Papers and Originals

Special Problems of the Aged and the Organization of Hospital Services

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The illnesses and disabilities of ageing have during the past two decades loomed increasingly large among the problems faced by health and welfare services in economically advanced countries. In recent years a number of surveys have helped to define the extent of the problem. In Newcastle upon Tyne, for example (Kay, Beamish, and Roth, 1964), the prevalence of psychiatric disturbances of at least moderate severity was found to be about 12% among a random sample of old people living at home.

The actual demand made on the health and welfare services varies considerably from one area to another, and this variation seems to be largely due to social factors that are constantly changing. These changes are likely to have important repercussions for these services. Thus surveys both in this country and in the United States have shown that a surprisingly large number of old people remain in contact with their relatives. Moreover, on the basis of field observations carried out in Bethnal Green, Townsend (1957) estimated that if it had not been for the care and attention given to sick and infirm elderly people by their families the burden on the health and welfare services would have been three to five times as great as it was. Yet none of these studies has told us anything about the rate of change in the predicament of aged people. Social and geographical mobility tend to increase progressively in industrialized and urbanized societies, and we have to anticipate an increase in the proportion of aged people who are left unsupported by their families. Nor are any of the measures we can adopt to offset such tendencies likely to prove effective within a short period.

These facts have to be considered in relation to the 4½% of people aged 65 and over accommodated at the present time within institutions in this country (Godber, 1962). This proportion is sufficient to strain to bursting-point the health and welfare services in most areas, and even an increase of 1% of aged people who require institutional care would be likely to cause serious embarrassment. It is widely appreciated that the number of beds to be made available in various kinds of institution is not the most important question. Only by anticipating the needs of the aged, by developing the community services, and by integrating all services into a comprehensive and balanced geriatric service can a solution be found (McMullan, 1963).

Present Inpatient Services for the Aged

Four main types of inpatient accommodation are available: (1) ordinary acute wards in general hospitals; (2) acute and chronic wards in general and special hospitals earmarked as "geriatric"; (3) mental hospitals and other psychiatric units;

and (4) residential homes provided by the local authorities or by voluntary bodies.

Attempts have been made to estimate the number of beds needed in the different types of unit. Two of the most authoritative are the Ministry of Health's (1962) own plan and the report of the Royal College of Physicians of Edinburgh (1963).

These reports reveal some quite striking differences (Table I). In the Ministry of Health's (1962) plan an overall diminution of beds from 6.45 to 5.7 per 1,000 population is envisaged, resulting from an expected fall from 3.3 to 1.9 per 1,000 in the need for beds in mental hospitals. The total number of beds proposed for 1975 is actually less than that suggested as desirable by the Scottish College at the present time, even though it includes the bed provision for *all* mental hospital patients, whereas the Scottish estimates are throughout for *geriatric patients only*. The discrepancy cannot be accounted for by an increased provision of beds in general hospitals, since these are also earmarked for reduction, although the proportion occupied by old people is likely to increase.

TABLE I.—Beds per 1,000 Total Population

	Ministry of Health Hospital Plan		R.C.P. Edinburgh 1962
	1960	1975	
Acute, general	3.9	3.4	?
Geriatric, acute and chronic ..	1.3	1.3	2.0
Mental	3.3	1.9	1.5
Welfare homes	1.85	2.5	2.5
Total	6.45	5.7	6.0

These estimates apply to different parts of Britain, and are therefore not strictly comparable. Moreover, the reduction in mental hospital beds for England and Wales is based on the assumption that the turnover will be more rapid than it is today, and that the community services will expand. But even if these assumptions turn out to be justified the adequacy of the provision of beds proposed in the Ministry's plan evidently depends to a large extent on finding a solution to the geriatric problem; and it is worth considering to what extent the present inpatient services for the aged are fulfilling useful and clearly defined functions.

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Mental and Physical Condition of Patients in the Different Types of Units

Studies in Newcastle upon Tyne (Kay, Beamish, and Roth, 1962) and elsewhere have shown that there is very considerable overlap between the types of patient currently treated in general hospitals, geriatric wards, psychiatric units, and welfare homes (Table II).

TABLE II.—*Mental and Physical Status of Aged Patients in Three Types of Institution*

	Mental Hospitals*	Geriatric Wards†	Welfare Homes*
	N = 133	N = 50	N = 73
Mental:			
Severe brain syndrome	49%	42%	29%
Mild brain syndrome	0%	18%	11%
Other mental syndrome	51%	24%	24%
Physical:			
Severe physical disability	28%	48%	12%
Housebound (before admission) ..	34%	30%	40%
Bedfast (before admission)	0%	20%	4%

* First admissions aged 65 and over. † Aged 65 and over.

(a) In 1954 there were over 600,000 admissions of people over the age of 65 to the wards of general hospitals, and about two-thirds of these were to acute wards (Godber, 1962). Psychiatric and social problems are by no means infrequent among these patients, and acute illness is often only an episode in a complex situation. The large number of elderly patients now being admitted to general wards emphasizes the need for both geriatric and psychiatric services in general hospitals, including adequate accommodation and staff, and for much more awareness than generally exists at present in general hospitals of the functions of the health and welfare departments of the local authority.

(b) "*Geriatric Wards*."—These tend to be occupied by patients over the age of 75. There is no hard-and-fast line of demarcation between the kinds of patients in the general and geriatric wards, but from a practical point of view geriatric treatment may be said to begin when it seems probable that the patient will never be restored to a fully independent way of life. Advanced age, chronic disease, mental or physical infirmity, and unfavourable social or domestic circumstances are all indications that supervision by the geriatric services is needed now or will be needed in the near future, and a geriatric service must be competent to deal effectively with all aspects of the situation and not only with the grosser consequences of mental or physical illness. In the Newcastle study it was found that 40% of patients in geriatric wards showed marked mental symptoms arising from organic diseases associated with arteriosclerosis and ageing, 18% showed organic mental changes of lesser degree but of similar type, while a large proportion of the remaining patients manifested psychiatric disorders of various kinds; 48% were severely disabled from physical disease.

(c) In *mental hospitals* it was found that one-half of recently admitted geriatric patients (aged 65 and over) were suffering from essentially irreversible arteriosclerotic or senile degeneration, while 28% were severely disabled from physical causes. There was thus a large area of overlap between patients in mental hospitals and geriatric wards in regard to both mental and physical illness. Robinson and Isaacs (1963) carried out a survey of patients aged 65 and over admitted to hospitals in the Glasgow and Dumfries areas. Their conclusions were that *nearly half the geriatric ward patients had psychiatric disturbances with or without physical illness, and half of the mental hospital patients had physical illness accompanying the psychiatric disorder.*

(d) *Residential Homes*.—In the Newcastle local authority homes our survey showed that both mental and physical disorder were common, and that mental disturbance was not confined to residents who had grown old in the home, but occurred

often in those admitted during the previous year. Only one-third of the residents were regarded as mentally normal.

Social Factors Associated with Admission

In the Newcastle survey the geriatric wards and welfare homes were found to contain an excess of widowed and single individuals compared with the general aged population and an excess of patients belonging to social class 5 (unskilled workers) and of those living in areas of high population density and poor housing standards. As Townsend (1957) pointed out, old age is a period of diminishing social contacts and domestic support, and those who are isolated and poor make a disproportionately heavy demand on the services of the State.

Shortcomings of the Present Inpatient Services for the Aged

Haphazard Selection.—It is evident that each type of unit—mental hospital, geriatric ward, and welfare home—contains patients who are physically ill, mentally ill, or both, and that social factors often either precipitate admission or delay discharge. In general hospital wards for acute cases, too, many psychiatric and social as well as medical and surgical problems are to be found. Since comprehensive assessment of the total situation before admission or placement is usually lacking, it is probable that many patients are admitted to a unit which is not the most suitable one for their needs. Now it might be argued that, since there is a wide overlap in the type of patient catered for in the various units, it does not matter much where the patient goes. But as Kidd (1962), for example, has shown, misplacement may impair the chances of recovery. This arises from the fact that, while the conditions treated are actually largely similar, the organization and accommodation, the attitudes and training of medical and nursing staffs, the ancillary services, and staff/patient ratios in the different types of unit are markedly dissimilar. The treatment regimens tend to be wholly different. The value of occupation and stimulation, for instance, which is recognized in hospitals, is largely absent in welfare homes, where *laissez-faire* is the rule (Townsend, 1962). In geriatric wards the regimen is designed to benefit the physically ill rather than the mentally ill. Most important of all is the attitude of the nursing and supervisory staff, who are usually trained in only one aspect of the multiple problems of geriatric medicine.

Delay in Admission.—A second undesirable feature is that admission is often delayed until it becomes unavoidable, owing to some medical or social emergency, and the patient has to be sent to whatever unit can most speedily provide a bed. The advantages of early assessment, treatment, and anticipation of future needs are thereby lost. The result is that what might have been a short stay in an acute or convalescent unit becomes a permanent stay in a chronic unit, and the resources and good will of the relatives or neighbours may be exhausted and future care of the patient at home resisted (Macmillan, 1960).

Defective Integration between Units.—It is often maintained that all these evils arise solely from a shortage of beds. This is not necessarily true. The mental hospitals have not increased their number of beds, but are able nevertheless to treat many more patients than formerly by raising their admission and discharge rates. *The use to which the available beds are put* is the crucial issue, and there is little doubt that this could be improved by more effective cooperation on the administrative and consultative levels between units. Geriatricians and psychiatrists deal with much the same clinical material but rarely trespass in each other's wards. Neither pay regular visits to welfare homes. Transfer of patients from one kind of unit to another is usually difficult, and errors in initial placement, even if recognized, may not be easily rectifiable. When a patient is transferred to a welfare home he may be "labelled" as a

hospital or "mental" patient and not be accepted by the staff, a situation which is probably due to lack of any kind of continuing interest or supervision by the hospital.

Scope of a Modern Geriatric Service

The main components of a service orientated towards preventive care should be as follows:

1. An *organization and administrative structure* which facilitates integration on a practical level of the various services provided by the local authority, the family doctor, and the hospitals, and, it might be added, so far as possible, the voluntary bodies.
2. A scheme of *ascertainment* of those aged most likely to need help, such as the infirm, the isolated, the widowed and bereaved, the very old, those with defective sight and hearing, and those suffering from economic hardship.
3. A number of *lines of defence within the community* designed to serve old people with differing needs, such as domiciliary services of various kinds, club and day centres, outpatient clinics, and day hospitals.
4. *Hospital inpatient services* of a kind that can be utilized not as a last resort but at appropriate stages, and often for short periods only, within the total programme of care.
5. Provision of *long-term accommodation* for the ambulant aged, including residential homes and "sheltered" housing of various kinds.

One of the key concepts in modern geriatric care is *integration of services*, with a proper balance between hospital and community care.

In a recent circular the Ministry of Health (1965) has drawn attention again to many of the problems, and has indicated how they might be solved. Various efforts towards co-ordinating the activities of the different branches of the health and welfare services have been made or suggested (Nisbet, 1962; Rudd, 1963; Woodside, 1965)—for example, the experiment of attaching health visitors to practices (Hall, 1965)—in which the number of geriatric problems was found to exceed all others. We believe, however, that integration can most rapidly and effectively be achieved, in the first place, *within the hospital service*, and that integration at this point would have the most favourable repercussions throughout the whole field of geriatric care.

In order to achieve this, there is a need for the establishment of special hospital units having as their essential feature comprehensive assessment wards where modern investigations of all kinds can be carried out, preventive and therapeutic measures started at an early stage of illness, and long-term programmes set in motion. The word "comprehensive" implies that the units must possess the equipment and staff needed to investigate all aspects of the aged person's health and circumstances, physical, social, and psychiatric. By "psychogeriatric" we mean a combined psychiatric and physical appraisal, and not merely the care of elderly psychiatric patients.

Comprehensive Psychogeriatric Assessment Units

The special contribution of such comprehensive psychogeriatric assessment units to the total service would lie first in the fact that they could be introduced with relatively little radical modification of the existing patterns of service and that no great expenditure need be involved. Secondly, they would stimulate other important developments by bringing together, in the way to be described, all relevant components of the service in the early stages of development of a geriatric problem. Physician, family doctor, psychiatrist, and representatives from local health authorities could, with great advantage to the patients, meet together in the unit in order to formulate suitable programmes of care.

Such units should be: (a) attached to the main district general or teaching hospital; (b) staffed by both physicians and psychiatrists; (c) supported by adjacent outpatient and day

hospital facilities; and (d) closely integrated, perhaps by joint appointments, with the local authority health and welfare departments, and with the general-practitioner service. The scheme is shown in the Diagram. It may be pointed out that while many "psychogeriatric units" exist in this country most of them are situated in mental hospitals and have more limited aims than those envisaged for the psychogeriatric unit. Usually the term implies little more than a unit for the treatment of mentally ill old people. Fish and Williamson (1964) described a small unit run jointly by geriatric physicians and psychiatrists in a geriatric hospital.

Scheme for geriatric services, showing lines of flow in and out of psychogeriatric unit.

Situation of Unit

The advantages of psychiatric units situated in general hospitals have been widely recognized (American Joint Commission on Mental Illness and Health, 1961; Ministry of Health, 1962); they include the need to integrate psychiatry with general medicine and to bring together a wide range of facilities for diagnosis and treatment. These advantages apply with at least equal force to the disorders of old age, where the coexistence of physical with mental disability is the rule rather than the exception, and diagnostic problems require full investigation by modern techniques, in the use and interpretation of which only general hospitals are fully equipped. A high order of skill in the medical and nursing staff and a high staff/patient ratio are essential. Moreover, the medicine and psychiatry of old age must be in a position to attract its fair share of the prestige and glamour of acute medicine, for without these the necessary funds and resources essential for the advancement of knowledge in the disease of old age will not be forthcoming.

It is noteworthy that the Expert Committee on Mental Health Aspects of Ageing and the Aged (W.H.O., 1959) made a strong recommendation that units of this nature should be established. Nowhere has this recommendation been put fully into effect. It was suggested, for example, that not only outpatient clinics and a day hospital but also ancillary staff, such as psychologists and social workers, could be located on the same premises. Other suggestions made were that a club for elderly people, a counselling service for patients and their relatives, and the central records department (containing records for each person who had come under consideration by the service) should also be established there. These suggestions have much to recommend them.

Psychogeriatric Unit and Main Geriatric Unit.—Where geriatric wards are already attached to general hospitals the psychogeriatric unit would form a specialized part of the geriatric department; where none exists, the psychogeriatric unit

and its associated facilities should form the nucleus of a general geriatric unit. The proportion of beds allocated to it and to the other geriatric wards would depend on local conditions and on experience. In Newcastle it is hoped that a unit containing 25–30 beds, with 30 day places, achieving an annual admission rate of 300–400, will become available, and that, together with about 180 beds in the existing geriatric wards, it will serve a population of about a quarter of a million. Direct admission to the psychogeriatric unit will be appropriate for patients with a combination of physical and mental illness, while those presenting with physical illness will continue to be admitted to beds in the other geriatric wards. It is envisaged that the psychogeriatric unit will be under the overall direction of a physician who will also have control over other geriatric beds, thus linking the two parts of the geriatric department together. By rotation junior medical and nursing staff will gain valuable experience, and staffing problems will be eased.

Psychogeriatric Unit and Other Hospital Departments.—Direct admissions to the general wards and the ordinary psychiatric unit will of course still take place when the problem is a straightforward one of uncomplicated medical or psychiatric illness. As already pointed out, a number of patients admitted to the general wards are likely to need further assessment in the psychogeriatric unit or its attached day hospital before discharge, and, as a consultant on the staff of the hospital, the physician in charge of the unit will be able to refer patients without delay to other departments for specialized forms of treatment or investigation, and to receive patients from them for detailed assessment and suitable placement. In this way close links will, it is hoped, be forged between the geriatric and the other departments, such as urology and orthopaedics, and eventually some beds might be set aside for them, thus completing the integration of geriatric medicine and psychiatry with general medicine and surgery.

Joint Staffing

Joint staffing of the psychogeriatric unit by physicians and psychiatrists is essential not only for diagnosis and treatment but also to ensure appropriate and expeditious placement. One of the reasons put forward for delay in admission and difficulties in transfer and placement is the pressure on beds. This is an argument for the establishment of units of this kind, since they would enable the best possible use to be made of the beds and other facilities available. It would, for instance, be in the interest of all members of the staff, medical and psychiatric, to maintain adequate rates of turnover (the outpatient and day hospital facilities would do much to assist this), the present conflict of interests between geriatric and psychiatric departments would vanish, and the needs and problems of the aged could be studied without prejudice. Through his psychiatric colleagues the physician in charge would have access to beds in psychiatric units and mental hospitals, but if some delay in placing certain patients was unavoidable the correct treatment regimen could be started in the meantime.

Outpatient and Day Hospital Facilities

These facilities are an essential part of the scheme, and the need for more of them emerged very clearly from a study of a random sample of old people living at home in Newcastle (Bergmann, Foster, and Kay, 1965). Day departments are particularly useful because attendance rates can be varied from daily to weekly, as seems desirable, and the number of patients receiving treatment may greatly exceed the number of daily places available (Whitehead, 1965). After discharge from the ward supervision can if necessary be continued on a day or outpatient basis. Moreover, some inpatients may also benefit from attending the day department, which should provide ancillary services, such as physiotherapy, as well as occupation.

Local authority and the General Practitioner

Close collaboration between the family doctor, the psychogeriatric unit, and the local authority will be essential. Local authority staff, both medical and welfare, must have a footing in the unit, to facilitate access to places in residential homes or to provide aftercare and supervision for the patient at home. The experiment of making joint appointments of consultants to the local authority and the hospital service, as has been done in Newcastle, or to the regional board and the local authority, as described by Wollner (1963), deserves wider trial. General practitioners should be encouraged to visit the unit for post-graduate teaching, and it might even be possible to make some part-time appointments of general practitioners to the staff.

The ultimate objective of the psychogeriatric unit and its associated facilities is to strengthen the domiciliary services provided by the general practitioner and the local authority. Indeed, with the exception of permanent care all hospital-based services, such as domiciliary consultations, outpatient clinics, day centres, convalescent homes, and even short-stay units, can be regarded as falling within the province of community medicine, in that they help to keep patients at home or to return home after treatment. The existence of a unit of the kind proposed, where emphasis will be put on ready access to short-stay beds or day centres, on comprehensive assessment, on prevention and early treatment, and, where necessary, on long-term programmes of care, should provide the foundation for a fully effective and integrated community-hospital service.

Teaching and Research

Two important advantages that would follow from the establishment of psychogeriatric units, of the kind proposed, in general hospitals deserve special emphasis.

Teaching.—(1) At present geriatric wards are staffed by nurses who have had little or no psychiatric training, while psychiatric units are staffed by nurses who have not usually received general training. A comprehensive unit would offer nurses training in both the mental and the physical aspects of geriatric medicine. (2) From the point of view of the medical student such a unit should be able to give (and is probably the only way of giving) a proper training in geriatric medicine, which would eventually improve the knowledge and interest of general practitioners in this field. Further, students would be able to observe the social aspects of geriatric medicine and become acquainted at first hand with the various services available. (3) By means of postgraduate courses and seminars general practitioners and others concerned with the care of the aged would acquire greater confidence in their ability to deal with the full range of problems, and, not least important, make personal contacts with the local authority and hospital staff.

Research.—Numerous opportunities for research would arise, and a comprehensive centrally placed unit would be in an excellent position to attract the staff necessary to carry it out. It is illogical that, with geriatric illness looming so large, so few opportunities are given for research in this field. No amount of reorganization of services can conceal the fact that fundamental advances in prevention and treatment are urgently needed.

Long-stay Units

However efficiently the domiciliary and acute inpatient services function, a proportion of the aged will need to be cared for in residential units during the last months or years of their lives. At the present time the respective roles of mental hospitals, long-stay sick wards, and residential homes in the care of the long-term geriatric patient are matters of dispute—for example, Enoch (1963). There are, however, excellent grounds for believing that the problem can be simplified, and that not

more than two basic types of unit are necessary. This is largely because, with the advent of the major tranquillizing drugs, only a very few geriatric patients—that is, those whose behaviour is seriously and persistently disturbing to others and the persistent wanderers—need the specialized facilities of a mental hospital.

It is probable that most *ambulant* patients, whether needing care for predominantly medical, psychiatric, or social reasons, can be looked after in residential-type accommodation. At the present time, in Newcastle, some 30% of residents of local authority homes show evidence of established dementia, and a further 20% evidence of other psychiatric disorder, recent or chronic. This situation does not seem often to give rise to serious difficulties, and further development of this type of unit seems appropriate, under certain conditions. These are (1) that transfer to more specialized units can be arranged at short notice in an emergency; (2) that regular consultant advice, which could most readily be supplied by the staff of the psychogeriatric unit, is available; and (3) that the residential home is more adequately staffed than most local authority homes are at the present time.

The other main long-stay and medium-stay requirement is hospital-type accommodation for *non-ambulant* patients—that is, those needing nursing in bed, or active rehabilitation, as following a “stroke,” or with multiple physical disabilities, including blindness. A good deal of active therapy should take place, and discharge of a patient to his home, to a day department, or to a residential unit need not be rare. Many patients with mental disorder combined with a physical disease that restricts their movements can be treated in this type of unit, within which there must of course be wards organized to cater for different types of patient.

This solution for the long-stay patient requires that both medical and psychiatric supervision and treatment are readily available, not only in the hospitals but also in the residential homes. This should not be difficult to arrange, once the central psychogeriatric unit is set up. It can be predicted that many of the administrative problems (as of deficiencies in care) in the realm of geriatric medicine will be found to be attributable in large part to the present division of responsibilities, and may be expected eventually to become of historical interest. However, improved care for the long-stay patient is unlikely to be achieved until a central organization based on comprehensive assessment units attached to general hospitals is established.

Summary and Conclusions

1. The number of old people in the population is increasing rapidly, and a high proportion of them are afflicted not only by physical ill-health but also by mental disability, by social distress, and often by a combination of all three. These facts make it essential that the health and welfare services for the aged are both comprehensive in scope and community-orientated, for the size of the problem is such that were it converted into a demand for beds it would threaten to overwhelm the hospital service; and the only practicable solution is to develop programmes of care centred on well-coordinated community services whose aim must be to maintain the old person within his own home environment by every possible means.

2. The key concepts on which a modern geriatric service must be based are as follows: (a) integration of services on a practical level to make the most efficient possible use of all the facilities available; and (b) early ascertainment of high-risk groups, thus allowing resources to be focused where they are most needed and enabling preventive and therapeutic efforts to be started at an early stage. It is becoming widely recognized that fulfilment of these aims hinges very largely on improving and co-ordinating the domiciliary services provided by the general practitioner and the local authority.

3. Within the framework of a community-orientated service *hospital departments* should have a major part to play, not merely by providing an emergency service and a number of long-stay beds, but (through domiciliary consultations, outpatient and day departments, and short-stay units) by helping to maintain the aged in their own homes or return them there after treatment. At the present time, unfortunately, hospitals do not seem to be working to this end as effectively as they might. All the main types of hospital unit (the general hospital ward, the geriatric unit, and the mental hospital), and also to a considerable degree the residential homes of local authorities, have been found to admit many patients with physical, mental, and social disabilities singly or combined. But each type of unit is organized predominantly to diagnose and treat only one or other aspect. Other disadvantages of the current situation are that admission tends to be delayed until a late stage, perhaps until a medical or social emergency forces action to be taken; that the choice of unit may depend more on irrelevant factors than on the actual needs of the patient; that transfer to another more suitable type of unit may be difficult; and that the special need of the aged for continuation of care after discharge from hospital is not always taken into account. The result is that the practitioner may come to think of the admission of an aged person to hospital as the last card he has to play, rather than as simply an episode during a programme of care.

4. The urgent need now is for the establishment of short-stay geriatric units (comprehensive psychogeriatric assessment units) where all aspects of a patient's condition can be fully investigated and the most suitable treatment initiated. These units should be attached to general or teaching hospitals, so that all modern methods of diagnosis, treatment, and research are available; they should be staffed by both medical and psychiatric specialists because of the frequency of combined physical and mental illness; and they should be very closely associated with the local authority staff, owing to the importance of social factors and of domiciliary care. A further essential requirement is that they should possess outpatient and day-hospital facilities, where both diagnostic investigations and treatment programmes can be carried out.

The advantages to the patient and his relatives of a full physical and psychiatric assessment, especially if this was made at an early stage of the illness, and combined with a social inquiry, would be that an appropriate programme of supervision, care, and treatment could be set in motion and the chances of influencing the progress of the illness be greatly improved. Anticipation of and preparation for future changes and needs, such as residential care, would become possible. Generally speaking, admission to a long-stay unit or home would take place only after assessment in the psychogeriatric unit or its day department. A close link between the staff of the unit and the long-stay units would be expected to develop. Although orientated towards the community, units of the kind envisaged could well become the hospital centre from which the chronic wards and homes were staffed and supervised.

By offering a comprehensive range of facilities, and encouraging early referral, these units would not only support and lighten the load on the domiciliary practitioner and local authority services but also go a long way towards making them more effective. In the course of time convalescent homes, clubs, and counselling services for the aged and their relatives would develop round this nucleus as essential components of the geriatric service.

5. Finally, the tremendous potential of such units, situated as they must be in general or teaching hospitals, for education and research, has been pointed out. For nurses and social workers, as for medical students and postgraduates, they would be able to offer a unique training in geriatric medicine in its broadest aspects. They would provide in addition a practical demonstration of an important area of social medicine in action.

In research into clinical, pathological, or social problems of ageing the psychogeriatric unit would be in a position to provide almost unlimited opportunities. Since the medicine of the future will be increasingly the medicine of old age, this nettle should be firmly grasped now.

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Assessment of Respiratory Function in the Asthmatic Child

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Clinical reports concerning the action of drugs, the influence of environment, infection, and psychological and allergic factors have lacked a satisfactory definition of "asthma" in physiological terms and means of measuring objectively changes in ventilatory function. Progress was made with the application of tests of respiratory function, but the position is still not entirely satisfactory. Tests of ventilatory function, such as the forced expiratory volume in one second (F.E.V.₁), applied in the conventional manner, do not distinguish between asthma and other respiratory disorders, because they do not pinpoint the specific abnormality of function in the asthmatic—namely, a labile type of bronchoconstriction. Thus the F.E.V.₁ may be normal at certain times in some subjects with severe asthma. What is required of ventilatory tests in asthma is greater specificity for the disease and a classification of the physiological abnormalities based upon such tests which correlates well with the main clinical features. An appropriate technique for examining ventilatory function and a classification of asthma are here described, based upon the F.E.V.₁ test.

Evidence of Bronchial Lability

It has been shown that physical exercise in the form of running for five to eight minutes is followed in asthmatic subjects by bronchoconstriction as indicated by a fall in the F.E.V.₁ below the pre-exercise resting value (Jones *et al.*, 1962). In order to obtain maximum bronchodilatation in the asthmatic it is necessary to give isoprenaline in the form of an aerosol followed by one minute's exercise (Jones *et al.*, 1963). By standardizing the use of exercise and drugs in the way defined by these authors it is possible to obtain an objective measure of the tendency of the bronchi to constrict and dilate in a given subject. If the fall and rise in litres below and above the resting value are added and expressed as a percentage of the predicted normal for that subject, the figure obtained can be used as an index of bronchial lability.

Lability index =

$$\frac{\text{Fall of F.E.V.}_1 \text{ in litres} + \text{Rise of F.E.V.}_1 \text{ in litres}}{\text{Predicted normal F.E.V.}_1 \text{ at rest}} \times 100$$

In the normal subject,

Lability index =

$$\frac{\text{Fall of F.E.V.}_1 \text{ in litres} + \text{Rise of F.E.V.}_1 \text{ in litres}}{\text{F.E.V.}_1 \text{ at rest}} \times 100$$

Classification

It will be shown that with few exceptions the lability index in normal children is less than 15%. The lability in asthmatic subjects always exceeds 20%, with the exception of a few in whom it lies between 15 and 20%.

It will be shown that when isoprenaline and exercise are used to produce maximum bronchodilatation the majority of asthmatic children have values for F.E.V.₁ which lie within the predicted normal range. These children may be subdivided into two groups (groups 1 and 2), according to whether the lability is low or high. The remainder, with resting values below normal after maximum bronchodilatation, form a separate group (group 3).

Group 1. F.E.V.₁ normal at rest, after maximum bronchodilatation. Lability index less than 30%.

Group 2. F.E.V.₁ normal at rest, after maximum bronchodilatation. Lability index greater than 30%.

Group 3. F.E.V.₁ below normal at rest, after maximum bronchodilatation. Lability index variable.

In all groups the lability exceeds 20%, with a few exceptions in group 1 which lie between 15 and 20%.

Methods

Ventilatory capacity was measured by the F.E.V.₁ test. A modified Gaensler spirometer¹ was used which records the volume of gas expired in the first second of a forced expiration, excluding the first 100 ml. (Gaensler, 1951; McKerrow *et al.*, 1960). The instrument was recalibrated daily by the method described by McKerrow *et al.* (1960). The F.E.V.₁ and forced vital capacity (F.V.C.) were recorded and results expressed at B.T.P.S. (body temperature and prevailing pressure and saturation).

Details of the exercise tests have been described elsewhere (Jones *et al.*, 1963). Exercise took the form of running. Bronchoconstriction was produced by exercise lasting up to eight minutes. With experience, the occurrence of bronchoconstriction during exercise could be recognized by the devel-

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¹ Made by Poulton and Sons, of Penarth, South Wales.