Financial Resources of Dental Schools

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Dentistry in the past half century has rapidly risen from a craft, learned largely through apprenticeship, to the stature of a profession. The evolution of dental education has been guided by an increasing understanding of the biological phases of dentistry and by the recognition of dentistry as a growing science. Laboratory observation and experiment have supplemented the didactic instruction formerly acquired solely through books, lectures, and demonstrations. Rigid supervision has been exercised by the profession itself with respect to standards of instruction. Demands have also been met for continuing postgraduate and refresher training to keep practitioners abreast of new developments in dental science and technology.

The process has been costly. The modern dental school with its laboratories, clinics, equipment, and library facilities bears little resemblance to its predecessor of 50 years ago. In the days when profit-making proprietary schools still flourished, one or two teachers attempted to impart by lecture and demonstration all dental precepts and techniques. Today small groups of students must receive highly individualized supervision in their laboratory and clinical work from specialists in each of the areas encompassed by the modern theory and practice of dentistry.

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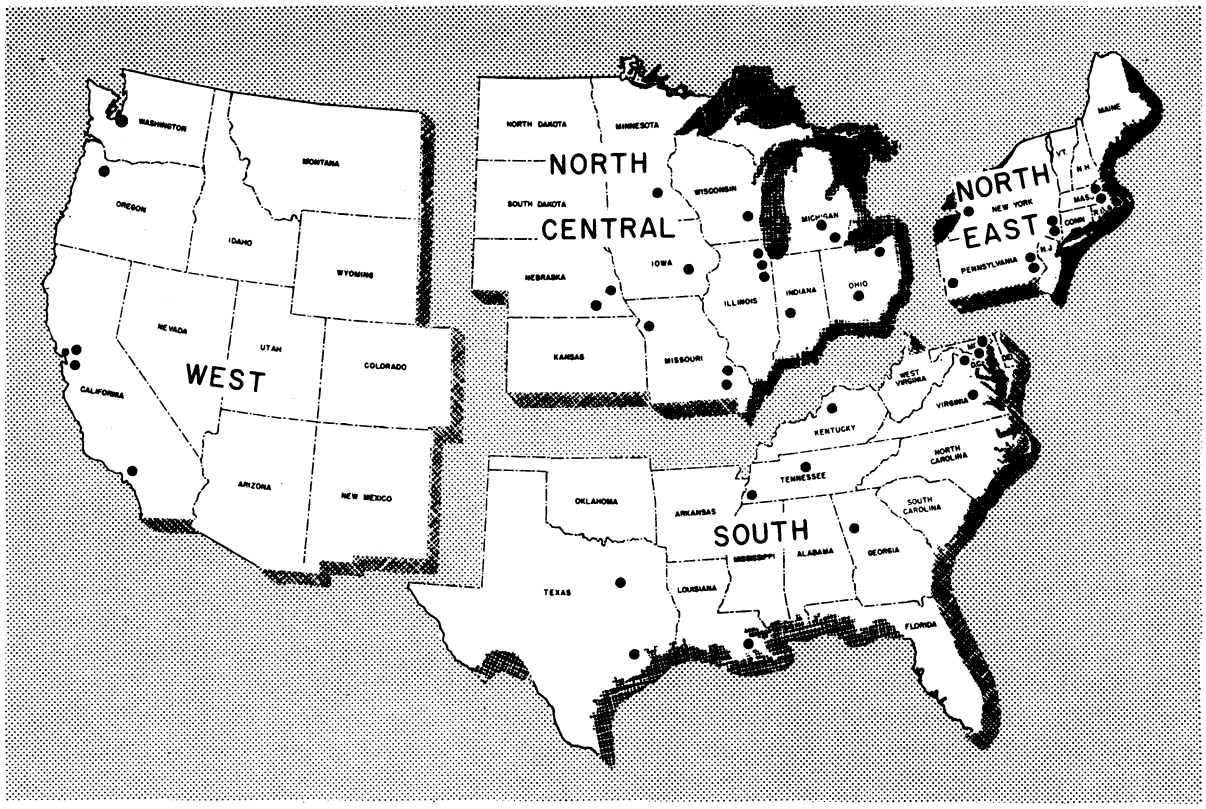
Mounting costs of dental education have been of great concern to dental educators and, in fact, to the dental profession. Dental schools of the United States have found it increasingly difficult to meet the costs of maintaining standards of instruction and research commensurate with the health needs of the Nation and the requirements of the dental profession. The dental schools, moreover, have a large backlog of construction and equipment needs which must be met to relieve overcrowding in their classrooms, laboratories, and clinics. This backlog has accumulated from the low-income years of the depression, from the World War II shortages of labor and building materials, and from the high costs and shortages during the postwar inflation.

Origin and Purposes of the Study

Aware of the importance of an objective appraisal of the financial status of dental schools, the American Dental Association's Council on Dental Education asked the Public Health Service to undertake a comprehensive survey of the situation. The council also, on December 18, 1950, designated a five-member committee to serve in an advisory capacity to the Public Health Service study staff and to interpret the purposes of the study to the deans and other officials of the dental schools. Dr. J. Ben Robinson served as chairman of that committee for the first 8 months and was consultant to the survey staff throughout the period of study. The four other members of the committee were Dr. Otto W. Brandhorst, Dr. Maynard K. Hine, Dr. Robert W. McNulty, and the author, who became chairman in September 1951.

The report of the survey, "Financial Status and Needs of Dental Schools," has just been

Figure 1. Location of 40 dental schools, 1949–50.



published (*5*). A brief digest of the findings is given here.

Characteristics of Dental Schools

During the study year (1949–50), the United States had 40 dental schools that had been in operation for four or more academic years. One school, that affiliated with the University of Alabama, was not included in the study because it was completing only its second year of operation. Another institution, the dental school of the University of North Carolina, did not open until the fall of 1950.

The 40 schools for which data were collected and analyzed had a total enrollment of 11,359 undergraduate students. The schools were located in 23 different States: 8 in the Northeastern section of the country, 16 in the North Central area, 11 in the South, and 5 in the West (fig. 1). About one-third of the schools had less than 225 undergraduate students, and about one-third had 349 or more. The remaining third were medium-sized schools (225 to 248 students). About half the total enrollment of all 40 schools was in the group of 13 large schools.

Curriculum

The first and second years of dental education are devoted mainly to work in the basic sciences (anatomy, physiology, bacteriology, pathology, biochemistry, and pharmacology). In addition, the first- and second-year students receive instruction in the principles of operative dentistry, dental prosthesis, oral medicine, and orthodontics. The third- and fourth-year students concentrate principally on patient management, treatment planning, performance of dental operations, and conduct of practice. Any rigid division between clinical and preclinical years, however, is rapidly disappearing. In actual practice, the basic science courses are increasingly extended into the clinical years, and clinical material is introduced into the first and second years of study.

University Affiliation and Relationships

Of the 40 dental schools surveyed, 37 were affiliated with a parent university. This affiliation brings to the dental schools the scholastic advantages of association with other branches of higher education. It also carries the administrative and economic advantages of centralized services for plant operation and maintenance, joint use of staff resources and facilities, centralized purchasing, and financial stability.

Two of the nonaffiliated schools operated at a university level in association with schools in other allied health professions; the third was planning affiliation with a nearby university.

University affiliation represents varying degrees of academic and fiscal relationships between dental schools and other departments of the university. Thus, some dental schools (about one-third of the total) carry major responsibility for the instruction of dental students in the basic sciences through their own faculty and facilities. About two-thirds of the dental schools, on the other hand, use the resources of the medical school or other department of the parent university for all or a large part of such training. Sometimes the entire costs of these services are absorbed by the medical school or other university department. In other instances the dental school bears the costs. Since these costs, however met, are a legitimate part of the total costs of dental education, all schools of dentistry were asked to reflect in the financial data supplied for the survey their prorata share of the costs borne by medical schools as well as other university expenditures for instruction in the basic sciences and any other shared expenses. The financial data presented in the report include these expenses.

One of the most significant types of comparison shown in the report and reflected in this summary of fiscal data is the difference between the 25 schools that were privately controlled and the 15 that were public institutions affiliated with universities supported by State or city governments. A trend toward increased support of dental education from State and local funds is indicated by the increase in the number of public schools of dentistry from 12 in 1940–41 to 15 in the study year; in addition the two new schools (in Alabama and North Carolina) not included in the study are affiliated with State universities.

Total Expenses for Basic Operations

Dental schools supplied financial data which permit analysis of expenses for basic operations, for separately budgeted research, and for separately financed postgraduate education. The basic operating expense consists of expenditures for instruction, including clinics as well

Table 1. Amount and percent of basic operating expense by expense item and form of school control for 40 dental schools, fiscal year 1949–50

Expense item	All schools	Public	Private
	Amount		
Total basic operating expense	$15, 667, 434	$6, 228, 879	$9, 438, 555
Instruction	10, 782, 803	4, 451, 614	6, 331, 189
Administration and general	2, 467, 335	813, 141	1, 654, 194
Plant operation and maintenance	2, 122, 408	845, 924	1, 276, 484
Libraries	294, 888	118, 200	176, 688
	Percentage distribution		
Total basic operating expense	100	100	100
Instruction	69	71	67
Administration and general	16	13	18
Plant operation and maintenance	13	14	13
Libraries	2	2	2

Table 2. Median basic operating expense by size of school and expense item for 40 dental schools, fiscal year 1949–50

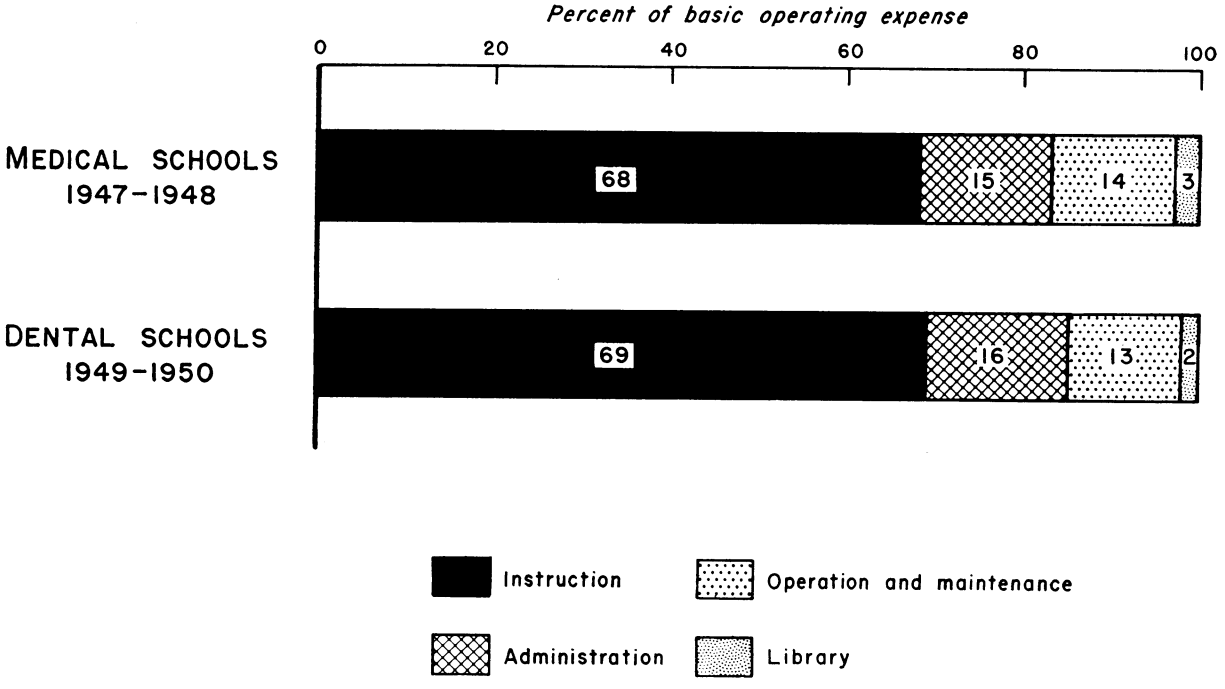
Size of school	Total basic operations	Instruction	Administration and general	Plant operation and maintenance	Libraries
All schools	$378, 253	$257, 483	$53, 226	$43, 670	$6, 254
Small	263, 235	194, 143	39, 857	24, 580	6, 133
Medium	378, 253	259, 692	50, 518	48, 482	7, 180
Large	435, 294	307, 361	61, 895	62, 667	6, 200

as postgraduate courses and research not budgeted separately; administration and general activities; operation and maintenance of physical plant; and libraries. The widespread adoption by universities of the classification of accounts recommended in 1935 by the National Committee on Standard Reports for Institutions of Higher Education (*1*) meant that considerable uniformity was found in the form of reporting dental school expenses.

The 40 schools spent $15.7 million in 1949–50 for basic operations. Of this amount, 69 percent was for direct expenses (faculty salaries, supplies, materials, and equipment for instruction) while 31 percent was for the indirect costs of administration, plant operation and maintenance, and libraries (table 1). The share of the total instructional expense for dental students borne by other units of the university amounted to $1.2 million. Medical schools supplied $1.1 million of this total to 23 dental schools (10 public and 13 private). This amount, as well as the pro-rata share of administrative services received from the university, is included in the total.

The percentage distribution of these expenses among items in the basic operating unit corresponds closely to that found for medical schools in 1947–48 (fig. 2). For both types of institution, instruction (mainly salaries) represented more than two-thirds of basic operating expenses.

Figure 2. Basic operating expense of dental and medical schools.



The median basic operating expense for the schools of dentistry was $378,253, as compared with a median of $509,978 for 72 (4-year) medical schools in 1947–48. The median indicates that half the schools spent more than and half spent less than this amount. The median was higher for public dental schools ($416,258) as a group than for private schools ($340,929). Moreover, the public dental schools tended to concentrate more closely than did private schools around the median for their group.

The median, of course, gives no indication of the wide differences among schools. Of the 40 dental schools, 4 private and 2 public institutions spent more than $500,000 each for their basic operations. At the other extreme, 1 public and 4 private schools spent less than $200,000.

Median expense levels for all items in the basic operating expense, except for libraries, showed progressive increases with increasing enrollment (table 2).

Basic Operating Cost per Student

The essential purpose of translating aggregate basic operating expenses into costs per student is to provide figures that are comparable among schools. Such figures, which are useful in analyzing financial differences among groups of schools, do not in themselves reflect efficiency or quality of instruction.

The median expense per dental student shown in table 3 indicates that public schools, as a group, spent 28 percent more per student for total basic operation and 31 percent more per student for instruction than did private schools. The range in total expense per student was wide. The average for the three schools spending the highest amount per student was $4,388, a figure more than five times the average of $798 for the three schools with the lowest expense per student. More than four-fifths of the 20 schools with the lowest amounts per student were private institutions, while in the group of 12 schools with expenses of $1,500 or more per student, 5 were private institutions. Expenses per student were inversely related to size of school.

Income for Basic Operations

The basic operating income of dental schools consisted of receipts from tuition and fees, State and city appropriations and university transfers, and income from clinics. In addition relatively small sums were derived from gifts and grants, income from endowments, miscellaneous transfers, and regional organizations. For all 40 dental schools combined, tuition and fees in 1949–50 met over one-third of the total basic operating expense. State and city appropriations and transfers from parent universities provided another third of total expenses. Receipts from clinic services furnished one-fourth of the total, while the remainder came from gifts and grants, endowment income, regional organizations, and miscellaneous transfers.

Great variations were found among the schools in the proportions of their basic operating expenses derived from these different income sources. Tuition and fees supplied 43 percent of the basic operating income of the private schools as contrasted with 22 percent for the public schools. Private schools as a group also relied somewhat more heavily than did public schools on income from clinics. As would be expected, public schools received more than half of their income from State and city appropriations and university transfers. Pub-

Table 3. Median expense per student by expense item and form of school control for 40 dental schools, fiscal year 1949–50

Expense item	All schools	Public	Private
Total basic operating expense	$1,316	$1,469	$1,147
Instruction	890	1,083	824
Administration and general	197	192	215
Plant operation and maintenance	165	143	168
Libraries	24	33	22

Table 4. Amount of income for basic operations by source of income and form of school control for 40 dental schools, fiscal year 1949–50

Source of income	All schools	Public	Private
All sources	$15, 667, 434	$6, 228, 879	$9, 438, 555
Tuition and fees	5, 422, 973	1, 369, 775	4, 053, 198
State-city appropriations and university transfers	5, 437, 610	3, 469, 429	1, 968, 181
Clinics	3, 958, 572	1, 282, 177	2, 676, 395
Gifts and grants	281, 921	66, 454	215, 467
Endowment earnings	249, 947	9, 758	240, 189
Miscellaneous transfers	182, 286	14, 786	167, 500
Regional organizations	134, 125	16, 500	117, 625

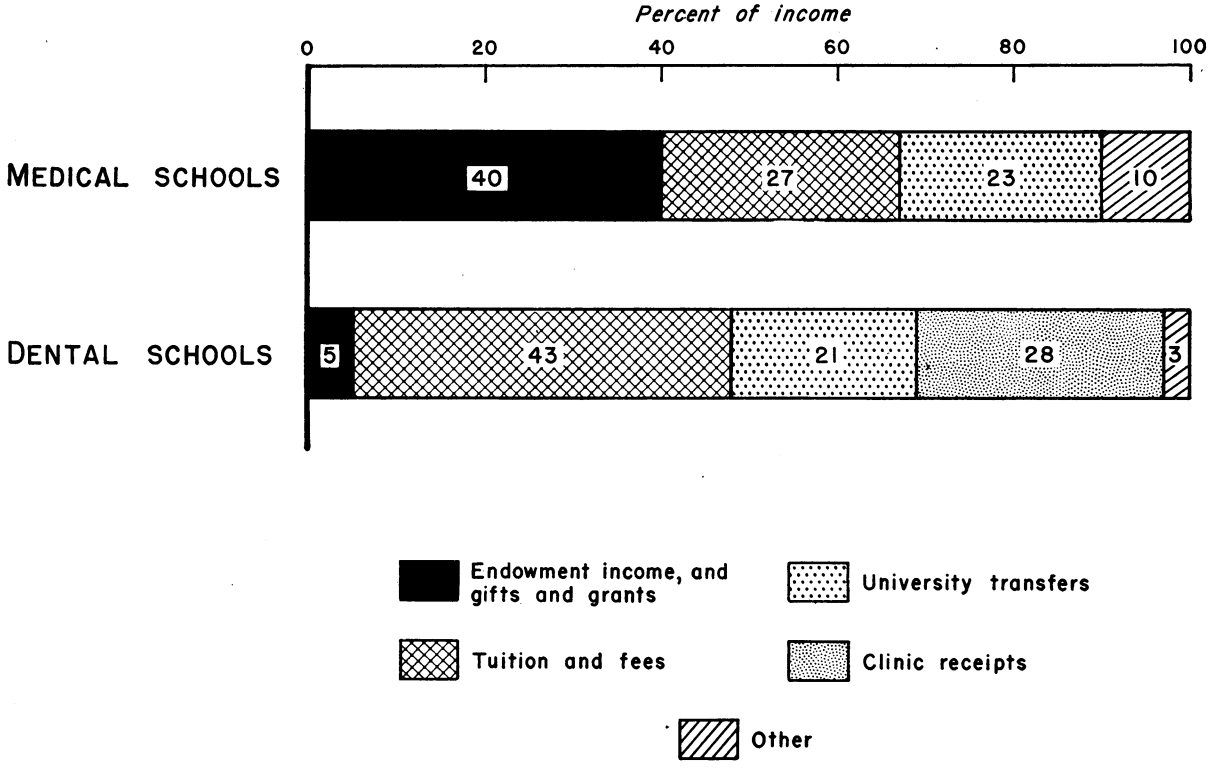
lic funds were included also in the operating income of private schools (table 4). For example the State of Pennsylvania makes biennial grants to many private educational institutions within the State boundaries.

Endowment

A total endowment principal of $8.6 million earmarked for dental schools was unevenly distributed among 23 schools. Two private schools, each with a general endowment of $1 million or more, accounted for 86 percent of the $5.6 million which represented all general endowment for dental education. Restricted endowment (funds whose income can be used only for a specific purpose) amounted to $2.8 million. Though more widely distributed than general endowment, it, too, was concentrated mainly in a few private schools, four of which held three-fourths of the total.

It will be recalled perhaps, from the study of the Surgeon General's Committee on Medical School Grants and Finances (*2*), that medical schools at the end of 1947–48 had a total

Figure 3. Income of private dental and medical schools, by source.



endowment of $210.7 million. Even discounting the larger number of medical schools than dental schools, the fact that medical school endowment represents a sum 25 times the endowment of dental schools indicates the minor role of endowment income in financing dental education.

The contrast between private dental schools and private medical schools is illustrated in figure 3. In 1949–50, private dental schools, as a group, received only 5 percent of their basic operating income from endowment and from gifts and grants. On the other hand, 40 percent of the basic operating income of private medical schools came from these sources in 1947–48. Figure 3 also shows the difference between private medical and dental schools in reliance on tuition and fees and clinic income to meet basic operating expenses.

Clinic and Other Income

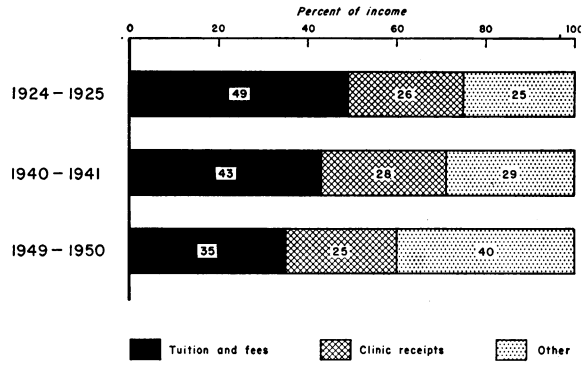
Dental school income has increased substantially over the past two and one-half decades (*3*). The fact that clinic income has remained a relatively stable proportion of the income of all dental schools combined (fig. 4) suggests rather fixed patterns of fiscal policies in dental education. Receipts from tuition and fees, representing nearly half of the total income of dental schools in 1924–25, had dropped to slightly more than one-third in 1949–50. Other income, mainly university transfers and State and city appropriations, represented only 25 percent of total income in 1924–25 and rose to 40 percent in 1949–50.

Deficits and Financial Needs

The amounts reported by the dental schools as deficits or surpluses for the study year reflect to some degree differences among the schools in the way university transfers are recorded. In their financial reports, 16 schools showed deficits aggregating $1.6 million. The reports of five of the private schools with deficits showed that each fell more than $100,000 short of income to meet basic operating expenses in 1949–50.

Unmet needs of dental schools in terms of funds for operating expenses and for construction and equipment were also analyzed. These needs, of course, varied widely from school to school and at best could represent merely approximations. The aggregates were as follows: $43 million for construction of physical facilities to relieve overcrowded classrooms, expand clinics, and develop research programs; $5.9 million to purchase equipment; and, not counting amounts reported as deficits, an additional $5.5 million for 1949–50 in operating funds to maintain and increase staff and to provide for administration and other indirect costs of instruction. At 1952 price and salary levels, this last figure would approximate at least $8.2 million as the annual amount currently needed for adequate operations.

Figure 4. Trends in sources of dental school income.



Separately Budgeted Research

Separately budgeted research is a relatively new activity in dental schools. In the fiscal year 1949–50, the total amount reported by 32 dental schools as expenses for separately budgeted research was about $733,000. The other 8 schools reported no expenditures for this purpose.

Grants from the Public Health Service to schools of dentistry met 20 percent of the total expenses for separately budgeted research. In all, 15 schools (10 private and 5 public) received these grants from the Public Health Service. Other Federal grants accounted for 24 percent of the total. Industry was the source of 19 percent of the total income for separately budgeted research expended during the study year. Foundations accounted for an additional 15 percent, and miscellaneous sources for the remaining 22 percent.

Postgraduate Education

Most dental schools keep no separate accounts for postgraduate instruction. In all, only 16 schools had separate figures for their expenses for this activity. The total for these schools was about $370,000, representing $170,000 reported by seven public schools and nearly $200,000 reported by nine private institutions.

Conclusion

The report that I have briefly summarized throws light on many of the financial problems in dental education and the difficulties schools face in maintaining high standards of instruction. It provides current data for comparison with that obtained for earlier years by the Council on Dental Education and Dr. William J. Gies (*4*). In addition, the full report (*5*) gives a comprehensive analysis of faculty resources of dental schools in terms of full-time equivalents. Certain summary data on schools of dental hygiene are also included.

The report will be read with interest and profit by all concerned with the financial aspects of dental education. The dental profession as a whole will, I feel sure, share the gratitude of the Council on Dental Education to the Public Health Service for collecting the data, analyzing the findings, and publishing the report.

REFERENCES

(*1*) National Committee on Standard Reports for Institutions of Higher Education: Financial reports for colleges and universities. Chicago, University of Chicago Press, 1935, 285 pp.

(*2*) U. S. Public Health Service, Surgeon General's Committee on Medical School Grants and Finances: Medical school grants and finances. Part I. Conclusions and recommendations; Part II. Financial status and needs of medical schools; Part III. Public Health Service grants—Their distribution and impact on medical schools. Public Health Service Publications Nos. 53, 54, and 55. Washington, D. C., U. S. Government Printing Office, 1951, 48, 84, and 58 pp., respectively.

(*3*) Horner, Harlan H.: Dental education today. Chicago, University of Chicago Press, 1947, 420 pp.

(*4*) Gies, William J.: Dental education in the United States and Canada. A report to the Carnegie Foundation for the Advancement of Teaching. Bulletin No. 19. New York, The Foundation, 1926, 692 pp.

(*5*) Financial status and needs of dental schools. Public Health Service Publication No. 200. Washington, D. C., U. S. Government Printing Office, 1952, 83 pp.

Environmental Health Center Training Courses

The Public Health Service Environmental Health Center in Cincinnati, Ohio, has announced the dates for two specialized sanitation training courses. Originally scheduled for November 4–7, 1952, the course entitled "Membrane Filter in Bacteriological Analysis of Water" is now scheduled for October 28–31, 1952. "Advanced Training for Sanitary Chemists in Water Pollution Investigations" will be conducted December 1–12, 1952.

Applications should be sent to the Officer in Charge, Environmental Health Center, Public Health Service, 1014 Broadway, Cincinnati 2, Ohio, or the medical director of the appropriate Federal Security Agency Regional Office.