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THE ROLE OF THE HEALTH DEPARTMENT IN
ENVIRONMENTAL HEALTH ACTIVITIES

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1 INTRODUCTION

For many decades it has been considered axiomatic that health departments should be responsible for environmental sanitation activities which, to most people, meant the daily routine inspection and control over those environmental factors directly related to the transmission of communicable diseases. This concept grew naturally from the time-honoured principle according to which environmental sanitation has its roots and justifications in epidemiology. In fact there are in different parts of the world many public health officials who give a very narrow sense to the term "environmental sanitation" and who think of this subject only in terms of communicable diseases which may be prevented through the application of sanitary legislation and of basic sanitation measures. The diseases which are of primary concern include:

- (a) infections commonly acquired or transmitted by the alimentary route, especially the enteric group, the dysenteries, and epidemic diarrhoeas, cholera, and some helminth diseases;
- (b) infections commonly acquired by the respiratory route, especially pulmonary tuberculosis, pneumococcal infections, and many virus infections, the transmission of which may, at times, be associated with housing conditions;
- (c) infections commonly acquired by surface contamination, especially trachoma and leprosy, diseases which are particularly associated with certain housing conditions, overcrowding, and lack of public appreciation of sanitation; and other infections, such as hookworm disease, caused by pollution of the soil;
- (d) infections transmitted through the agency of an alternative host, especially malaria, bilharziasis, plague, and epidemic typhus.

All these diseases and environmental conditions cited here are still highly prevalent in many countries of the WHO Western Pacific Region and they account for a large percentage of the morbidity and mortality reported. It is not the purpose of this paper to list in detail a catalogue of environmental deficiencies and the effects of these deficiencies on the public health. These are known to the public health officers. Instead the paper will attempt to identify some of the recent and important trends and evolutionary changes in the concept, the planning and the organization of environmental sanitation, as well as a few special problems encountered by health departments which are making positive efforts to raise the level of health and well-being by means of improvement of man's environment.

It is gratifying to note that during the past two decades several countries in the Western Pacific Region have given high priority to environmental sanitation within their national health programmes. Others have not. In both instances, it is perhaps time for health administrators to pause in order to take stock of their successes and failures, to re-orient their efforts as may be necessary and to assign priorities in the light of both the traditional and the newer environmental health problems facing their administrations.

As far back as 1949, the WHO Expert Committee on Environmental Sanitation expressed the firm belief that "environmental sanitation programmes depend ultimately upon governmental or public action. Even in advanced countries where the public may be presumed to take a keen interest in implementing such programmes, governmental initiative has not only been found useful, but very often it has been necessary for arousing the public to action. In the less advanced countries, where public consciousness and the resources of local self-governing units, such as municipalities, are not so widely developed, governmental initiative and help are much more necessary to accelerate progress."¹

There is no doubt that national and local health departments can fill a very important role in improving environmental health if they tackle this task correctly.

2 BROADENING OF CONCEPT OF ENVIRONMENTAL SANITATION

It is necessary first for the health officer, the sanitary engineer² and the sanitarian to realize that in every country the role of the health department in environmental health activities is today in a state of transition, and that it is constantly broadening due to the impact of urbanization and industrialization. To the older but still persisting environmental sanitation problems of a microbiological nature should now be added those hazards resulting from ionizing radiation, from microchemical pollution of soil, food, water and air, and those problems associated with community environmental planning and sometimes included under the meaning of "aesthetics" or of "well-being" of man, although they are clearly "health-related". This has led to a broadening of the original concept of environmental sanitation to one in which man's comfort and efficiency have assumed increased importance. The term "environmental health" is now used to identify the enlarged range of the field which the new concept covers.

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Wld Hlth Org. techn. Rep. Ser., 1950, 10, 11

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The terms "sanitary engineer" and "public health engineer", as used in this paper, are interchangeable. These, together with the terms "sanitarian" and "public health inspector" are defined in Annex 1.

3 EFFECT ON PLANNING AND ORGANIZATION OF ENVIRONMENTAL SANITATION PROGRAMMES

The new problems mentioned above present a formidable challenge to the ill-prepared and ill-staffed health administrations which are often so deeply engaged in routine sanitation and nuisance control work that they have no time nor the ability to deal with them. Where this situation prevails, there is little or no public health control over these problems, and the other government administrations as well as the private industrial concerns responsible for the creation of these environmental deficiencies are left free to take (or not!) whatever measures they believe to be appropriate. Experience demonstrates that in many countries the abandonment by the health administrations of their rightful and legal responsibilities has had dire and sometimes irreparable consequences on the public health and the well-being of the populations concerned.

During the last decade increased recognition has been given to the need for government health administrations to develop new administrative and technical relationships with other departments and to participate more effectively in physical, social and economic development programmes, of direct or indirect importance to environmental health, conducted outside of the formal public health establishment.

This evolution in concept has created a profound effect upon the planning and the re-organization of the traditional environmental sanitation programmes in health departments. The traditional medical officer of health-sanitarian team approach is now proving to be inadequate to deal with the new technical and administrative problems at hand, even in countries which are still in the early stages of development. This is especially the case at national and urban levels, in which the main concern is felt over health and sanitation problems resulting from increased urbanization and industrialization. In rural areas, however, the role and activities of the medical officer of health-sanitarian team, continues to be of paramount importance, although there are many rural sanitation problems, the solution of which requires consultation and participation from qualified engineers.

The introduction of public health or sanitary engineers into the public health team is gradually being accepted by government health and municipal administrations as being highly desirable. These specialists are trained to assist the chief medical officers in dealing with the engineering implications of both "old" and "new" environmental problems, in indicating solutions and, perhaps more importantly, in influencing policies at a responsible level in establishing priorities in the environmental health field. They are also professionally equipped to deal on the same level with both the medical officers in health administrations and the engineers, architects and city planners in the public works, housing and planning, and industrial agencies. In this respect the WHO Expert Committee on Environmental Sanitation stated in 1951:

"The assumption, perhaps too widely made, that underdeveloped regions are not prepared for the services of the best-trained specialists in environmental sanitation can readily be contested. Countries of minimum resources are most in need of the highest expert service available, both for diagnosis of need and for planning of solutions. The relegation of these functions to less adequately prepared persons results from a great misunderstanding of the complexity of the problems in environmental sanitation encountered in areas of low economic level. These problems require for their solution the impact of high intelligence, training, and experience, even when the number of persons possessing such qualifications is necessarily a minimum. It is unsound practice literally to send a boy to do a man's job."¹

A corollary of this statement particularly pertinent to operations within the health department is that, because environmental health is frequently done outside the health department and because the health officer is administratively (and technically) responsible for many activities not connected with environmental health, the health officer may allow himself to become engrossed in the operation of those services for which he is responsible and may not expend much time and effort in environmental health improvement, a task for which he has not been especially trained. The university-educated public health engineer can render him and the health administration as a whole a most useful service by taking over the planning and supervisory functions in the environmental health field, thus liberating him for more productive medical and public health work for which he is uniquely qualified. WHO itself set the example since 1952 for Member States to follow, of raising to the status of a full division the former Unit of Environmental Sanitation which was a part of the Division of Public Health Services at WHO's Headquarters in Geneva.

While the health department should maintain major responsibility and leadership in environmental health, it is appropriate that it should encourage other government departments carrying out physical development programmes to establish counterpart and adequately staffed sanitary engineering services whose duty it will be to advise their own administrations and engineering colleagues on the environmental health aspects of their work and on the proper application of environmental health standards and regulations established by the health authorities. Such units would greatly facilitate the necessary liaison and co-ordination with the health administrations.

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Wld Hlth Org. techn. Rep. Ser., 1952, 47, 5-6

The sanitary engineering services required in a country may be subdivided in two main categories:

(1) Services or activities involving the conception, design, construction, operation and management of sanitation facilities, e.g., waterworks and water distribution systems, sewerage and sewage treatment works, incinerators, water pollution control installations, etc. The procedures involved and the role of the sanitary (public health) engineer in the development of such facilities include:

- (a) investigation and planning,
- (b) design of structures and preparation of engineering specifications,
- (c) evaluation of costs and economic feasibility studies,
- (d) construction of facilities,
- (e) management, maintenance and operation,
- (f) administration.

Such services are normally provided in part or in whole by public works departments, water and sewerage departments of municipalities, special agencies (e.g. corporations) and by consulting engineering firms. None of these functions are usually carried out by public health administrations, except (and this is important) in the case of sanitary facilities for small communities and rural areas.¹ In order for these departments or agencies to conceive and to build the necessary facilities incorporating all sanitary features for the safeguard of the public health (and not creating new sanitation problems because of improper design), it is necessary for them to be staffed with qualified sanitary engineers who will be responsible for these works at all stages from investigation and planning through management and operation. Should these departments and agencies be obliged to utilize civil and hydraulic engineers for carrying out such functions, these engineers should have had in the course of their academic training at least some courses in the principles and practice of environmental health.²

(2) Services involving essentially the promotion, supervision and regulations of sanitary facilities. The activities falling under this category are:

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World Health Organization (1958): Monograph Series No. 39, 20-22; (1959) No. 42, 20-23

2

World Health Organization (1965) Engineering, education and training programmes for environmental health (Report of an inter-regional symposium, Geneva, 6-12 July) (Unpublished document PA/136.65 rev.1 pp. 10 and 15)

- (a) the promotion of sanitary facilities, through the establishment and maintenance of technical liaison and co-ordination with all government departments and outside agencies concerned;
- (b) provision of technical advice and guidance;
- (c) approval of plans of all sanitary installations;
- (d) control and supervision of operation and maintenance of existing works;
- (e) conception of projects or practices to correct existing deficiencies;
- (f) investigation, design and construction of sanitary facilities in rural areas and small communities;
- (g) development and enforcement of rules and regulations;
- (h) planning and administration of environmental health programmes;
- (i) technical and administrative participation in the planning, design, construction, operation and maintenance of other elements of community life related to the protection and promotion of public health.

These services are normally the responsibility of public health ministries or departments and, more specifically, of their sanitary (public health) engineering divisions.

Although the preceding paragraphs have emphasized the need for health departments to cope with the "newer" problems of environmental health, this does not mean that traditional sanitation activities should receive lower priority. It must be recognized that in several countries of the Region, especially in the rural areas, the major technical problems of environmental sanitation remain, and will probably continue to be for many years to come:

- (a) unsafe and inadequate water supplies,
- (b) absence or inadequacy of excreta disposal facilities,
- (c) the proliferation of vectors of communicable diseases.

To these must be added the lack of proper government sanitary organizations, the dearth of trained technical staff, the lack of public conscience and of knowledge of the causation, transmission and control of disease, and finally the perennial shortage of funds for carrying out improvement works. Yet in the light of modern technical knowledge and of efficient administrative and financial procedures, none of these problems should

constitute unsurmountable obstacles. The important thing to remember is that the planning of adequate solutions for these problems requires skills which are often extraneous to medical science and that, therefore, the proper personnel must be brought into the public health circle if appreciable results and permanent success are to be achieved.

For several components of environmental sanitation programmes, e.g. food and milk hygiene, vector control, individual and rural water supply and excreta disposal, the sanitarian (or public health inspector) continues to be the "backbone" of the sanitation services in government health and municipal departments. In fact his role and daily control activities have greatly increased in recent years in some countries as these problems have multiplied while becoming increasingly complex (e.g. in milk and food technology, and in the use of new pesticides). In the United States of America many states now require a Bachelor of Science or a Bachelor of Arts degree as an initial qualification for recruitment of such personnel in health departments. In 1964 the first graduate course for public health inspectors in the United Kingdom was inaugurated at the University of Aston in Birmingham which will grant a Bachelor of Science degree after four years of study. The University also intends to offer a master's degree in the future.

In many countries, under WHO's stimulation, programmes have been initiated also for the advanced training of already qualified sanitarians in order to enable these personnel to assume higher and broader responsibilities in the environmental sanitation field at either the municipal, provincial or even national level. There should be no misunderstanding, however, of the fact that such post-graduate or post-basic training does not purport to make a public health or sanitary engineer of a sanitarian, and that these categories of personnel are not interchangeable. Rather they complement each other. As Freedman rightly states:¹

"The sanitary engineer and the sanitarian are the technicians and, to a large extent, the planners and executors of the environmental sanitation program. The public health physician serves as general advisor. The sanitary engineer is usually the administrator of state and large local programs. He is technical consultant, general supervisor, and field technician on major technical problems. The sanitarian is the skilled field worker who carries on the inspection and supervision of maintenance of the sanitary facilities and gives recommendations as to construction and reconstruction of less technical sanitary facilities. He gives guidance in hygienic practice relating to environmental factors. He inspects major technical facilities with the guidance

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Freedman, B., Sanitarian's Handbook. Theory and Administrative Practice. Peerless Publishing Co., New Orleans, 1957, 1083 pp.

and advice of the sanitary engineer. He may become the organizer, administrator, and planner of special or general sanitary programs on the state or local level. The good sanitarian quickly learns the extent of his technical abilities, and in what circumstances he requires the consultation of the engineer. These two categories of personnel are the inseparable team in environmental sanitation. Each has his definite place and both have a common meeting ground."

It will also be noted that Freedman, a medical officer of health himself, believes in the role which the public health physician should play as a "general adviser", and not as an executor or direct supervisor, in environmental sanitation programmes. This belief has been expressed in its own way by the WHO Expert Committee on Environmental Sanitation in its various reports.¹

It is recognized that in many countries in this region and elsewhere, such is not the case at present due to different traditions and patterns of organization of public health work. However, it is interesting to note that, as environmental sanitation work becomes increasingly more technical in nature, health administrations even in the most developed nations are demanding greater technical and engineering qualifications from supervisors of these programmes. The trend is definitely in this direction and is likely to be stepped up under the pressure of countries' physical and economic development.

4 THREE SPECIAL PROBLEMS FOR HEALTH DEPARTMENTS

A review of environmental sanitation activities in the Western Pacific Region indicates that, beside the matters analyzed above, there are three special problems facing health departments interested in raising the level of health by the improvement of the environment. These will be mentioned briefly here.

4.1 Lack of suitable epidemiological information

All too often it is not known to what extent particular diseases are present in an area or, if known, to what extent they are significant from the public health standpoint. Such data must be available if proper priorities are to be established in the total public health plan of a health administration in general, and, if relevant, in the environmental sanitation programme in particular. For instance the presence of tuberculosis or of cardio-vascular diseases in a given country, if properly assessed from ample and reliable epidemiological data, may help to decide

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Wld Hlth Org. techn. Rep. Ser., 1950, 10; 1952, 47; 1954, 77

whether more emphasis should be given in a national health plan, to the control of these diseases rather than the control through environmental sanitation measures of, say, typhoid fever, other diarrhoeal diseases or food-borne infections, and vice-versa. The statistical aspects of this matter have been raised in the course of the Technical Discussions of the Nineteenth World Health Assembly in Geneva¹ in May 1966. As it has already been pointed out, however, some of the newer environmental health problems have no suitable epidemiological basis so far, and yet their public health significance is undeniable and justifies early and vigorous action by health administrations.

4.2 Lack of investment funds

It is fairly common to hear health administrators say that:

- (a) environmental sanitation is extremely important,
- (b) however, it requires considerable outlay of capital expenditure,
- (c) health departments are always plagued by lack of funds,
- (d) therefore, health departments can do little about environmental sanitation improvement.

This argument sounds logical, yet it is an inaccurate statement. The WHO Expert Committee on Environmental Sanitation stated in 1949:

"When a (sanitation) programme is drawn up for a country, the cost of the projects sometimes appears bewilderingly high. However, the expenditure need not be incurred all at once but can be spread over many years. If the projects are carefully worked out, the bulk of the expenditure can be a means of providing employment for the people and can be incurred within the country in the production of local materials by local labour. The committee is of the opinion that such expenditure should be treated as productive capital expenditure and should be financed out of long-term loans that may be floated in the country. Many governments try to earmark a portion of their revenues for such capital works and find themselves handicapped."²

If the economic principle contained in this statement were to be accepted and applied in every country, considerable improvement would be achieved within a short time, especially in developing nations. In Latin

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World Health Organization (1966) Report of the Technical Discussions on the collection and use of health statistics in national and local health services, Geneva (Unpublished document A19/Technical Discussions/6)

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Wld Hlth Org. techn. Rep. Ser., 1950, 10, 20-21

American countries, for instance, such has been the case since the war, upon the stimulation, advice and assistance of the WHO Regional Office for the Americas/~~Pan American~~ Health Organization. As a result, substantial funds have been raised even within poor countries and communities to match outside capital which otherwise could not have been obtained.

The real difficulty is the fact that health administrations are seldom geared or staffed to deal with environmental health problems (such as water supply or sewage disposal), the solutions of which rest heavily on economic considerations. If staffed with the right type of engineering personnel, these health administrations would clearly understand at an early time that it is frequently cheaper to provide adequate and safe public water supply and sewerage facilities than to perpetuate individual private, costly and dangerous springs, wells, cisterns, cess-pools, and septic tanks. This concept, however, can be applied only when ingenious, but orthodox, fiscal procedures and the use of local materials are carefully explored and adopted.¹ This view is reflected in resolution WHA12.48 of the Twelfth World Health Assembly,² dated May 1959, which marks a turning point in the history of International Environmental Health work.

4.3 Evaluation of environmental sanitation programmes

It is important that health departments should carry out periodical evaluations of their environmental sanitation programmes in order to determine not only the actual status of these programmes but also to measure the efforts made in their implementation and the effectiveness of the programme components in achieving the desired goals. If this is not done, health departments will go on indefinitely spending (or one may even say, wasting) money on some sanitation activities which normally should have very low priority in the programme, or which will result in little public health benefit. It should be remembered that the total amount of funds expended for environmental sanitation and the numbers of field sanitation workers do not constitute by themselves reliable indices of success achieved. No health officer should delude himself, thinking that he is doing his duty in the field of sanitation, if he has no concrete proof, through an adequate evaluation, concerning the measure of accomplishment in each of the components, e.g. milk and food, hygiene, refuse disposal, water supply, excreta disposal, etc. of his environmental health programme.

The principles which should be observed in making such evaluations for rural sanitation programmes have been cited briefly by the WHO Expert Committee on Environmental Sanitation.³ For general environmental health

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Wld Hlth Org. techn. Rep. Ser., 1950, 10, 22

²
Wld Hlth Org. Handbook of Resolutions, 8th ed., 103-104

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Wld Hlth Org. techn. Rep. Ser., 1954, 77, 17-18

programmes, Professor M.S. Hilbert, Public Health Engineer of the School of Public Health, University of Michigan, United States of America, has outlined in a most authoritative manner the important steps required as well as the various methods at present available to health departments.¹ For the benefit of the reader who may not have ready access to Hilbert's paper (or the other references cited in the attached bibliography), a summary of the main steps is given as follows:

- (1) Define the goals which are expected to be attained if the sanitation programme is effective, and to define clearly the aims and objectives of each component of the environmental health programme. In some programmes the goals may be established easily on the basis of securing the installation of various kinds of sanitation equipment or upon the objective of securing compliance with various sanitary standards based on physical requirements. In other cases, it may be more difficult to set goals if, for instance, the objective is very broad and concerned with the provision of a community environment in which man may thrive rather than merely survive.
- (2) Measure the effectiveness of each of these programmes in order to assess the degree of achievement toward the stated goals. This implies:
 - (a) that the existing facilities to implement the programme will be enumerated;
 - (b) that the description of the programme will be listed with an outline of information required in order that the status of the programme may be properly assessed. This must be done before comparing achievement with goals.

Several benefits may be derived, besides, from making periodically such an evaluation. First, the study will help to determine whether or not the health department's environmental sanitation programme is sufficiently broad to cover all the really important facets of the community's problems in this field. Second, it will lead to an effective measurement of the amount of time and effort actually devoted to each component of the programme (e.g. on milk and food sanitation, water sanitation, excreta disposal, wastes disposal). Thirdly, the study will also make it possible to determine the effectiveness of the sanitation staff in communicating with the people and in measuring their degree of motivation, of perception of problems as well as their change in attitude as the programme developed. Finally, the study will inevitably conclude with a review and analysis of the administrative organization, procedures and practices which are applied in the execution of the programme.

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Hilbert, M.S. (1964) Evaluation of environmental health programmes, J. Milk & Food techn., 27, 30-34

Among the evaluation methods mentioned by Hilbert are the American Public Health Association Evaluation Schedule first developed in 1942 and now being revised under the title of "Indices for Community Health Services", another appraisal method developed in 1938-42 by the W.K. Kellogg Foundation (Battle Creek, Michigan, United States of America), the United States Public Health Service "Environmental Health Planning Guide" issued in 1962 and the procedure described in detail by J.A. Salvato in his book "Environmental Sanitation" cited in the attached bibliography.

5 SUMMARY

This working paper, prepared for the Technical Discussions of the WHO Regional Committee for the Western Pacific Region in September 1966, calls attention to the changing and expanding role of health departments in environmental health activities. It is no longer sufficient for these departments to cater for the traditional sanitation problems of communities and to attempt to correct themselves environmental deficiencies created by other departments and agencies when carrying out economically-useful physical developments projects without sanitary control. The paper points to the need for better organized and co-ordinated environmental health services in both public health and other departments. It indicates how this aim can be achieved and it concludes with a plea for periodical evaluation by health departments of their environmental sanitation programmes.

DEFINITION OF TERMS

For the sake of clarity and in order to avoid misunderstanding, it has been considered useful to add in this annex definitions of certain appellations which are included in the working paper and which are not universally employed in the Western Pacific Region. These appellations are:

1. Public health engineer - Sanitary engineer
2. Public health inspector - Sanitarian

1. The first two terms, as used in the paper, are interchangeable. In the World Health Organization, the official term used is "Sanitary Engineer". It defines an individual who has a broad and thorough understanding of the whole range of environmental conditions that affect human well-being, who is well-qualified by aptitude, training and experience to serve as a true professional at various levels of responsibility relating to the environment in public health and associated organizations, and, in the upper echelons, who is able to take his place alongside his counterparts in other professions in assuming responsible administrative duties and other public health functions. In addition he should possess the skills required to prepare the design and to supervise the construction and operation of sanitary works.¹ This definition has been given by the WHO Expert Committee on Environmental Sanitation which added:

"Public-health engineers should possess basic education and training in engineering followed by at least an academic year's specialized education and training. The latter should include the sciences of bacteriology, chemistry, and human physiology as related to problems of public-health-engineering interest. Also, the principles and practices of engineering analysis, design, and operation as applied to works of water-supply purification, sewerage and sewage treatment, the collection and disposal of municipal, rural, and industrial wastes, insect and rodent control, the engineering and administrative phases of food and milk sanitation, the sanitation of buildings, including ventilation, air conditioning, heating, plumbing and illumination, housing, industrial sanitation with particular reference to those industrial hazards the correction of which is an engineering problem should be considered. . . The postgraduate training of the engineer should also include adequate instruction in public health, including public-health practice, epidemiology, health statistics, and health education of the public."²

¹Wld Hlth Org. techn. Rep. Ser., 1952, 47, 9

²Wld Hlth Org. techn. Rep. Ser., 1952, 47, 13

Obviously this expert should not be confused with the so-called sanitary engineer who, in certain countries of the world, is only a plumber.

2. The last two terms, sanitarian and public health inspector, as used in the paper are also interchangeable. In the Expert Committee report¹ the term which applies in this case is "Health Inspector". It defines an individual described by the Expert Committee as "the backbone of the sanitation service". This officer should possess an educational background equivalent to twelve (12) years of education from the beginning, and sufficient to permit him to matriculate at a university. His duties are those described by Freeman and quoted in the paper.

The term "public health inspector" is preferred in the United Kingdom and its Commonwealth, having replaced the old fashioned and confusing title of "sanitary inspector" since 1955. The term "sanitarian", as used in the United States of America applies to a high level sanitary inspector or to a university graduate in the sanitary sciences (possessing therefore a bachelor's degree). Several American universities also have courses for sanitarians leading to a master's degree and even to a degree of Doctor in Philosophy (Ph.D.).

In an increasing number of countries, both developing and developed, the complex nature of environmental sanitation problems is making it imperative to train these officers more thoroughly and during a longer period than one year, as is indicated in the paper. WHO is sponsoring advanced and university-level courses for health inspectors who will assume responsible and supervisory functions in health administrations, especially at provincial level and at central health departments for certain sanitation programmes such as food and milk sanitation activities. Such high level sanitarians are able to work under only broad supervision by public health administrators. This is often the case in local health administrations in the United States of America, United Kingdom and New Zealand for instance. This pattern is likely to develop further everywhere and any training scheme for health inspectors (or sanitarians) should take into consideration the possibility for graduates to continue their professional education and, as a result, to advance to higher posts.

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Wld Hlth Org. techn. Rep. Ser., 1952, 47, 11

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