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POSTGRADUATE MEDICAL EDUCATION IN NEW ENGLAND

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A REVIEW of postgraduate or continuing education of physicians in the New England area of the United States requires at the outset clear definition of the ground to be covered in this presentation. It is apparent that the term 'postgraduate' does not have precisely the same meaning for members of the British and the American medical professions.

On inquiry it has been learned that in the United Kingdom *postgraduate* is a designation of generic scope, covering all advanced education and training; formal and informal, following graduation from medical school. By contrast, until recently in the United States, it was accepted usage to limit the term to short courses and sessions of refresher type for the physician engaged in active practice. However, recognition by American educators of the shortcomings of such delimitation has resulted in the adoption of the term *continuing education* which better describes programmes for practitioners.

The term *graduate medical education* has been retained in American usage to designate all full-time advanced work of hospital residents or fellows, leading to specialization in one field as opposed to a more general type of practice. It is assumed that a registrar in the British system closely resembles the American resident.

At the suggestion of the Editor of this Journal, there will be some inclusion of *graduate* as well as *continuing* medical educational programmes in this paper, especially residencies in non-university hospitals.

Quite obviously clarification of definitions is only the first step in working out better understanding

and effective solutions for the exceedingly complicated factors involved. As pointed out by Ellis (1954), a leading figure in New England medicine: 'The continuing professional education of practising physicians constitutes one of the most important, difficult and neglected problems facing American medicine today. It is unnecessary to labour the point, that complexity and rapidity of developments in all branches of medical knowledge have forced the modern physician to be continually going to school if he is to be considered competent and well trained.'

'The crux of the problem is, of course, how to reconcile and co-ordinate the demands upon the time needed for the busy doctor's practice, with time required for "going to school".'

Consideration of all continuing or postgraduate resources available to physicians in New England must take into account those nationally as well as locally sponsored. As a locality, British readers will be interested to learn that New England, while encompassing a land area approximately three-quarters the size of England and Scotland, has only one-sixth their population.

As a beginning it will be helpful to review the array of continuing educational resources available to the New England profession. They include those provided by:

- (1) University medical centres in Connecticut, Massachusetts, New Hampshire and Vermont.
- (2) Other hospital centres in Maine and Rhode Island, with programmes on extramural non-university bases.
- (3) State medical society meetings and courses.
- (4) State, New England and national medical journals.

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(5) American Colleges of Physicians, and of Surgeons; national and regional sessions.

(6) Medical and surgical specialty society programmes; local and national.

(7) Internship, residency and fellowship opportunities.

(8) The Joint Commission on Hospital Accreditation requirements.

(9) The Bingham Associates Fund regional and consultative system.

(10) The Postgraduate Medical Institute programmes of Connecticut, Maine, Massachusetts, New Hampshire, Rhode Island and Vermont.

(11) State Chapters of the American Academy of General Practice educational requirements.

(12) Annual New England Postgraduate Assembly in Boston.

(13) Annual New England Hospital Assembly in Boston.

(14) The institution of full-time directors of medical education in non-university hospitals.

(15) Two-way radio—postgraduate programmes.

(16) American Heart Association postgraduate projects.

(17) New concepts on teaching and learning in medical schools.

(18) New instructional media—teaching machine and programme possibilities.

(19) 'Audio-Digest' tape recordings of edited postgraduate material.

Continuing Educational Courses for Physicians in New England

The Council on Medical Education and Hospitals of the American Medical Association compiles annually a list of all postgraduate courses offered to the American profession (Ruhe, 1961). Currently, 49 courses are listed in the New England states, under the auspices of a number of universities and colleges. The sponsors include: Harvard, Tufts, Vermont and Yale Universities; Colby College in Maine; the Institute for Living at Hartford, Connecticut, the Vermont Heart Association, and the American Thoracic Society. Co-operating teaching institutions comprise the Beth Israel, Boston Lying-In, Children's Medical Center, Massachusetts General, Massachusetts Eye and Ear Infirmary, New England Center and Boston Dispensary, New England Deaconess, New Haven and Peter Bent Brigham Hospitals.

The courses cover such diversified offerings as: adolescent medicine, anatomy, cardiology, pulmonary function, dermatology and syphilology, electrocardiography, diabetes, epidemiology, ambulatory medicine for the family doctor, hæmatology, internal medicine, mycology, neurology, gynaecology, obstetrics, occupational hearing loss, ophthalmology, orthopædics, pathology, pædi-

atrics, metabolism and endocrinology, psychiatry for physicians, radiology and general surgery.

Backgrounds of Medical Education in New England

To better comprehend the evolution of these present-day programmes valuable perspective can be obtained from backgrounds in which Great Britain and New England share a common heritage.

Early medicine in the original Massachusetts Bay Colony was deeply rooted in the ideals and traditions of the 17th and 18th century university and hospital medical colleges of Great Britain. Pioneers in American medical leadership of that period were Drs. Benjamin Waterhouse, James Jackson, John Collins Warren, and others who derived their inspiration and training from such celebrated figures as Dr. John Fothergill and Sir Astley Cooper of London, and other great teachers in London, Edinburgh and Leyden (Major, 1954).

Waterhouse and Jackson returned home to become professors of theory and practice at Harvard, and the latter was the first physician at the Massachusetts General Hospital when it was opened in 1821. They were alert to the importance of encouraging continuing medical education, even at that early day. Between 1803 and 1821 they gave vigorous support to the revitalization of the Massachusetts Medical Society, the publication of the 'Massachusetts Pharmacopeia', the establishment of the Boston Medical Library, and the founding of the *New England Journal of Medicine and Surgery*.

At the sesquicentennial celebration of what is now become the *New England Journal of Medicine* (Howe, 1962) its unparalleled record of the longest uninterrupted years of publication among present-day medical journals was recognized by the editors of many medical periodicals, including those of the *Lancet* and the *British Medical Journal*. Quite obviously this popular and widely read New England publication is of immense influence in keeping practitioners abreast of advances in the arts and sciences of medicine. This includes physicians not only within the area suggested by its name but to a wide circle of readers elsewhere.

Despite the promising start made a century and a half ago, and the succeeding efforts by the American Medical Association beginning with its organization in 1847, all forms of medical education in the United States languished throughout most of the 19th century during the country's 'growing pains' of rapid development. It was not until 1889 that what may be considered the first true university hospital medical centre was created by Johns Hopkins University (Shryock, 1953) at Baltimore, Maryland, and long-term

graduate training toward specialties was introduced. From that pioneering under the inspiring leadership of Billins, Osler, Halsted, Welch and Kelly the modern university-hospital medical centres have evolved in other American cities, and become dominant factors in current advances of medical education at all levels, as well as of research, and elevated standards of patient care. They serve as essential bases for the rapid growth of the clinical and research resources to foster educational opportunities. It is this quite spectacular change in the situation which now attracts so many thousands of medical graduates from abroad, and has tended to reverse the flow of large numbers of graduates and postgraduates who formerly went to the great medical centres in Europe.

It was a philanthropic bachelor without financial obligations to relatives, Mr. Johns Hopkins, who was responsible for providing the support for the first American graduate medical centre which bears his name. Some 40 years later another bachelor philanthropist, Mr. William Bingham, 2nd, of Bethel, Maine, pioneered in a related field, the regionalization of medicine. Under what came to be called the Bingham Associates Program, a combination postgraduate-regional educational medical programme among hospitals in the State of Maine was established. It was based at what is now the Tufts-New England Medical Center in Boston. This was followed by extension of this regionalization concept to other areas in New England, partially supported by the Rockefeller Foundation. It is this concept of regionalization which today dominates the American scene in continuing medical education. It was also largely responsible for the Hill-Burton Act by the United States Congress, through which federal grants have fostered the construction of new community hospitals in small towns and rural areas by providing funds to match local voluntary contributions. This great augmentation in the number of community hospitals has made it possible for all practitioners to attain staff membership and to participate to some degree in the care of their own hospitalized patients.

If continuing medical education is to be fully successful as applied to the requirements of general practice it must take into account the problems of this hard-pressed portion of the profession. The steady decline in the proportion of general practitioners to the rest of the profession is related both to the confining nature of relatively isolated rural practices and lack of good schooling for the doctors' children, as well as the difficulty in securing release from heavy patient responsibilities, to take postgraduate work.

A better definition of the roles of the future generation of physicians in the changing pattern of medical practice is urgently needed. All forms of professional educational programme require clearly defined objectives to be effective. Such questions are as yet unanswered as to whether 'solo' practice is doomed to extinction with merger into various forms of group practice centring around the local community hospital. Significantly, the trend toward group practice is steadily growing, while that toward general practice has declined. As an illustration, 6,970 graduates chose general practice as a career in 1930, but only 3,570 in 1960 (U.M.A. News, 1961).

Evaluation of Present-day Postgraduate Medicine

In 1940 Buerki reported that in 12 states in which the most satisfactory figures were obtainable it appeared that in any one year only 25% of all physicians are taking some form of postgraduate work.

While Vollan (1955), in a study of the scope and extent of continuing medical education in the United States, considered regional variations, his findings in general may be applied quite reliably to the New England states. He concluded that educational advancement of the practitioner fell into five general types of activity as illustrated in Table 1.

These were in addition to what he learned from studies of his patients, and opportunities to participate in teaching and research.

TABLE 1

	Estimated Time Distribution
1. Reading of medical literature	1/3
2. Individual personal contacts with colleagues, consultants, pharmacists and representatives of pharmaceutical companies	1/3
3. Hospital meetings, including staff, clinico-pathological and radiological conferences and journal clubs	1/4
4. Attendance at national, state and local, general and special medical societies	1/20
5. Formal postgraduate courses at university centres and those provided by 'circuit riding' teams	1/20

It was estimated that almost all doctors spent about 21% of a 60-hour working week in the first four activities, and 70% reported taking formal courses over the previous five years. Although such courses were ranked second in educational value to reading of the literature, total attendance in any one year was only 25%. It was concluded that to 'keep up' each practitioner should devote ten days per annum in formal course participation.

This concept has been applied most extensively

and intensively in the State of Kansas through the co-operation of the University School of Medicine and the State Medical Association, where it has been demonstrated that over 60% of the physicians of that state have been included each year either in medical centre or in circuit-riding courses.

As reported by Rappleye as early as 1932, similar programmes were meeting varying success in North Carolina, Wisconsin, Minnesota, Michigan and a number of other states with university, state medical society and Board of Health co-operation. Throughout the United States more than 3,500 physicians were taking courses each year, and about 1,000 others were doing graduate work abroad. According to Rappleye, opportunities for the latter were provided by the Fellowship of Postgraduate Medicine and British Postgraduate Medical Federation with 50 affiliated hospitals, and 80 teaching centres in Germany, together with some French and Dutch hospitals.

With this review of general developments in the United States as a background it will be of interest to trace what has been developing in New England in the programme sponsored by the Bingham Associates Fund, initiated by Mr. William Bingham, 2nd, and his colleagues.

The Fund was organized in 1932 as a non-profit corporation under the laws of the State of Maine for 'the advancement of medicine and medical education'. It grew out of the interest in the problems facing the doctors in rural practice in Maine similar to those seen around Mr. Bingham's home village of Bethel. The Bingham Associates Program began with the establishment of consulting and educational relationships between the smaller communities in Maine and regional medical centres, located both in Boston and in a few of the cities of Maine.

Mr. Bingham was fortunate to draw into a role of leadership in developing the programme Dr. Joseph Hersey Pratt, a pioneer in group treatment of tuberculosis and of psychoneurotic patients. As Physician-in-Chief at the Boston Dispensary and Clinical Professor of Medicine at Tufts College of Medicine, Dr. Pratt was in a strategic position to implement the concepts of Mr. Bingham's Associates (Garland, 1960), ably seconded by Dr. Samuel Proger, now President of the Bingham Associates Fund, Physician-in-Chief of the Pratt Clinic, New England Center Hospital, and Chairman of the Department of Medicine at Tufts University School of Medicine, and by other staff members of units of the Tufts-New England Medical Center, where the Bingham Associates Program has its headquarters.

During the earlier years general practitioners from rural areas were given a full month of bed-

side clinical instruction in a 20-bed unit in the Boston Dispensary (the oldest 'day hospital' in the country with a continuous record of service to the people of Boston since 1796). From that small beginning has evolved the Pratt Clinic, New England Center Hospital, a unit of the Tufts-New England Medical Center which now also includes Tufts University Schools of Medicine and Dental Medicine, the Boston Dispensary and its new Rehabilitation Institute, and the Boston Floating Hospital for Infants and Children.

Patients referred for special diagnostic studies and treatment to this centre are considered not only of educational value to medical students, interns, residents and other staff members, but to their referring doctors as well. These doctors are free to attend staff conferences, and are sent complete reports of findings on their own patients which are of obvious postgraduate instructional value.

Over the years the Bingham Associates Fund has encouraged in every way possible the strengthening of regional medical centres at strategic points in the State of Maine at Bangor, Lewiston, Portland and Waterville. Their 'constellation' of surrounding community hospitals, with the 'B.A.F.' serving as a co-ordinating agency, make up the essence of the regional medical concept and are bases of numerous postgraduate activities. Included are medical as well as paramedical personnel, since sustaining excellence of high standards of medical care also requires postgraduate opportunities for those involved in administration, nursing and technical activities.

TABLE 2

BINGHAM ASSOCIATES FUND

CO-OPERATING HOSPITALS AND CLINICS, MAINE
Formal and Informal Regional Relationships

1. AUGUSTA
Augusta General Hospital
2. BANGOR
Eastern Maine General Hospital
3. BAR HARBOR
Mount Desert Island Hospital
4. BATH
Bath Memorial Hospital
Hyde Rehabilitation Center
5. BELFAST
Waldo County General Hospital
6. BIDDEFORD
Notre Dame Hospital
Webber Hospital
7. BLUE HILL
Blue Hill Memorial Hospital
8. BOOTHBAY HARBOR
St. Andrews Hospital
9. BRIDGTON
Northern Cumberland Memorial Hospital
10. BRUNSWICK
Parkview Hospital
Regional Memorial Hospital

11. CALAIS
Calais Regional Hospital
12. CAMDEN
Camden Community Hospital
13. CARIBOU
Cary Memorial Hospital
14. DAMARISCOTTA
Miles Memorial Hospital
15. CASTINE
Castine Community Hospital
16. DEXTER
Plummer Memorial Hospital
17. DOVER-FOXCROFT
Mayo Memorial Hospital
18. EAGLE LAKE
Northern Maine General Hospital
19. ELLSWORTH
Maine Coast Memorial Hospital
20. FARMINGTON
Franklin County Memorial Hospital
21. FORT FAIRFIELD
Fort Fairfield Community Hospital
22. FORT KENT
People's Benevolent Hospital
23. GARDINER
Gardiner General Hospital
24. GREENVILLE
Charles A. Dean Memorial Hospital
25. HARTLAND
Scott Webb Memorial Hospital
26. HOULTON
Aroostook General Hospital
27. ISLAND FALLS
Milliken Memorial Hospital
28. JACKMAN STATION
Murtha Memorial Hospital
29. LEWISTON
Central Maine General Hospital
St. Mary's General Hospital

30. MARS HILL
Aroostook Health Clinic
31. MILLINOCKET
Millinocket Community Hospital
32. MILO
Milo Community Hospital
33. MONSON
34. NORTH CONWAY, NEW HAMPSHIRE
The Memorial Hospital
35. NORWAY
Stephens Memorial Hospital
36. PORTLAND
Maine Medical Center
Mercy Hospital
37. POLAND SPRING
38. PRESQUE ISLE
Arthur R. Gould Memorial Hospital
39. ROCKLAND
Knox County General Hospital
40. RUMFORD
Rumford Community Hospital
41. SANFORD
Henrietta D. Goodall Hospital
42. SKOWHEGAN
Fairview Hospital
Redington Memorial Hospital
43. STEEP FALLS
Ervin A. Centre Clinic
44. VAN BUREN
Van Buren Community Hospital
45. VINALHAVEN
Island Community Medical Services
46. WATERVILLE
Sisters Hospital
Thayer Hospital
47. YORK
York Hospital

▼ = Machias and Pittsfield—hospitals in planning stage.

NH = Madawaska—nursing home facility.

N = Matinicus—visiting nurse service.

☆ = Rangeley—community services.

★ = Unaffiliated hospitals with informal relationships.

The Bingham Associates Fund has established multiple consulting services for medical staffs and hospitals in the State of Maine. These include clinical medicine and pathology, health education, hospital administration, radiology, nursing, technology, operating-room nursing and aseptic practice, nursing administration, medical record keeping, medical social service, dietetics, accounting and hospital finance, and public relations. Scholarships are provided for certain medical and paramedical postgraduate studies where there is need for financial assistance. Stipends are available to graduate nurses, medical technologists, dietitians and other hospital personnel who wish to take courses in their own specialties.

All physicians are welcome to attend grand rounds, conferences, and other professional meetings scheduled at the Tufts-New England Medical Center. Each month there is an X-ray conference conducted by leading radiologists from hospitals throughout the Greater Boston area. These con-

ferences serve as both postgraduate teaching exercises as well as consultation sessions. A similar programme is presented weekly by the Departments of Pathology of Tufts University School of Medicine and the New England Center Hospital. At these sessions interesting pathological specimens brought in from hospitals from surrounding areas are presented and discussed. Under the Bingham Associates Lecture Series physicians on the staff of the member units of the Tufts-New England Medical Center, as well as physicians from other hospitals in the Boston area, are sent to conduct clinical teaching exercises for hospital staffs and medical societies in various parts of New England and occasionally into the Canadian province of New Brunswick. These are regularly scheduled presentations on a bi-weekly or monthly basis and usually take the form of a case presentation and lecture on current developments in medicine.

In 1956 a survey of the unmet needs in medical care of rural people in the State of Maine was sponsored by the 'B.A.F.' and financed by the Rockefeller Foundation. This study provided valuable information on distribution, numbers, average age of physicians, and types of practice (Smillie and Curran, 1956).

In the published report Dr. Daniel F. Hanley, Executive Director of the Maine Medical Association, stated that one of the important factors encouraging physicians to settle at places of need was the opportunity for postgraduate continuing education. Extensive consideration was given to how this requirement was to be attained. It was concluded, after consultation with physicians concerned, that every physician should go to a university centre for a period of a minimum of three months at intervals of not less than four years.

In keeping with the rapidly changing nature of medicine and its educational functions at all levels the programmes sponsored or encouraged by the 'B.A.F.' and its associated Tufts-New England Medical Center units have gone through progressive transitions.

In 1946 Tufts University School of Medicine established a Postgraduate Division supported by a sizeable grant from the Kellogg Foundation to provide one to three months' refresher courses for hundreds of medical officers returning from military service after World War II. Subsequently, another large grant to the Bingham Associates Program from the Rockefeller Foundation permitted extension of the concept of regional co-operation of the 'B.A.F.' to 14 hospitals in Western Massachusetts and on Cape Cod. Regional medicine, now the cornerstone of postgraduate activities for all types of personnel among 50 hospitals in Maine and other affiliates

in New England, involves co-operation and mutually advantageous assistance from the larger medical centres to the smallest community hospital in rural areas.

Dr. Robert P. McCombs, Director, Postgraduate Division of Tufts University School of Medicine, and consultant to the 'B.A.F.' since 1946, has now been appointed Assistant Dean and Professor of Graduate Medicine in charge of courses for graduates at the Tufts University School of Medicine.

Programmes by Specialty Organizations

The regional as well as national meetings of the American Colleges of Physicians and Surgeons and the various medical and surgical societies of specialists are of potent influence upon the professional advancement of their members through attendance at their annual and semi-annual sessions. Formal courses, costing a fee, as well as annual programmes of a week's duration are regularly available.

The American College of Physicians

Of the 3,571 American physicians at the 42nd Annual Session of the A.C.P. in 1961, 199 came from New England. At regional meetings between 1961 and 1962, 139 members and guests registered at the Portland, Maine, session, 15 came from Canada.

The American College of Surgeons

The surgical specialists attend local and national postgraduate meetings in larger numbers than any other groups, to an extent that only a few American cities can accommodate the attendance of the annual meetings of the American College of Surgeons. Short courses and symposia are offered in university affiliated hospitals for the most part. According to Deterling (1961) 'the more progressive community hospitals offer educational programmes to visiting staff and house officers in the form of lecture series and visiting surgical chiefs (*pro tem.*)'.

The Boston Surgical and New England Surgical Societies are examples of strong urban and regional surgical groups with scientific sessions of excellent calibre.

'Specially oriented organizations such as the College of Chest Physicians, Cancer Society, Heart Association have active local chapters with surgical programme material and membership'. The American College of Surgeons has an annual series of sectional three-day meetings, some of which are held in New England. A portion of the state medical meetings, as in that of the American Medical Association, is devoted to surgical sessions.

'In surgery, perhaps more than in internal medicine, the specialist in the community makes attendance at the large national surgical meetings such as that of the American College of Surgeons a voluntary obligation in order to keep abreast of the rapidly changing fields. This single meeting now occupies an entire week and there are available ten postgraduate courses, motion picture sessions, panel discussions, forums on basic science and telecasts from the operating rooms of local hospitals. Increasing attendance at such national meetings by the surgeons of New England attest to their strong support of postgraduate education of the highest quality.'

State Medical Society Postgraduate Programmes

While each of the New England State Medical Societies have programmes on continuing education for practitioners, the Massachusetts Medical Society has fostered a broad approach of value to all physicians in New England. In 1951 a committee representing Boston, Harvard and Tufts Universities, teaching hospitals, organized medicine, the Massachusetts Department of Health, and the Academy of General Practice conducted a survey of doctors' educational needs and developed an up-to-date mailing list of 18,000 physicians and hospitals in New England. A Postgraduate Medical Institute was formed to deal with the unmet educational needs revealed by that survey.

After ten years of experience the 'P.M.I.' is now firmly established under a part-time Executive Director, who is available for consultation without charge to hospitals wishing to set up local postgraduate programmes.

A booklet entitled 'What Goes On' is published and distributed each month by the Postgraduate Medical Institute to a mailing list of over 18,500 addresses in New England, including hospitals and doctors of medicine and osteopathy. Through this medium the medical centres and hospitals of Connecticut, Maine, Massachusetts, Rhode Island and Vermont are stimulated to publicize their teaching conferences of interest to practitioners and encourage them to attend. In addition, one-day to one-week formal courses are announced, including the essential information as to time, place and tuition charges, if any.

Of special note is the programme for practising physicians at the annual New England Postgraduate Assembly held in Boston each November. This activity covers three full days and attracts more than 1,000 registrants. Clinics, symposia, panels, lectures, discussions, 'gem' lectures, clinico-pathological conferences, technical and scientific exhibits comprise the educa-

tional bill-of-fare. The state chapters of the Academy of General Practice collaborate with the state medical societies in sponsoring this New England-wide effort.

Academy of General Practice Symposia

The state chapters of the American Academy of General Practice schedule symposia at regular intervals in various convenient locations. The topics presented at these meetings reveal a growing awareness of new opportunities for services to be rendered by the family physician. They include, for instance, the generalist's responsibilities for treating the inadequately met needs of psychoneurotic and alcoholic patients. The chapters in Maine, New Hampshire and Vermont now co-ordinate their efforts under a full-time Field Director of Educational Programming, with an office at Barre, Vermont.

A recent full day's session of the Maine Chapter at Thayer Hospital, Waterville, Maine, covered such pertinent topics as: the 'Red Eye', *Medical Care for the Aged* (presented by the State Commissioner of Health and Welfare), *An Unusual Approach to the Peptic Ulcer Problem* (by a panel of internist, psychiatrist, rehabilitationist, pathologist and surgeon), *Pitfalls in Labour*, and the *G.P.'s Opportunities and Challenges in Preventive Medicine*. More than 50 practitioners attended.

Radio Symposia

New and quite exciting possibilities for reaching the busy practitioner to keep him abreast of the latest advances in medicine have been opening up over the past few years through the use of radio, television and tape recordings designed to reach the listener at his hospital, office and the sitting-room of his home. 'Audio-Digest', produced in California, summarizes important contributions to the literature on tape on a subscription basis.

Broadcasting stations on Mount Greylock in Western Massachusetts and Mount Washington in New Hampshire, and studios at Albany, New York, Boston and Litchfield, Maine, are offering a rapidly expanding radio and TV service which will shortly cover all of New England.

A unique feature is a two-way radio lecture-discussion period programme. This was originated at the Albany Medical College in 1958, under the direction of Dr. Frank M. Woolsey, Jr., the Associate Dean (Woolsey, 1961). Practitioners gather for luncheon around a combination transmitter and receiver set up at a remote hospital and listen to a 15 to 20-minute radio talk on a pre-announced topic by two or three specialists assembled at one of the New England centres. Following this presentation, the listeners are encouraged to pose questions and engage in a

spirited discussion over the 'air waves'. By three times a week scheduling an increasing circle of doctors are able to 'attend' in this ingenious '40,000 square-mile radio classroom' (Fredette, 1961). 'Faculty' participants have been brought in from Albany, Boston, Harvard, Tufts, Vermont and Yale Universities. Mimeographed teaching aids include charts, graphs and outlines which are sent out in advance. Over the first five years hospital listener attendance rose from 3,976 to 6,388, while 100 or more tuned in at their offices or homes. By the sixth year 30 hospitals in a 130-mile radius of Albany participated. Since that time additional groups have come in, one as remote from Albany as the Maine Medical Center in Portland, 244 miles distant.

Joint Commission on Accreditation

Since the ultimate test of the success of continuing medical professional development is the quality of patient care provided, the requirements of the Joint Commission on Accreditation of Hospitals are valuable tests as to the standards of performance by each hospital staff (Babcock, 1959). This Commission, sponsored by the American College of Physicians, American College of Surgeons, American Hospital Association, the American Medical Association, and their Canadian counterparts, established the standards by which hospitals are approved or disapproved on the basis of evaluation at regular intervals by representatives of the Commission. Survey evaluations cover such requirements as (a) medical staff organization for the supervision and control of professional work; (b) conferences for the review and analysis of clinical work at regular intervals; (c) accurate and complete medical record with sufficient data to justify the diagnoses and warrant treatments; (d) clinical laboratory and X-ray facilities for the confirmation or elimination of diagnoses; and (e) elimination of fee-splitting. In addition to the various specialized clinical fields, standards are also specified for departments of general practice, rehabilitation, dentistry, and nursing.

The impact of this programme upon the standards of hospital practice in New England is illustrated by the fact that 35 of the 57, or 61%, of the hospitals in Maine listed by the American Hospital Association are accredited by the Joint Commission. Of the 211 hospitals in Massachusetts, 167, or 79%, are so accredited.

It would seem quite obvious that the hospitals in each state which failed to meet the standards of the Joint Commission on Accreditation of Hospitals present basic challenges to themselves and to all postgraduate efforts, to devise ways and means to correct their apparent inadequacies.

The importance of hospital staff memberships to their continuing professional development through participation in organized educational activities, programmes of the Academy of General Practice and the urban medical centres has been stressed repeatedly (Curran, 1961).

In-Hospital Requirements

Since active membership on a hospital staff is of vital importance to the physician's status and success in practice in the United States, there is a growing realization by trustee and medical staff leadership that disciplinary responsibility must be considered in requiring all concerned to 'keep up' professionally.

Recently, Leonard (1962), a Director of Medical Education at the Hartford Hospital in Connecticut and a Governor of the American College of Physicians, posed the question of how inadequate performance may be dealt with. 'Would that we could find the secret of awakening motivated interest in the tired, apathetic or too busy physician. . . . Shall we, then, as a profession solve the problem by asking each hospital, at the community or area level, to require of each staff physician evidence of participation (or teaching) in a programme of continuing medical education? This might be an annual or biannual requirement for hospital staff appointment. . . . Since every hospital has disciplinary control of its staff regarding patients' medical records, is it any less important that the hospital have reasonable assurance that the physician has remained alert to the recent advances in the diagnosis and treatment of his patient?'

In 1957 an outline guide for postgraduate medical education programmes was issued by the Council of the American Medical Association. This has been followed by a proposed national agency for continuing medical education, formulated in November 1961. Centring of educational activity in the community hospital and active participation of the physician-learner was again stressed. The proposed initiation of an examination system either anonymous or for credit and of 'core curricula' are interesting new features.

Another recent approach to the continuing educational problem is that by the American Heart Association, through their state associations, as published in a report of status and objectives (1961). In co-operation with the Maine Medical Association, Academy of General Practice, and the Bingham Associates Fund a committee has been established to develop pilot experimental programmes within small community hospitals to implement the concepts and techniques delineated by the American Heart Association, with financial assistance provided by the Association.

Contributions by State Departments of Health and Welfare

Through their various departments the Health Departments of the several states make significant contributions to the continuing education of physicians.

In Maine the Department of Health and Welfare has regularly allotted space in the *Maine Medical Journal* for reports of studies, educational activities and health care programmes. Financial support is extended to teaching sessions in fields of cardiac and malignant diseases. Training opportunities are provided for training in special pathological and rehabilitation procedures, and in the management of premature infants and handling of radioactive materials.

The Department of Mental Health contributes instruction in the use of tranquillizers and energizers, on psychiatric treatment in office practice for general practitioners, and on social psychiatry (Fisher, 1962).

Teaching and Learning

Perhaps some of the explanations for the shortcomings and failures in postgraduate endeavours may be revealed by the re-examinations of educational methodology by Miller and his associates at the University of Illinois School of Medicine (Miller, Abrahamson, Cohen, Graser, Hernale and Laud, 1961).

In their studies they raise fundamental questions as to motivation, relevance, incentive, interest, reward and punishment in the learning process.

In reference to the North Carolina study (Peterson, Andrews, Spain and Greenberg, 1961) as to the effectiveness of teaching and learning in application, Miller and colleagues observe 'in medicine Peterson and his associates have made the only carefully documented study of professional performance. It revealed among other things that nearly half the sample of general practitioners observed did not take an appropriate history or conduct a physical examination in keeping with the patient's complaint. If this is the behavioural outcome of one of the most vigorous instructional efforts in a medical school, there is little reason for satisfaction'.

Recent advances by psychologists in the science of learning and the art of teaching and the effects of new approaches to the effects of *re-enforcement* in learning are beginning to attract the attention of medical educators. Their implementation through the use of mechanical devices such as the various types of teaching machines, merit serious consideration. The programming of such presentations requires new skills and know-how, and still are at the experimental stage. Educational

psychologists present us with new concepts of the learning process, including those of *re-enforcement* and *aversion*. To what extent are practitioners 'blocked' in effective participation in educational opportunities by *aversion*? As pointed out by Skinner (1960), 'ultimate advantages are not contingent on behaviour in ways which generate action. Many a student can testify to the result. No matter how much he may *want* to become a doctor or an engineer, say, he cannot force himself to read and remember the page of text in front of him at the moment'. Obviously, this inhibition and its prevention might be applied to any form of teaching and learning situation.

Directors of Medical Education

A recent special article in the *Journal of Medical Education* by Uhl (1962) gives a full description of a new movement to introduce full-time and part-time Directors of Medical Education to non-university hospitals engaged in training interns and residents. First proposed in 1940, it has grown rapidly over the past decade to include several hundred hospitals throughout the country. One of the first successful efforts under full-time leadership was at the Hartford Hospital in Connecticut.

The acceptance and value of this innovation has been due to the realization that satisfactory administration of a major graduate-teaching programme can no longer be delegated only to those already engaged in active medical or surgical practice.

These Directors of Medical Education, who are highly qualified clinicians as well as teachers, function somewhat as non-academic assistant deans. Their growing numbers and success are clear evidence of a fundamental need to be met. In some cases the move has proved to be an intermediate step to the introduction of full-time heads of major clinical services. This trend has enabled the hospitals involved to include research in their realm of activities, for its value in enhancing the quality of teaching and standards of patient care.

Lifetime Learning for Physicians

In a report with this intriguing title, which has just been issued, Dryer (1962) sets forth the principles, practices and proposals to guide the practitioner in his career of lifetime learning. Ellis (1954), the experienced president of the Postgraduate Medical Institute of New England, was quoted as stating, '... my admiration is unbounded for the numerous doctors who sacrifice precious time and energy to make weekly pilgrimages in the dead of winter and at unearthly hours to attend meetings and courses at teaching

centres that may be as far as 100 miles from their homes', but too often 'circuit riding' by a medical teacher to a local community has experienced disappointing attendance.

With the assumption that 'continuing medical education of the physician is the most important single problem facing medical education today', it was concluded that 'A partnership . . . of our major medical resources will give strength to all which none possess separately', and that 'such an efficient balance can be organized to articulate national, regional, state and local plans'.

It is on such a basis that continuing medical education in New England and elsewhere will look for future success.

As indicated by Professor Sir George Pickering (1962), the postgraduate development of physicians is a matter of growing international interest.

Furthermore, the concentration of attention at the Second World Conference on Medical Education (1961) as a lifelong pursuit reminds us that the success of the physician in keeping abreast of the advances of medical science is a matter of global concern.

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BOOK REVIEWS

Biological Effects of Freezing and Supercooling

AUDREY U. SMITH, D.Sc., M.B., B.S. A Monograph of the Physiological Society. Pp. x + 462. London: Edward Arnold. 1961. 55s.

Although Mantegazza in 1866 had prophesied that spermatozoa would one day be preserved by freezing, the idea of suspended animaⁿ in a frozen state was used mainly by writers of science fiction, until the team working at the National Institute for Medical Research discovered, only 11 years ago, the protective effect of glycerol on frozen spermatozoa, since when progress has been rapid. Artificial insemination of hens and cows with frozen and thawed spermatozoa was soon accomplished, and the preservation and distribution of bull semen in a frozen state has become an important aid to cattle breeding. During the same period a similar technique has been applied to the preservation of blood cells, so that it is now possible to store for reference samples which have rare combinations of antigens; while even more recently a naval hospital in the United States has transfused its patients with frozen and reconstituted blood for more than a year, without misadventure and with complete abolition of transfusion hepatitis. Nowadays similar procedures are being applied to yeasts, protozoa, and cells from mammalian organs. The most astonishing accomplishment has been freezing and revival by thawing of small animals; many have made an apparently complete recovery.

This book is a review by one of the leaders in this field. Not only has she considered the technical problems of the laboratory, but she has extended her review to include many matters of importance to clinicians and pathologists, such as the mechanism of frostbite, the preservation of corneal tissue, of bone marrow and spleen cells, the prevention of gastric hæmorrhage during cooling, and the revival of exsanguinated dogs; it is due largely to the work of the Mill Hill team that occasional frozen drunks are being revived and restored to this unhappy life. Perhaps the science-fiction writers are right in picturing the human passengers on interstellar voyages as being permeated with preservative and frozen in tanks, to be revived, perhaps centuries later, and light-years elsewhere, by some automatic machine. This story of discovery, accident, and experiment is as fascinating and thrilling as any science fiction.

Arteriography

DAVID SUTTON, M.D., M.R.C.P., F.F.R., D.M.R.D. Pp. viii + 322, illustrated. Edinburgh and London: E. & S. Livingstone. 1962. 70s.

This is an excellent book, reflecting as it does the vast personal experience of one of the foremost authorities in this field of radiology. The work is a general survey of arteriography, excluding pulmonary arteriography. Obviously it would be outside the scope of one author in a single volume to cover the whole field of arteriography in a completely comprehensive manner. What is to be appreciated is that so much useful information and so many beautifully illustrated cases have been brought together in a volume of moderate size and price. Radiology being an essentially pictorial subject, not enough praise can be given to the excellence of the reproductions in this book.

The first part of the book deals with technique, instruments, and complications. Techniques may vary, but the text provides a sound basis for arteriography. Nevertheless, two points may be worthy of comment. First, many would consider the maximum dosages of contrast media somewhat conservative, and particularly with large injections, dosage based on body weight, bearing in mind renal function, may be more useful. Also, in the technique of catheterisation, the operators are shown ungowned. It is generally accepted that sterile gowns are essential to avoid contamination of the catheters and guide wires by contact with unsterile clothing.

The second part of the book, apart from the chapter on intracranial lesions, which has presumably been condensed for reasons of space, covers the radiographic appearances of most of the lesions likely to be encountered and includes many of the rarer conditions. There is much useful clinical information.

It is safe to say that no one should embark on arteriography without either having read this book, or being conversant with its content. Even the experienced can learn a good deal from it. Clinicians too will find much to interest and instruct them, and this will help their radiological colleagues by assisting in the selection of cases for arteriography.

This work does great credit to the author, the St. Mary's School, the Institute for Nervous Diseases, and not least to British radiology.

ERRATA

1. 'Postgraduate Medical Education in New England'—J. A. Curran, Vol. 39 no. 441 (July 1962) page 377.
The town marked 16 (lower right hand of map between 7 and 3 and to the N.E. of 7) should be marked 19.
2. 'Motor Neurone Disease'—T. Partington, Vol. 38 no. 441 (July 1962) page 392.
The caption should read as follows:

- FIG. 4.—A. Electromyogram of *normal resting muscle*, showing absence of electrical activity.
B. Electromyogram of *resting muscle in motor neurone disease*, showing fibrillation potentials.
C. Electromyogram of *resting muscle in motor neurone disease*, showing fasciculation potentials.
D. Electromyogram of *normal actively contracting muscle*, showing crowded interference pattern.
E. Electromyogram of *actively contracting muscle in motor neurone disease*, showing poor frequency response of abnormal motor units (cf. Fig. 4, D).