Community Planning for Mental Health

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THE BASIC CONCEPTS of mental health and social welfare cannot be clearly separated one from the other. Bradley Buell in "Community Planning for Human Services" (*1*) groups mental health clinics with his group of welfare services. The World Health Organization definition of health as "not merely the absence of disease, but physical, mental, and social well-being," on the other hand, includes social welfare in health. The conclusion indicated is that psychiatrists must collaborate with social planners and social workers and vice versa. Each field has experience that demands the others for the formulation of satisfactory theory to explain what is happening and to plan for what should happen.

Psychiatric theory since Freud has set forth clearly that both mental health and mental illness depend, among other things, on what the relationships are between family members. It has been equally clear to the social scientist that the social health of the family depends upon the mental health of its members. Gruenberg's chapter, "Socially Shared Psychopathology," in "Explorations in Social Psychiatry" (*2*) makes this apparent.

There is ample evidence that, whatever the succession of events leading to the condition, social and health problems are associated more than mere chance could account for. Buell found this in his study populations and Svihus (*3*) has just shown that the same thing happens in naval recruits. Although social factors were not directly studied in the chronic disease survey in Baltimore, Downes found that all sorts of diseases tended to "nest" together; psychoneurosis had more than chance expectancy in families where there was also cardiac, arthritic, or diabetic disease (*4*). We badly need a theoretical structure for the facts, but in the cases the facts speak loudly of the association between social welfare and psychiatry, between social welfare planning and psychiatric planning.

From a therapeutic viewpoint, no modern psychiatrist imagines that psychiatric illness is cured by absolutely individual treatment. Social psychiatry is popular at the moment, and we hear a great deal about treating all family members and of the need to establish healthy environments. "A sound mind in a sound body" is no longer an adequate aim. Social psychiatry is more than a fad, and the aim must now be "a sound mind in a sound body, a sound family and a sound community" if it is adequately to express present health notions.

When these notions escape the ivory tower and get into the melee of living, they cause no end of administrative trouble. One gets to longing for the simplicity of Popeye's old "I am what I am." Instead, he finds himself a member of a crowd of helping professions not simply a "doctor" or a "social worker." The physician who confines himself to the hospital or to the operating room is recognized as an inadequate physician, however valuable he may be as an operating room technician. The social worker who confines herself to food and clothing needs is inadequate as a social worker. The physician must sharpen his sensitivities to include what the social worker faces; the social worker must be cognizant of the medical and psychiatric condition of her relief client. While we may ponder the meaning of "social, physical,

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and mental well-being" in everyday work, grasping it and translating it into practice is precisely what all the helping professions are striving for.

We medical people have had a hard time getting physical and mental health integrated, and our success still leaves a good deal to be desired. The integration is so far from complete, for example, that medical students serving in surgery in an afternoon clinic will refer patients to themselves at the psychiatric clinic the next morning; neither they nor their teachers expect them to be physicians to physical and mental illness at the same time.

Nor is such illogicality confined to the medical profession. A school principal I know had to keep very quiet the fact that she had a closet full of shoes in her school, because the welfare workers in the community resented a teacher invading their bailiwick. And did you ever hear of a nurse being asked or given the authority to do a welfare investigation on a tuberculous patient whose condition she knows very well? No, she must write, or get a physician to write a sheaf of papers, and somebody who knows neither the patient nor about his tuberculosis must learn about them and decide whether he is eligible for relief. Our practice in these instances falls short of integration. Nevertheless, we have established the ideal of integrated health services which recognize that social, physical, and mental health are essentially indissoluble, that health is health, and that it cannot be achieved piecemeal.

The Planning Process

Planning is usually divided into two not really separable parts, short term and long term. Without distorting the truth too much, it often appears that short-term planning means adapting to immediate pressures as best one can, while long-term planning is synonymous with setting up an ideal no one thinks can ever be reached. The former always leaves great gaps that are likely to be covered by statements that some people must die before any more than this can be done. The long-term plan often contains many loose ends. Since nobody thinks it can be accomplished anyway, why bother to make it accord to reality? There is a little more disillusionment and cynicism here than I really mean, but it does picture the situation as it sometimes exists.

I know of no better discourse on social planning than a book which hasn't that as its purpose at all. It is the collection of papers by Homer Folks entitled "Public Health and Welfare" (*5*). Folks was one of the first professionally trained social work administrators. He literally grew up with, and at the same time built, the New York State Charities Aid Association. He was quite conscious of his role as planner, particularly as he grew older and looked back, and he evaluated what had happened as he had worked. There is a kind of freshness about his approach, a balanced sort of enthusiasm, at times almost a naivete about the way he approached things. He stripped away details and the objections they may give rise to, but had the goal so clearly in mind that no one could disagree with it.

Such an attitude makes possible real planning but also carries with it the kind of objectivity that preserves flexibility. I'm sure Folks would approve extramural treament of tuberculosis and mental disease, but I suspect his dispassionate objectivity would protect him from jumping on the bandwagon of propaganda now braying loudly that both tuberculosis and mental hospitals are all wrong and should be abolished. His devotion to realistic planning would have led him to know full well that populations cannot be managed by abolishing things; social change is more gradual than that.

Self-conscious social planning is not a very old invention; one need not point out that social changes and events have speeded up to such a degree now that we simply must plan. Clarke (*6*) wrote about the development of social and health agencies in Oak Ridge soon after that town sprang, full-grown, out of the Tennessee ground. This history was almost a recapitulation of the centuries-long evolution of social agencies compressed into a few years. The development was possible in so short a time mainly because patterns of planning had been discovered in the long evolution.

Patterns of planning for social and health services are well known to this audience. But often overlooked is the fact that successful

planning operations always have a leader, a kingpin, who, although he may deliberately stay out of the limelight, knowing he works best unnoticed, sustains consistent direction of movements and makes possible workable solutions. Sometimes I picture this person as a goat with the bell of responsibility for planning hung on him.

I think we need to define "community" before we can discuss planning for mental health. Are we talking of a group of families living relatively contiguously, a town which has been swallowed up in a metropolis but retained a little of its traditional identification, a minority group, a political subdivision of a State, a State or Province, a Nation, or do we mean the community so rudely thrust upon all our consciousness by communications and the bomb, the whole world? I have decided to avoid none of these possible definitions completely, but to pay particular attention to governmental units, both the traditional ones and those, like multiple State units and metropolitan areas, which are so obviously needed and which are evolving before our eyes—sometimes of our own making.

Community planning for mental health will have to be planning within the broadest definition of health. It will have to consider the fracturing of fixed boundaries, boundaries ideological, geographic, and political. It will have to deal with the community that is the family and the community that is the world.

Mental health planning must, of course, begin locally, and history shows that it did. The town had its ways of caring for or rejecting its mentally ill and its often inadequate ways of protecting its citizens from absolutely destructive stress. Neither the care of the mentally sick nor the protection from excessive stress worked very well, however. County hospitals and, more often, combinations of jails, almshouses, and hospitals, became so deplorable that radical reforms had to be undertaken.

Without our present recognition of sociological and family stress relationships of mental disease, and with the tax authority favoring State over local resources, the logical step seemed to be to move toward State responsibility for the mentally ill. The result was the present system of State hospitals. It is fashionable now to decry this move because we now know more. This is like complaining that physicians didn't treat syphilis with penicillin before that drug was discovered.

Perhaps we do have a right to complain that our forebears built so well that their buildings outlasted their ideas! But with the newer social psychiatric knowledge we now have, we are again concentrating on local services to meet problems close to their sources and to maintain patients in or near their homes rather than away from them. Fiscally this is being managed by State subsidies to local governments for this purpose.

The Sickest Patients

In general, planning originates around a pressing difficulty that is capable of solution. In mental health planning, the traditional starting point is the sickest patients, those who show the most deviant behavior. Their needs are pressing, and there is a management instrument traditionally available, the psychiatric hospital, where they can be locked up so their behavior bothers only psychiatrists and their helpers. The helpers sometimes become so inured to the situation that they fail to be disturbed by it, but this is not unlike what we do when we discharge clients because they are uncooperative—we manage to forget their acute difficulties because there are so many of them we can't stand to face them.

This simplicity of concept about severe behavior disorder is crumbling rapidly. We are learning that disturbed behavior need not be as serious as has been thought, that disordered behavior can be tolerated, and can, with newer methods, be minimized. In Amsterdam, Netherlands, the psychiatric services available during behavior crises serve to reduce the disturbance within tolerable limits in many instances so that hospitalization becomes unnecessary. Furthermore, sustaining the sick patient in the community is often possible through regular visits by one or another kind of helping person.

Finally, the community in contact with such services seems to acquire new attitudes. It increases its tolerance of psychiatric disability. The key to all three of these changes appears to be local services available on call, and, when

necessary, supplying services where the patient lives.

The simple procedure of turning the sickest patient over to the hospital is crumbling on another ground as well: the question of whether it is good for the patient to be there. The most poignant presentation of this situation I know is by Goffman (*7*). He depicts what happens in an institution which strips the man entering of all of his property, however much its sentimental value, which makes him a member of a group he didn't select rather than an individual, which dresses him like everyone else. It becomes clear, after a while, that although many of these things can be altered by good hospital management, being a chronic patient still has a stultifying effect on personality. Bowlby (*8*) and others have presented evidence that when children are institutionalized, their personalities are not likely to mature satisfactorily. As we agree that children who cannot stay in their own homes are better off in foster homes than in institutions, so, it appears, we are forced to agree that adults with mental disease would be better off in some sort of community setting. Planning for future psychiatric services must provide for the management of chronic psychiatric patients outside total institutions.

This does not mean the psychiatric hospitalization is never necessary. It does mean that it should be for short periods whenever possible, the patient returning home when an acute episode is over, but with services available on call at home or in a foster home. The psychiatric hospital should, like the general hospital, be the resource for treatment that cannot be given equally well elsewhere; it should be a long-term home for patients as rarely as possible. Readmissions in such a system are not marks of failure but only indications of need for another period of treatment because of an acute exacerbation of illness.

Many patients need not even go to the special psychiatric hospital for their definitive treatment; they can now get it in the local general hospital. Planning locally to take full advantage of this resource is basic.

Planning community services in mental health includes services on call where the emergency occurs, usually in the home as well as in a physician's office or clinic. Since we are planning for the future, I leave out the police detention issue. The police, too, should be able to call on medical service when they find themselves embroiled in a situation with a person whom they suspect is mentally ill.

As a second resource, there will be local treatment services in the general hospital. If the treatment can be done here, the patient goes home, using, if necessary, a sustaining service, public or private, in the community. If a specialized treatment is needed, he may go to the specialized hospital. Until our control of symptoms is more perfect than it is now, there will undoubtedly be some patients—only experiment will tell us what proportion of the present population of hospitals—who must live in the hospital, nursing home, halfway house, or other institution yet to be invented.

The Self-Disturbers

The next group to be considered in planning often overlaps with the disturbed group, and this overlap may increase as treatments become refined and more specific. For the most part, however, these are patients who disturb themselves, not others. Their discomforts may incapacitate them for productive work in the community, but they do not require that someone else be withdrawn from society to offer them care.

Again, a traditional solution exists, the psychiatric outpatient clinic. This social institution grew up during a period when the accent in the study of psychopathology was on the internal conflict within the individual. The therapeutic regimen adopted to cope with this conceptualization of what was wrong was individual psychotherapy or, at most, psychotherapy of individuals within the family as well as the patient, this latter technique being used mostly for children.

It was during this period that psychiatric social work became a sedentary profession rather than a traveling one, a matter of interviewing rather than one of observation of behavior in its natural setting. Freudian concepts of therapy were ascendant, and what the patient recalled and felt about his family life was more important than reality as seen by an objective observer. Recently the recognition of the im-

portance of the milieu, exemplified by the trend toward ego psychology in the analytical field, has begun to disturb the clinic team and to drive it to a more active consideration of environmental management as acceptable therapy and as an aim in prevention.

In planning the future for this group of patients, comprising mostly the severe and moderate neurotic, depressed, and minor delinquent patients, we must look toward family- and community-oriented outpatient clinics and many more of them. I think I will state flatly that every general hospital that has any sort of outpatient service should have a psychiatric outpatient department, available to patients not needing hospitalization and to patients who need treatment after or before hospitalization.

The All-Purpose Clinic

Children are another special group that we must consider in planning for the future. Some years ago we talked much of the "all-purpose clinic" which would meet all the psychiatric needs of ambulatory patients in the community. One hears less about it today, and part of the reason is that it could not be reconciled with specialization within psychiatry itself. Services to developing personalities probably do require special understandings of growth and development and of communication beyond what is required to deal with adults.

Some have suggested that the specialist in child psychiatry and his team ought to be relieved of the job of selecting their own patients, that the specialized clinic should accept only those referred after study by an all-purpose clinic. This proposal assumes that the all-purpose clinic staff is competent to diagnose for the specialized clinic.

Planning in a situation as unsettled as this may actually be unwise. I am attracted by the logic of the plan just outlined, but I know it cannot presently be used in most places, partly because no right is more firmly supported by clinic teams than that of deciding which patients are to be accepted for service. One of the most astounding things to the person from the United States observing the Amsterdam system of service is that community psychiatrists make all decisions to hospitalize. There is ample communication between hospital and community psychiatrist so that errors can be corrected, but the hospital agrees that it is a treatment service, not a selection service. Such willingness to turn over the keys for admission is not often found in our country, except, of course, in the State and receiving hospitals which must accept those whom the law dictates are to be admitted.

Groups at Special Risk

The next body of individuals to be considered are not usually thought of as psychiatric patients but as a group at special risk of becoming decompensated in their social and mental adjustments. They comprise the caseloads of social agencies, of many courts, the clientele of marriage counseling agencies. They include all people who admit or are accused of being maladjusted socially. Some are found to be frankly sick with easily recognized psychiatric symptomatology; this is a large gateway to the recognition of need for treatment. Sometimes the delinquency represents the wild waving of a red flag by the person to call society's attention to his intolerable situation. Kanner (*9*) noted that many symptoms are "tickets of admission" to clinical services needed for serious personality disturbances.

It is not the frankly sick that concern us in this group, however. To be sure, we must plan so that the worker who sees them is acute to recognize illness and often is able to "carry" ill people until a therapeutic opportunity can be found. And our eventual plans must be to get these people first to diagnostic services and then to proper therapy although, depending upon the diagnosis, the same management may do both jobs.

But what do mental health services have to offer "people in trouble" when there is little evidence of fixed psychiatric symptoms? We immediately face some extremely difficult definitions, and, as mental health workers, we get embarrassed because, as we state the case, we seem outrageously conceited.

Not long ago I heard of the contribution mental health workers had made in improving conditions in refugee camps in one country. The people working in the camps had fallen

into the habit of treating the refugees according to a stereotype. The camp workers acted as though, because the refugees were dependent upon the host country, they all preferred to be dependent and were exploiting their hosts. Furthermore, because some refugees leaned somewhat toward the political philosophy of the places they had fled, all were regarded as subjects for political suspicion. Because some were highly trained and wished to continue to use their training, all were said to be uppity and unwilling to do menial tasks. Having adopted such a stereotype, the workers in the camps could justifiably adopt the attitude that repressive and confining tactics were justified; such people deserved no better. There was revolt among the inmates, ending in still stronger repressive tactics.

The obvious move was to break down the stereotype so that the refugees could be dealt with on their own merits as individuals. With the establishment of goals for the refugees beyond the camp confines, the camp employees could help toward some end other than mere repression. A psychiatrist was placed in the highest councils of the government management of the camps, and he set up an elaborate inservice education program for the camp employees.

The question of why the counselor of the administrators and the educator should have been a psychiatrist was immediately raised. The issues as I have outlined them were obvious; were they not grasped by others as well? They could have been, but no one else acknowledged the situation, and the psychiatric association of the country had almost to force the State to change its ways.

It is tempting to say that psychiatrists are particularly sensitive to situations like this, and I sincerely hope they are. On the other hand, it must be pointed out that inhumaneness in psychiatric hospitals is often not brought to public attention by organizations of psychiatrists, but by an outraged public led by a newspaper reporter.

The Usefulness of Consultants

It is extremely easy to fall into stereotyped attitudes and habitual, unthinking ways of acting. Professional training should prevent this; but it does not always succeed in making us change the color of our glasses every so often so that we see our ways of working in a new light. Planning services, particularly in this area, must include getting consultants, perhaps of an entirely different profession, to help us do this. Recognition of this need in the last decade has brought philosophers, psychologists, and social scientists into psychiatric teaching and research institutions.

But we often stress how unprepared they are to understand our problems and proceed to seduce them into our point of view until they become useless to perform the critical function we invited them for. The more traditional way of meeting this need is the lay board. Unfortunately lay boards, not having the protection of professional training, are also susceptible to seduction and may become as blind as he whose nose is on the grindstone.

The net result of this long discussion is to point out the need for outside consultation frequently but not too frequently, frequently enough to cause recurrent fresh analysis of administrative systems and ways people are treated, but not so frequently that the consultant adopts the attitudes of the host agency.

I once had a commanding officer in an army psychiatric hospital who spent much of his time looking for things to change in administration and treatment, just to keep us from falling into the notion that any treatment we were carrying out was specific. A very perceptive reporter visited the hospital. In his story he said that our greatest therapeutic asset was the gleam in the commanding officer's eye. Eyes that see only stereotypes cannot gleam. Change and reevaluation must be planned into all programs.

Prevention

Much of the casework function must be regarded as preventive in the sense that it protects the personality from the ultimate strain that, presumably, would result in complete disorganization of the person and the family. Sometimes this task can be a temporary relief with no need for continued help. Often the diagnosis will be that the person or group needs continuous care and supportive counseling to avert the disaster of confused disorganization. At the moment, many are considering whether

more "cures" would result if we could maximize our efforts for a short period, rather than furnishing the too-late dribble of partial, inadequate, and short-term service that is often the current custom. Of all research areas, this is one of the most inviting.

In considering planning for the total population, let me say at the outset that I do not know whether this should be called prevention of psychiatric disease, promotion of mental health, or simply helping people avoid useless discomfort.

I am skipping the easy problems of the prevention of psychiatric disabilities of known and specifically preventable causes. There are more of them than you might at first imagine. They are, for the most part, taken care of by people whose primary consideration is the preservation of sound organs, including the nervous system, while we, in general, are more concerned about keeping the sound organ functioning properly.

Planning and Levels of Government

Planning things to be applied in total populations is a frightening task. We almost always abandon it after a little while and retreat to dealing with the much smaller group who are leaders or who operate one or another social institution. The ones I concern myself with are in public health primarily and psychiatric services secondarily. This allows me to consider a group of perhaps a few hundred thousand public health workers in the country and an equal number of hospitals and clinic employees, and salves my conscience about the 180 million people I should be looking at.

We all do this to some extent but we should not allow ourselves to. There must be plans for teachers, for ministers, for the elderly, for potential suicides, for expectant mothers, for men entering the army, for men at work, for men retiring; and all these should be coordinated. Planning becomes an immense task that easily frustrates one into supine submission to overwhelming odds.

A way out of this dead end has been invented by society, and we in mental health are only beginning to learn it; this is the policy of levels of government. I do not mean only official, public government, but the management of all sorts of large undertakings.

Mental health services began locally, moved to the State level, and are now returning to the local level because the task of using all therapeutic resources demands local understanding of individual homes and individual people in their local culture. These factors could not be comprehended for so large and complex a subdivision as a State, so the solution is to return services to local communities. I need not point out that this is a not unpopular political slogan, although not too many politicians easily take the absolutely unavoidable next step, to return more taxing power to local communities.

A challenge for both government and voluntary agencies is the very large city. Obviously, meeting the needs of cities must be planned for on a large scale, often, as for New York City, transcending even State organization. For such purposes as individual attention to families and family members, such large units are unmanageable. City planning for these services must somehow recapture the small town atmosphere.

Sometimes I think the present vast multiplication of shopping centers which shorten travel distances in cities and bring back the possibility that you may know the person at the cash register or the teller in the bank may be supplying the helping professions with a key to our future in planning. Maybe we should consider a store front for a nonspecialized social agency in the shopping center areas. If grocery stores can sell everything from garden tractors to pepper, maybe we can design a social and health agency that can serve psychiatric needs, poverty, prenatal care, and recreation planning for the aged.

We can keep the big specialized agencies in the central city, referring patients to them. This may be too much planning, but I am sure that centralization and specialization are not the only answers to the future. We need a local "general practitioner" who can supply a locus for community identification.

The next level of administration may well be citywide or statewide. Its function in planning will be to survey the rise of spontaneous or managed communities and the forces operating to establish them. These forces include, as they obviously have in the past, a drainage system, or, as they often do now, a real estate operator

or a corporation locating a factory, not infrequently without enough attention to the drainage system, according to my friends in sanitary engineering.

The organization of these communities must be recognized and planned for. We are only beginning to recognize that we who are interested in the promotion of social and mental health have a great deal of responsibility here. Planning means preventive organization as well as designing ways to repair disorganization.

Planning at this level includes the collection and analysis of the statistics about services requested and supplied so that trends can be observed and adaptations made. There is much to be learned; the epidemiology of social and mental maladjustments is in its infancy. It can grow through comparison of like observations in different areas. This step may allow concentration of services before the appearance of some dire emergency demands it.

There are ample predictions that many housing projects will turn into slums, but few actions to increase services when the units are built in order to prevent this happening. Again planning might mean designing a generalized service for such units rather than trying to service them from a series of specialized agencies distant from the occupants. Health agencies have accomplished this in a few places, but the definition of health they followed is much narrower than that of the World Health Organization.

The next level of administration is the combination of States or Provinces, a National Government. Its planning functions are further collection of statistics, evaluation of programs, and anticipation of areas of difficulty. All units beyond the local level also carry the consultation function.

In our country, the National Government, particularly in the last 15 years, has evolved two other functions, training personnel or financing training in the helping professions and research. Training is a Herculean task, the responsibility of everyone in our profession. The Federal resources have helped, but they must stimulate even more the use of State and local funds if we are to achieve the increase needed for even the most economical consolidations of services that we can imagine. To some extent, it is an accident of political economy in our country that stimulation of training should be easier for Federal than for State government. Actually the responsibility rests heavily on both, and we must constantly plan to discharge this responsibility.

Although similar considerations apply in research, there is perhaps more justification for Federal administration in this area. Currently, the Federal level is the ultimate receptor of statistics for the entire Nation, and these should give leads to the problems that need solution everywhere. Therefore, it seems quite proper that research on schizophrenia, aging, delinquency in general, new treatment methods, and other matters are national considerations. Of course, this does not relieve the State or locality of its responsibilities in research. One would expect these researches to be related more closely to service efficiency and methods than to the overwhelming and massive issues such as the etiology and treatment of the depressive psychoses, for example.

One more step and I'll conclude. I must say something about the world community. Like localities, nations differ and a world administration must be available to consolidate statistics and spot the places where there are marked differences in one or another phenomenon that invites further investigation. Research in schizophrenia, for example, is of world significance.

Had we had as much experience in international as in national government, perhaps all nations would be willing to accept international administration and contribute funds or even consign taxing authority to an international government so that this might be accomplished. But international administration is almost as new in all its functions as local mental health services; both need much development. Internationalism in health and welfare survived World War II and were the only international services to survive the holocaust. In our particular field we are grateful to India for the discovery of reserpine, to France for the synthetic tranquilizers, to Italy for electroshock treatment. Health is international (*10*).

Summary

Ill health defies analysis into physical, mental, and social components. Modern concepts

of causation of recognizable mental disease force us to emphasize local community services. These should probably be planned as general all-purpose services at the "phase junction" between the public and its helping professions and be backed by more highly specialized ones. Every mental health service should be planned with the aim of keeping the patient in his ordinary social and family atmosphere, and he should be removed from it only when treatment of a more or less specific sort is needed, or when symptoms are severe and escape medical control.

Planning and evaluation are not episodic functions but are integral parts of service. Training and recruitment of personnel is a function of all levels of administration; it is a vital part of our responsibility to the future. Research is appropriate at all levels of administration, depending on the generality of the problem to be chosen. Somehow those in the health and welfare field sense the need for international development more than many others. We can well afford to spend some time on planning in that area also.

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Establishing a Tradition of Immunization

Immunization in early childhood should be established as a tradition, especially among the hard-to-reach lower socioeconomic groups in the population, says Dr. Ollie M. Goodloe, health commissioner of Columbus, Ohio. In the April *Columbus Health Bulletin*, he suggests that mass communications media be used to help establish this tradition, especially for poliomyelitis which strikes so many before they reach the age when vaccination might be required for admission to school.

"Many communities," Goodloe says, "have found acceptance of vaccination is closely related to socioeconomic status, which in turn depends upon education, occupation, and income.

"Many of these people will accept inoculation if it is brought to their doorstep or even to their block or neighborhood. This, of course, is a frightfully expensive undertaking. . . .

"Even then the results are only temporary because each year a new generation of babies appears. . . .

"What is needed is a well-established tradition passed on from one generation to the next, of the value of early immunization . . . . Mass media might be of value, especially on a nationwide scale."

Radioisotope Labeling in Dental Research

Radioactivity in blood and saliva contributed to important dental research described to the Atomic Energy Joint Congressional Subcommittee on Research on March 27, 1961, by Dr. Wallace D. Armstrong, head of the department of physiological chemistry, University of Minnesota Medical School.

He reported that research using radioisotopes has revealed that the teeth constantly exchange ions with blood and saliva; that the fluoride content of mature teeth can be enriched; that all filling materials now used leak mouth fluids between tooth and filling; that some agents are effective in sealing the cavity before filling while others increase the permeability of dentin; and that the body has highly efficient mechanisms for regulating the concentration of fluoride in the cells.

Armstrong told the subcommittee that, in one of his own experiments, mature rats with fully formed molars were injected with sodium phosphate labeled with radiophosphorus. When they were killed and their teeth studied 116 days later, radiophosphorus could definitely be detected in the molar teeth and even in the enamel. Similar results have been obtained with radioisotopes of calcium, carbon, and strontium.

Armstrong said that experimentation, notably that of Sognnaes and associates, indicates that the turnover of phosphate in tooth enamel occurs mainly with saliva, and in dentin mainly with blood. At least some substances, such as iodide, migrate from the saliva completely through the teeth into the bloodstream. He said a reverse process was also observed.

The fact that ions and molecules move into and through teeth does not mean that mature teeth change in total amounts of calcium and phosphorus in response to nutritional or metabolic changes, according to Armstrong. "Very probably the appearance of these labeled ions in the tooth tissues is a result of an exchange of the labeled ions for preexisting calcium and phosphate ions of the mineral without the total number being affected. Only in the case of fluoride do we have confirmed evidence for the enrichment of a tooth constituent after tooth formation," he said.

In discussing his second topic, the evaluation of dental treatment methods through radioisotope labeling techniques, Armstrong cited studies in which teeth filled with different materials were immersed in saliva containing radiocalcium and then sectioned horizontally. Leakage into or around the fillings was detected on photographic film. Various degrees of penetration have been observed depending on the filling material and the way it is prepared. Armstrong sees the methodology as an extremely valuable aid in the development of more effective filling materials.

In similar fashion, the effectiveness of the several kinds of agents used to seal and disinfect the floor of the cavity before it is filled has also been tested with radioisotopes. Silver nitrate, phenol, and alcohol were among the agents which actually increased the permeability of dentin to radiophosphorus. Some agents, such as phosphate and preparations containing calcium hydroxide, effectively sealed the cavity. "The results of these studies have indicated the advisability of employing less caustic agents in cavity sterilization and sealing than many use in current clinical practice," Armstrong said.

He next described some findings in radiofluoride studies which support the safety of water fluoridation. Fluoride was found to be excreted rapidly through the kidneys: on an average, fluoride present in 91 milliliters of plasma was excreted into the urine per minute. The renal clearance for fluoride is much higher than for chloride. Moreover, experiments with dogs have shown that excretion of fluoride is enhanced when its intake is increased.

Armstrong said that other experiments have pointed out the role of the skeleton in regulating the concentration of fluoride in body fluids. He concluded that since these homeostatic mechanisms operate effectively we can understand how the body avoids the toxic action of fluoride by preventing large accumulation of this ion in cells.