so important that the state cannot afford to play with it. I cannot accuse the Central and Provincial governments of either the lack of courage or vision so far as the nation-building activities are concerned, for, their record during the last two years is certainly one which should inspire confidence. In their own spheres, the respective governments have sacrificed a good deal of revenue and incurred additional expenditure to put schemes in action which, according to them, were necessary for the uplift of the masses. I submit that the health of children today is a problem as much important and probably more so than some of the other schemes undertaken by the state. It is all the more necessary therefore that the government formulate and carry out the projects for the provision of mid-day meals in schools. The public usually complains about the additional burden thrown on it when any new developmental scheme or schemes add to the taxation. There is no evidence however, to

show that the state has reversed or considerably modified its policies on account of such complaints. I sincerely hope therefore that the government would take a bold stand in the matter where the health of school children is concerned. The people on their part should also realise their responsibility and co-operate without reservation, for only then can any lasting results be expected.

The need for mid-day meal in schools is most acutely felt by the children who are not able to get anything like a nutritious diet in their homes, and these form the bulk of the school population. The purpose of the mid-day meal should therefore be to supply an appreciable proportion of the child's daily requirements. If this is done a certain deficiency in quantity and the indifferent quality of food provided in the homes will not matter much.

A committee of nutrition experts of the South East Asian countries which met in the Philippines in February 1948 under the auspices of the Food and Agriculture Organisation of the United Nations has formulated a mid-day meal schedule taking into consideration the facts mentioned above. The recommendation of the Committee on the subject is quoted below in full:—

"The type of free meal for school children recommended by the Committee may be based on the following formula:—

- (1) Cereals (Cereals available such as lightly milled rice, high-extraction wheat, millets or other cereals) 2½ ozs.
- (2) A pulse ½ "
- (3) Small fish of which the whole body is eaten (such fish provide calcium) ¼ "
- (4) Vegetable (green leafy vegetables preferred) 1 "
- (5) Oil (preferably an oil containing carotene) ¼ "
- (6) Salt ½ "

"A meal of this kind will provide about 400 calories and will contain all the essential nutrients. It should be regarded as illustrating the general pattern of a cheap school meal, and may of course be modified in various ways in accordance with local conditions and the availability of various foods. "For example a greater amount of vegetables might be included or fruits might be supplied as an alternative to vegetables. Nutrition workers in the different countries can give advice on such questions."

"When facilities are not available for the distribution of full meals, specially prepared buns, cakes, chapatties made from flour, food yeast, and other ingredients such as powdered small fish may be found satisfactory. The type of the meal which can most suitably be supplied in school feeding programmes will depend on local circumstances."

In the recommendations mentioned above the absence of milk cannot escape unnoticed. Apart from the circumstance that the inclusion of milk would appreciably increase the cost, the main consideration before the Committee was the absence of milk production and the comparative rarity of its use as a food-stuff in several countries represented at the meeting. Not much is lost by the exclusion of milk. If it can be provided it will certainly enhance the nutritive value of the meal. Suitable adjustments in the above schedule can be made to meet the requirements of vegetarians.

It should be clear then that if the above recommendations were followed, nutritious meals at comparatively very moderate cost could be provided in most schools. There is no doubt, however, that a system of apportioning the cost between the government, the school and the parent will have to be carefully worked out. Those who stand to benefit most by the meal will not be in a position to pay. At the same time, the middle class parents who invariably spend some money to enable their children to have a

mid-day snack of doubtful value would probably agree to pay part of the cost of the school meal, provided they are satisfied that the child is assured of nutritious food cleanly prepared and served under hygienic conditions. I agree that the problem is not so simple as would appear from what I have said, but I do not consider the difficulties to be insurmountable.

The effect of school meal programmes will be seen not only in an improvement in the health of the general population of school children but will also inculcate in them the ideas about the proper dietary required for maintaining health and also the necessity of observing cleanliness and hygiene during the preparation and consumption of food, impressions which cannot be conveyed merely by dietetic teaching. Whether these effects would last throughout life is a question which it is very difficult to answer. As stated above, the economic condition of the parent is bound to influence to a great extent the application in life of whatever has been taught in schools. Secondly, it must be remembered that a large number of children finish their education once they leave the schools and between the time that they leave the school and the time when they are able to control their own household, there will be a large interval and it is quite possible that during this time, all that they have learnt may be forgotten and as the influence of the environment would be much stronger, than that of the school-environment which they have already left behind, the possibility of their lapsing in the old ways is not altogether remote. But it is also possible that a few of them who are benefitted by the previous experience may be able to carry out in practice what they had learnt. Even if this small proportion of the child population is capable of doing so in later years, it will not be a small gain.

It would be necessary to supplement the mid-day meal programme by the formation of an efficient school medical service. Certain larger

and more progressive local bodies have already organisations dealing with this aspect, although the possibility of further improvement in these cannot altogether be ignored. A large majority of the school population in the country, however, is left untouched by such local schemes. Periodical medical examination is one of the methods to keep a check on the results obtained from the introduction of schemes like physical education and mid-day meals in schools. Apart from this fact, it permits the introduction of improvements wherever necessary and is of invaluable assistance to the child who may need medical attention for conditions which otherwise would have passed unnoticed. Therefore, the provision of a school medical service should form an integral part of a well conceived mid-day meal programme.

There are well known methods for the evaluation of nutritional status of children. These have recently been carefully considered by the Nutrition Advisory Committee of the Indian Research Fund Association, and have been tabulated for use. It is advisable that these methods are utilized by the personnel in charge of child health inspection. A certain amount of training would of course be necessary, and for this facilities exist at the Nutrition Research Laboratories, Coonoor. If the authorities concerned depute suitably qualified medical personnel to be trained at Coonoor I would only be too glad to render all possible help.

In my talk of today I have purposely restricted myself to the needs of children. I do accept

that ill-health due to under-nutrition or mal-nutrition or both is as rampant in adults as it is in children. While we should certainly take steps to improve the lot of adults, we are in duty bound to consider first the problem of the future generation lest the ill effects now seen are made to last for another generation. The effects of mal-nutrition are slow and insidious in onset, unless an acute condition is precipitated by almost total deficiency in one or more nutrients. Similarly the ill effects of sustained undernutrition are not appreciated since they are not as spectacular as those resulting from starvation. But in the long run, they are more dangerous, since they undermine the health of the population. The great capacity for adaptation, which living beings possess, renders it possible for man to live and lead an active life, to reproduce and multiply, in spite of continued malnutrition. But the progeny of such people undoubtedly suffers a set back at the very start of life as can be shown by the poor state of physical development in the average Indian child. It will take more than a generation to demonstrate beyond doubt the improvement in health brought about by the improved dietary of the children even if ameliorative schemes are put into effect immediately. People in authority are usually impatient and are only satisfied if quick results can be produced. They are too ready to cut off the supply of funds for nation building schemes like the mid-day meal programme. For such people I would advise patience for they should know that "Rome was not built in a day."

Health is the vital principle of bliss
And exercise of health.

—(Thomson)

MALARIA CONTROL IN BOMBAY PROVINCE

by
Our Staff Specialist

Bombay was the last presidency to start Malaria Control and Madras was the first. So far as Madras is concerned the less we talk about the results the better.

From an account of the work done in the Bombay Presidency, one would be agreeably surprised at the spectacular results achieved. It is difficult to apportion appropriately the credit among all those who took part in executing the programme. There is no doubt that Dr. M. D. D. Gilder, Minister of Health, Bombay, deserves a large share of the credit for his having given all facilities for his advisers to go forward enthusiastically with the work they planned out. The technical advisers have on their part plunged into the work with a gusto and enthusiasm to achieve results. The Bombay experience proves also that far from being a handicap, a trained medical man can achieve a lot as a Minister of Health. It is altogether wrong to presume that technical men should not be Ministers of the department in which they have specialised.

—Ed. P.H.

ORGANISATION

Bombay presidency had a population of 20 millions; but subsequent to the integration and merger of States, it has now a population of 30 millions. The Malaria organisation in Bombay province started in 1942 much later than most of the provinces in India; but despite the late start or perhaps because of it, it has been able to avoid the mistakes of other similar organisations. It has carried out a steady programme of survey, research and control.

The organisation consists of an Assistant Director of Public Health and an Entomologist at the top and several field units. It was visualised that a Malaria Engineer also should have been included; because at that time it was felt that no Malaria organisation could at all function without a Malaria Engineer. The need is just as urgent now with the use of large scale equipment and spraying technique calling for accurate observation regarding dosage, particle size of insecticide used, most effectual and economical

spraying equipment, labour problems, etc. It is hoped that the organisation would soon fill this void.

PLAN OF WORK

A restricted but sufficiently large area was first taken up for survey, research and control. From 1942-45 Kanara district was the scene of such activities. After demonstrating in this district that malaria control is not only feasible but extremely worthwhile, surveys of other districts have been taken up.

At the end of the survey, proposals on a district-wide basis are formulated and, after government sanction, control measures are instituted.

At present malaria control measures are being carried out on a district-wide basis in every malarial village in six districts: Dharwar, Kanara, Thana, Kaira, Ahmedabad, and Bijapur. In a portion of Poona district including greater Poona urban area, similar work is in progress.

The total population that is at present receiving malaria control measures is approximately 5 millions, and the actual total budget is Rs. 20 lakhs per year.

The five survey squads will complete the malaria survey within the next two years and if the same pace of progress is maintained it should be possible that within a period of 3 to 4 years, the total population of 30 millions is included within the scope of malaria control at a total estimated cost of Rs. 15 million per year approximately. A most gigantic undertaking but a most fruitful one too—all honour to the Hon'ble Dr. M. D. D. Gilder, Minister of Health, Government of Bombay.

AN EXAMPLE FOR OTHER PROVINCES

The common mistake that is made in established malaria organisations in various provinces, is either to concentrate the technical staff at



headquarters without adequate field units or to have a number of field units without headquarters staff of adequate status and experience, so that there is no effective co-ordination and guidance.

Madras itself has passed through these unwholesome phases during the last 20 years although it was one of the earliest Provinces in India to establish a malaria organisation. There is however, considerable attempt made in recent times of planning on right lines.

PIONEER RURAL MALARIA CONTROL: SPECTACULAR RESULTS: 300,000 MALARIA CASES SAVED

The successful research activities of the Bombay organisation attracted technical notice to such an extent that when a large scale malaria control scheme involving 1,000 villages and a population of one million at a recurrent cost of 4 lakhs of rupees was submitted, there was not the usual apathy that public health schemes

suffer at the hands of administrations and the scheme was immediately sanctioned. The results of this pioneer scheme are worth mentioning.

During each of the last three years there has been a saving of 300,000 cases of malaria in the scheme area and in accordance with an estimate of Sinton, a reputed authority on malaria, each case of malaria involves at least six days loss in wage-earning capacity. At the present-day wages of Rs. 2 per day even to the unskilled worker in that Province, this involves a saving of Rs. 12 per malaria case saved, and therefore of about Rs. 3,600,000 saved by the control of malaria. For bringing out such a result as mentioned above, the annual expenditure is only Rs. 4 lakhs. Never before have public health measures been demonstrated as an extremely practical proposition even in terms of solid cash but who can put a price upon the conquest of a disease which acts in a vicious circle, makes the malarious poor and the poor malarious and saps the vitality of the nation. Apart from reducing malarial morbidity these measures have resulted in a considerable increase of the population to the extent of 7 to 8 per mille. From decade to decade from 1881 to 1941 for which detailed figures are available, the population has been steadily declining. The course is now altered to an upward trend. Whatever views students of demography may have on bringing about increase in population at a time when the country is suffering from want of adequate supply of food, there is no question of doubt that so far as the immediate objective of the public health worker is concerned, saving of life is his sacred task. More than that increase in local population in a district with virgin soil, copious rainfall and thick forests is far more likely to bring about increased food production than by any attempts at colonising the area with displaced and disgruntled persons from other parts of the country.

COLLATERAL BENEFITS-CONTROL OF OTHER INSECT-BORNE DISEASES

Apart from such direct effects of malaria control, during the last three years, there has not been a single case of plague although there have been instances of rat falls due to plague. In other words there has been plague in rat but no plague in man. Despite the appalling housing conditions in this country, man fortunately, has not yet started to live inside the rat burrows and the infective fleas, before they transmit plague to man should get access to him in his room and when this is sprayed there is no possibility of the survival of the infected flea.

Thus application of insecticide to houses only leads to the control of more than one insect-borne disease. There has been no recorded instance anywhere in the world of any anti-rat measures such as baiting and trapping having substantially brought out any reduction in rat population. Without minimising the importance of improved housing conditions and provision of rat-proof houses and godowns it is obvious that they must be deemed as long-term plans. But DDT provides to the public health worker an immediate measure of disease prevention by treating the chain just before the infective flea gets access to men. Several public workers may express surprise, how plague could be controlled if rats are ignored. Sufficient has been said above to explain the mechanism by which it is possible to prevent the transmission of plague on to man. Yet another benefit that is being observed in the scheme area is the very considerable reduction in the number of deaths due to dysentery in areas where cattle sheds are also sprayed with DDT as in Dharwar district. These are not included in Kanara for the Kanara Malaria mosquito is found to rest mostly in houses. The Dharwar malaria mosquito is generally found to rest more in cattle sheds. But in the appalling housing conditions the poor mosquito fails to detect which is man and which is beast

and even a cattle feeding mosquito gets an opportunity to bite man and transit malaria.

PREMISES SANITATION

The collateral benefits raise DDT spraying to a new concept of *Premises sanitation* which includes control of all insects of public health importance. In the experience of Bombay authorities there has been no public health measure which has been received with such enthusiasm and public co-operation as the application of DDT, in every house-hold. In fact times out of number the opinion is expressed by every villager, that only two aspects of government administration have reached him—one is the collection of taxes and the other the application of DDT.

DOUBTS CLEARED

A question is often asked in connection with this ideal of premises sanitation whether it would succeed by itself. The control of mosquito larvæ in the water places constituted the sole measure of malaria control in the past. It need hardly be stressed that in the cycle of child and adult, the whole population can be reduced irrespective of the fact whether the child or the adult is primarily attacked. The method of choice would depend on feasibility of application and the costs involved. In urban areas with large populations where the spread of water places is comparatively limited when compared with the total population—no doubt the method of choice would still be anti-larval control but even here it would be of advantage to treat the peripheral area at least with DDT spray. But for the control of rural malaria in any province in this country, there is not the slightest shadow of doubt that the application of DDT is the only practical and economic method at the present day.

Another question is asked how DDT would succeed if the mosquito takes the bee line at

night to the skin of man, completes its meal of blood and shoots out into wild during the night itself. It would be like locking the stables after horses have bolted. DDT will fail to act in such cases, but no Indian anopheles is such an acrobat!

Some people seem to think that since DDT destroys mosquitoes only after some time after contact, it will be better to add some knock down material to be able to destroy the mosquitoes immediately. So far as the public health administrator is concerned, he is not a sadist. He does not want to see the carcass of his enemy so long as he is dead.

NO EVIL EFFECTS

Finally, men and cattle have been in close contact with the DDT for last 3 years, but there has not been even a single instance of evil effects to men or cattle.

RAILWAYS AND MALARIA

How far has railways been contributing to the spread of Malaria?

It is an accepted fact that any engineering which leaves a trail of malaria behind, is bad engineering and Railways have no doubt in the past been associated with leaving behind their constructional projects considerable added facilities for the transmission of malaria. Time and again the Indian Research Fund Association has stressed on the Railway Board the need for establishment of a permanent malaria organisation in each of the railways and to take adequate steps for the control of malaria in the railway colonies themselves and what is more important for the prevention of malaria effectively in the constructional projects in which the railway may be engaged. With a few exceptions, this recommendation has been ignored. B.N. Railway, however, has carried out schemes of control-measures and its output must be an eye-opener to other railways. However, even within the

143148

considerable limitations in which malaria organisations have to work, there is considerable scope to improve the lot of the railway employees themselves. The question of creating malaria-breeding grounds is perhaps not of the same degree of importance at the present day, when modern methods of large scale malarial control by the application of insecticides are available. One would not, naturally, like to add to the malarial effects even if control measures are practicable; but even in the absence of constructional projects, the application of DDT would, in any event, be necessary. It would no doubt be ideal still that every railway constructional project aims to avoid, as far as possible, the creation of malariogenic factors. One of the factors which has been associated with railways with reference to malaria is that it adds to the possibility of insects being carried from long distances to different areas. For instance, there was a scare some years past in Calcutta that the B.N.Ry., was possibly importing *A. sudaicus* from Calcutta into Orissa and Vizag. There has been no positive proof for this. However, one fundamental factor deserves to be noted here. Railway carriages in the past, were notorious for the rapid migration of bugs throughout the country. Application of insecticides to every railway carriage, would in any case therefore be, a very necessary measure of sanitation vital not only to destroy all the bugs but also insects of proved public health menace. The cost is extremely small. The time has come when the administrations and the public must realise that spraying every surface with DDT is as important as painting the wood or whitewashing, because its effects are so far-reaching.

CORRECT PERSPECTIVE OF THE ROLE OF ENTOMOLOGIST

Malaria control measures may perhaps engender a facile idea that whenever there is any complaint of malaria, send for the malarialogist and his

DDT. Some workers have even gone to the extreme extent of saying that with the advent of DDT there was no longer the vital necessity, even in the first instance for making mosquito surveys. Nothing can be farther than truth.

The dosage of application of DDT, the frequency of spray, the structures to be sprayed are all of vital importance for economy and efficiency. It has been found in Kanara, after a patient study, that structures should be sprayed at intervals of two months. Quite possibly the interval may be extended. In Dharwar, where the malaria-carrying mosquito is the same as in the greatest part of the country, it is necessary to spray DDT at intervals of six weeks. The dosage for effective malaria control is about 56 milligrams per sq.ft. The European and American workers apply about 180 to 200 milligrams. Some of them claim that even a single application is quite enough to keep off the malarial insects.

In public health practice one is not out to exterminate but merely to keep the insects within the critical threshold so that the cost may be maintained at the lowest level. Further researches are no doubt necessary in this country whether the present methods of repeated smaller dosage are more effective, or the experience in western countries may be usefully adopted.

The studies so far carried out, however, are in favour of repeated smaller dosage presumably because of various environmental factors encountered, humidity, temperature, wind action, dust, nature of surface, etc. Above all, the practice that is not uncommon of smearing the walls with cow-dung, mud plaster, etc., on the part of the villagers renders DDT however large the dose ineffective.

ERADICATION V/S. CONTROL

Malaria control has progressed along well defined stages of development. Emphasis is almost entirely now directed against the adult

mosquito. A more recent advance is in the direction of total eradication. This is not considered economically possible in this country. Furthermore, eradication of malaria conflicts with the ideal of premises sanitation emphasized above, because measures of eradication are confined to malaria while premises sanitation aims at the destruction of all insects of public health importance.

SELF HELP OR STATE HELP ?

Finally, one of the questions that may be asked is whether the premises sanitation should be left to the individual application on the part of the householder or taken up as a state enterprise. At a time when the difference between

the state and the subject is rapidly disappearing, it makes very little difference which agency carries out the operations, the sole consideration being the thoroughness with which they are carried out.

The mosquito is no respecter of geographical or political frontiers. Unless all the householders can be expected to be health-conscious, individual enterprise would leave loopholes and the conscientious house-holder would suffer for the lack of co-operation of his neighbour. State enterprise would therefore seem preferable and since no service can be made without payment, a small per capita fee could be reasonably levied and the scheme made self-supporting.

THE ANOPHELES GAMBIAE PROBLEM IN BRAZIL AND WEST AFRICA

"Experience at U. S. Army installations in West Africa in 1944 demonstrated that the *A. gambiae* threat to the Americas could be successfully combated only by the establishment of effective environmental control over *A. gambiae* breeding in and near those airfields from which trans-atlantic flights were made. Aircraft spraying is valuable only as a supplementary measure. Environmental measures of control over *A. gambiae* at trans-atlantic air terminals should aim at local species eradication, bearing in mind that the practicability of this procedure depends on local conditions. The successful antigambiae program of the U. S. Army in 1944 directly contributed to the marked reduction in malaria rates among U. S. Army military personnel at West African stations. An antimalaria program based on individual protective measures may be highly successful, but it remains essentially unsound until environmental control over the mosquito vector has been established.

"The success of the 1944 antigambiae program at U. S. Army installations in West Africa is primarily the result of the loyalty and devotion to duty of the officers and men of the Administrative Section, the 2759th Provisional Malaria Control Unit, the 16th, 19th and 212th Malaria Survey Units, and the 27th, 29th, 33rd, 108th and 118th Malaria Control Units."

(P. H. Engg. Absts.—Aug-Sept. 48)

PLANNING A PEDIGREE COW RESEARCH ON FODDERS

Since primitive days animals have played a great part in meeting the needs of man. The nomadic man met all his needs from the flock, its meat and milk as his food, its fur as his clothes, and even sometimes its bones as his weapons.

But then, to expect the best out of the animals, the latter also needs in turn proper and adequate food, proper maintenance, and care during sickness. If the land is to be ploughed properly, the bullocks should be strong and healthy. If fresh milk is required for the child, the mother cow—so aptly venerated in India but so poorly looked after from a practical point of view—should be properly treated, should have enough food to eat, enough concentrates to provide for the necessary nutrition and adequate attention when she is sick or in a delicate state of health.

SAHIWAL BREED

Although India possesses the largest cattle population of the world the milk production in the country is extremely low. The average daily consumption of milk per man in India is 5 ozs. as against 41 ozs. in the U.K. and 36 ozs. in U.S.A. In the cattle division of the Indian Agricultural Research Institute, New Delhi, experiments on the improvement of Sahiwal breed of Cattle—a milch breed—have been undertaken for a long time and some striking results obtained.

The experiments on the Sahiwal breed are directed towards (1) increasing the milk yield; (2) early maturity of cows; (3) reduction in the dry period; and (4) production of good breeding bulls. Some of the interesting results obtained through careful management and controlled feeding are:—

The increase in milk yield recorded has increased from 10.5 lbs. in 1914 to 20.9 lbs. in 1947;

The age of calving has been reduced from 41 months in 1904 to 29½ months in 1947;

The dry period of the cows has been reduced from 208 days in 1938 to 133 days in 1947.

Besides, a large number of good breeding bulls has been produced and sold to provinces and states. The milk yielding capacity has been substantially improved as compared with the normal cow. A cow kept under controlled condition in this dairy produces as much milk as 10 village cows. The consequent economy in fodder is remarkable as while the pedigree cow in the Institute requires 13 lbs. of dry fodder and 8 lbs. of concentrates, the food requirements of 10 village cows are at least 120 lbs. of dry fodder and 8 lbs. of concentrates.

Tamili, one of the cows in the Institute has yielded 13,004 lbs. of milk in a lactation period of 306 days which works out at 42.5 lbs. or roughly, more than ½ maund of milk per day. India, however, has still to make up a large leeway as this result, though satisfactory, is less as compared with the maximum yield in some other countries.

GROWTH RATE OF HEIFERS

The growth rate of heifers is studied at the Institute and steps are taken to check any deficiency or deformity as soon as they are noticed. A healthy heifer in the Institute is expected to grow at the rate of 1 lb. every day up to the age of six months and at the time of mating, which is not permitted before she is one and a half years old, she should weigh at least 600 lbs. If she does not show these results, expert veterinarians take measures to correct the deficiency.

Pedigree cows and bulls bred under controlled conditions in the Institute are supplied to provincial governments to serve as nucleus stock in experimental cattle farms. Some of the animals are also occasionally sold to the public, although all cows above certain standards are usually given to provincial governments and cattle farms.

FODDER REQUIREMENTS

Provision of good food to the cattle is an important requisite for maintaining their efficiency as

well as their productive capacity. India's fodder resources are limited while the cattle population is very large. The result is that most of the cattle are undernourished except probably the few owned by wealthy people.

The Institute is doing considerable research work for improving indigenous grasses and in introducing some of the foreign fodder plants in India. A grass and legume nursery has been established in the Institute which has collected sixty different species of grass, both indigenous and exotic. There are besides 33 legumes. A species of grass from Madras Presidency—botanically called *Panicum repens*—on which research is progressing, promises to produce good results. Preliminary investigation has shown that its protein content is very high. Investigations are in progress to study how grasses and legumes could be associated in the cropping system, with a view to ensuring a perennial supply of fodder. The provincial governments have been supplied with names and specimens of 15 different types of grasses and legumes to try them in their areas as they have shown promise

both as good fodder as well as for soil conservation.

KUDZU VINE

An interesting experiment is being carried out at the Institute on the possibilities of cultivation of Kudzu Vine, a climbing plant which is used extensively in the U.S.A. as fodder as well as for soil conservation. The fodder growing capacity of this plant is great; it produces as much as 500 mds. of fodder per acre. A variety of this plant is also found in India in the Khasi Hills in Assam. If successfully introduced, it is likely to relieve to a great extent fodder shortage in the country. One species of this plant which was sown at the Institute two years ago has spread rapidly to cover a circular area of 1,400 sq. feet. The plant is evergreen, needs no irrigation and is perennial. Its soil holding capacity is very great. The roots which go down deep hold the soil in its numerous roots like an octopus, so that Kudzu Vine, if cultivated on the hill slopes or where soil is loose should also serve as a great preventive to erosion.

(Courtesy, Press Information Bureau, Govt. of India)

(Continued from page 439)

disquieting feature. However, it augurs well for the future. Incidentally, we have action, unaccompanied by talk—tall platform talk. In evidence of this happy augury, the Ministry have now issued orders to build up a reserve of cast-iron pipes to get over the usual plea trotted out to justify the do-nothing-policy.

There is also one other point which requires immediate consideration. Mere allotment of funds for the purchase of materials from abroad, cannot land the materials at the work spot. Negotiations at higher levels would be neces-

sary to get the necessary sterling and or dollar exchanges. In addition to this, the agency for the procurement of materials should be sought for. Unless someone in high authority keeps a vigilant eye over these aspects, we are afraid nothing tangible would result from budget allotment of funds.

The provision of budget allotments alone will not do. The foundation for a stable and efficient organisation should now be laid. Unless this is done, history is likely to repeat itself in that, budget allotments will remain as budget allotments only.

SANITARY QUALITY OF GROUND-WATER SUPPLIES

by

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INTRODUCTION

Ground-water supplies, when properly developed in suitable localities, are generally recognized as the least contaminated of natural waters. Their purity is the result of the action of many factors that are unfavourable to bacterial life and thus tend to prevent the transmission of harmful bacteria from an original source of contamination. Among the factors which tend to eliminate bacteria in ground water are the low temperature, commonly below 55°F. in this region; the alkaline character of most natural waters; the general absence of food supply in rock materials at some distance below the root zone; and the effects of capillarity and lowering of the surface of the water-saturated zone, which may result in death of bacteria by drying. Bacteria requiring oxygen especially tend to accumulate near the water table (the upper limit of the zone of saturation), where they may subsequently be unwatered and killed by a lowering of the water table.

With these factors operating to remove harmful bacteria from ground water, the distance which those bacteria may be carried from a source of contamination is dependent largely upon the rate of movement of the ground water. In soluble limestones and porous lavas having large caverns formed by solution or flow tunnels, ground-water may move without filtering action at rates of a mile or more a day by turbulent flow, similar to that of streams. Indeed, solution channels in limestone may be large enough to receive the entire flow of a stream, which then flows underground for some distance, and may reappear at the surface as a spring, still carrying

its suspended mineral load and its chemical and bacteriological impurities. Turbulent flow underground, however, is the rare exception rather than the rule. Most ground-water moves by laminar flow, or diffuse percolation, through interstices and fractures whose dimensions can ordinarily be measured in fractions of a millimeter. The velocity of movement is dependent upon the size of these interstices and upon the hydraulic gradient. At a hydraulic gradient of 1 per cent the average rate of movement has been estimated by Tolman to be about 30 feet per day in gravel having grain sizes of 2 to 10 m.m., 6 feet per day in coarse sand of grain size 0.5 to 2.0 mm., 1 foot per day in medium sand 0.25 to 0.5 mm., and less than 25 feet per year in silt and fine sand having grains of 0.005 to 0.25 mm. in diameter. If the water-bearing material is poorly sorted or partly cemented, the permeability and velocity of movement may be reduced far below these figures.

OCCURRENCE OF GROUND-WATER IN THE WESTERN UNITED STATES

In the western part of the United States the broad basins or valleys that lie between the mountain ranges generally contain great deposits of rock waste that has been washed down from the mountains. These deposits are commonly called valley fill. The valley fill is the great water-bearer of the arid part of the United States, and doubtless ranks first among all formations in the country in the quantity of water delivered through wells. The streams tributary to these valleys transport debris from the mountains—including particles of all sizes from clay to large

blocks—and deposit it along their channels from canyon mouth to the floor of the valley. Unassorted or poorly assorted material is deposited by torrential streams and sheet floods, and the larger perennial streams also deposit beds of well-assorted gravel, sand, and finer materials in the valleys. Many of those valleys now contain lakes in their lowest portions, and others have held lakes in past geologic ages in which have been deposited well-assorted lake clays in the central parts of the valleys, and gravel or sand deposits near their shores.

In general the coarsest debris is deposited near the mouth of each canyon, and forms the apex of the alluvial fan built by the stream. Clean gravels deposited by large streams or reworked by lakes in these localities are excellent producers of water, but it is commonly necessary to pump the water from a considerable depth below the ground surface. If there are unassorted products of torrential deposition between the surface and these water-bearing gravels, they may protect the water supplies from surface contamination. Nevertheless, bacteria may travel for considerable distances in permeable gravels, and contamination of water supply is a possibility that should not be overlooked.

At greater distances from the bordering mountains, the valley fill consists generally of an increasing proportion of finer materials, and silt and clay commonly predominate in the central or lowest part of the valley. Ground-water may be encountered at shallow depth in permeable silt, sand, or gravel at or near the ground surface, and this water occurs under water-table conditions unless it is separated from the surface by impermeable clay. This is the water that is typically encountered in dug wells or shallow bored wells, whether along stream or canal channels, in river flood plains, or distributed over the valley floor. As this shallow ground water moves from the borders of the valley to the lowest part of the valley floor, generally above all clay

or other impermeable material, it is likely to deteriorate in chemical quality because it picks up alkali or salt deposits that accumulate as the surface as a result of evaporation, as well as mineral constituents dissolved by excess irrigation waters. Bacterial contamination is also common, for this ground water occurs just below the zone in which privies, cesspools, and drains discharge, and it may also receive contributions from sanitary sewers, storm sewers, and industrial wastes. Although the ground water in these parts of a valley commonly moves at a much slower rate than in the coarse gravels near the borders of the valley, the chances for pollution are greater because of the greater number of sources and the nearness of the water table to the surface. The inferiority of this shallow source is well recognized in Utah, and the great majority of wells tap deeper sources. Nevertheless, there are numerous dug domestic wells adjacent to canals and streams in certain parts of the State which yield essentially surface water with a slight amount of filtering.

Among the very important sources of water in the valley fill of Utah and other Western States are the gravel and sand beds that are overlain by impermeable clay or other material. The water, confined in the gravel by this overlying clay, is under artesian pressure and may flow at the surface when encountered in wells. The confining layer effectively prevents contamination from reaching the aquifer, and a well properly constructed with good casing that extends to the aquifer will most certainly yield a water supply free from harmful bacteria. In flowing wells especially, because of the outward pressure of the water, contamination is very unlikely.

The solid rocks that form the mountain ranges and plateaus and extend under the valley fill are locally important producers of water in the Western States. Limestones in Utah mountains give rise to many springs, some of which have

been utilized for municipal supplies. Limestone is also the aquifer which produces water for the important Roswell artesian basin in New Mexico. Because water is capable of developing large solution channels in limestone, there is a possibility that contamination may be introduced into the water supply from relatively distant sources. The lavas of the Columbia Plateaus, covering more than 200,000 square miles in Idaho, Oregon, and Washington, yield water freely from joints, large openings, and porous zones. Like limestone, this rock carries water through large openings, and contamination may travel long distances from its source.

Sandstone is a relatively unimportant aquifer in the West, both as to number of wells and total yield of ground water, but it is the major source of ground water over extensive areas of the Colorado Plateau in Utah, New Mexico, Arizona, and Colorado. For the most part these sandstones, partly cemented, yield only moderate amounts of water, but owing to their texture they filter the water so that contamination will generally travel only a short distance from its source.

POSSIBLE SOURCES OF CONTAMINATION OF WATER SUPPLY FROM WELLS

It has already been suggested in discussion of the water-bearing rocks that the water in the aquifers themselves can be contaminated. Ground water under water-table conditions may be contaminated by direct downward percolation from cesspools, privies, sewers, and polluted streams, or the contamination may be transmitted to the water table through abandoned wells, drainage wells, or animal burrows. Careful selection of the site for a well is the obvious means of avoiding such contamination. For approved public ground-water supplies, the Public Health Service requires at least 50 feet, and others have recommended 150 feet, as the

minimum distance of a domestic well from a possible source of contamination, provided that the well is not in the direction of movement of the ground water from that source. Since bacteria find the optimum living conditions at the horizon of the water table, wells should be tightly cased from the surface down to a point several feet below the water table.

Although current standards have been empirically developed, experience has indicated that they are reasonable for average conditions. As an example, the city of Parkersburg, West Virginia obtains its water supply from 16 wells located 100 to 150 feet from the low-water line of the Ohio River. The Ohio River water, generally containing several thousand bacteria and an abundance of coliform bacteria, undergoes sufficient natural filtration or other changes to lose its objectionable pathologic properties before reaching the wells, for the coliform bacteria content of well waters as shown by daily tests was continuously less than 9.2 per ml. in 81 of the 85 months between 1935 and 1943, and objectionable tastes and odors were absent. However, existing standards are not yet adequately supported by systematic study of the capacity of various types of water-bearing materials to screen out or eliminate bacteria. Co-ordinated effort of ground-water hydrologists and sanitary engineers is needed to furnish data as to "safe" distances from contaminating sources under various conditions of permeability and rate of movement of ground water under water-table conditions.

Artesian aquifers are ordinarily safe from contamination by reason of the over-lying impermeable layer which creates the artesian condition. Conceivable sources of contamination, however, are drainage wells or other wells which may dispose of wastes or otherwise carry contaminated water to the aquifer. Prevention of such discharge into aquifers is the best solution of this problem: otherwise care must be used in

selecting sites sufficiently remote from the polluting source.

In most instances of well-water contamination that have been described in technical journals, improper construction of well, well-housing, collecting system, or reservoir has been concluded to be the cause of the contamination. If the casing is broken, corroded, or open at the top, or if there is not a tight seal to prevent downward migration of water around the casing and into the well, contamination may result. Well houses, collecting systems, and reservoirs may likewise introduce contamination if improperly constructed or subsequently damaged.

ADVISABILITY OF CHLORINATION OF WELL WATERS FOR PUBLIC SUPPLIES

The drinking water specified by the U.S. Public Health Service as requiring no treatment are limited to "under-ground waters subject to no possibility of contamination as shown by regular and frequent inspection and laboratory tests." On the other hand, the water from most of the wells that the Army and Navy have used at their major installations in Utah is regularly chlorinated prior to use, even though many of those wells are so deep and so remote from possible sources of contamination as practically to assure bacteriological purity. Army regulations specify that all ground water from new sources should be chlorinated until its safety has been assured by repeated bacteriological examinations and contained until there is no possibility of contamination under any circumstances, and permanent use of chlorination apparatus has doubtless been adopted in order to assure adequate safety of water supplies.

Salt Lake City owns a group of flowing wells in an artesian basin near Murray, and chlorinates the water from these wells when used for municipal supply. In this case, however, the collecting system includes some soil pipe which has devel-

oped several leaks, and the chlorination is a protective measure against possible entrance of contamination into the collecting system.

Perhaps the best commentary on the advisability of chlorination of well-water supply is the experience of the city of Houston. As described by Sauls and Harvill, all municipal water supplies for Houston came from 31 wells in 1932, when the population was about 300,000. The wells penetrate the Beaumont clay, about 300 feet thick, and obtain water from underlying sand beds aggregating 500 feet in thickness, at depths of 300 to 1,850 feet below the surface in the city limits. The outcrop area of these aquifers is 15 to 50 miles north-west of Houston, and the water moves down a gradient of about 35 feet per mile. The rate of movement is estimated to be about 200 feet per year, so that it would take 3 to 25 centuries for rainfall upon the outcrop area to reach the city wells, protected from surface contamination at all times by the overlying impervious clay.

The city wells were drilled with every sanitary precaution, including care that workers did not contaminate the area, and sterilization of well and equipment during construction. Nevertheless, during the years 1930 to 1932 every one of these wells at some time showed contamination in excess of that allowed by U. S. Public Health Service standards for untreated water (coliform bacterial content 10 per 100 ml.), and the longest period during which an individual well yielded water within safe limits was one year. At that time there were also 450 private wells in Houston which were used daily by an estimated 75,000 to 100,000 people. Of 13 private wells sampled only one came within the allowable standards in contamination for untreated water. The conclusions from these tests were that, although the aquifer could generally be considered safe from contamination, the dense spacing of wells in Houston would permit local contamination in case of flood or as a result of discharge of

waste into abandoned wells, of which there are 116 in the Houston area. As to the city wells, although the causes of contamination were not traced in all cases, it was shown that repair work on the wells increased the bacterial count and that wells could not be thoroughly sterilized even with a solution containing 100 ppm of chlorine. Chlorination of public supplies was thus recommended for safety but not as a substitute for adequate precautions in selecting a well site, and in construction.

The city of Ogden, the largest user of ground-water supplies in Utah, now has a problem of possible contamination of its well-water supplies. The bulk of that supply, amounting to as much as 21,000,000 gallons per day in summer, is obtained from the artesian basin which underlies Pine View Reservoir in Ogden Valley. The artesian aquifers, receiving water from a recharge area several miles to the east, are considered reasonably safe from contamination, but the fluctuations of level in Pine View Reservoir have caused breaks in the collecting system in recent years, with the result that the municipal supply may have at times been augmented by water of questionable purity from Pine View Reservoir. Much of the collecting system can be inspected only when the reservoir is drained. Although the city has made several improvements to assure that these breaks do not recur, there is the possibility that other failures may occur and be undetected for months, and Ogden is wisely chlorinating all water supplies drawn from the basin.

TESTS TO DETERMINE SOURCE OF CONTAMINATION

Numerous instances have been described in technical journals in which wells after yielding water of satisfactory quality for extended periods, have developed evidences of contamination. If the source of this contamination is suspected, fluorescein dye may be introduced into the suspected source and, if identified in the well water, will prove the connection.

No instances are known where bacteriological contamination has been traced by hydrologic methods to an unknown source, but these methods have been used successfully to trace the source of gasoline which was contaminating wells in Arlington, Virginia. For several years a small area in that town was troubled by accumulations of gasoline fumes in basements, sometimes in toxic or explosive concentrations, and by the presence of gasoline in water wells. One of these wells yielded 8,700 gallons of red gasoline with a wartime octane rating, and the source was postulated to be a leak from one of the buried storage tanks, of which there were at least seven within a radius of 1,000 feet from the contaminated wells. In order to determine which of these tanks was leaking it was necessary to drill eight test wells to define the limits of the contamination, and then to plot the position of the water table, based on measurements in these eight wells and in eleven other wells in the vicinity. The direction of movement was thus determined, and the gasoline traced to its probable source.*

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WATER SUPPLIES

"Still problem to decide when expedient to build small reservoir for water supply. Cannot be denied that farmer just as much entitled to sufficient and safe supply as city dweller, yet small reservoirs can only be economical when they serve relatively large territory. Small installations require careful planning to get foolproof operation by relatively little-trained personnel they can afford. Small reservoirs also require very careful study of dam structure, its location and geological condition. Hydraulic conditions and especially problems of pollution and biological growth in water may be completely different from those encountered in large deep reservoirs.—R. A. C.

(From "Public Health Engineering Abstracts.")

FREE EYE CARE FOR ALL IN BRITAIN

Optical Services In National Health Scheme

by

Laurence Dopson

About 5,821 optometrists and around 620 dispensing opticians are taking part in the free ophthalmic service which forms part of Britain's National Health Service. In addition, there are 1,126 ophthalmologists. Before the service began it was estimated that the demand for spectacles would be just under 4,000,000 a year. But the actual demand at present is between 8,000,000 and 9,000,000.

How the service works is explained in this article, the author of which is a writer on medical affairs and contributes to leading medical and nursing journals in Britain and overseas. He has made a special study of the National Health Service.

A free ophthalmic service, including the provision of spectacles, forms part of Britain's national health service, which began on July 5 last. The ophthalmic service is proving extremely popular, the demands upon it being much greater than had been anticipated. The number of those who had their sight tested up to January of this year was over 3,000,000 and the number of spectacles supplied or on order was over 4,500,000. No fuller details than this are available for the whole of Britain, but two London areas of different character give an indication of what is happening throughout Britain and lead to some interesting conclusions.

In the first area, which has a population of some 120,000 the number of sight tests performed by ophthalmic medical practitioners up to January 31, during the first seven months of the scheme, was 3,056, and the number performed by optometrists (ophthalmic opticians) was 14,465;

the number of prescriptions dispensed was 9,545.

In another district, with a population of 246,888, the figures up to January 31 were: sight tests by ophthalmic medical practitioners 7,939; sight tests by optometrists 21,942; prescriptions dispensed 12,860. Both areas are "dormitory" suburbs, but the former mainly working class and the latter mainly middle class.

It would appear that more use is being made of the service in the working class area, and that the proportion of those coming forward for tests in that area who are found to want glasses is higher than in the other, taking the proportion of the number of prescriptions dispensed to the number of sight tests.

It is also interesting that more people in the middle class area appear to visit the ophthalmologist than the optometrist; it is significant that in the middle class district there were fewer

sight tests, but more of these were conducted by ophthalmic medical practitioners.

ULTIMATE AIM

It is intended ultimately to base the ophthalmic service entirely on hospitals, which are arranged under regional boards. When the Minister of Health is satisfied that the ophthalmic services in a particular district are being adequately provided by the hospital and specialist services, he can make that the sole source of sight testing and supply of spectacles. The conversion into a hospital ophthalmic service is, however, a long-term plan only, and among the limiting factors are post-war building difficulties and the need to keep capital expenditure to a minimum.

Some hospitals have now appointed optometrists to their staffs and others are advertising for them. This, however, does not necessarily represent a step in the creation of such a plan; optometrists are needed in hospitals because certain appliances may be supplied, under the national health service, only through hospitals. Opticians in hospitals perform sight tests as they would in private practice. The departments are in the charge of ophthalmologists of specialist standing.

Although at present a certain amount of ophthalmic work is done in hospitals, the majority of it is done through what is known as the supplementary ophthalmic service, set up for the testing of sight and supply of glasses only. Persons requiring specialist medical treatment for eye conditions, or needing special kinds of lenses (such as contact lenses) or artificial eyes, have to go to hospital. Although the Minister of Health has the power to wind up the supplementary service at any time, it is hoped by many members of the profession that it will continue concurrently with any extensive hospital ophthalmic service.

It is felt that the present interim system, where the person sees the optometrist or the ophthalmologist in his private consulting room, is working

well and is more personal than would be a service provided wholly from clinics. All figures given in this paper refer to the supplementary ophthalmic service, unless otherwise stated.

Taking part in this service are ophthalmic medical practitioners, optometrists and dispensing opticians. About 5,821 optometrists and around 620 dispensing opticians are taking part in the service. These figures represent about 96 per cent. of the whole number in Britain. In addition, there are 1,126 ophthalmologists in the service. Opticians and ophthalmologists participating in the State scheme are allowed to take private cases as well, but private practice, at least so far as opticians are concerned, has dropped to negligible proportions and now amounts to about only four per cent. of the total work. Opticians are still allowed to sell the goodwill of their practices.

DOCTOR'S RECOMMENDATION

When anyone wants spectacles for the first time under the national health service, whether he is at present wearing glasses or not, he must first go to his doctor for a recommendation that his sight needs testing (special provision is, however, made for persons such as Christian Scientists to dispense with the visit to the doctor). The recommendation from the doctor, which is handed to the patient, explains that the patient is entitled to consult either an ophthalmologist or optometrist, as he chooses. A list of both is displayed in the doctor's surgery, in post offices and other places. Once a person has had his sight tested under the national health service, he can go direct to his optometrist or ophthalmologist when he feels his eyes need testing again.

Both ophthalmologists and opticians taking part in the service must first be approved by a central professional committee; firms or companies of ophthalmic or dispensing opticians can apply for admission to an ophthalmic list, provided that in all premises where ophthalmic services are provided, a qualified ophthalmic or dispensing

optician is in charge. Opticians are not allowed to advertise the fact that they are taking part in the service, beyond displaying a standard card.

If, after the ophthalmic optician or ophthalmic medical practitioner has made the test, he finds that the person needs glasses, he sends the prescription to the local ophthalmic services committee for approval. After this approval has been given, the applicant may take the prescription to any ophthalmic or dispensing optician in the service, to have the glasses made up.

There are 19 types of frame available under the national health service. He may choose one of 10 which are supplied free, or if he wishes to have one of the other nine, he is charged a small fee. If he wishes to obtain frames other than the official varieties, he has to pay for both frames and lenses.

Where anyone needs more than one type of spectacles, such as a pair for close work and one for long distance, he is supplied with the appropriate number of pairs; it is estimated that from 25 to 30 per cent. of applicants are issued with two or more pairs in this way.

BIG DEMAND

The average delay at present in the supply of spectacles is some four months, the hold-up being mainly in the preparation of lenses. Before the service began it was estimated that the demand for spectacles would be just under four million a year; at present, however, the demand is between eight and nine million. There was the usual seasonal falling off in applications for spectacles at Christmas, but the figures soon reached the peak again, and it is not anticipated that there will be an appreciable decline in the demand for some time to come. Ultimately, of course, it is reasonable to expect a drop after the initial demand, though probably at a figure higher than was originally anticipated.

The seemingly phenomenal demand for spectacles under the service is not really so surprising.

In a survey of old people in an English industrial town in 1948, Sheldon (*The Social Medicine of Old Age*, London, 1948) found that over 90 per cent. of them had spectacles for reading, yet of those, 17 per cent. had never had a sight test—they either bought their spectacles from a general store or travelling salesman or had inherited or been given them—and 35 per cent. had not had a sight test for over five years. That such figures are reflected in the national health service is shown by the experience of one optometrist, who found that 20 per cent. of those coming to him for sight tests under the service were over 65, and in a large proportion of cases it was anything up to 10 years since they had last had their eyes tested.

A writer in the "Optician" (London), has stated: "There is now positive proof that under-prescribing has been the rule" (that is, before the service). He draws attention particularly to the number of persons found to need spectacles for distant vision. An optometrist who surveyed the first few hundred patients he examined under the scheme has reported that 16½ per cent. had never worn glasses before, 47 per cent. had not been re-examined during the previous four to 10 years, and 19 per cent. were wearing glasses for which they had never been examined. It is estimated that not more than 10 per cent. of applications do not need spectacles.

INCREASED COST

Because the use of the optical service has been much greater than had been expected, the cost has been more also. Taking England and Wales only (that is, excluding Scotland and Northern Ireland, the cost from the start of the service to the end of the financial year, a period of nine months, had been estimated at £2,000,000 (Rs. 2.67 crores); in actual fact, it will be £12,900,000 (Rs. 17.2 crores).

Of the ophthalmologists and ophthalmic opticians working in hospital, some are full-time

staff whilst others are part-time and paid on a sessional basis, but the ophthalmic optician in the supplementary service is at present paid 15s. 6d. (Rs. 10-5-0) for a sight test; in addition, the ophthalmic or dispensing optician receives £1. 5s. (Rs. 16-11-0) for dispensing each pair of spectacles—a sum which covers the cost of frames and lenses and fitting, with a margin for loss, storage and so on.

The sight testing fee paid to an ophthalmic medical practitioner was £1 11s. 6d. (Rs. 21) on the basis that each test took 30 minutes. On April 1, this fee is being reduced to £1 5s. 0d., since it has been found that the average test takes only 24 minutes. The dispensing represents the average remuneration under the previous insurance scheme.

Optometrists have two bodies through which they deal with the Ministry of Health. One is the joint emergency committee of the profession (comprising representatives of various professional and examining bodies) which discusses general policy; and a "Whitley Council," which discusses details of service conditions. The Whitley Council is a special form of negotiating machinery set up in all parts of the national health service, there being a series of functional Whitley Councils comprising, in addition to that for opticians, ones for pharmacists, nurses and midwives, and so on; there is also a general council, with representatives from each individual council, to deal with matters common to all branches of the service.

COUNCIL'S COMPOSITION

Each Whitley Council consists of a "management" side, with representatives of the Ministry of Health, Department of Health for Scotland, regional hospital boards and local authorities, and a "staff" side comprising, in the case of opticians, representatives of organisations, including trade unions, which have optician members. The staff side on the Whitley Council includes dispensing opticians as well as optome-

trists, but the former have a separate negotiating body for general policy.

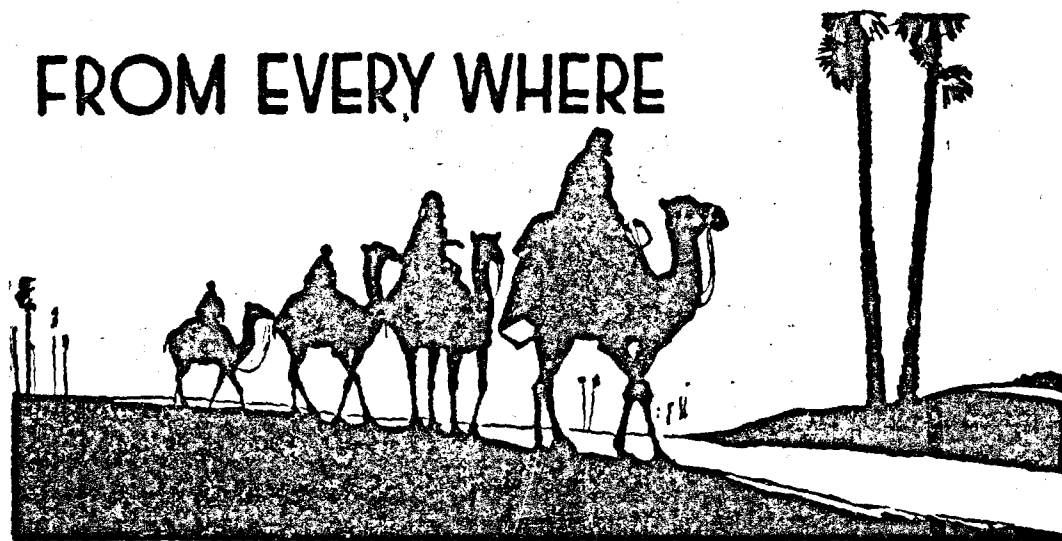
So far a Whitley Council for doctors has not been set up and at present the revision of the fees paid to ophthalmic medical practitioners is the subject of direct negotiation with the Ministry. In the event of the staff and management sides failing to reach agreement on the matter of optometrists' and dispensing opticians' fees, the question will be settled by arbitration.

The local administration of the supplementary ophthalmic service is under executive councils, of which there are 138 in England and Wales; there is a similar arrangement in Scotland. In each executive council district there is an ophthalmic services committee, which is responsible in that area for arrangements for the testing of sight and supply of optical appliances. The committee consists of three persons who are ophthalmic medical practitioners approved by the British Medical Association and Faculty of Ophthalmologists jointly, three ophthalmic opticians appointed by the joint emergency committee, one dispensing optician appointed by the Association of Dispensing Opticians, and one general practitioner appointed by the medical practices committee; the remaining half of the committee is appointed by the executive council.

To advise the optometrists on the ophthalmic services committee, the optometrists in each area themselves formed local counterparts to the statutory medical, dental, and pharmaceutical professional committees; these optical committees have now been enlarged to include representatives of the local dispensing opticians, and are known as local optical committees.

For the hospital and specialist services opticians have formed ophthalmic optical advisory committees in each of the 14 regional hospital board areas. From these will be drawn optician members to serve on any ophthalmic sub-committees of the regional hospitals boards that may be formed.

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 LOUSE

"The louse shares with us the misfortune of being prey to the typhus virus. If lice can dread, the nightmare of their lives is the fear of some day inhabiting an infected rat or human being. For the host may survive; but the ill-starred louse that sticks his haustellum through an infected skin, and imbibes the loathsome virus with his nourishment, is doomed beyond succour. In eight days he sickens, in ten days he is in extremis, on the eleventh or twelfth his tiny body turns red with blood extravasated from his bowel, and he gives up his little ghost. Man is too prone to look upon all nature through egocentric eyes. To the louse, we are the dreaded emissaries of death. He leads a relatively harmless life—the result of centuries of adaptations; then out of the blue, an epidemic occurs; his host sickens, and the only world he has ever known becomes pestilential and deadly; and if, as a result of circumstances not under his control,

his stricken body is transferred to another host whom he, in turn, infects, he does so without guile, from the uncontrollable need for nourishment, with death already in his own entrails. If only for his fellowship with us in suffering, he should command a degree of sympathetic consideration."

(Extract from "Rats Lice and History" by Zinsser.)

EATING UTENSILS SHALL BE CLEANSED

Health News, N. Y. State Dept. of Health.
Restaurant hygiene was discussed at the Buffalo meeting of the Medical Society of the State of New York on April 29. It was stated that health authorities have commonly made the mistake of trying to prescribe just how washing and sterilizing dishes and glasses should be done instead of establishing standards of cleanliness which must be met. The result has been

a welter of different and sometimes conflicting regulations.

Investigations carried out in the laboratories of the New York State Department of Health showed that good washing with a satisfactory detergent by chlorine or ultraviolet light is ineffective when not preceded by effective washing. Tests are now being made with different detergents in waters of varying hardness and at various temperatures, and results of this research will be made public.

Bacteriological cleanliness will not be obtained without visual cleanliness and the New York State Department of Health has encouraged the development of a device for the detection of film on glasses and will require that the glassware be free from visible film before laboratory tests for bacterial cleanliness are made.

The New York State Sanitary Code now provides: "All eating, drinking, and cooking utensils shall be so cleansed and disinfected as to be free from bacilli of the coliform group and to have a total bacteria count of not more than 100 per utensil as determined by a test in a laboratory approved for that purpose by the State Commissioner of Health."

—SETH G. HESS

(P.H. Engng. Abts.—Vol. XXI.)

THE ANALYSIS OF PERSONALITY

In order to analyze or judge personality thoroughly, you must consider the detailed characteristics of which personality is composed. As you have learned, personality includes three major groups of characteristics, namely physical, mental and emotional. Sometimes, however, it is difficult to determine to which group a particular characteristic belongs; for instance, whether it is physical or mental, or whether it is mental or emotional. Accordingly, in an analysis of personality the characteristics frequently are classified as follows: looks or visible characteristics, as a person's height or the colour of his eyes;

abilities, which represent what he can do; interests, which indicate what he likes; and traits, which reveal his habits and behaviour.

Many characteristics of personality are brought to light by the health examination. Others may be determined by especially prepared tests such as mental tests and aptitude tests. A mental test, as you would judge from its name, reveals a person's mental ability, his ability to learn and to think. An aptitude test reveals his natural tendencies, or his natural abilities and interests. Both types of tests are given widely in schools as aids in helping young people prepare for the future.

Even without tests you can go far toward analyzing your personality if you but try. Naturally you are better acquainted with your own characteristics than anyone else. The only trouble is that you may be inclined to see yourself through "rose-coloured glasses" to magnify your virtues and to minimize your faults. If you are honest with yourself, however, you can determine with a considerable degree of accuracy what kind of personality you have. Moreover, if you are sincerely interested in the matter, you can enlist the help of your friends. They will be glad to point out weaknesses, provided you will not be offended by what they say. Perhaps you can work with them on a co-operative exchange of criticisms, since they will wish to analyse their personalities too.

(Extract from "Life and Health"—Wilson—Bracken—Almack.)

WATER SUPPLY AND SEWAGE DISPOSAL FOR DAIRIES

—J. R. Fleming.

The Milk Dealer.

In selecting a water supply for a dairy, consider availability, adequacy, and quality. The supply should be of safe sanitary quality, in sufficient quantity and conveniently located so that equipment may be properly washed. Whenever

possible a public supply should be used; otherwise make use of a ground water. Private supplies, if not naturally safe, may easily be made so by use of chlorine compounds which are simple to use and inexpensive. Cross connections should be avoided.

Disposal of sewage and milk plant waste presents serious problems. Potential sources of contamination of water supplies together with methods used in overcoming contamination are discussed briefly.

—C. S. LEETE.

—(P. H. Engng. Abts. Vol. XXI).

AGRICULTURAL DEVELOPMENT

Experts and representatives of forty-four Allied and Friendly nations held an important conference at Hot Springs in 1943. The conference represented over 80 per cent of the world's population. Among the findings of the Conference was this: "There has never been enough food for the health of all people" and also that "production of food must be expanded and we have now the knowledge of the means by which this can be done." The conference was of the opinion that "the primary responsibility lies with each nation for seeing that its own people have the food needed for life and health; steps to this end are for national determination."

—SPEAKERS' DIGEST.

PSYCHOLOGY IN MEDICINE

—Culpin, M.

Lancet, (1945)

"Thus then, if we required to frame some one common definition, which will apply to every form of mind (psyche) it would be that mind is the earlier perfect realization of a natural organic body. The definition we have just given should make it evident that we must no more ask whether the mind and the body are one, than, whether the wax and the figure

impressed upon it are one, or generally inquire whether the material and that of which it is the material are one; for though unity and being are used in a great variety of senses, their most distinctive sense is that of perfect realization."

Probably this conception of Aristotle's had, in the past, more influence on men's minds than any other passage of equal length in scientific literature, but clever men always wish to go one better than the master. Thomas Aquinas did so and, anticipating Lewis Carroll's Cheshire Cat, separated, in thought, form, from body or matter; there was inevitably a reaction and form, realization, was subordinated to matter, a scientific Arian heresy. Dr. Culpin's learned and witty address scarifies the heretics. It is so easy to "explain" the bizarre figure through the properties, or supposed properties of the wax. Night-blindness, for instance, *might* be due to material defects; but it might not. Dr. Culpin had doubts and warned the medical public that if we talked enough about vitamins and night-blindness, we might start an epidemic.

"It all came true. The epidemic arrived and one quasi-scientific paper appeared in *The Lancet* in 1941 reporting a study of night-blindness in soldiers due to vitamin deficiency. Everyone by now had heard about night-blindness Radio comedians put it in their gags, the advertising quacks cashed in on it, and vitamin fans ate carrots till their skins turned yellow Finally a confidential memorandum was sent to Army ophthalmologists telling them that for practical purposes night-blindness did not exist in the absence of gross ocular disease, and any difficult cases should be referred to the psychiatrist." This and other sad examples lead Dr. Culpin to criticize the Goodenough Committee's plan for education in medical psychology.

Of course one of the difficulties is itself psychological. If the wax does *not* determine the lines of the inscription, what does. Aristotle's answer

is obscure; that of Thomas Aquinas quite definite but unpalatable.

—M. GREENWOOD.

WEIRD CHINESE REMEDY WORKS IN U.S.

Medical science has confirmed the two-thousand-year-old Chinese treatment for the relief of pain in sprains, according to Janet Travell and Audrie L. Bobb of the Cornell University Medical College.

The researchers discovered that the simple procedure of acupuncture (insertion of a needle) used in the Orient two thousand years ago, proved valuable in restoring painless function of a sprained ankle despite the fact that the joint remained swollen and discolored.

While much attention has been given to the treatment of sprains by local injection with novocaine, a salt solution, or by merely needling the few precise spots within the injured tissues, it remains an enigma as to why this simple procedure produces the striking and long-lasting relief it does.

The scientists said that the abolition of pain by local injection technics may be due to mechanical release of pressure when the needle ruptures deposits within the injured tissues.

(From "Science Digest"—October, 1947.)

MANURES

Much of the manure that is now wasted in India, ought to be profitably used in the fields. One of the best articles of manure, cow-dung, we burn, instead of using it as manure for the fields. This means a considerable loss to the agriculturist. We produce nearly 160 million tons of cow-dung capable of manuring 25 million acres at a rate of 40 lbs. nitrogen per acre, but we use only two-

fifths of this amount. But for lack of alternative fuel supply, the villages burn the cow-dung. To make up this deficiency trees should be planted near the village to provide fuel for burning. Another good source of manure is nightsoil and refuse, which could be converted into good fertilisers by composting. Chemical fertilisers may also be used where necessary. There is another source of good manure, i.e., bone-meal. Nearly one million tons of bones are available every year in the country. Out of this 3 lakh tons are collected and about 2 lakh tons crushed giving about 50,000 tons of bone-meal. The Government intends to take early action for proper collection and utilization of bones as a source of fertiliser. They also have in hand a scheme to produce 300,000 tons of ammonium sulphate.

We have already mentioned the direct connection the supply of wood for fuel has to the use of cow-dung as manure. The Government of India have addressed the provinces to establish village forests to provide timber. The land lying near the railway lines and road is useful for growing fuel and for producing material for composting.

—Speakers' Digest.

GENERAL RATTUS

Charles H. Blake. *Tech. Rev.*

Estimates of the damage done in the United States each year by domestic rodents runs into hundreds of millions of dollars. Domestic rodents are associated with the carriage of a number of important diseases such as plague, Weil's disease, rat bite fever or sodoku, endemic typhus, Japanese river fever, and food poisoning of various types. Rat killing campaigns have not been successful. Effort must be made to substitute the rat control programme which consists of: (1) education, (2) elimination of food and

harbourages and ratproofing of buildings, and (3) extermination. Although rats must be killed, partly to prevent their migration from rat-proofed areas, the ratproofing of buildings and elimination of outdoor sources of food are even more necessary.

—FLORA MCKINLY
(P. H. Engng. Absts.)

FOLIC ACID IN TROPICAL SPRUE

Manson-Bahr and Clarke found in a case of Tropical Sprue which had resisted the usual treatment for two years, the oral administration of 10 m.g. of Folic acid per day for 5 days. Effected remarkable improvement which was maintained after the folic acid was discontinued. They consider folic acid may provide the switch by which the vicious circle of these diseases can be reversed and further recovery can continue without its aid.

(Lancet.)

PROMIN THERAPY IN LEPROSY

Seven young adults with advanced lepromatous lesions, who were rapidly going down hill in spite of many years of the orthodox chaulmoogra oil treatment were given 2 gm. daily (intravenously) of Promin for the first six days followed by one day's rest. Dose gradually increased by 1 gm. weekly until a maximum of 5 gm. was reached. Then it was continued at 5 gm. daily throughout the year. At the end of every 6 weeks one week's rest was given. At the end of 6 months, the improvement was so great in all the seven cases that the other lepers demanded the drug. Seventy patients have since had the treatment for six months and all show remarkable improvement, especially as

regards healing of chronic ulcers. Promin destroys leprosy cells and helps the formation of fibrous connective tissue. It is a very safe drug to give over long periods.

(Leprosy Review, London.)

STOPPING HICCUPS

Hiccups can be stopped by inhaling amyl nitrite—even the alcoholic kind of hiccups. Amyl nitrite is a heart medicine. Dr. C. R. Nairn, while a lieutenant-surgeon in the British Navy demonstrated the drug's effectiveness when standard methods failed to relieve hiccups in a stoker.

In a desperate search for some remedy Dr. Nairn examined his stock of medicines for anti-spasmodic that had not been tried. His eye fell on amyl nitrite. He gave it to his patient. It worked.

When he landed in Great Britain, Nairn searched the literature and found that others before him had discovered that the inhalation of amyl nitrite works like a charm in cases of hiccups.

(Science Digest.)

GLEANINGS

Italian University Professors are required to give up teaching at the completion of the 70th year of age. The Minister of Public Education has proposed to the Council of Ministers that this age limit should be extended to the 75th year. The Council has not come to a decision yet but has found a temporary solution by renewing for one year the teaching assignment of those professors who have completed their seventieth year.

(J.A.M.-A.)

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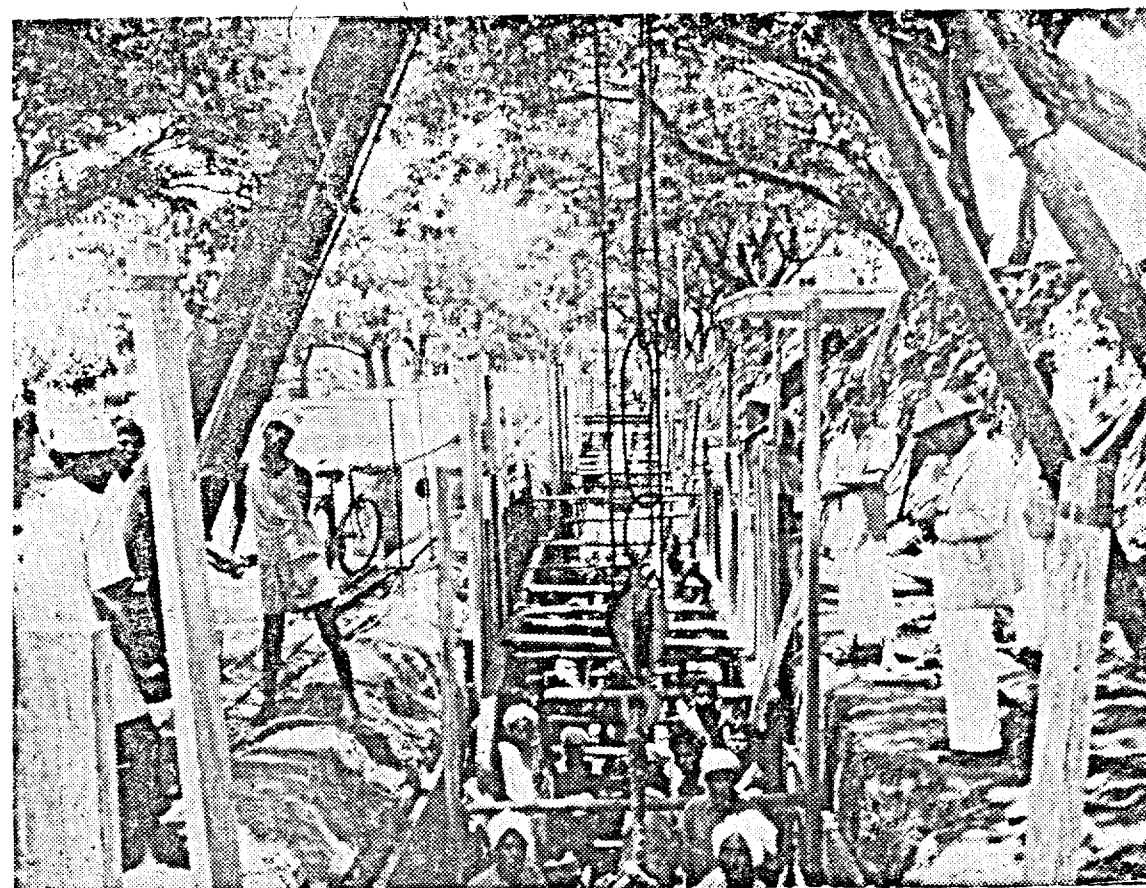


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