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ABSTRACT

This final report is the result of a survey requested by the United States Agency for International Development (USAID) and undertaken by the Organization for Rehabilitation through Training (ORT) of four countries (Cameroon, Chad, Central African Republic, and Gabon) and a conference on vocational training sponsored by the Economic and Customs Union of Central Africa (UDEAC). Four parts are contained within the report. Part 1 consists of an introduction explaining the origins of the survey, how the conclusions were established, the purpose of the study, and the methodology used. General conclusions and recommendations are also included, together with an inventory of existing institutions in the region and a list of abbreviations. Part 2 deals with the project proposals, among which are the creation of (1) a regional center for the training of automation technicians, (2) a marine merchant school, (3) a training center for taxidermists, (4) a training center for computer programmers and analysts, (5) a training center for technicians in industry and education, (6) a technical teacher training institute, (7) hotel trade and hunting guide schools, (8) a training school for watch and instrument repair, and (9) an agricultural mechanics training center. Part 3 contains results of each survey, including facility inventories, manpower and training needs estimates, and conclusions and recommendations. The UDEAC conference report is found in part 4. (NJ)

TECHNICAL EDUCATION AND VOCATIONAL TRAINING IN CENTRAL AFRICA

FEASIBILITY SURVEY
OF THE REGIONAL DEVELOPMENT
OF RAPID VOCATIONAL TRAINING

CAMEROON, CENTRAL AFRICAN REPUBLIC, CHAD AND GABON

1969/1970

CONTENTS

PART ONE: GENERAL

INTRODUCTION

FOREWORD

The United States Agency for International Development (AID) requested ORT (Organization for Rehabilitation through Training) to undertake a feasibility survey of the regional development of rapid vocational training in Cameroon, the Central African Republic, Chad and Gabon. The survey was to emphasize the identification of the nature and extent of needs for training to meet skilled and middle-level manpower requirements, and the development of suggested program plans based on a regional approach. The selection of ORT was based on the extensive experience of the organisation in this field, in Africa and elsewhere.

To undertake this survey, ORT sent two experts, Mr. Eugene B. Abrams and Mr. Simon Guedj, to the region in the summer of 1969.

The experts prepared a preliminary report following their visit. This preliminary report served as the basis for a conference, which was held in Bangui on October 29 and October 30, 1969, on the vocational training needs of the region. The conference was sponsored by the Economic and Customs Union of Central Africa (UDEAC). UDEAC members Cameroon, the Central Africa Republic and Gabon took part in the meeting, and Congo (Brazzaville) was represented by an observer. Chad also participated.

This final report is the result of the survey and the conference, and takes account of the opinions expressed by the participants in the conference. The conference was the first meeting of its kind to be held in the region. It established the basis for continuing regional collaboration on questions of vocational training and technical education.

The final communique of the conference expressed the wish of the participants that their recommendations would be implemented with the least possible delay. This final report is being submitted to the United States Agency for International Development and to other governments as well as to private bodies, with a view to the sponsorship and financing of the project proposals which this report contains.

THE REGION COVERED BY THE REPORT

The four countries surveyed in this report, Cameroon, Chad, Central African Republic and Gabon, cover an area of 2,641,000 square kilometers (1,115,000 square miles) or a slightly larger than Argentina. The area is a varied one, ranging from tropical rain forest in Gabon in the south, through savannah and bush in the C.A.R., northern Cameroon and southern Chad, to the deserts of northern Chad. The population is relatively sparse, thinning out away from the coastal areas. The total population of the area is estimated at just over 10 million. It is growing at a rate of about 2 percent per year. Over four-fifths of the population live in rural areas.

Agriculture is the principal occupation for the large majority of the population, mainly in such principal staple crops as cassava, millet, peanuts and sorghum. In Chad and northern Cameroon cattle raising is of considerable importance.

Most of the area is lacking in natural resources, except for Gabon where considerable amounts of uranium, petroleum, manganese and timber are produced and exported. Extensive deposits of high-grade iron ore are also about to be exploited. Diamonds are mined in the C.A.R.

The industrial sector is now beginning to develop, concentrated mainly on processing of agricultural and forest products, and consumer goods industries for local consumption.

The educational system at primary, secondary and technical levels, is patterned fairly closely on that of France. Institutions of technical education and vocational training in the region are, for the most part, concentrated in the urban areas, although efforts are also being made in the field of rural technical education.

THE STRUCTURE OF THE REPORT

Part One of the report consists of this introduction which explains the origins of the survey, how the conclusions were arrived at, the purpose of the study and the methodology used. Thereafter, the general conclusions and recommendations are given, together with an inventory of existing institutions in the region, and a list of abbreviations.

Part Two consists of the project proposals.

Part Three is the four country surveys, to serve as reference material for the recommendations and project proposals. Each country survey starts with an inventory of existing capabilities and is followed by an estimate of needs. The conclusions and recommandations in respect of that country end each section.

Part four consists of the agenda, minutes and other material of the UDEAC conference at Bangui.

METHODOLOGY

In accordance with its agreement with AID, ORT undertook the survey in the following manner:

1. an inventory by appropriate classification was prepared of existing vocational training resources both in the government and private sector, in each country;
2. available manpower data of each country was examined, to serve as a basis for estimating current and future manpower requirements;
3. the nature and extent of opportunities for on-the-job and other informal training in each country was explored;
4. priority vocational training needs were identified, which could be satisfied most economically and effectively through a regional approach;

5. the interest was assessed of each government in utilizing existing or new facilities which offer opportunities for training;

6. rough estimates were developed of requirements for the development of selected facilities for regional utilization. This covered needs for buildings, equipment and instructional materials, and for staff, which were also phased and costed out;

7. the availability was determined of local staff either trained or available for training, students qualified for training, and job opportunities;

8. This final report constitutes a plan for a regional approach to vocational training for skilled and middle-level manpower in Central Africa under the sponsorship of UDEAC. This approach is not confined to those activities recommended for U.S. financing, but focuses on the priority needs of the area. It includes factors for developing private enterprise capability to conduct on-the-job as well as skill improvement training for employed workers.

February, 1970

Eugene B. Abrams
Director of Technical Assistance
ORT

GENERAL CONCLUSIONS AND RECOMMENDATIONS

The conclusions and recommendations set forth below in each of the four country chapters are recapitulated herewith, reviewed from a regional viewpoint (two or more countries). The national recommendations, which appear in the country chapters only, remain valid.

1. It would appear upon review of the inventory of the training facilities of each country that these facilities, schools or centers are numerous enough to satisfy the country's needs. However, when viewed in the light of the needs of industry and commerce, it becomes readily apparent that there is a considerable gap with respect to middle-level manpower, technicians and supervisory personnel, in industry and commerce. There is also a gap in the system of vocational training at the skilled worker level. The apprenticeship system at the Chambres des Metiers is illusory. The ILO should review this situation for the purpose of establishing a model apprenticeship contract between the employer and a young worker who desires to learn a trade. Complementary courses could be provided to young workers (languages, mathematics, industrial design and technology) sponsored by the national technical education department.

2. There is an insufficient variety of courses given in the technical education schools (Lycées Techniques and CET). Because the labor market is rather narrow, greater diversification is necessary in the range of courses offered. The creation of the following sections is recommended to meet this need:

   a) electronics (particularly in Cameroon and in Gabon), in the existing Lycées Techniques.

   b) automation (mechanical, hydraulic, pneumatic and electric) for Cameroon and Gabon.

   c) computer programmers and analysts, since electronic computers are already in use in Cameroon, Gabon and in CAR.

   These last two specialties should be in the form of regional schools.

3. A more precise evaluation of available resources and foreseeable needs is necessary for setting a logical policy of integrated training within Development Plans. A clearer definition of manpower training goals and the financial and logistic means for achieving these goals is mandatory.

   More accurate job availability estimates, numbers of persons employed, and evaluation of needs by sector are required. It would also be useful to define the psycho-sociological obstacles which confront middle-level manpower. Defining the optimum selection processes for selection and orientation of youth towards the jobs they are best fitted for is of capital importance. A wide range of means of training and upgrading is required, using methods and programs geared to specific circumstances.

   Part one, paragraph II of this survey outlines the difficulties of reconciling supply and demand in relation to training needs. Once defined, the training policy could become more effective.

To further this end, the creation of a National Office of Vocational Training (similar to the ONFP in the Ivory Coast) in each country is strongly recommended. There is such a body in Gabon, and a nucleus of one is developing in Chad. However, nothing of the sort exists in Cameroon or the Central African Republic. The creation of a Vocational Training body in each country should be accomplished in coordinated fashion — whereby the importance of this Office which would supervise on-the-job training effectively. It would also review the activities of the totality of Vocational Training Institutions outside of technical education, and would at the same time supervise the development or creation of such schools.

An Office Regional de la Formation Professionnelle (ORFP) would be created within the framework of U.D.E.A.C. which would harmonize the activities of the national offices, by providing them with the necessary technical assistance and by assuring an exchange of documentation and information. From this harmonization of national vocational training policies would flow the creation of such regional vocational training institutions as would be needed because of the non-economic basis for investment in purely national institutions.

4. In paragraphs II B and II C of Part One, the importance of the needs for foremen and technicians in the industrial field in particular was noted. Also noted in the inventory of training means was the capacity of personnel training at this level, in existing schools. This capacity could never meet the levels of skilled manpower required.

The Libreville Institute of Technology (IUT) could train engineer-technicians and senior technicians of University level.

The Lycées Techniques are abandoning increasingly the training for the Brevets de Techniciens in favor of the baccalauréat de technicien (notably in Cameroon).

It is therefore necessary to create a *Regional School for Technical Training* in various specialties.

5. National projects for the creation of a Teacher Training Institute exist in each of the four countries and requests for financial aid to various international organizations have been submitted separately by the countries concerned. These requests should be grouped for the benefit of a Regional Teacher Training Institute for the four countries. This request is supported by the analysis provided in Annexes A and B.

The percentage of students who complete training is small, but even more serious than the mediocre results in examinations is the number of drop-outs during the school year. In Annex C of Cameroon, is a review of the results of 1966/67, 1967/68 and a projection for 1968/69. The weak scholastic output is discouraging with the resultant wastage a heavy load on the respective national economies.

If such a school were created immediately, with full support from all, it would not solve all of the problems in this field. Optimistically speaking, at least one year would be necessary for the creation and start-up of operations of such an institution. The needs are immediate. In the light of this urgency, attention should be focused on the need to send to specialized institutions, for a short period of time, a certain number of African instructors, already practicing the teaching profession, but who lack pedagogical qualifications for a period of technical and pedagogical training in their specialities. A number of such

institutions exist that have considerable experience in this field. and who have already carried out similar activities on behalf of other African countries. The Central ORT Institute located at Anières, in the outskirts of Geneva, which specializes in the training of technical instructors, is fully qualified to provide such training and has the flexibility necessary to design specific training courses.

6. The issue of training and upgrading of technical teachers has just been dealt with. There is, however, another problem related to the training of primary school teachers. This problem was reviewed in Cameroon with the UNESCO project for rural teacher training and in Central African Republic with the INPPPE. These projects contain a new idea, which is that of a teaching methodology better adapted to rural life, specifically agriculture and artisan training, through the introduction of manual training and agricultural education at the primary school level. This same problem is prevalent in Chad.

   It is recommended that, there be created an institution which would be responsible for the conception and manufacture of audio-visual aids, as well as other manual training materials for use in the primary schools.

   This center could be situated at either NGOUMOU or at BANGUI, following discussion and agreement between the countries concerned. It should be noted that ORT had already created in Mali, beginning of 1962, such a center, which is still in effective operation. This center is similar to the one presently operating at the Central ORT Institute in Anières.

7. In each of the country sections in the foregoing report, the sectors of tourism and hotel management are reviewed, in the light of the considerable investments for which the various national development plans have provided. Despite all of the planning for tourism and hotel investment and management, nowhere, in any of the countries, does a training institute exist in these sectors. The creation of a hotel training school within the framework of an existing hotel, specifically in Chad, is recommended, based on proposals made to the survey team by Chadian officials.

8. Creation of a regional watchmaking and instrument repair school. In the field of training of watch makers and instrument repair men, there is a total lack in each of the four countries. This school would not only train watch repair specialists, but would also train precision mechanics and maintenance and repair personnel for control instrumentation (aircraft instruments, electric meters, etc.). ORT has already contacted the Swiss Watchmaking Federation which has indicated its interest in this project.

9. Creation of a school of merchant marine skills. The importance of fisheries and merchant marine activities have been dealt with for Cameroon, Gabon, Chad and the Central African Republic. While it is obvious that for Cameroon and Gabon merchant marine activities play a relatively important role in their economy, the question of fluvial navigation is of equal importance for the Central African Republic and Chad.

   The objective of such a school would be to train specialists capable of maintaining marine diesel engines, small outboard and inboard motors, radios, electrical installations aboard sea-going and river craft, as well as refrigeration technicians for the fishing fleet and the merchant marine. This regional school could, of course, serve other countries such as Congo (Brazzaville) and Spanish Guinea.

Its creation should be undertaken in close conjunction with a shipping company.

10. One special recommendation arises in connection with Chad and the Central African Republic (in connection with the latter country, see the request formulated by the Bangui Chamber of Commerce (annex VI-CAR). It is recommended that a study team cover the interior of both countries with the objective of surveying the commercial exchange system, with a view to bear reform and development through an adequate training effort. While, in the commercial sector, a number of large companies completely cover the import and export requirements of the countries concerned, the commercial structure in the interior is in a relatively embryonic stage.

11. It is recommended that the telecommunication schools in Chad and the Central African Republic be further developed. They complement each other but do not yet play a regional role, in terms of satisfying the needs of the four countries.

12. A similar recommendation is made for the Public Works School in Chad, which should be renamed the Regional Public Works School, whose capacity is sufficient to allow the admission of a considerable number of students from other countries in the region.

INVENTORY OF INSTITUTIONS

	TYPE	CIDAD	
		Institution	Enrolment
A	Institutions and resources administered by Ministry of National Education		
A 1	Institutions for long-term technical training courses (2nd cycle)	Industrial LT at FtArchambault + CET annex	117
		Community LT at Fort-Lamy	322
A 2	Institutions for short-term technical training (1st cycle + CAP)		
A 3	Para-Industrial and craft training	11 apprenticeship centers	199
A 4	Education of women and girls (home economics and dressmaking)		
A 4.1	Training for CAP diploma		
A 4.2	Work for CAP diploma	5 training centers	
A 5	[illegible]		
B	Institutions administered by the Ministry of Labour		
B 1	Centers for Accelerated Vocational Training	Accel. Voc. Tr. Center at Fort Lamy	129
C	Institutions administered by other ministries		
C 1	Public Works Department	Ecole Nationale, Fort-Lamy	65
C 2	Ministry of Postal Service and Telecommunications	Ecole Nationale, Fort-Archambault	28
D	Training within the enterprise	CITA, SFEE, banks	100
E	Training provided through bilateral and multilateral aid		
E 1	USAID		
E 2	UNESCO - FED	Rural Training Center	na
E 3	Others		

na = not available

INVENTORY OF INSTITUTIONS

CAMEROON		GABON		CAR	
Institution	Enrolment	Institution	Enrolment	Institution	Enrolment
6 Ind. LT and courses 1st cycle	955	LT Libreville	547	LT in Bangui	221
2nd cycle	881	Immaculée Conception	66		
		Commercial School, Port-Gentil			
54 CET and similar institutions	7810	5 CET	455	CET annex to LT Bangui	244
		1 commercial section, BIEAM	19	School of Arts & Crafts	53
26 craftsmanship sections	1 302	10 apprenticeship centers	338	Apprenticeship centers	1090
				Craftsmanship schools	362
2 Home eco schools	40			Ecole Notre Dame	193
				Lycée Caron	
9 Home economics sections	385				
In industrial [illegible]					
Accel. Voc. Tr. Center [illegible]	30	Accel. Voc. Tr. Center [illegible]	105	Accel. Voc. Tr. Center Bangui	68
Accel. Voc. Tr. Center Yaoundé	30	Accel. Voc. Tr. Center Port-Gentil	45		
Accel. Voc. Tr. Center Douala	30	Accel. Voc. Tr. Center, Ste-Marie			
Training Center for engine mechanics, Douala	18			Center at Boali (closed)	0
		Postal Training Center	16	Ecole Nationale (planned for 1970)	50
Renault, Regie [illegible]	170	COMILOG-COMUF [illegible]	n.a.	SCKN, Renault	n.a.
Very active participation in other institutes	n.a.	Minor participation	n.a.		
Yes (already incorporated)				Training of craftsmen INIPPE (short courses)	planned courses 50
I.P.D.	n.a.			ORT/AID Center	n.a.

LIST OF ABBREVIATIONS

AFCA	Association pour la Formation des Cadres de l'Industrie et de l'Administration
AID	United States Agency for International Development L'Agence des Etats Unis pour le Développement International
BAC	Baccalauréat
BE	Brevet Elémentaire
BEPC	Brevet Elémentaire du Premier Cycle
BEC	Brevet d'Enseignement Commercial
BEI	Brevet d'Enseignement Industriel
BP	Brevet Professionnel
BSEC	Brevet Supérieur d'Enseignement Commercial
BSEN	Brevet Supérieur d'Ecole Normale
BT	Brevet de Technicien
CAP	Certificat d'Aptitude Professionnelle
CAPES	Certificat d'Aptitude Pédagogique pour l'Enseignement Supérieur
CAPET	Certificat d'Aptitude Pédagogique pour l'Enseignement Technique
CAPC	Certificat d'Aptitude Professionnelle Commercial
CEAP	Certificat Elémentaire d'Aptitude Professionnelle
CEG	Collège d'Enseignement Général
CEP	Certificat d'Etudes Primaires
CEPE	Certificat d'Etudes Primaires Elémentaires
CEPT	Certificat d'Etudes Primaires Tchadien
CET	Collège d'Enseignement Technique
CETC	Collège d'Enseignement Technique Commercial
CETI	Collège d'Enseignement Technique Industriel
CFA	Centre de Formation Accélérée
CFPP	Centre de Formation Professionnelle et de Perfectionnement
CFPR	Centre de Formation Professionnelle Rapide
EPS	Ecole Primaire Supérieure
FPA	Formation Professionnelle Accélérée
IFA	Institut Francais d'Afrique
ILO BIT	International Labour Office Bureau International du Travail
INPPPE	Institut National Permanent pour le Perfectionnement du Personnel Enseignant
IPD	Institut Panafricain de Développement
IUT	Institut Universitaire de Technologie
LT	Lycée technique
MEN	Ministère de l'Education Nationale
MESC	Ministère de l'Education de la Jeunesse et de la Culture

NSCKN	Nouvelle Société Commerciale du Kouilou-Niari
ONFP	Office National de la Formation Professionnelle
ORFP	Office Régional de la Formation Professionnelle
ORT	Organization for Rehabilitation through Training
PEG	Professeur d'Enseignement Général
PETT	Professeur d'Enseignement Technique Théorique
PNUD / UNDP	Programme des Nations Unies pour le Développement / United Nations Development Program
PTA	Professeur Technique Adjoint
PTET	Professeur Technique pour l'Enseignement Théorique
SAR	Sections Artisanales Rurales
SEEE	Société Equatoriale d'Energie Electrique
TME	Travaux Manuels Educatifs
TP	Travaux Pratiques
UDEAC	Union Douanière et Économique de l'Afrique Centrale (Economic and Customs Union of Central Africa)
UTA	Union des Transports Aériens
UIT	Union Internationale des Télécommunications

PART TWO: PROJECT PROPOSALS

NOTE ON PROJECT PROPOSALS

The amalgamation of project proposals 3 and 4 (Regional Technical Training School and Regional Technical Teacher Training Institute) and project proposals 4 and 5 (Regional Technical Teacher Training Institute and Regional Training Aids and Educational Research Center) was effected at the request of the Agency for International Development, in the interests of a more efficient use of resources.

In the project proposals it should be noted that:

1. The cost of transportation of equipment and materiel to the recipient country is included in the budget.
2. Equipment and materiel costs do not include customs duty on the assumption that they will enter the countries duty free.
3. In all of the project proposals, it is assumed that students' living expenses will be covered by the governments. Consequently, no boarding facilities have been provided for.
4. The ORT fee covering assignment of specialists includes:

   salaries
   expatriation allowances
   family allowances
   education allowances
   pension contributions
   accident and health insurance
   ORT headquarters support including by Geneva and New York personnel
   salaries, course materials, syllabi and documentation
   all other expenses related to employee compensation.

5. No attempt has been made to allocate budgetary expenses as between donor and recipient governments. This allocation of expenses would be decided on a project-by-project basis.
6. The costs of the first two years of operation are generally higher than subsequent years. This is because most of the "one-time" expenses (buildings, equipment, etc.) are made at the beginning of the project.

If any of these assumptions should prove incorrect in a particular case, corresponding upward budget adjustments will be required.

PROJECT No. 1

PROJECT PROPOSAL FOR THE CREATION OF A REGIONAL CENTER FOR THE TRAINING OF AUTOMATION TECHNICIANS

I. INTRODUCTION

During 1969, an ORT team carried out a survey in Cameroon, Chad, Central African Republic and Gabon for the purpose of attempting to identify the needs for regional action in vocational training. The preliminary results of this survey were incorporated in a draft report which was the main basis of discussion at a conference held in October 1969, in Bangui, under the auspices of the Union Douanière et Economique de l'Afrique Centrale (UDEAC). The representatives from the member Governments of the UDEAC : Cameroon, Central African Republic, Gabon and Congo (Brazzaville) were present at this conference, as well as a representative of the Government of Chad, which was formerly a member of the UDEAC.

In all of the Central African countries various kinds of complex automatic equipment are installed such as elevators, printing presses, and packaging machines. In none of these countries does there exist African staff capable of maintaining or repairing this equipment. This is true not only in countries having membership in UDEAC and Chad, but also all of French-speaking Africa. The repair of a film projector or a lathe-copying machine, for example, must be carried out in Europe, or requires the despatch of a European technician to Africa.

This project proposal stems directly from discussions in the field with African leaders concerned with this problem who indicated to the ORT team during their on-the-spot investigations the pressing need for trained Africans in this field. This particular activity was unanimously accepted at the Bangui conference on vocational training.

II. PROJECT OBJECTIVE

The objective of this project is to train, in three years, technicians capable of repairing, adjusting and maintaining all kinds of automatic machinery and equipment, including but not limited to the following types:

- mechanical
- pneumatic
- electro-magnetic
- hydraulic
- electronic

The Center should admit 15 students per year which would result in approximately 12 graduates per year beginning in 1973, assuming that the Center

would be created by 1970 and that the percentage of dropouts would be approximately 20%, which is a reasonable assumption given the problems in this specialty.

III. METHOD OF OPERATION

Recruitment would be carried out in all of the countries of Central Africa, but arrangements could be made to admit students from other African countries.

Selection criteria for the admission of students would be particularly high and would especially take into account the natural aptitude of the candidate in logic, initiative and mathematics.

The recruitment level should be higher than the BEP or the CAP. The following candidates could be admitted as students after selection and examination :

— holders of the electro-mechanics CAP having one year of industrial experience.

— holders of the electro-mechanics BEP having one year of industrial experience.

— holders of the electro-mechanics BEI or equivalent.

In any event the candidates should have received comprehensive training in electro-mechanics.

Given the extremely long lead time in equipment deliveries and the administrative and logistic problems involved in the construction of buildings, the first year of the project should be devoted to :

a study in depth of local conditions and the refinement of this project proposal

the selection of students

the drawing up of equipment lists and placing of orders

supervision of construction

equipping and furnishing of shops and classrooms, if construction is sufficiently advanced.

preparation of course material on the basis of student aptitude and level

creation and construction of training aids designed to meet regional needs.

This preparatory period would require the presence of two technicians, one being the Chief of Project. The total teaching staff would assume their functions 12 months later.

The training provided by the Center would utilise the most modern pedagogical techniques, given the complexity of this specialty, through the use of audio-visual and didactic training aids and materials such as :

film projectors
slide projectors
overhead projectors
epidiascopes
didactic models
explanatory charts

The foregoing elements are indispensable for the teaching of the theory courses (automation technology, draftsmanship, circuit design, building, numbers

theory, Boole algebra, electronics, logic circuits, electro-technology, hydro-pneumatic equipment).

In the shop, training aids and didactic material, particularly controlled simulators, would be used. For the use of automation demonstrations by analogy, a didactic demonstration stand would be utilized. A number of courses could be given in the form of programmed instruction.

The project would be Africanized approximately six years after its start-up, but the African counterparts, who would be designated to take over from the ORT teaching staff, would have to spend one to two years, at a minimum, abroad before being capable of taking over in the classroom.

IV. BUILDING REQUIREMENTS

A. Classroom needs:

3 classrooms
1 preparation room
1 lecture hall
1 library/study room
1 draughting room
1 instructors room
1 technical studies office

Workshops:

1 machine shop
1 automation laboratory (simulators, computers)
1 physics and electricity laboratory
1 stockroom for tools and raw materials

B. Administrative space needs:

1 office for project head
1 secretarial office

C. Miscellaneous:

sanitary facilities
cloakroom

Total floor space: 900 to 1000 m² (970 m² 10,800 sq. ft.)

V. TEACHING PERSONNEL

A. ORT Personnel:

First year of operations (preparatory)

1 chief of party
1 automation instructor

Second year of operations

(In addition to first-year personnel):
1 electronics and mathematics instructor
1 storekeeper

Third year of operations

(In addition to second-year personnel):

1 automation instructor
1 electro-mechanics instructor

Fourth year of operations

(In addition to third-year personnel):

1 automation instructor
1 mechanics instructor

B. **LOCAL STAFF:**

1 secretary

Locally-recruited instructors for sports, French, etc. (approximately 6 man/months per year).*

1 caretaker*
2 laborers
1 night watchman
1 chauffeur
1 assistant storekeeper*

VI BUDGET ESTIMATE FOR THE FIRST TWO YEARS OF OPERATION

			US$
A	**Buildings and Grounds**		75,000
B	**ORT Staff**		
	First year	$ 56,000	
	Second year	112,000	168,000
	Third year	144,000	
	Fourth year onwards	192,000	
C	**Local Staff**		
	First year	$ 8,000	
	Second year onwards	$ 18,000	26,000
D.	**Equipment, Material, Tools**		
	Classroom and office furniture		20,000
	Training aids		12,000
	Mechanics workshop		25,000
	Automation laboratory		60,000
	Physics & electricity laboratory		12,000
	Expendable items ($12,000 per year)		24,000
	Textbooks, film, supplies, etc ($9,000 per year)		18,000
E.	**Expatriate staff housing (including electricity, water & gas)**		
	First year	$ 14,000	
	Second year	$ 28,000	42,000
	Third year	$ 42,000	
	From fourth year onwards	$ 56,000	
		carried forward	$482,000

* Starting with second year of operations

			US$
		brought forward :	482,000
F.	**School operating costs**		
	Water, electricity, gas, etc Postal, telephone, cables Gasoline Janitorial supplies and miscellaneous ($15,000 per year)		30,000
G.	**Two utility vehicles**		6,000
H.	**Travel of staff and families and transportation of personal effects**		
	First year	$ 8,000	
	Second year	$16,000	
	Third year	$22,000	24,000
	From fourth year onwards	$29,000	
I.	**Inspections, consultations, per diem, etc.** ($3,000 per year)		6,000
		TOTAL	$548,000

NOTE :

Beginning with the third year of operation, training overseas is projected for eight counterparts, who would assume teaching tasks following their return from training. Training costs are estimated at $60,000 per year for a group of eight trainees.

PROJECT No. 2

PROJECT PROPOSAL FOR THE CREATION OF A REGIONAL SCHOOL FOR THE TRAINING OF COMPUTER PROGRAMMERS AND ANALYSTS

I. INTRODUCTION

During 1969 an ORT team carried out a survey in Cameroon, Chad, Central African Republic and Gabon for the purpose of attempting to identify the needs for regional action in vocational training. The preliminary results of this survey were incorporated in a draft report which was the main basis of discussion at a conference held in October 1969, in Bangui, under the auspices of the Union Douanière et Economique de l'Afrique Centrale (UDEAC). The representatives from the member governments of the UDEAC; Cameroon, Central African Republic, Gabon and Congo (Brazzaville) were present at this conference, as well as a representative of the Government of Chad, which has formerly a member of the UDEAC.

During the discussions at the conference, there was unanimous approval of the ORT recommendation to create a regional facility for the training of computer programmers and analysts. In addition to on-the-spot observations in Central Africa made by the ORT team, conversations with representatives of leading computer manufacturers were held with a view to isolating more specifically the training problem.

The following project proposal is therefore based on field observations as well as the review of the problem with those representatives of computer manufacturers dealing with personnel and training problems. It is designed to meet an acute shortage of trained Africans in this field.

It is estimated that there is at present a backlog requirement for approximately 100 to 150 computer programmers in Central Africa. This function is presently being carried out in the 5 Central African states by expatriate Europeans. The major computer manufacturers have attempted in the past to train computer programmers on-the-spot, but have run into a variety of difficulties. The principal problem has been the recruitment of persons qualified to follow the course material, most of which is in the form of programmed instruction. This is a rather typical problem encountered in Africa, which ORT has successfully solved in the past, through the creation of special preparatory courses which bring the level of learning capacity up to that necessary required to absorb technical and abstract subjects.

While the computer manufacturers feel that it would now be premature to institute formal training programs for computer analysts, it is felt that further information on this aspect of the problem should be obtained in Central Africa, from computer users. There are two methods possible for training analysts. The first involves young administrators, already at work, who have the aptitudes required for this type of training. The second involves the selection of the best of the computer programmers for additional training in the technical and administrative sectors.

The need for 100-150 programmers in the Central African states is Based on the present number of computers installed and operating in government and private

enterprise in these countries and the number of expatriate programmers presently employed. In addition, however, it is estimated conservatively that once the backlog needs have been met, an increase of approximately 10 to 20 programmers per year will be needed to keep up with the annual increase in computer installations.

II. PROJECT OBJECTIVES

The objectives of this project are to create a regional school, or sections in an existing institution, for the purpose of training computer programmers in the short run, and analysts and programmers in the long run. Courses would be given to approximately 40 students per year which, taking into account normal attrition and present and future needs, would result in filling the backlog by 1976. Beyond that year, current needs would begin to be met. Course materials would be based on programmed instructional materials currently utilized by the computer manufacturers for training in Europe and North America, appropriately modified by ORT for African conditions. Prior to actually beginning the programmer course material, students would be given one year of preparatory work, with heavy emphasis on the use of audio-visual methods, to bring them up to the level required for successful assimilation of the course material. It is estimated that following the one year of preparatory work, approximately one year would be needed for the actual programmer training.

III. METHOD OF OPERATION

Selection and recruitment of students would be at the BEPC or baccalaureat level, preferably the latter, if sufficient candidates were available. Emphasis in selection would be placed on demonstrated ability in the mathematics and logic field. Selection procedures would use commonly accepted psychological and intelligence tests, appropriately modified for the African context by ORT, in close cooperation with the computer manufacturers.

For the training of 40 to 50 persons annually, it is estimated that four or five classrooms of approximately 60 m² each would be needed to house the preparatory and training year students. In addition, practical work would be carried out using local computers. Computer time would be purchased from the computer owners if necessary.

Prior to the actual start-up of the project, a period of three months would be necessary for the ORT pedagogical services to develop a course of programmed instruction through modification of existing systems.

Three years after project start-up, training of counterparts to replace the expatriate instructors would begin. It would be accomplished through selection of those students having demonstrated the greatest aptitude and who, in ORT's judgment, have potential teaching talent.

Equipment needs for this project are minimal, consisting only of normal classroom furniture and materials, and a modest amount of audio-visual training aids. It is not considered economically viable to purchase or rent a computer for instruction purposes. However, the school must be located in close physical proximity to an operational computer installation.

IV. BUILDING REQUIREMENTS

4 classrooms
1 preparation room
1 instructors room
1 office for project head
1 secretarial office
1 storeroom
1 cloakroom
sanitary facilities

Total floor space: 450 - 500 m² (4900 - 5400 sq.ft.)

V. PERSONNEL

ORT STAFF:

First year of operations:

Four instructors, including Chief of Party

Second and following years:

Seven instructors, including Chief of Party

LOCAL STAFF:

1 secretary
1 janitor
1 night watchman
1 caretaker

Locally-recruited instructors for sports, French, etc., 16 hours per week.

VI BUDGET ESTIMATE FOR THE FIRST TWO YEARS OF OPERATION

			U.S.$
A	Buildings and grounds		38,000
B	ORT Staff		
	Preparatory period (Geneva) 3 months	$ 16,000	
	First year	100,000	
	Second year	170,000	286,000
C.	Local Staff		
	$15,000 per year		30,000
D.	Equipment		
	Classroom and office furniture		14,000
	Training aids		18,000
	Teaching equipment		12,000
		Carried forward:	398,000

		U.S.$
	Carried forward	398,000
	Storeroom	4,000
	Air conditioners	2,000
	Textbooks, supplies	8,000
	Miscellaneous	4,000
E.	ORT Staff Housing (including electricity, water, gas)	
	First year $28,000	
	Second and following years $49,000	77,000
F.	School Operating Costs	
	Computer time, water, electricity, gas, gasoline, transportation, janitorial needs $16,000 per year	32,000
G.	Travel of instructors and families and transportation of personal effects	42,000
H.	Inspections, consultations, per diem, etc.	6,000
	TOTAL: U.S.$	573,000

PROJECT PROPOSAL FOR THE CREATION OF A REGIONAL TRAINING INSTITUTE FOR TECHNICIANS IN INDUSTRY AND EDUCATION

CONTENTS

ANNEXES

PROJECT PROPOSAL FOR THE CREATION OF A REGIONAL TRAINING INSTITUTE FOR TECHNICIANS IN INDUSTRY AND EDUCATION

FOREWORD

The purpose of this project proposal is the creation of a Regional Training Institute for Technicians in Industry and Education (IRFCIET).

The project consists of creating an institution designed to meet a dual need felt acutely in all the countries of Central Africa.

We therefore propose to make a combined approach toward two essential objectives which could be pursued separately. Each of these is sufficiently important to justify separate action in each field, namely the training of technicians for industry and the training of persons who will provide technical and vocational education. However, by marrying these two actions it will be possible obtain a number of advantages which should be considered.

One of the most important is that the Institute, by virtue of its very size, will permit more rational utilization of plant, in particular teaching premises and equipment. It will, in addition, facilitate the assignment of functions to teachers and administrative services. This will entail substantial financial savings.

This dual training of skilled personnel will make for better coordination of education under the same leadership. The future PTA's and PTET's will thus be able to obtain very valuable direct experience during the first and second years of their training as technicians.

During the actual studies the fact that the technicians, representing future industrial supervisors, and the PTA's and PTET's, as the future instructors for skilled manpower, will be working side by side will itself provide the basis for better understanding and later collaboration between the people trained according to these two methods.

Under a single leadership the institute will be able to guide its students more easily into the branches most suited to their natural abilities. Guidance need not be restricted to the period before entry and can play a most important part during the initial phase of tuition. This will help to some extent to reduce failures and dropouts.

Some of the students will be concerned more with the technical aspects, while others will be taken up more fully with teaching questions, which will give a particular stamp to the school situation, without any adverse effect.

Obviously, the establishment of a training unit of such a size will give rise to numerous problems, starting with the actual location. These are matters which will have to be decided in the final project in conjunction with the authorities of the countries concerned.

The project is presented by first reviewing the elements relating to training of future teachers and then considering questions relating to technicians.

I. INTRODUCTION

A. Training of PTAs and PTETs

Examination of recent statistics on technical and vocational training supplied by the Union Douanière et Economique de l'Afrique Centrale (UDEAC) makes strikingly clear the lack of a technical teaching corps, the gaps being particularly noticeable and critical in the case of teachers who are nationals of the countries involved. The number of scholastic failures in the technical field and the high wastage in this category of education are all too evident. Over the short and medium term, technical and vocational training is the key element in the economic and social development of a country or a region. In addition, the immediate foreseeable needs in terms of numbers of skilled workers throw into even sharper relief the problem of technical teaching staff.

The scale of this problem has been recognized by every one of the UDEAC countries. The conference at Bangui unanimously approved the recommandation to create a Regional Technical Teacher Training Institute (ERNET), and to give it the priority which it merits.

The relevant part of this recommendation stated :

"National projects for the creation of a Teacher Training Institute exist in each of the four countries, and requests for financial aid to various international organizations have been submitted separately by the countries concerned. These requests should be grouped for the benefit of a Regional Teacher Training Institute (PTA and PTET) for the four countries. This request is supported by the analysis provided in Annex A (Distribution of teaching staff) and Annex B (Results of the various examinations) for each of the countries.

"The percentage of students who complete training is small, but even more serious than the mediocre results in examinations is the number of dropouts during the school year. Annex C contains a review of the results for 1966/67 and 1967/68 and a projection for 1968/69, which shows an unsatifactory prospect, with low efficiency and resultant wastage, placing a heavy load on the respective national economies.

"If such a school were created immediately, with full support from all, it would not solve all of the problems in this field. Optimistically speaking, at least one year would be necessary for the creation and start-up of operations of such an institution. The needs are immediate."

B. Training of technicians

The recommendation for the creation of a "Regional Training School for Technicians" was reviewed and endorsed by the Bangui Conference.

The report states that:

"In each paragraph IIB and IIC in the survey of each country, the extent of requirements for foremen and technicians was observed, particularly in industry. It was also noted in the first part, "Inventory of Training Facilities", that the possibility of training personnel at this level in all the existing institutions could never attain the level indicated in the statement of needs.

"The University will train engineering graduates. The Institute of Technology in Libreville will train practical engineers or senior technicians. The technical lycées have progressively abandoned Brevet de Technicien training in favor of the Baccalauréat de Technicien training (particularly in Cameroon).

"It is therefore necessary to create a Regional Training School for Technicians in several specialities."

The foregoing defines the level at which training should be given and indicates that training as a technician is a vital complementary means towards the effective utilization of engineers trained in the universities or the Institute of Technology in Libreville.

In practice graduate engineers work at peak efficiency when backed by a team of technicians, who serve as the link between the conception of a project and its realization.

The estimates of current skilled-labor needs, and those for the present decade, indicate large requirements in the fields of industry and construction in each country of the region. Consequently, an immediate effort is needed on order to expand the training of technical foremen and technicians.

II. PROJECT OBJECTIVES

A. Training of teachers

The objectives of the Institute are essentially threefold:

- to train teaching staff in the field of technical education and vocational training, either as workshop instructors (PTA) or as teachers of technical theory (PTET);
- to provide periodic advanced training and refresher courses for existing teaching staff;
- to contribute to and collaborate with a Regional Training Aids Center, which would also be responsible for educational methodology research for technical and vocational training.

The foregoing objectives would be conducted along parallel lines in the following areas of specialization:

- **industrial**: dealing with the different branches of the family of trades included under mechanical engineering and electricity;

— **construction :** dealing essentially with woodworking and building construction ;

— **commercial :** dealing with accounting, secretarial skills and commercial activities.

This proposal outlines a project designed to train technicians for the industrial and constructional sectors, at PTA and PTET levels.

Given the broad complex of training activities required in the various fields, the action of the technician sections will limit itself essentially to the training of middle-level technicians for industry. A section of this school will however be devoted to building construction, and in particular, the training of building construction foremen. At a later stage civil engineering technicians could be trained.

Stress will be put on the training of technicians in fields related to mechanics and electricity which are the main basic trades. The following sections would be created as a first step :

— general mechanics
— automobile and diesel mechanics
— electrical installation for building and industry
— electro-mechanics
— refrigeration
— building and public works

The total enrollment of the technician sections will be 524 students at the time of full operation. Since courses will last four years, each graduating class will comprise about 12 to 20 technicians graduating in each of the sections. A diesel section would be added later. Specialization in this branch will take place during the final year.

III. PROJECT DESCRIPTION

A. Training of teachers

1. Institute Graduates' Assignments

The precise duties of the teaching staff described as PTAs and PTETs are as follows.

The PTAs will have as their principal task the teaching of pratical work at the level of the CPA diploma in the vocational training schools and technical high schools. However, they must also be capable of teaching workshop technology and technical draftsmanship in their own subjects, even if only to first-year students.

The PTETs will be responsible for the teaching of the technical theory involved in each trade, in the vocational shools and technical high schools. Each one must, in addition, be capable of teaching laboratory work in his own subject. The practical knowledge of the PTETs should be sufficiently thorough and recent to enable them to provide training which is geared to current industrial practice.

2. Recruitment and Level of Graduation

The training will be given at two levels. The same is true of recruitment of the students who are to become PTAs or PTETs.

PTA Level (period of studies : 3 years)

The minimum level of recruitment would be the BEI diploma, or in exceptional cases, the CAP diploma, with some years of practical experience in the trade in each case. Provision could be made, however, for recruiting experienced teachers with a good general education but without a technical diploma ; in this case, a preparatory course would be necessary.

PTET Level (period of studies : 3 years)

Here the recuitment level would be that of the **baccalauréat technique,** possibly the BEI. In the latter case, consideration might be given to the possibility of providing a preparatory year or semester before entry to the the Institute. In all cases, several years of practical experience in industry would be desirable.

PTET Alternative (period of studies : 1 year)

Here the criteria for recruitment would be more severe. Qualified technicians with some years of industrial practice would be able to apply. It does not seem likely that a technical engineer already in employment and having family responsibilities would be able to quit work for three years in order to obtain a PTET diploma.

In any event, the method decided for training of teachers will be finally selected in the light of the study to be carried out prior to the launching to the Institute.

Diplomas

On completion of their studies, with successful termination of the technical and education methodology courses, and the presentation of a final thesis, the graduates would be given titles of PTA or PTET.

3. Duration of studies

This will be three years except for the PTET alternative under which training will last one year, including technical and teaching periods and the preparation and presentation of final diploma studies.

4. Number of Students and Types of Training

Given the most acute immediate requirements in the region, the first courses for PTAs and PTETs would be given in the specializations and with the enrollment shown in Table I.

The flexibility of orientation and conversion of the Institute would be such as to allow courses to be established later in other sectors of economic activity of the region.

Table I covering the full number of students at the Institute calls for a number of explanatory comments. Some of these relate more specifically to teacher training.

The principal points are :

(1) **dropouts :** this does not appear substantial at first glance, but our fore-

casts are justified by the fact that we are allowing for the opportunity afforded to students to repeat a year's study.

(2) **PTET - masonry:** recruitment of candidates for this section would be made among certain students in the final (third year) class of the building and public works section. In addition, masonry PTAs of a satisfactory theoretical standard may apply (which is why there are more PTA students in this branch than elsewhere), as well as foremen or supervisors from the private sector.

(3) **PTET - carpentry:** these will be trained by taking the best PTAs in the branch (PTA carpentry students: 22 instead of 15). Recruitment could also be made among competent persons in actual employment in such trades.

5. Program and Course Bases

As already mentioned, studies are to last three years.

The future teachers are assumed to know the basic fundamentals of their skill. The main role of the Institute is focused on education methodology. However, given the speed at which industrial techniques are developing, it will be necessary to devote part of the time to refresher courses and upgrading of technical knowledge already acquired.

Table 2 shows, as an example the range of subjects to be taught during the training, both for teachers and for technicians.

Explanatory comment concerning table 2: Distribution of courses and requirements of teachers

In accordance with the previous description, recruitment for PTET sections might be made among students who have completed technician sections or are at the level of the final class in those sections. This would provide an additional opening allowing for late provisions and career decisions to persons not entering industrial sectors for various reasons.

Former technicians wishing to change specialty and having some years' experience in industry could also enter such classes.

Other industrial personnel not having a diploma corresponding to a technician's qualifications could also apply for a PTET place, but in that case prior examination could be necessary. If the number of candidates justifies it it would be possible to provide for a semester or a full year to prepare for entering the PTET sections.

If PTET training were to be conducted over a three-year period for various reasons, the effect in terms of persons and premises would be as follow :

- the number of students would rise from 65 to about 225
- the number of classrooms would be increased by 10.
- the number of teachers would go up by 15, from 92 to 107

6. Supplementary Training and Information Overseas

It would be highly desirable and even essential, to incorporate, as a part of study, a period of training abroad in Europe. Preparation of the final thesis could form a part of such overseas training.

This would to provide the future teachers with valuable insight into the latest developments in industry and educational techniques. In addition to facilitating the recruitment of qualified candidates, it would provide an important additive to the technical knowledge of future teachers.

B. Training of technicians

1. Recruitment level

For the technician sections recruitment will be at the BEPC level, after nine years of schooling. It would be useful, however, also to permit admission of qualified candidates having an industrial CAP diploma and particularly students from the second or first year of technical lycées. A preparatory year could be created for those candidates having the CAP, while those from the technical lycées could enter the second or third year. At any rate, an entry examination should be required, as well as a probationary period of about one semester during the first year.

2. Graduation level

At the end of their training and after having passed a final examination an examination board, the students would obtain the title of "Advanced Technician".

3. Number of students and types of training

As shown in table 1 the number of student technicians will be 524 once the Institute is fully operative, namely,

- 144 in the first year for 6 classes
- 132 in the second year for 6 classes
- 124 in the third year for 6 classes
- 124 in the fourth year for 7 classes

Two explanatory comments concerning training of technicians relate to table no. 1:

(4) the first and second years are combined (see explanation in the section concerning the program and course bases)

(5) training of diesel technicians; specialization will begin with the fourth and last year of study. The number of students for the third year in the automobile section is therefore higher (24 persons) than in the other branches (20 persons).

4. Program and course bases

The training given should be based on the most modern methods and techniques. Active teaching techniques and methodology should be applied in order to attain optimum results.

With the exception of the civil engineering and construction section, the other sections will follow identical courses during the first two years. Mathematics and science in the different specialities taught in the school will have certain common elements.

After two years of observation of student progress through techniques

built into the system of training, the students will be oriented to their respective specializations, based on their demonstrated aptitudes and preferences.

As indicated in Table No. 2 the following subjects will be taught in addition to general studies :

— technical theory of each trade as well as management
— scientific and mathematical theory
— shop and laboratory work

A fundamental objective will be to provide the students with a solid educational base and disciplined work habits not only for immediate employment following graduation, but also for continuous retraining at a later date. Training programs would coordinate theory and practice as fully as possible.

Practical training periods within industry would be organized during a portion of the school vacation. A longer training period would be organized prior to the final examination period.

IV PROPOSED TIMETABLE FOR ACTION AND LOCATION

A. Stages of action

First stage : Establishment of the final project

Three months' study conducted if possible by a team of three persons, consisting of the Director-General, as the head of project responsible for its conduct, the Director of Educational Study and the Dean of the technician section.

Second stage : Construction of the school

This stage is concerned more specially with the preparation and installation of the facilities with a view to ensuring the proper operation of the first school year. During this stage, in addition to the administrative heads of the project, at least eight specialists, one for each branch of training, will have to be present. Table two shows, as an example and subject to approval of the proposed range of branches of education, the numerical requirements of specialists for each year of operation of the institute.

Thrid and successive stages until full operation of the Institute

The essential principle should be respected of bringing in the specialists needed for the particular stage several months before the beginning of the school year.

B. Location

It is important that the institute be situated in an area offering the opportunity of contact with industry and teaching establishments.

C. Africanization of the Project - Training of Counterparts

The problem of replacing expatriate experts must be foreseen from the very beginning. At the same time as the basic structure of the training system is created, which would result in full operation in four years, the recruitment and training of counterparts would need to be fully covered. Two complementary systems are possible :

1. local recruitment and training supplemented by a medium-term training period abroad.
2. partial training locally, with advanced training during a longer period of time abroad.

The Africanization of the project, as far as specialized teaching personnel is concerned, could start the year following the first graduation class.

V. STAFF

A. General

This chapter refers to the following tables :

— Table 2 : teaching facilities and numbers of teachers required
— Table 3 : organization chart of the institute.

Table 1 indicates that the number of technicians will amount to 524 and the number of teacher trainees to 491 (426 PTAs and 65 PTETs).

The number of classes will be 25 for technicians and 29 for teachers.

However, if PTET training were to last three years instead of one the figures would be 1172 for students and 64 for classes.

Requirements of teaching staff for the Institute are summarized in Table 2 both under activities (full operation) and under year of operation. In the second case an explanatory comment is required concerning the method of determining the number of teachers.

It is impossible in practice to apply an arithmetic formula for calculation of the number of teachers by merely taking the number of classes and the number of hours of tuition given by each of them in the various branches. The needs imposed by timetables and by the particular specialization of teachers mean that some five to ten percent of teaching time must be over and above the strict theoretical requirements.

Moreover, a teacher having a shorter teaching period than the standard (24 hours per week) during the school year will be able to use the extra hours to carry out various technical or teaching jobs assigned to him.

This means that the theoretical total of 90 teachers will go up to 92 in our forecasts.

In addition, if PTET training is to be conducted over a three year period the number of teachers will have to be increased by 15, thus going up to 107 when the Institute is fully operative.

Teachers of Applied Psychology and Education

Under this title two specialized categories are covered. The first consists of teachers of pure education and psychology, while the second consists of persons qualified in the technical subjects taught at the Institute but also having a sound knowledge of educational psychology. It is the second category that will provide practical services in education.

Teachers of Methodology

These are persons qualified in the various branches of training at the Institute and also having experience and competence in educational psychology enabling them to instruct future teachers in the techniques of transmission of knowledge.

B. Organization chart - Table 3

Table 3 outlines the structure of the Institute and the major channels of communication between the various services. This chart may be substantially changed once the final on-the-spot study has been completed.

Two elements in the organization chart call for explanation.

- **Role of the Administrative Board.** Its composition and activities should be decided by the authorities of the UDEAC countries. The scope of this project exceeds the limits of any single country. Supervision of activities and the major choices of action must depend on the consent of all the beneficiaries.
- **Role of the Advisory Committee.** Its primary function would be to advise the director on teaching programs and general policies to be followed.

The functions and inter-relation of the other elements in the organization chart appear clear from their place in the general outline pattern.

C. List of executive, administrative and supplementary staff, apart from teachers

1. **Executive**

   1 Director general
   1 Director of education
   2 Deans
   6 Chiefs of section
   1 Vocational guidance officer (psycho-technician)
   1 Social welfare officer
   1 Administrative assistant
   1 Procurement officer also responsible for stock control
   1 Chief of planning

2. **Administrative and supplementary**

- Secretariat
- Accounting office
4 Planning office employees
1 Document reproduction employee
1 Nurse
4 Assistants

3. **Auxiliary**

- Drivers
- Cleaners
- Watchmen

D. Teacher requirements per year of operation

The requirements for teaching staff are stated in table 2. The numbers have been decided in accordance with the following two factors :

— number of hours per teacher (24 per week) and

— number of classes for each school year.

The resulting number of teachers per year of operation of the Institute amounts to :

First year of operation : 760 hours per week

— 3 teachers of general education
— 5 teachers of technical theory and management
— 6 teachers of scientific theory and mathematics
— 4 teachers of practical and laboratory work
— 5 teachers of applied psychology and education
— 9 teachers of educational methodology

Two important comments must be made at this stage : if arithmetical calculations are employed the need for teachers is a fraction in certain subjects and for certain periods. The solution is to use a teacher who will be only partly employed or to give a teacher a number of additional hours which will be covered by engaging new teachers during the following year.

— For certain pratical branches during the first year of operation of the Institute we shall only need 4 teachers, this being the number fixed by arithmetical calculation. But there are more than 4 different specialties in the school, and it would be up to the chiefs of the various sections to provide the tuition facilities.

Second year of operation : 560 hours per week

— 3 teachers of general education
— 4 teachers of technical theory and management
— 5 teachers of scientific theory and mathematics
— 4 teachers of practical and laboratory work
— 4 teachers of applied psychology and education
— 6 teachers of educational methodology.

Third year of operation : 560 hours per week

- 2 teachers of general education.
- 5 teachers of technical theory and management.
- 2 teachers of scientific theory and mathematics.
- 4 teachers of practical and laboratory work.
- 4 teachers of applied psychology and education.
- 5 teachers of educational methodology.

Fourth year of operation : 280 hours per week

- 6 teachers of technical theory and management.
- 2 teachers of scientific theory and mathematics.
- 4 teachers of practical and laboratory work.

This makes a total of **92** teachers, to which should be added **15** additional teachers if the PTETs are to be receive 3 years' tuition instead of one.

VI. PREMISES

The premises required have been determined approximately to allow for the number of classes (see table 4) and the type of subject taught.

The latter is covered by table 5, showing the number and type of premises to be provided and equipped for each year of operation.

A. Teaching premises

First year of operation - 26 rooms - 19 classes

- 10 classrooms.
- 11 workshops.
- 5 laboratories.

Second year of operation - 21 rooms - 14 classes.

- 6 classrooms
- 11 workshops
- 4 laboratories.

Third year of operation - 9 rooms - 14 classes.

- 7 classrooms
- 2 workshops.

Fourth year of operation - 6 rooms - 7 classes.

- 6 classrooms

Comment :

If PTET training is to last three years the number of rooms will increase by 10 in order to permit 400 additional hours of teaching.

The extra premises then necessary will be as follows:

— 1 science laboratory
— 1 mechanics laboratory
— 1 electricity laboratory
— 1 draftsmanship classroom
— 6 classrooms.

B. List of additional administrative and other premises

— 1 Director General's office
— 1 Office of Director of Education and Coordinator of Studies
— 2 Deans' offices
— 1 Secretariat office
— 1 Accountancy office
— 1 Purchasing office
— 1 Planning office
— 1 Vocational guidance office
— 1 Vocational testing room
— 1 Social welfare officer's office
— 6 Offices for chiefs of section
— 2 lecture rooms
— 2 teachers' rooms
— 1 teachers' library
— 1 students' library
— 1 model classroom for audio-visual teaching with adjacent room for preparation
— 1 language laboratory
— 1 photographic laboratory
— 1 storeroom for teaching aids
— 1 room for document reproduction (previously mentioned as study premises)
— 1 hall with 100 seats communicating with
— 1 hall with 200 seats
— 1 dispensary
— 4 study rooms for students and for personal activities (students' committee, publication of a journal, etc.)
— 1 central store
— 6 section stores
— communal premises (gymnasium, showers, WC, etc.)

approximately: 3,000 m²

VII. EQUIPMENT

A. Equipment for teaching

This section deals with the equipment of premises designed exclusively for teaching.

Comment

It is intended that each section (trade) taught in the school will have at least one classroom specially equipped for technological teaching. This classroom should be connected with a storage space containing the relevant teaching aids, and will be so designed as to permit a wide range of technical and teaching experiments.

The same applies to certain classrooms for teaching, draftsmanship, science, etc.

The equipment requirements are listed by year of operation.

Table 5 recapitulates all of the premises to be equipped, broken down by:

- Simple classrooms,
- Classrooms for teaching draftsmanship,
- Classrooms for technological teaching,
- Laboratories,
- Workshops.

Equipment of premises for the first year of operation.

10 classrooms, including:

- 3 for draftsmanship,
- 1 for mechanical technology,
- 1 for electrical technology,
- 1 for woodworking technology,
- 1 for building technology,
- 3 simple classrooms.

11 workshops, including:

- 2 for general mechanics
- 1 for machine tools
- 1 for automobile mechanics
- 1 for diesel
- 1 for electro-mechanics
- 1 for electrical installation
- 1 for refrigeration
- 1 for carpentry
- 1 for masonry and building
- 1 for reproduction of documents

5 laboratories, including:

- 1 for mechanics and resistance
- 1 for refrigeration
- 1 for electricity
- 1 for science (physics, chemistry),
- 1 for flooring and construction mechanics

In addition, equipment will have to be provided for the following premises:

- Guidance and selection tests

— Model classroom for audio-visual education
— Language laboratory.

Equipment of premises for the second year of operation

6 classrooms, including :

— 2 for draftsmanship
— 1 for refrigeration technology
— 1 for automobile technology
— 2 simple classrooms

11 workshops, including :

— 1 applied mechanics
— 1 applied automobile mechanics
— 1 applied diesel technology
— 1 applied electricity
— 1 applied electro-mechanics
— 1 applied refrigeration
— 1 applied carpentry
— 1 applied masonry
— 1 mechanical and electro-mechanical assembly work
— 1 metal-working
— 1 welding.

4 laboratories, including :

— 1 thermodynamics
— 1 electricity
— 1 science (physics, chemistry)
— 1 metallurgy and heat treatment

Equipment of premises for the third year of operation

7 classrooms, including :

— 1 draftsmanship
— 1 diesel technology
— 1 electro-mechanical technology
— 4 simple classrooms

2 workshops

preparing prototypes and producing teaching aids

Equipment of premises for the fourth year of operation

6 simple classrooms

Comment :

If PTET training takes 3 years, equipment of the following 10 units must be provided :

— 1 science laboratory
— 1 mechanics laboratory
— 1 electricity laboratory
— 1 draftsmanship classroom
— 6 simple classrooms

B. Additional equipment

Budgeting allows for the miscellaneous premises forecast under item VI B.

VIII BUDGET

A. Preliminary study mission

3 specialists for three months

B. Preparatory period

1. ORT personnel
2. Local personnel
3. Buildings
4. Equipment
   Allow for the forecasts under VII A and B for the first year of operation
5. Operating costs
6. Housing for ORT personnel
7. Travel

C. First year of operation

Same items as for B.

D.

E. 2nd, 3rd and 4th years of operation

F.

Same items as for B.

Estimated Budget for the Preliminary Mission and First Two Years of Operation

	US $
I. First year and Preparatory Mission	
3 specialists for 3 months ; travel to Europe, Africa, USA, 1 specialist, Geneva office, consultants' fees Preparation of the detailed study Total - preparatory mission :	41,000
A. ORT Personnel :	
Direction - (see page 44) 15 experts	380,000
B. Local Personnel :	
1 qualified secretary 1 assistant store keeper 2 drivers 4 laborer-cleaners 2 watchmen 4 auxiliary staff	16,000
C. Buildings and grounds	850,000
D. Equipment ;	
1. Equipment of offices and communal premises (see page 47)	80,000
2. 35 classrooms	175,000
3. Workshops (see pages 48, 49, 50) total - 22 workshops	367,000
* 4. Laboratories : (see pages 48, 49, 50) total 12 laboratories	130,000
5. Special equipment - Closed circuit television, language laboratory, lecture rooms, hall, etc.	52,000
6. Library	8,000
7. Stores (stocks of raw materials, and small tools)	90,000
8. Teaching aids	130,000
Carry forward :	2,319,000

* one-time expenses.

		US $
	Brought forward	2,319,000
E. Operating expenses :		
Gasoline, oil, consumer items, stationery, water, electricity, gas, post, miscellaneous		18,000
F. Accomodation for ORT personnel		120,000
G. Travel for experts and families, transport of personal effects and automobiles, travel by project authorities, consultations		55,000
H. Inspection, study travel, per diem		2,000
	Total First Year :	2,514,000

II. **Second year**

A. ORT Personnel :

Top level personnel : 15 experts
Teaching staff (see page 45)
32 specialists — 1,195,000

B. Local personnel :

Same as for the first year, plus :
personnel needed for teaching related theoretical subjects (French, legislation, sports, etc.)
1 nurse
1 accountant
1 shorthand typist
2 auxiliaries
1 driver
3 laborer-cleaners
1 watchman. — 50,000

C. Additional Equipment	150,000
D. Stores (stocks of raw materials and small tools)	88,000
E. Operating costs	40,000
F. Accomodation for ORT personnel	376,000
Carry forward	1,899,000

		US $
	C.F.	1,899,000
G. Travel for experts and families Transport of effects and automobiles,		152,000
H. Inspection, study travel, per diem, etc.		6,000
	Total 2nd year :	2,057,000
Total First Year		2,514,000
	GRAND TOTAL	4,571,000

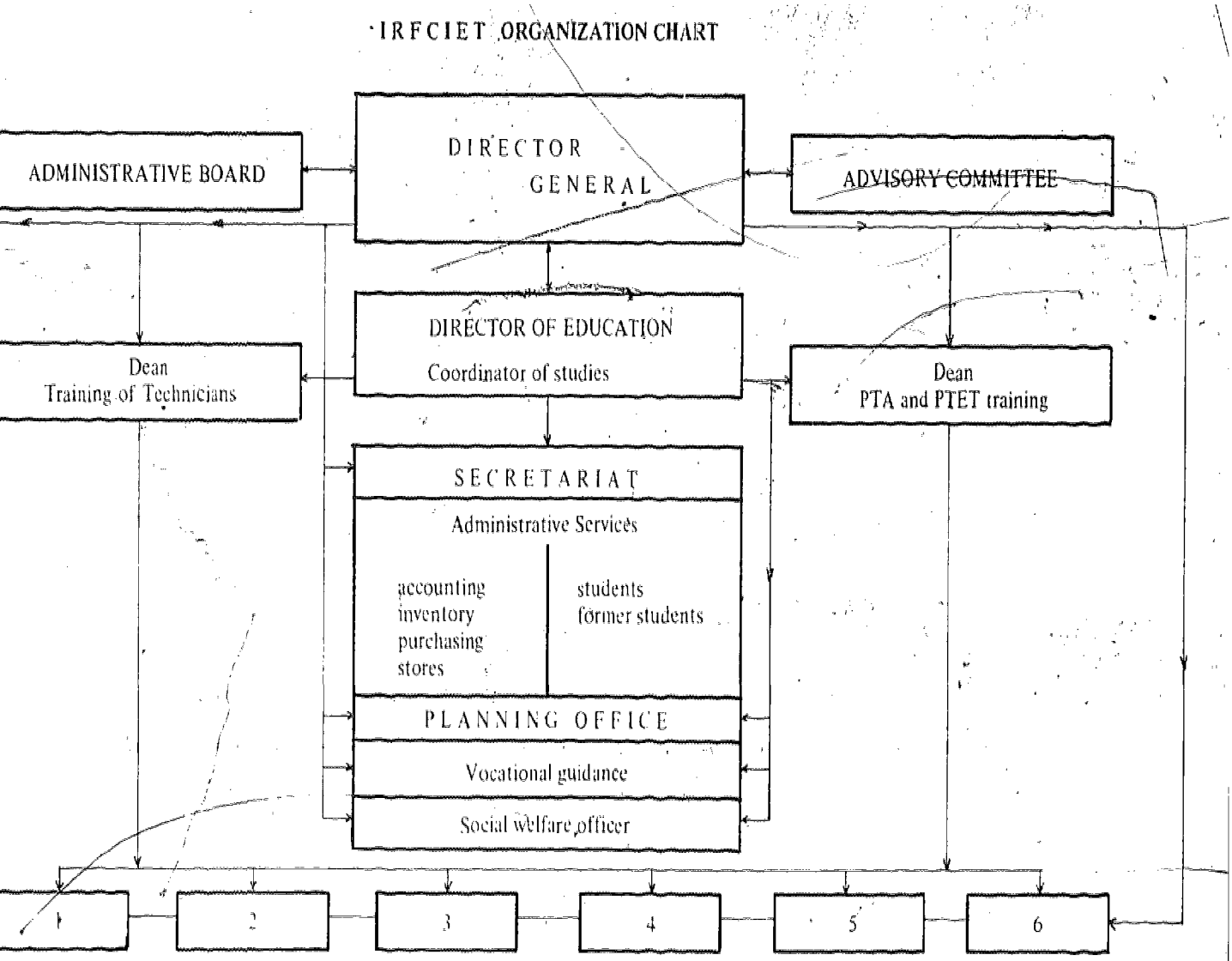
IRFCIET – NUMBER OF STUDENTS

ng		Technicians				PTET	PTA			PTET - alternative		
		No of students per year of study				Special year of teacher training	No of students per year of study			No of students per year of study		
		1st and 2nd years combined		3rd	4th		1st	2nd	3rd	1st	2nd	3rd
l mechanics action		24	22	20	20	15	18	15	15	18	15	15
obile mechanics		24	22	24	12	15	18	15	15	18	15	15
					12		18	15	15			
-mechanics		24	22	20	20	15	18	15	15	18	15	15
al installation		24	22	20	20		18	15	15			
ration		24	22	20	20		18	15	15			
g and public works		24	22	20	20	10	25	22	22	15	12	12
ry						10	25	22	22	15	12	12
	Students 1015 (1172)	144	132	124	124	65	158	134	134	84	69	69
		524					426			222		
	Classes 54 (64)	6	6	6	7	5	8	8	8	5	5	5
		25					24			15		

I R F C I E T : BREAKDOWN OF TEACHING – REQUIREMENTS FOR TEACHERS

r/wk. 1 class = 40 hr/wk.

	Technicians				PTET	P T A			Number of hours of teaching				Total teacher requirements per speciality	Teacher requirements per year			
Year of study	Year of training				Training in one year	Year of training											
	1st-2nd years		3rd	4th		1st	2nd	3rd	Technicians	P.T.A.	PTET	TOTAL		1st	2nd	3rd	4th
es	6	6	6	7	5	8	8	8	25	24	5	54					
	10%	10%	10%	–	10%	10%	10%	10%	72	20	96	188	$7\frac{20}{24}$	$3\frac{4}{24}$	$2\frac{8}{24}$	$2\frac{8}{24}$	–
f hours per year	24	24	24		20	32	32	32						76	56	56	–
, management PTA, PTET school)	15%	15%	30%	50%	10%	20%	15%	20%	284	20	176	480	20	5	$3\frac{12}{24}$	$5\frac{16}{24}$	$5\frac{20}{24}$
f hours per year	36	36	72	140	20	64	48	64						120	84	136	140
y, mathematics on)	40%	35%	20%	10%	10%	10%	10%	–	256	20	64	340	$14\frac{4}{24}$	$6\frac{4}{24}$	$4\frac{20}{24}$	2	$1\frac{4}{24}$
f hours per year	96	84	48	28	20	32	32							448	116	48	28
oratory work	35%	40%	40%	40%	–	–	–	–	388		–	388	$16\frac{4}{24}$	$3\frac{12}{24}$	4	4	$4\frac{16}{24}$
f hours per year	84	96	96	112										84	96	96	112
ogy and education					30%	20%	25%	30%	–	60	240	300	$12\frac{12}{24}$	$5\frac{4}{24}$	$3\frac{8}{24}$	4	–
f hours per year					60	64	80	96						124	80	96	–
eoretical and ion					40%	40%	40%	40%	–	80	384	464	$19\frac{8}{24}$	$8\frac{16}{24}$	$5\frac{8}{24}$	$5\frac{8}{24}$	–
f hours per year					80	128	128	128						208	128	128	
	100%	100%	100%	100%	100%	100%	100%	100%	1000	200	960	2160	90 (92)	$31\frac{16}{24}$ (32)	$23\frac{8}{24}$ (24)	$23\frac{8}{24}$ (24)	$11\frac{16}{24}$ (12)
f hours per year	240	240	240	280	200	320	320	320						760	560	560	280



s of section partly responsible for teaching

- mechanics
- obile and diesel mechanics
- -mechanics and electrical installation
- ration
- g and public works, masonry
- try

Planning office

Team of : 2 construction engineers
1 electro-technician
1 building draftsman

'53

following of

- progress
- miscellaneous production drawings
- technical job sheets
- manuals etc.

Table 4 NUMBER OF CLASSES PER YEAR OF OPERATION

Year of Operation	Type of training			TOTAL
	Technicians	P.T.A.	P.T.E.T.*	
1st year	6	8	5	19
2nd year	6	8	– (5)	14 (19)
3rd year	6	8	– (5)	14 (19)
4th year	7			7
TOTAL	25	24	5 (15)	54 (64)

* *If PTET training is to last three years, the number of classes will increase by 10, thus rising from 54 to 64 once the Institute is fully operative.*

ble 5 AREA REQUIRED FOR TEACHING PREMISES

ar of operation	Type of premises			TOTAL
	Classrooms	Workshops	Laboratories	
year	10 x 60 m2 = 600 m2	11 x 150 m2 = 1650 m2	5 x 120 m2 = 600 m2	2850 m2
l year	6 x 60 m2 = 360 m2	11 x 150 m2 = 1650 m2	4 x 120 m2 = 480 m2	2490 m2
l year	7 x 60 m2 = 420 m2	2 x 150 m2 = 300 m2		720 m2
year	6 x 60 m2 = 360 m2			360 m2
TAL	1740 m2	3600 m2	1080 m2	6420 m2
ditional premises if PTET ining lasts 3 years	7 x 60 m2 = 420 m2		3 x 120 m2 = 360 m2	780 m2

lassroom = 60 m2
orkshop = 150 m2
aboratory = 120 m2

If PTET training lasts 3 years, total area would be 7200 m2
Administrative and miscellaneous premises, approximately 3000 m2
I.e. total area to be built . . . . . 9420 to 10200 m2

60

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AMALGAMATION OF PROJECTS 4 & 5

PROJECT PROPOSAL FOR THE CREATION OF A REGIONAL TECHNICAL TEACHER TRAINING INSTITUTE (ERNET) AND AN APPLIED EDUCATION CENTER (CPA)

I. INTRODUCTION

Examination of recent statistics on technical and vocational training supplied by the Union Douanière et Economique de l'Afrique Centrale (UDEAC) makes strikingly clear the lack of a technical teaching corps, the gaps being particularly noticeable and critical in the case of nationals of the countries involved. The number of scholastic failures in the technical field and the high wastage in this category of education are all too evident. Over the short and medium term, technical education and vocational training is the key element in the economic and social development of a country or a region. In addition, the immediate foreseeable needs in terms of numbers of skilled workers throw into even sharper relief the problem of technical teaching staff.

The scale of this problem has been recognized by every one of the UDEAC countries. The conference at Bangui unanimously approved the recommendation to create a Regional Technical Teacher Training Institute (ERNET), and to give it the priority which it merits.

The relevant part of this recommendation stated :
"National projects for the creation of a Teacher Training Institute exist in each of the four countries, and requests for financial aid to various international organizations have been submitted separately by the countries concerned. These requests should be grouped for the benefit of a Regional Teacher Training Institute (PTA and PTET) for the four countries. This request is supported by the analysis provided in Annex A (Distribution of teaching staff) and Annex B (Results of the various examinations) for each of the countries.

"The percentage of students who complete training is small, but even more serious than the mediocre results in examinations is the number of dropouts during the school year. Annex C contains a review of the results for 1966/67 and 1967/68 and a projection for 1968/69, which shows an unsatisfactory prospect, with low efficiency and resultant wastage, placing a heavy load on the respective national economies.

"If such a school were created immediately, with full support from all, it would not solve all of the problems in this field. Speaking optimistically, at least one year would be necessary for the creation and start-up of such an institution. The needs are immediate."

Examination of existing facilities with regard to technical and vocational training in the UDEAC countries reveals the almost complete absence of any system or body with the exclusive function of studying teaching methods in their application to the different types of teaching as well as the creation and administration of a center for documentation and the distribution of teaching aids.

This deficiency was noted in the preliminary report and stressed during the conference in Bangui. Recommendation No. 6 stated :

"It is recommended that there be created at regional level an institution which would be responsible for questions of teaching and the conception and production of audio-visual aids as well as other manual training materials."

Before going on to consider the principal ideas which should serve as a guide in planning such an institution, we should like to dwell briefly on the present performance record of the various types of teaching, as revealed in recent statistics for the region. This record fails by a long way to justify the financial investment made by the countries concerned.

One of the possible reasons is that education expenditures are often considered as items which have to be written off and from which no profit can be sought. If the same criteria were to be used in an industrial enterprise the result would soon be bankruptcy. Dramatic results are not so apparent in education.

The criteria which determine the prosperity of an industrial enterprise rest basically on the adaptation of production facilities to market requirements and constant research in order to keep up with current and future demand.

Education in the region should operate on similar principles, by having available the means of action and research which would permit it to overcome the present situation of providing third-rate, high-cost education.

The role of the Center proposed herein should not be limited exclusively to technical education. It should also concern itself with traditional primary and secondary education. Secondary education and training is vitally dependent on the quality of primary schooling.

Research and the use of audio-visual and other training aids should be applied to primary education as well as for various types of secondary education. Domestic science and agricultural education, as well as educational manual work (TME) would also be areas of concern of the Center.

We propose that the Teacher Training Institute (ERNET) and the Applied Education Center (CPA) be integrated within a single regional program, for the following reasons :

1. It is consistent and rational that two bodies concerned primarily with teaching methods should form a joint unit ;
2. Efficiency and output will be improved because :
   - students of the ERNET will spend periods of practical training at the CPA, where they will become accustomed to creating their own teaching aids for future use ;
   - conversely, the African counterparts at the CPA due to replace the ORT experts will be able to spend periods as technical teachers and their work of research and adaptation will be closer to technical reality and actual needs. In addition, it will be possible to test the teaching methods and aids devised on the actual students at the ERNET.
3. The teaching materials devised at the CPA can be produced in the necessary quantities at the ERNET.
4. The saving from the combination of the CPA with the ERNET will also be valuable for operational efficiency. This relates specially to class-rooms and workshops, because there is no point in providing "model" premises if these already exist at the ERNET. It applies also to the staff attached to the project.

II. PROJECT OBJECTIVES

The whole of the project has a wide range of aims. We shall consider these under two headings, relating respectively to the role of the ERNET and of the CPA.

A. Functions of the ERNET

- to train teaching staff in the field of technical education and vocational training, either as workshop instructors (PTA) or as teachers of technical theory (PTET) :
- to provide periodic advanced training and refresher courses for existing teaching staff ;

B. Functions of the CPA

- To carry out applied educational research for technical as well as other types of education.
- To review modern educational techniques, particularly the promotion of methods involving student participation and programmed instruction, suitably modified for local conditions.
- To continuously examine, adapt and update education programs
- To create and supervise pilot schools, sections or classes for the purpose of applying new methods on an experimental basis.
- To create and produce manuals and education curricula and course materials.
- To create and produce, after trial and approval, specific training aids for different types of education.
- To maintain close contact with the ERNET and other schools so as to ensure effective coordination.
- To maintain close contact through conferences with the different types of educational inspectorate in order to supervise the application of new methods and means already operational.
- To organize conferences and seminars for teachers and school directors for information and readaptation purposes
- To maintain a permanent exhibition of audio-visual aids and training materials.
- To create a comprehensive bibliography and obtain the most recent pertinent documentation dealing with requests for such action as :
  the creation and building of schools
  the equipment and installation of laboratories, specialized classrooms and workshops, etc.
  suitable production items to be included in technical and vocational education, etc.
- To circulate a periodical of education and technical information.
- To obtain regular information on international exhibitions and conferences concerning education and related techniques, with a view to possible participation.
- To prepare and produce slides and films corresponding to school programs and adapted to the needs of the African countries.

III. PROJECT DESCRIPTION

A. Description of the ERNET

1. Institute Graduates' Assignments

The duties of the teaching staff described as PTAs and PTETs will be :

The PTAs will have as their principal task the teaching of practical work at the level of the CPA diploma in the vocational training schools and technical high schools. However, they must also be capable of teaching workshop technology and technical draftsmanship in their own subjects, even if only to first-year students.

The PTETs will be responsible for the teaching of the technical theory involved in each trade, in the vocational schools and technical high schools. Each one must, in addition, be capable of teaching laboratory work in his own subject. The practical knowledge of the PTETs should be sufficiently thorough and recent to enable them to provide training which is geared to current industrial practice.

2. Recruitment and Level of Graduation

The training will be given at two levels. The same is true of recruitment of the students who are to become PTAs or PTETs.

PTA Level

The minimum level of recruitment would be the BEI diploma, or in exceptional cases, the CAP diploma, with some years of practical experience in the trade in each case. Provision could be made, however, for recruiting experienced teachers with a good general education but without a technical diploma ; in this case, a preparatory course would be necessary.

PTET Levels

Here the recruitment level would be that of technical baccalaureate or possibly of the BEI. In the last case, consideration might be given to the possibility of providing a preparatory year or semester before entry to the Institute. In all cases, several years of practical experience in industry would be desirable.

Diplomas

On completion of their studies, with successful termination of the technical and education methodology courses, and the presentation of a final thesis, the graduates would be given the title of PTA or PTET.

Length of Courses

The courses will be of three years' duration, including the technical and educational methodology course work and the preparation of the final thesis.

3. Number of Students and Types of Training

Given the most acute immediate requirements in the region, the first courses for PTAs and PTETs would be given in the specializations and with the enrollment shown in Tables I and Ia.

The flexibility of orientation and conversion of the ERNET would be such as to allow courses to be established later in other sectors of economic activity of the region.

Table 1 - PTA Enrollment

BRANCH	YEAR		
	1st	2nd	3rd
General Mechanics	18	15	15
Automobile Mechanics	18	15	15
Diesel	18	15	15
Electrical Installation	18	15	15
Electro-mechanics	18	15	15
Refrigeration	18	15	15
Carpentry	18	15	15
Masonry	18	15	15
(24 classes) TOTAL = 384	144	120	120

Table 1a - PTET Enrollment

BRANCH	YEAR		
	1st	2nd	3rd
General Mechanics and Construction Draftsmanship	18	15	15
Auto and Diesel Mechanics	18	15	15
Electricity (diagram drawing, laboratory)	18	15	15
Carpentry	18	15	15
Masonry	18	15	15
TOTAL = 240 (15 classes)	90	75	75

4. Program and Course Bases

As already mentioned, studies are to last three years.

The future teachers are assumed to know the basic fundamentals of their skill.

The main role of the ERNET is focused on education methodology. However, given the speed at which industrial techniques are developing, it will be necessary to devote part of the time to refresher courses and upgrading of technical knowledge already acquired.

Tables 2 and 2a show as an example the range of subjects to be taught during training.

Table 2 - Breakdown of Training by Subject and Year for PTAs

SUBJECT	YEAR		
	1st	2nd	3rd
General Education	10%	10%	10%
Trade Mathematics	10%	10%	–
Technical Theory and Workshop Organization	20%	15%	20%
Applied Methodology and Psychology	20%	25%	30%
Methodology of Shop Work	40%	40%	40%
TOTAL	100%	100%	100%

Table 2a - Breakdown of PTET Training

SUBJECT	YEAR		
	1st	2nd	3rd
General Education	10%	10%	10%
Scientific Theory and Mathematics	20%	15%	15%
Technical Theory	20%	20%	10%
Applied Methology and Psychology	20%	25%	35%
Educational Methology	30%	30%	30%
TOTAL	100%	100%	100%

Supplementary Training and Information Overseas

It would be highly desirable, and even essential, to incorporate, as part of the final year of study, a period of training abroad in Europe. Preparation of the final thesis could form part of such overseas training.

This would provide the future teachers with valuable insight into the latest developments in industry and educational techniques. In addition to facilitating the recruitment of qualified candidates, it would provide an important additive to the technical knowledge of each student.

B. Descriptions of the CPA

The Center's functions have already been defined. In order to perform these the Center must have the necessary resources of

- staff
- premises
- equipment.

1. Staff

In addition to the management personnel coming under the project head and responsible for the running of the ERNET and the CPA (namely the chief of the center and the chief of the planning office), the Center will comprise the following sections, with the corresponding specialized personnel :

- a planning office (3 draftsmen)
- an education office with seven specialists in different branches, namely :
  - a psycho-technician, for evaluation
  - a specialist in programmed education
  - a specialist in primary education

a specialist in traditional secondary education
a specialist in educational manual work (TME)
a specialist in agricultural education
a specialist in domestic science education

- an office for the preparation and production of slides and films for teaching purposes (2 specialists)
- an office for project execution (launching, planning, coordination) (2 technicians)
- a library with a qualified librarian.

Comment : The Center must have specialists in the main branches of technical teaching, and in particular

- mechanics
- electricity
- commerce
- building
- woodworking.

The chiefs of section of the ERNET will perform this function, and they will come under the ERNET and CPA at the same time. In this manner collaboration between the two branches of the one program will be assured both at the top (a single director) and at the base (heads of the joint technical sections).

2. **Premises**

The Center's premises are to comprise, in addition to the administrative and planning offices, **model rooms** for all **specialised teaching not available** at the ERNET.

These rooms will be equipped with audio-visual and other teaching aids permitting modern and rational education geared to needs. Provision must be made in particular for :

1 model room for primary education
1 model room for secondary education (non-technical)
other rooms as required.

The Center will also contain :

1 cinema and photographic laboratory
1 prototype production workshop
lecture and projection rooms
a permanent exhibition of teaching aids and audio-visual media
miscellaneous premises

Counterpart training would start from the second year of the program, partly abroad. It is possible to contemplate the Africanization of the Center between the fourth and sixth years of its actual operation.

IV. STAFF

In accordance with the data given in Tables 1 and 1a, the numbers of PTAs and PTETs will be 384 and 240 respectively. The eight PTA sections and the five PTET sections make up thirteen classes per school year, i.e., a total of 39 classes when the ERNET is fully operational. The requirements in teaching staff for all the classes is shown schematically in Table 3.

Table 3 - Specialized Teaching Staff Requirements

TYPE OF TRAINING	NUMBER OF TEACHERS PER YEAR						TOTAL
	1st		2nd		3rd		
	PTA	PTET	PTA	PTET	PTA	PTET	
General Education	1 1/3	5/6	1 1/3	5/6	1 1/3	5/6	6 1/2
Trade Mathematics Scientific Theory and Mathematics	1 1/3	1 2/3	1 1/3	1 1/4	–	1 1/4	6 5/6
Technical Theory Workshop Organization	2 2/3	1 2/3	2	1 2/3	2 2/3	5/6	11 1/2
Applied Methodology and Psychology *	2 2/3	1 2/3	3 1/3	2 1/12	4	2 11/12	16 2/3
Methodology **	5 1/3	2 1/2	5 1/3	2 1/2	5 1/3	2 1/2	23 1/2
TOTAL (1 Teacher = 24 h)	21 2/3		21 2/3		21 2/3		65

* Under this heading, there are two categories : one for teaching pure methodology and psychology, the other is of professional teachers in the technical courses provided by the Institute with, in addition, a sound knowledge of the psychology of teaching. The latter group will be in charge of the practical work in methodology.

** These are professional teachers in various branches of the school's training courses, having, in addition, qualifications and experience in the psychology of teaching. They would be able to instruct the future teachers in the techniques of transmitting knowledge.

The total number of staff required for operation of the program will be divided into the following four categories :

- administration
- specialized teachers
- staff attached to the CPA
- additional staff.

A. Administration

1 director, chief of party
1 technical director (ERNET)

1 planning chief (ERNET)
1 head of CPA
8 chiefs of section
1 specialist in educational psychology
1 head of planning office
1 administrative coordinator

B. Specialized Teaching Staff

Recruitment would be carried out in the light of the observations made under Table 3.

For the first year of operations
(8 PTA classes, 5 PTET classes)

2 teachers of general education (including one responsible for the language laboratory)
3 teachers of scientific theory and mathematics
5 teachers of technical theory (1 per subject of the PTET course - see Table 1a)
4 teachers of applied methodology and psychology
8 teachers of methodology (1 per subject of the PTA course - see Table 1)
22 teachers

For the second year of operations, in addition to those for the first year

2 teachers of general education
2 teachers of scientific theory and mathematics
5 teachers of technical theory corresponding to the subjects in the PTET courses
5 teachers of applied methodology and psychology
8 teachers of methodology, 1 per subject of the PTA course
22 teachers

For the third year of operations, in addition to those for the first and second years

2 teachers of general education
1 teacher of mathematics
4 teachers of technical theory and workshop organization
6 teachers of applied methodology and psychology
8 teachers of methods
21 teachers

C. Staff attached to the CPA

15 specialists belonging to the Center (see Description of the CPA, above)

D. Additional staff necessary for :

teaching related subjects
secretariat
bookkeeping
procurement and stock
dispensary
employment as :

laborers
auxiliaries
watchmen
drivers

V. BUILDINGS

The approximate estimate of the buildings required has been made on the basis of the number of classes (39 for the whole school after three years) and the range of the subjects to be taught (see Tables 2 and 2a).

Table 4 - Classroom space required (ERNET)

TYPE \ YEAR	1st	2nd	3rd	Total
Classrooms (simple and specialized for technology and draftsmanship)	8	9	8	25
Workshops	10	8	2	20
Laboratories	5	3	–	8
Total	23	20	10	53

Table 5 - Area needing to be built (ERNET)

Year	Type of Space			Total
	Classrooms	Workshops	Laboratories	
1st	8 x 60 m2 = 480 m2	10 x 150 m2 = 1,500 m2	5 x 120 m2 = 600 m2	2,580
2nd	9 x 60 m2 = 540 m2	8 x 150 m2 = 1,200 m2	3 x 120 m2 = 360 m2	2,100
3rd	8 x 60 m2 = 480 m2	2 x 150 m2 = 300 m2	–	780
TOTAL	1,500 m2	3,000 m2	960 m2	5,460

(One square meter = 11 square feet approx.)

Administrative and other space needs (ERNET)

Director's office
Educational methodology coordinator's office (head of planning)
Technical directors office
Secretariat
Accounting
Stockroom
Teacher's room
Dispensary
Library
Lecture Hall
Common space (gymnasium, sanitary facilities, showers, etc.)

approximately 1,400 sq. meters

CPA

Total building space: 6,860 sq.meters

IV. EQUIPMENT

At this point we refer to the equipment of premises for teaching purposes only. The requirements are for each year of operation.

Comment: Special arrangements are needed for equipment of the ERNET premises, owing to their particular purpose. Each section (trade) should have at least one classroom specially fitted for the teaching of the relevant technology. This room should be connected with a storeroom containing training aids. The classroom will be arranged to permit any necessary technical or instructional experiment. Similar criteria will apply to classrooms for the teaching of draftsmanship, science etc.

First year

8 classrooms, i.e., 1 for each subject taught in the PTA course
8 workshops, i.e., 1 per subject taught in the PTA course
2 auxiliary workshops, 1 for welding and 1 for metalworking
5 laboratories, i.e., 1 per subject taught in the PTET courses

Second year

9 classrooms, 5 of them for technical draftsmanship
8 workshops, for applied studies corresponding to each of the subjects taught in the PTA course
3 laboratories
- 1 electricity
- 1 thermodynamic
- 1 metallurgy

Third year

8 standard classrooms
1 workshop for the electrical trades
1 workshop for heat treatment of metals

Equipment of the CPA

- Planning office
- 7 offices, by type of education
- 3 model classrooms (not existing at the ERNET)
- 1 language laboratory
- 1 workshop (prototypes)
- 1 lecture hall
- 1 permanent exhibition of teaching aids
- 1 cinema and photographic laboratory
- audio-visual material (closed-circuit television, overhead projectors, cameras, film projectors, etc.)
- teaching materials (books, boards, models, etc.)
- raw materials

administrative offices
office for educational psychology tests

VII. PROPOSED TIMETABLE

First stage: Establishment of the final detailed project.

Three months' study conducted preferably by a team of 3 experts including the future project head.

Second stage : Construction of the school.

Distribution of premises and internal installations (electricity outlets, etc.)
Building work
Establish lists for goods to be ordered.

This stage, the length of which will depend on the duration of the building operations, will be about six months. The work will be done partly on the spot and partly at the Geneva office. This stage requires the full-time services of the three specialists and occasional services of consultants.

Third stage : Preparation of the school

About six months before the building is finished, it will be necessary :

to order equipment
to draw up the first teaching programs
to select students
to equip the classrooms
to install apparatus as received.

During this stage, which will last about six months, it is essential that the directors should be present, together with the heads of sections and certain specialists in teaching methods as well as the storekeeper, making a total of 15 persons.

Comment :

Stages 2 and 3 are the preparatory part of the project. Their duration is one year, but it is not certain that these two stages will follow immediately. There may be a break in building and the related action exceeds a period of nine months.

Fourth stage : Opening of courses

The opening of the ERNET should take place when the new academic year begins, in the fall.

Comment :

The total duration of the project to its complete Africanization is estimated as seven years from the opening of the ERNET. The CPA may be handed over to the African authorities earlier.

BUDGET ESTIMATE FOR THE PREPARATORY MISSION AND THE FIRST TWO YEARS OF OPERATION

		US $
I.	**Preparatory Mission** (1st stage)	
	3 specialists for 3 months travel to Europe, Africa, and U.S.A.	
	1 specialist, Geneva office	
	Detailed preparation of study	
	Consultants' fees	
	TOTAL FOR PREPARATORY MISSION	39,000
II	Preliminary Period (first year)	
	A. ORC Personnel	
	3 specialists + 1 consultant 6 months	
	15 specialists 6 months	245,000
	B. **Local Personnel** : (3 months each)	
	1 skilled secretary	
	1 assistant storekeeper	
	2 drivers	
	4 laborers	
	2 watchmen	4,500
	C. **Buildings and grounds**	600,000
	D. **Equipment** :	
	1. Equipment of offices and commercial premises	40,000
	2. Classrooms	130,000
	carry forward	1,019,500

		US $
	Brought forward	1,019,500
*	3. Workshops :	
	1 general mechanics	
	1 machine tool mechanics	
	2 automobile mechanics	
	2 Diesel	
	3 Electrical Installation	
	2 Electro-mechanical	
	2 Refrigeration	
	2 Carpentry	
	3 Masonry	
	1 Metalworking	
	1 Welding	
	1 Heat treatment	
	1 Prototype production	
	Total :	260,000
*	4. Equipment of the 8 laboratories, including	
	1 Physics	
	1 Mechanical resistance	
	1 Refrigeration	
	1 Automobile (Diesel)	
	2 Electricity	
	1 Building materials	
	1 Woodworking materials	
	Total :	70,000
*	5. Teaching aids	150,000
*	6. Stores (raw materials and small tools)	70,000
*	7. Cine-photo Laboratory-closed-circuit television	25,000
*	8. Utility Vehicles	10,000
*	9. Library	8,000
*	10. Language Laboratory	20,000
*	11. Permanent exhibition	12,000
*	12. Specialised technical offices	
	planning offices	
	psychotechnical offices	
	offices for various types of education	14,000
F.	Operating expenditure :	
	Gasoline, oil, consumer items, stationery, water electricity, gas, post and telephone, etc.	15,000
F.	Accommodation for foreign staff	52,500
	Carry forward :	1,726,000

	US $
Brought forward:	1,726,000
G. Travel for experts and their families Transport of personal effects Official travel by project head consultations	50,000
H. Inspection, study travel, per diem, etc	2,500
TOTAL FIRST YEAR:	1,778,500

* = *One-time expenditure*

III. Second year

A. ORT Personnel:

Direction:

1 project head
1 technical director
1 planning chief
1 head of CPA
1 specialist in educational psychology
1 head of planning office
1 administrative coordinator
8 chiefs of section

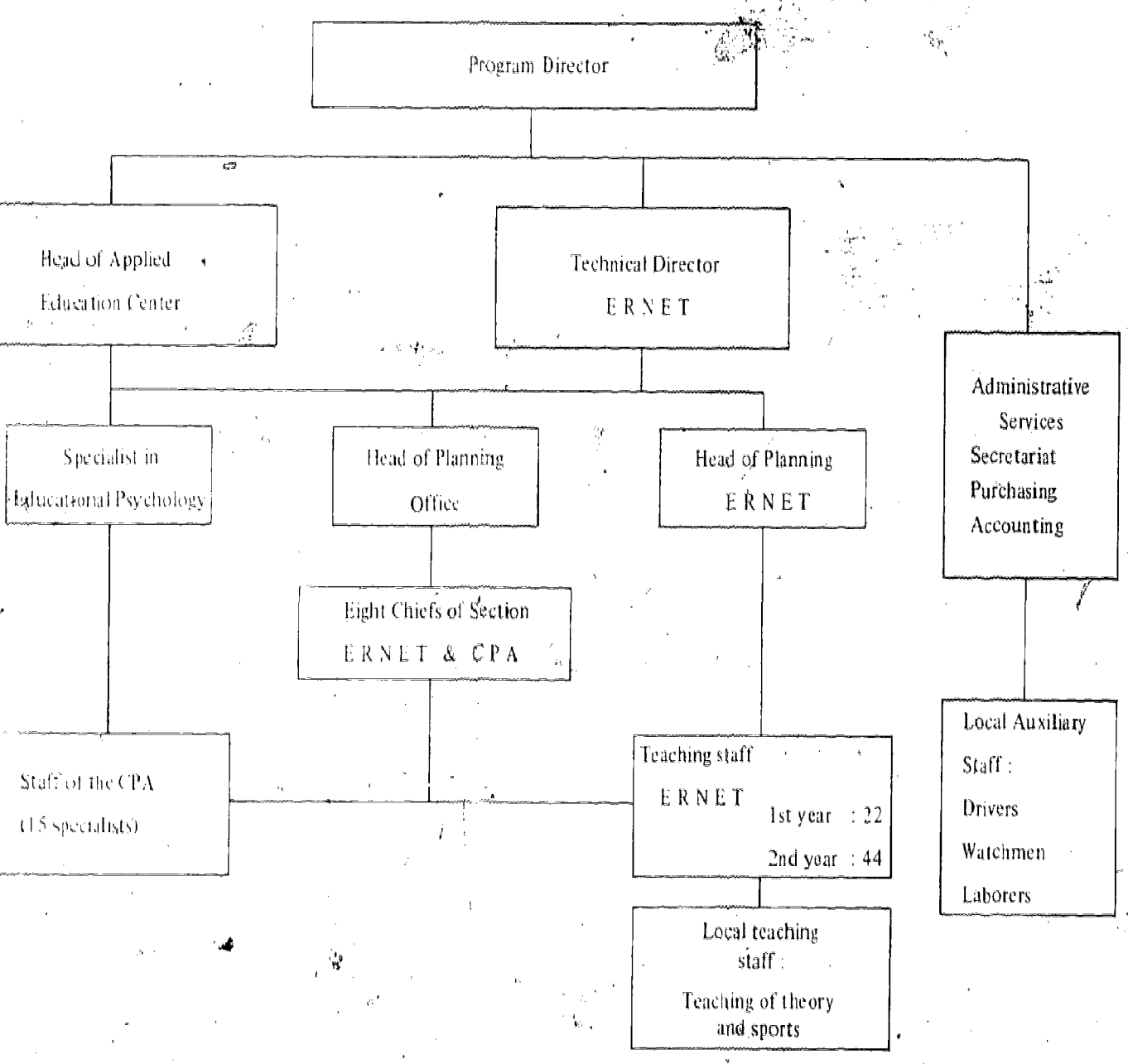
Teaching staff:

22 technical teachers
(see details page 45)

CPA Staff
15 specialists

		US $
	i.e. 52 experts =	1,268,000
B.	**Local staff :**	
	Local teaching staff (equivalent to 2 man/years)	
	Skilled secretary Accountant Shorthand-typist 5 auxiliaries Assistant storekeeper 10 laborers and cleaners 3 drivers 4 watchmen	53,000
C.	Additional equipment	130,000
D.	Stores (consumer items and small tools)	40,000
F.	Operating costs	30,000
F.	Accommodation for foreign staff (including electricity, water and gas)	364,000
G.	Travel by experts and their families Transport of effects Miscellaneous travel	155,000
H.	Inspection, visits, study travel per diem, etc	5,500
	TOTAL 2nd YEAR	2,045,500
TOTAL PREPARATORY MISSION	$ 39,000	
TOTAL FIRST YEAR	$ 1,778,500	1,817,500
	OVERALL TOTAL	$ 3,863,000

STAFF ORGANIZATION CHART



PROJECT No. 6

PROJECT PROPOSAL FOR THE CREATION OF A REGIONAL HOTEL TRADES AND HUNTING GUIDE TRAINING SCHOOL

I. INTRODUCTION

During 1969 an ORT team carried out a survey in Cameroon, Chad, Central African Republic and Gabon for the purpose of attempting to identify the needs for regional action in vocational training. The preliminary results of this survey were incorporated in a draft report which was the main basis of discussion at a conference held in October 1969, in Bangui, under the auspices of the Union Douanière et Economique de l'Afrique Centrale (UDEAC). The representatives from the member governments of the UDEAC : Cameroon, Central African Republic, Gabon and Congo (Brazzaville) were present at this conference, as well as a representative of the Government of Chad, which was formely a member of the UDEAC.

The participants at the Bangui conference unanimously approved the project for the creation of a regional center for hotel trades and hunting guide training.

The majority of governments concerned are making considerable efforts to promote tourism in Central Africa. These efforts include :

- The creation of an Inter-African Office of Tourism
- The improvement of the aviation infrastructure, including the construction of new airports
- The development of tourist facilities, including the creation of a number of safari organizations and the construction of new hotels.
- An increase in publicity in the developed countries.

Unfortunately, the management of the tourist facilities (hotels, restaurants, safaris) is entirely in the hands of expatriate personnel, since the countries of Central Africa do not have at the present time either the necessary qualified personnel, or a school for the training of such personnel. The personnel needs have been evaluated by the Central African Office of Tourism for the 10 years to come as follows :

	CAR	CAMEROON	CHAD	GABON	CONGO	TOTAL
Hotel Trades	35	35	35	25	25	155
Restaurant Personnel	50	50	50	30	50	230
Hunting Guides	20	20	20	10	10	80
TOTAL	105	105	105	65	85	465

Approximately 50% of these requirements are urgent since almost all of the personnel now employed are European.

Following the interruption of the Second World War, tourism in Central Africa is experiencing a renaissance, thanks to the efforts of the governments and because of the overcrowding of vacation sites in the developed countries and the wish of vacationers to go further afield. The advent of cheap mass air transportation is certain to result in a considerable surge in tourism to the Central African Region. The importance of tourism and hotel industries for a country or for a region are indisputable. This importance is based on cultural as well as financial considerations, through direct impact on the balance of payments of the recipient countries. In addition, the development of tourism promotes the growth of local artisan activities and creates a considerable number of jobs in sectors linked to tourism, such as agriculture, transport, artisan activities, entertainment, commerce, and service industries in general.

Thus tourism plays a vital role in economic development.

II. PROJECT OBJECTIVES

The school would have as its objectives the supply of middle-level manpower for the tourist industry in the following specialties:

- hotel trades
- restaurant personnel
- hunting guides

The future hotel trades personnel will be given training which would permit them not only to manage a hotel operation, but also to hold responsible positions within the hotel complex, for example:

- reception
- treasurership
- accounting
- reservation services
- laundry operations

Their training would, consequently, not only include on-the-job training in all of the varying services, but also classes in theory of the various technical subjects such as accounting, management, human relations, hotel legislation. In addition, the trainees would be taught a major foreign language.

The future restaurant personnel would be given similar training but oriented more to:

- food supply
- food preparation
- restaurant operation

The aptitude of the students will be taken into account in orienting them toward one or other of these specialities.

The future hunting guides would be selected from among the best students in hotel trades and restaurant personnel, i.e., those that had earned the highest grades in the various disciplines taught at the school.

The hunting guide must above all provide for the shelter and comfort for his guests under difficult conditions. He should have a combination of respect for nature, sensitivity to human relations and a knowledge of certain techniques, most of which are learned on-the-job such as :

— knowledge of nature
— marksmanship
— organization of safaris
— first aid

Consequently, the balance of the training of the hunting guide will take place following his completion of the hotel school in the form of appropriate practical instruction periods, supplemented by brief technical courses in these subjects.

III. METHOD OF OPERATION

The recruitment of students would take place at the level of first or second class of the lycée. Consequently, the students would have a level close to that of the first part of the baccalaureat, without necessarily having actually obtained the diploma.

In the selection of candidates, account would be taken of their facility in human relations as well as their sense of organization.

Prior to actual startup of the school, a preliminary period of selection of students, installation of the school premises, procurement of materiel, program and curriculum preparation, and if necessary supervision of the building construction, would take place. This preparatory period, estimated at one year, would require the employment of one specialist, the future chief of the project.

The hotel trades school should be situated in or near to an existing hotel or in a building specifically designed for this purpose which would operate as a medium-price hotel with the students and teachers as the operating personnel. This hotel would have the advantage of encouraging less-affluent visitors to come to Central Africa. Training, which would be essentially of a practical nature, (approximately 60% on-the-job, and 40% technical theory courses) would be carried out using modern methods involving maximum student participation, which ORT has already used successfully in a number of developing countries.

The length of studies would be two years for the hotel trades and restaurant sections, and four years for the hunting guides.

The two years of supplementary study for the training of hunting guides would be composed of :

two periods of one month each for special courses
a training period with the Forestry Service in the savanna area
a training period as assistant to an experienced hunting guide
a training period at the School of Nature located at Garoua, Cameroon.

At the beginning of the second year of the project, fifty students would be admitted to the school, divided into two identical classes. After one year of studies, the students would be divided into two different classes, one consisting of restaurant personnel and the other of hotel personnel, based on the preferences of the students on one hand, and on their aptitudes on the other. At this point, a second class of students would be admitted to the school. At the end of the final year, ten students will be selected for training as hunting guides.

Based on the foregoing, the school would produce the following groups:

- 19 restaurant personnel per year, beginning with the third year of the project,
- 19 hotel trades personnel, beginning with the third year of the project,
- 10 hunting guides, beginning with the fifth year of the project.

After 10 years of activity, including the preparatory year, the program will have provided the following personnel:

- 133 restaurant personnel
- 133 hotel personnel
- 50 hunting guides

This would cover approximately 60% of future needs.

Beginning with the fifth year of the project, the Africanization of training in the hotel and restaurant trades, following one year of overseas training of the counterparts, would be possible. The school could thus be completely turned over to its local authorities in its seventh year of operation.

It should be noted that beginning with the second year of the program, no financing, other than that necessary for the payment of the instructors, would be necessary, since the hotel school should earn enough to cover its own expenses.

IV. BUILDING REQUIREMENTS

Classroom needs:

- 5 classrooms
- 1 audio-visual room
- 1 typing room and model office
- 1 library
- 1 language laboratory with audio-visual center

Administrative space needs:

- 1 instructor room
- 1 office for project head
- 1 secretarial office
- 1 stockroom
- sanitary facilities
- cloakroom

approximately 750 m² (8,200 sq. feet)

Should the school not be located on the premises of an existing hotel, one would have to be constructed having approximately 1,000 - 1,200 m² (10,000 - 13,000 sq. feet).

V. PERSONNEL

ORT Personnel

1st year : 1 chief of party

2nd year : 1 chief of party
2 hotel trades instructors
1 restaurant specialist
1 commercial studies instructor

3rd year : same personnel plus :
2 hotel trades and restaurant instructors.

4th year : same personnel plus :
1 hunting guide.

Local Personnel :

1st year : 1 secretary
1 laborer

Second year onwards :
1 secretary
1 gardener
1 caretaker
1 night watchman
1 chauffeur
2 laborers.

Locally - hired teachers : approximately 20 hours per week of instruction in French, sports, etc.

VI. BUDGET ESTIMATE FOR THE FIRST TWO YEARS OF OPERATION

		U.S.$
A.	**Buildings :** (Should it be necessary to build a small hotel, estimated cost, including construction, equipment and furniture would be approximately U.S.$200,000).	90,000
B.	**Expatriate Staff**	
	First year	24,000
	Second year	150,000
	(Third year onwards - per year $173,000)	
C.	**Local personnel**	
	First year	6,000
	Second year onwards - per year	18,000
D.	**Material, equipment and operating costs :**	
	Training aids	9,000
	25 seat language laboratory	20,000
	Office machines	3,500
	Typewriters	2,500
	Office furniture	4,000
	Furniture for 5 classrooms	9,000
	Other furniture	3,000
	Textbooks, stationery, etc.	8,000
	Raw materials ($5,000 per year)	10,000
	Stockrooms ($4,000 per year)	8,000
	Miscellaneous ($5,000 per year)	10,000
	Operating expenses ($14,000 per year)	28,000
E.	**Expatriate housing, including electricity, gas, water :**	
	First year	7,000
	Second year	42,000
	(Third year onwards per year $49,000)	
F.	**Utility Vehicles :**	
	1 pickup, 1 jeep	6,000
G.	**Travel of staff and families and transportation of personal effects :**	
	First year	4,000
	Second year	25,000
H.	**Inspections, consultations, per diem, etc. :**	
	($3,000 per year)	6,000
		L. 493,000

NOTE :
Beginning with the fifth year of the project, overseas train[illegible] continuing would begin, and the cost of this training is estimated at $[illegible] per year.

PROJECT No. 7

PROJECT PROPOSAL FOR THE CREATION OF A REGIONAL CENTER FOR THE TRAINING OF WATCH AND INSTRUMENT REPAIR TECHNICIANS

I. INTRODUCTION

II. PROJECT OBJECTIVES AND OPERATION

- A. Objectives
- B. Method of Operation
  1. Bases
  2. Students
  3. Training
  4. Enrollment
  5. Personnel
  6. Buildings
  7. Equipment
- C. Location of the Center

III. TIMETABLE OF OPERATIONS

IV. BUDGET

- A. Project Preparation, Construction, Installation
- B. ORT Personnel
- C. Local Personnel
- D. Buildings and Grounds
- E. Equipment
- F. Operating Expenses
- G. Staff Housing
- H. Vehicles
- I. Travel and Transportation
- J. Consultation, Inspection

I. INTRODUCTION

During 1969 an ORT team carried out a survey in Cameroon, Chad, Central African Republic and Gabon for the purpose of attempting to identify the needs for regional action in vocational training. The preliminary results of this survey were incorporated in a draft report which was the main basis of discussion at a conference held in October 1969, in Bangui, under the auspices of the Union Douanière et Economique de l'Afrique Centrale (UDEAC). The representatives from the member governments of the UDEAC: Cameroon, Central African Republic, Gabon and Congo (Brazzaville) were present at this conference, as well as a representative of the Government of Chad, which was formerly a member of the UDEAC.

During the course of the field survey the total absence of skilled technicians capable of maintaining and repairing watches, clocks and delicate instruments was found to be common in all countries visited.

Recommendation 8, which was reviewed by the delegations attending the Bangui conference, received unanimous support. This recommendation called for the creation of a school which would "not only train watch repair specialists, but would also train precision mechanics and maintenance and repair personnel for control instrumentation (aircraft instruments, electric motors, etc.)".

It is virtually impossible to find, in the UDEAC region, local technicians capable of carrying out repairs or maintaining watch and clock mechanisms as well as other types of control apparatus. The result is that when materiel of this type becomes unserviceable it is necessary to seek the services of the few expatriate technicians available or, in most cases, to send the various types of equipment overseas for repair. In the latter case the loss of time must be added to the extremely high cost of repairs. A limited quantity of locally-trained technicians in this field would permit better maintenance and would result in a higher level of productivity of the equipment concerned.

II. PROJECT OBJECTIVES AND OPERATION

A. Objectives:

The creation of a regional center for the training of watch and instrument repair technicians corresponds to a real need. The labor market in the UDEAC countries can absorb, without any difficulty, from 10 to 15 specialists annually in this field. Trained specialists would be absorbed by both the private sector, as watch and clock repair specialists, as well as the public sector for the maintenance and repair of control instruments, laboratory measuring devices and equipment utilized in applied research analysis activities.

Graduates of the center would play an important role in those cases where partial manufacture or assembly of watches and clocks or instruments would be created. These graduates would also be available to assist in development of any precision activities to be undertaken in the region.

B. Method of Operation :

1. Bases

The length of studies, taking into account recruitment level, would be two years. A supplementary year of training would be given to those graduates of the watchmaking course who demonstrated superior ability for specialization as control and measuring instrument repairmen.

The center would function with a single class, that is to say, there would be graduation and recruitment every two years. Every third, fifth and seventh year, there would be a graduating class of control instrument repairmen. This initial arrangement could easily be modified in order to permit annual graduation, in the light of labor market conditions. The following table sets forth the proposed operating schedule of the center :

Year of Operation	1st	2nd	3rd	4th	5th	6th	7th etc.
Number of Classes	1	1	2	1	2	1	2
Category of Graduates		W	I	W	I	W	I

W = Watch Repair I = Instrument Repair

2. Students

Recruitment will take place at the level of the BEPC or equivalent. Arrangements will be made in order to permit the integration into the center of those candidates having a CAP certificate, in either the machinist or electro-mechanics specialty.

Selection criteria for a watch repair specialist are precision, a sense of order and cleanliness, and an aptitude for precision mechanics. From a physical point of view the candidates must have a steady, dry hand. In addition good eyesight and ability to concentrate are indispensible.

The recruitment for the class of instrument and control repair specialists will be carried out from among the watch repair graduates. They should have an aptitude for dealing with abstract concepts and be oriented toward electricity and electronics.

3. Training

The ratio between shop and laboratory work and theory classes should be approximately two-thirds for shop and one-third for theory.

The shop work would begin with micro-mechanics for the purpose of providing general manual training. Through the fabrication of personal tools and appropriate exercises the student will learn a variety of machine operations including filing, turning, drilling, polishing, sharpening of tools, drills and taps. Heat treating and hardening of metals would also be dealt with.

This would be followed by the other standard types of work involved in this kind of training such as truing of wheels, drilling and shaping of jewels and fabrication of various watch and clock parts.

This would be followed by assembly of watch and clock movements, with increasing order of difficulty beginning with large clock (alarm and other), and with other mechanisms of a fairly simple nature such as winding mechanisms, time setting mechanisms, wheelworks and finally escapements.

The next operation would consist of installation of hairsprings and balance wheels and the various adjustments required. This would be followed by adjustment, watch assembly and practice on watch repair. Repairs would be carried out on clocks, watches of all types including automatic, calendar and chronometers. Also small clocks, electric clocks and electronic mechanisms would be assembled and repaired. Work would be done on regulating and adjusting the various control apparatuses.

Typical theory instruction would include specialized knowledge of theory of watches and clocks, electricity, complicated watches, after-sales service, quality concepts, and current inventory and ordering procedures.

4. Enrollment

Starting with a class of 25 students for the first year, and allowing for attrition going into the second year it is estimated that approximately 20 qualified watch repair technicians would be graduated. Beginning with the third year of operation of the Center the total enrollment would include, in addition to the 25 students newly recruited, a group of 7 to 10 students in the instrument repairs section. The enrollment by year of operation of the Center would be following:

Year	1st	2nd	3rd	4th	5th	6th	7th	etc
Enrollment	25	20 W	25 I	10 20 W	25 I	10 20 W	25 I	10

W watch repair graduates

I instrument repair graduates

It will be noted from the foregoing chart that every second year of operation the enrollment drops from 35 to 20. It would be possible, beginning with the fourth year, to create a cooperative made up of four or five watch and instrument repair specialists, who could, under the direction of the center, begin to take on outside work.

5. **Personnel**

In addition to local personnel who would be necessary for the teaching of general subjects (approximately 4 hours per week for the watchmakers), and who would be hired on a part-time basis, the project would require the following expatriate personnel :

- The project director who would teach technical theory subjects, beginning with the first year of operations
- A laboratory and workshop specialist beginning with the first year of operations
- An additional specialist beginning with the third year of operations.

Buildings

Administrative :	
Director's office	20 m²
Instructor's office, also used as technical studies office	40 m²
Secretarial office	20 m²
Stockroom	50 m²
Sanitary facilities	50 m²
Classrooms:	
Theory classroom	60 m²
Main workshop	140 m²
Supplementary workshop required beginning with the third year	60 m²
TOTAL :	approximately 440 m² (4,700 sq.ft)

7. **Equipment**

Details are shown under the corresponding line item in the budget. Estimates are based on an enrollment of 35 students.

C. Location of the Center

The ideal solution would consist of the creation of a center, completely independant and autonomous. However, it would also be possible to locate it in conjunction with a technical lycée which had sufficient available space. If the latter solution should be adopted it would be indispensable that the management of this center should be completely independent.

III. TIMETABLE OF OPERATIONS

First phase: Project preparation, lasting approximately 3 months, the objective would be the working out of a detailed operating plan for the school. This would be carried out by a specialist, preferably the future director of the center.

[illegible]nd phase: Ordering of materiel and establishment of the center. This would last approximately four months. At that time the presence of the director and the specialists in workshop training is necessary. It is also necessary for the auxiliary personnel to be in operation.

Third phase: Opening of the center (watch repair section only). At this point in time the employment of a general studies instructor is indicated.

Fourth phase: Beginning with the third year of operation, an instructor in the repair of control and measuring instruments would be required.

The progressive takeover of the center by locally-trained personnel would be possible beginning with the end of the fourth year of general operations.

IV. BUDGET ESTIMATE FOR THE FIRST TWO YEARS OF OPERATION

	U.S.$
A. Project preparation and start-up (6 months)	25,000
B. ORT personnel :	
2 specialists (2 years)	98,000
C. Local personnel :	
1 secretary 2 laborers 1 night watchman local teaching personnel } ($ 19,000 per year)	38,000
D. *Buildings and grounds :	40,000
E. Equipment :	
*25 individual work places at $600 each	15,000
*furniture	3,000
*machine tools	12,000
*equipment	6,000
*stock of tools and raw materials	6,000
*classroom equipment	2,500
*training aids	5,000
*textbooks, manuals, stationery	5,000
*miscellaneous	6,000
F. Operating expenses : $1200/month	28,800
G. Expatriate staff housing (including electricity, water and gas) :	
First year : $14,000 Second year : $18,000	32,000
H. Utility vehicle	3,000
I. Travel of staff and families, and transportation of personal effects	7,000
J. Inspections, consultations, per diem, etc.	5,000
TOTAL :	$337,300

*one-time expenses.

PROJECT No. 8

PROJECT PROPOSAL FOR THE CREATION OF A REGIONAL MERCHANT MARINE SCHOOL

I. INTRODUCTION

During 1969 an ORT team carried out a survey in Cameroon, Chad, Central African Republic and Gabon for the purpose of attempting to identify the needs for regional action in vocational training. The preliminary results of this survey were incorporated in a draft report which was the main basis of discussion at a conference held in October 1969, in Bangui, under the auspices of the Union Douanière et Economique de l'Afrique Centrale (UDEAC). The representatives from the member governments of the UDEAC: Cameroon, Central African Republic, Gabon and Congo (Brazzaville) were present at this conference, as well as a representative of the Government of Chad, which was formerly a member of the UDEAC.

During the field study carried out by the ORT team, the considerable number of marine diesel engines and outboard motors which were out of use in many of the coastal towns, because of the lack of mechanics capable of repairing them, was constantly apparent.

Also, in the shipyards of the port cities of Central Africa, such as Douala, Libreville, and Port Gentil very few qualified African technicians could be found. A similar situation exists in the interior where a great deal of river and lake traffic utilizes internal combustion engines.

As pointed out in the report industrial fishing is undergoing a considerable expansion, especially in Cameroon and Gabon. The governments concerned are currently making considerable capital investments in this sector, but there are no qualified personnel available either to repair, operate or maintain the following:

- refrigeration installations
- diesel and gasoline motors
- electrical installations
- mechanical equipment
- electronic equipment and instruments (radios, radars, sonars, interphones, etc.)

It is frequently not possible to repair damaged vessels in Central African ports, not because of inadequate equipment, but because of the lack of qualified personnel in sufficient quantity. What few qualified personnel are available are expatriates, resulting in extremely high operating costs for repair facilities.

In Cameroon alone there is a fishing fleet of 23 vessels which will shortly grow to 34, composed of refrigerated trawlers, shrimp trawlers and deepsea fishing vessels (see pages 47 and 50 of the report).

Fish breeding and lake and sea fishing are of fundamental importance for Africa, both for solving nutrition problems and for creating a fishing industry which would be economically viable.

For the foregoing reasons in a number of cases the ORT team was approached by African leaders and requested to recommend the creation of a merchant marine training school. This recommendation was particularly welcomed at the conference which was held in Bangui.

II. PROJECT OBJECTIVES

The objectives of this project are to create a school which would train, in approximately three years, highly qualified specialists in the following skills :

- marine electro-mechanics
- marine refrigeration
- marine mechanical construction
- engine mechanics
- marine electronics specialists.

The electronics specialists would be trained so that they would be able to install, maintain, and repair the installations and high voltage electrical equipment installed on ships and in ship repair facilities.

The refrigeration specialists would be able to install, maintain and repair the refrigeration installations on board vessels and in ports.

The mechanics should be completely familiar with shipbuilding procedures (steel and non-ferrous metals). They would also receive training in the following specialties :

- heat treating of metals
- welding
- fitting
- machine tools
- sheet metal work
- ship's hull work

The foregoing skills should permit the technicians to install ship's mechanical equipment, to repair equipment and sub-assemblies, such as hulls, winches, transmission assemblies, pullies, anchor gear, gangways, boilers, smokestacks, propellers, etc.

The engine specialists should be skilled in diesel and gasoline, internal combustion engines. The majority of them would work on board ship as engineroom mechanics, while the others would be assigned to shore-based repair installations.

The electronic specialists would be trained so that they would be able to repair all electronic equipment used in the merchant marine, including radio installations, telephone installations, and radar. They should also be qualified to be able to operate radio equipment on board ship.

III. METHOD OF OPERATION

Selection and recruitment of students would be from those at the CAP or the BEP level, but would not actually require the possession of such certificates for admission.

The mechanics should have had at least two years of training in an automobile mechanics section of a CET.

The electronics, electro-mechanics and refrigeration specialists should have had at least two years of study in the electricity section of a CET.

As for the future machinists, they should have had the foregoing training in a machinists section.

The first year of the program would consists of the following steps:

- pre-selection of the students
- observation of shipbuilding techniques
- fitting-out of shops and quarters
- procurement
- pinpointing of specific needs for skills in the various specialties
- setting-up of a program of collaboration with a local or foreign shipping company, such as, SOPECOBA or ZIM. This collaboration would permit the students to be assigned to on-the-job training activities during the summer months.

The first, or preparatory, year would require the presence of two expatriate technicians — the future project head and the technical coordinator.

The second year would be devoted to the training of five classes of 20 students (engine room and ship construction, electro-mechanics, refrigeration and electronics).

At the beginning of the third year of the program (which would be the second year of training) the students would be divided up by specialty. At the same time recruitment would be carried out for the group beginning the first year. The school would at this point have ten classes, five first-year and five second-year.

During the fourth year of the program the school would have five new classes, first-year, and the number of students would then stabilize at approximately 300. Following the foregoing timetable, the school would graduate approximately 90 students a year, beginning with the end of the fourth year, as set out in the following table of student enrollment:

Specialty	Year		
	1st	2nd	3rd
Mechanics	20	19	18
Metalworking	20	19	18
Electro-mechanics	20	19	18
Refrigeration	20	19	18
Electronics	20	19	18
Total 285 (in 15 classes)	100	95	90

At the end of the fourth year the Africanization of the project would begin. The future counterparts, who would replace the expatriate specialists, would be selected from among the best students of the first graduating class, but would not be limited to this source. Their technical and teacher training period would last two years and would take place overseas.

The seventh and last year of the project would be devoted to total Africanization of the project and, at this point in time, expatriate personnel would be cut in half. The counterparts would work with a few of the original teaching staff during one school year following which the program would be completed and turned over to the local competent authorities.

The training program carried out at the merchant marine training school would use modern methods that have been used with considerable success by ORT in a number of African countries. Stress would be placed on practical shop work, which would account for approximately 60 % of the total training time.

The school should be located at a port with access to a shipyard, or failing this, the school should have a small private port available.

IV. BUILDING REQUIREMENTS

Classroom needs :

10 classrooms
1 preparation room
1 lecture hall (capacity 100 persons)
1 library
1 instructors room
2 draughting rooms

Approximately 1000 m² (11,000 sq.ft.)

Administrative needs :

1 office for project head
1 secretarial office
1 technological coordinators office
1 technical studies office (proctor)

Approximately 100 m² (1100 sq.ft.)

Workshops :

1 machine shop
1 electromechanics shop
1 motor shop
1 air-conditioned diesel laboratory

1 refrigeration shop
1 metalworking and welding shop
1 fitting shop
1 electronics laboratory
1 electricity, physics and chemistry laboratory
1 materials-testing laboratory

Approximately 1500 m² (16,000 sq.ft.)

Miscellaneous :

Stockroom
Sanitary facilities
Dispensary
Cloakroom

Approximately 350 m² (3,800 sq.ft.)

Total Area : Approximately 3000 m² (32,000 sq.ft.)

V. PERSONNEL

ORT Personnel :

First year:
1 chief of project
1 technical coordinator

Second year:
Same, plus
1 technical studies specialist
1 technological studies specialist
1 storekeeper
1 motor mechanics specialist
1 metalworking specialist
1 electro-mechanics specialist
1 refrigeration specialist
1 electronics specialist
1 machinist specialist

Third year:
Same, plus
1 instructor of physics, chemistry and materials testing
1 administrative assistant
1 motor mechanics specialist
1 welding specialist
1 electricity specialist
1 refrigeration specialist
1 radio specialist

Fourth, fifth & sixth years :
Same, plus
1 machinist specialist
1 metalworking specialist

1 electro-mechanics specialist
1 refrigeration specialist
1 electronics specialist

Seventh and final year:
chief of project
1 technical coordinator
1 technical studies specialist
1 technological studies specialist
1 storekeeper
1 motor mechanics specialist
1 metalworking specialist
1 electromechanics specialist
1 refrigeration specialist
1 electronics specialist
1 machinist specialist
1 physics, chemistry and materials testing instructor
1 administrative assistant

Local Staff:

First year:
1 secretary
2 laborers
1 night watchman
1 chauffeur

Second year:
Same, plus
1 typist
2 laborers
2 gardeners
1 caretaker
1 chauffeur
1 assistant storekeeper

Locally-recruited instructors for sports, mathematics, French and other subjects for approximately 50 hours per week.

Third year:
Same, plus
50 hours per week of theory

Fourth and following years:
Same, plus
50 hours per week of theory

VI. BUDGET ESTIMATE FOR THE FIRST TWO YEARS OF OPERATION

			U.S.$
A.	**Buildings:**		230,000
B.	**Expatriate Staff:**		
	First year — 2 specialists		48,000
	Second year — 11 specialists		274,000
	Third year — 18 specialists	$432,000	
	4th, 5th, & 6th years — 23 specialists	$552,000	
	Seventh year — 13 specialists	$312,000	
C.	**Local Staff:**		
	First year —		11,000
	Second year —		33,000
	Third year —	$ 47,000	
	Fourth & following years —	$ 61,000	
D.	**Equipment, material, tools:**		
	Stockroom (expendable items, hand tools parts, etc.)		
	First year —	$ 40,000	
	Following years —	$ 20,000 p.a.	60,000
	*Office furniture		5,000
	*Classroom furniture		25,000
	*Audio-visual equipment		16,000
	*Training aids $6000 per year		12,000
	*Machine shop		55,000
	*Electro-mechanics shop		22,000
	*Motor shop		18,000
	*Diesel laboratory		15,000
	*Refrigeration shop		50,000
	*Metalworking, forge, welding		7,500
	*Fitting shop		4,500
	*Electronics laboratory		20,000
	*Physics, chemistry, electricity laboratory		18,000
	*Materials testing laboratory		4,500
	Miscellaneous $24,000 per year		48,000
	Operating expenses $12,000 per year		24,000
			carried forward $1,000,500

		U.S.$
	brought forward	$1,000,500
E. **Expatriate staff housing (including electricity, water and gas)**		
First year		15,000
Second year		77,000
Third year	$126,000	
4th, 5th & 6th years	$161,000	
Seventh year	$ 91,000	
F. **Utility vehicles**		
*1 pickup, 1 four-wheel drive jeep, *1 staff car		10,000
G. **Travel of staff and families and transportation of personal effects:**		
First year		6,000
Second year		33,000
Third year	$ 54,000	
4th, 5th & 6th years	$ 66,000	
Seventh year	$ 39,000	
H. **Inspections, consultations, per diem**		6,000
TOTAL		$1,147,500

*one-time expenses

PROJECT No. 9

PROJECT PROPOSAL FOR THE CREATION OF A REGIONAL CENTER FOR THE TRAINING OF TAXIDERMISTS

I. INTRODUCTION

During 1969 an ORT team carried out a survey in Cameroon, Chad, Central African Republic and Gabon for the purpose of attempting to identify the needs for regional action in vocational training. The preliminary results of this survey were incorporated in a draft report which was the main basis of discussion at a conference held in October 1969, in Bangui, under the auspices of the Union Douanière et Economique de l'Afrique Centrale (UDEAC). The representatives from the member governments of the UDEAC (Cameroon, Central African Republic, Gabon and Congo (Brazzaville) were present at this conference, as well as a representative of the Government of Chad, which was formerly a member of the UDEAC).

During the course of discussions at the conference a number of delegations stressed the need for filling the gap, not only in Central Africa, but in Africa in general, of lack of trained taxidermists.

The director of tourism of the Central African Republic, as well as other leading figures, placed great emphasis on this question during the conference. The problem revolves about the treatment, conservation and mounting of animals, birds, fish, insects, reptiles, and hunting trophies, with a view to their exportation towards the developed countries where such articles are in demand, not only by individuals as decorative items, but also by schools for the teaching of the natural sciences and for museums of natural history.

In Central Africa it is impossible to obtain either a snake skin or a crocodile skin because of poor tanning methods. It is also impossible to find a mounted reptile or mammal.

While the creation of group of artisans able to carry out these tasks would not only create a new source of employment, also it would represent for the governments concerned a considerable source of foreign exchange earnings.

II. PROJECT OBJECTIVES

The objectives of this project are to train approximately 60 skilled taxidermists (length of training 3 years), capable of mounting animals, birds, insects, fish, and reptiles, and to tan properly valuable animal skins. Creation of such a group of artisans would have the following effect:

- it would create a viable and active new form of employment
- it would create important sources of export revenue

— it would encourage and support the tourist industry by making possible the mounting and stuffing of hunting trophies and would permit the sale to visitors of examples of the natural fauna of Central Africa.

III. METHOD OF OPERATION

There would be no particular restrictions with respect to the age of students admitted to the Center.

All that would be required would be a primary school education (6 years) with the ages of the candidates varying between 17 and 22 years. The study program would be essentially a practical one, but would include certain technical theory courses, particularly : natural sciences, basic accounting, commercial correspondence, arithmetic review, technology of taxidermy, technology of tanning, basic chemistry applied to taxidermy, and the study of instruments and their application.

The practical work (averaging 25 hours per week) would be supplemented by field work.

The length of studies would be three years. This Center would admit only one class of 20 students every three years, which would permit progressively meeting the needs of the UDEAC countries and of Chad, and which would entirely cover their needs in approximately 10 years.

Following the first graduating class of the Center the best four graduates would be selected for supplementary training, lasting two years with a view to making them into instructors, replacing the ORT specialists. This counterpart training would take place during the first year at the Center itself, with the trainees taking the role of assistant instructors, while the second year would take place overseas, in conjunction with the Museum of Natural History.

Consequently, the total duration of the project is five years. At the end of that period not only would the Center be Africanized but it would be entirely autonomous from the financial point of view, thanks to the production and sale of its products.

The Center would also be in a position to organize refresher courses for local tanners.

IV. BUILDING REQUIREMENTS

Classroom needs :

1 Taxidermy laboratory
1 Tannery
1 Classroom
1 Preparatory room
1 Instructors room
1 Stockroom

Administrative space needs:

1 Office for project head
1 Secretarial office

Miscellaneous:

Cloakroom
Dispensary
Sanitary facilities

Total area: approximately 600 m2 (6,500 sq.ft.)

V. PERSONNEL

ORT Personnel:

1 Chief of Party (teaching certain courses)
2 Taxidermy specialists

Local Staff:

1 Secretary
1 Chauffeur
2 Janitor/Laborers
1 Caretaker
1 Night watchman
1 Stockroom clerk
Part-time instructors teaching approximately 12 hours per week.

VI. BUDGET ESTIMATE FOR THE FIRST TWO YEARS OF OPERATION

		U.S.$
*A.	**Buildings and Grounds**	50,000
B.	**Expatriate Staff** $72,000 per annum	144,000
C.	**Local Staff** $22,000 per annum	44,000
D.	**Equipment, material, tools:**	
	*— Classroom and office furniture	10,000
	*— Training aids and documentation	8,000
	*— Taxidermy laboratory	22,000
	*— Tannery	8,000
	*— Raw materials and hand tools:	
	— First year $12,000	
	Following years $6,000	18,000
	carried forward:	$304,000

	U.S.$
brought forward	$304,000
— Textbooks, school supplies, etc., $3,000 p.a.	6,000
*— Hunting equipment and supplies	3,000
— Miscellaneous $4,000 per annum	8,000
*— Air conditioning	1,800
E. **Expatriate housing (including electricity, water and gas)** $28,000 p.a.	56,000
F. **School operating costs**	
Electricity, water, gas Postal, telephone, cables Gasoline Transportation Medical needs and miscellaneous $10,000 p.a.	20,000
*G. **Two utility vehicles**	
(one 1-ton truck, one pick-up)	5,000
H. **Travel of staff and families, and transportation of personal effects**	28,000
I. **Inspections, consultations, per diem, etc.**	4,000
TOTAL :	435,800

NOTE:

1. Cost of transportation of school equipment and supplies is included in foregoing estimates. Customs duties are not included as it is assumed that these items will enter duty-free.

2. Beginning with the end of the fourth year of operations, one year of overseas training is envisaged. It is estimated that this training will cost $25,000.

3. The cost of the first two years of operating particularly the first year, is considerably higher than the following years because of the one-time capital expenditures.

*One-time expenditure

PROJECT No. 10

PROJECT PROPOSAL FOR THE CREATION OF A REGIONAL AGRO-MECHANICS TRAINING CENTER

I. INTRODUCTION

During 1969 an ORT team carried out a survey in Cameroon, Chad, Central African Republic and Gabon for the purpose of attempting to identify the needs for regional action in vocational training. The preliminary results of this survey were incorporated in a draft report which was the main basis of discussion at a conference held in October 1969, in Bangui, under the auspices of the Union Douanière et Economique de l'Afrique Centrale (UDEAC). The representatives from the member Governments of the UDEAC: Cameroon, Central African Republic, Gabon and Congo (Brazzaville) were present at this conference, as well as a representative of the Government of Chad, which was formerly a member of the UDEAC.

80% of the population of the member countries of UDEAC and of Chad, or over 9,000,000 persons, have as their principal activity, agriculture. Major crops produced are cotton, millet, peanuts, cassava, sorghum.

In addition, the industrial sector is based principally on the processing of agricultural and forest products. The modernization of the economies of these countries is closely linked to improvement in agricultural production methods.

During the course of the survey described above, carried out by the ORT team, a considerable amount of time was devoted to the agricultural sector. Discussions were held with representatives of the Ministries of Plan and Agriculture in the countries visited for the purpose of determining where the major priorities exist. Efforts by the respective governments as well as by private enterprise to involve the persons working in the agricultural sector are apparently succeeding. While much of this improvement is concerned with improved seed varieties, use of fertilizers, etc., in a great number of instances mechanization and motorization of agricultural methods, particularly in connection with land clearance and preparation as well as for harvesting, is gaining in importance.

The various Ministries of Agriculture in the countries reviewed are making particular efforts to accelerate the use of mechanized agricultural equipment.

In many instances the mechanization of agriculture has been held back through a lack of qualified personnel able to maintain repair and overhaul of various types of equipment involved (bulldozers, tractors with accessories, harvesters.)

At the present time the kind of work described above is in many instances under the direction of and in many cases carried out by expensive expatriate technicians.

Part One of this survey describes in a number of cases training programs that are being carried out in this sector. Unfortunately, for the most part, these training programs are concerned mainly with the training of low level and relatively unskilled personnel.

The principal requirements are, at a higher level, that of Chief of Section and Shop Foreman. The training of semi-skilled specialists in agro-mechanics can, and for the most part is, being carried out at the national level in a number of countries.

II. PROJECT OBJECTIVES

The objectives of this project are to create a regional center for agro-mechanics training which would train qualified people at two levels :

A. — Shop foremen who would supervise the repair and maintenance of all equipment utilized in the agricultural sector.
— Chief mechanics specialized in the repair and tune-up of gasoline and diesel engines as well as accessory equipment.

B. — Section chiefs capable of repairing agricultural equipment.

The Center would have a training capacity of :

— 15 to 20 shop foremen every three years
— 15 to 20 chief mechanics every two years
— 15 to 20 chief agricultural specialists every two years.

Training would be carried out using methods perfected by ORT in other African countries. It would include courses in teaching methodology and practical pedagogy, so that each graduate of the Center would be able to train qualified workers at his place of assignment.

III. METHOD OF OPERATION

Recruitment would be carried out among graduates having at least a CAP in automobile mechanics or agricultural mechanics.

Selection would be carried out following the application of standard testing and selection procedures. The future shop foremen should have at least three years of on-the-job experience before their admission to the school. This requirement is not necessary for the admission of the two other categories. The length of studies would be three years for the shop foremen and two years for the two other specialties. Each class would consist of 20 pupils.

It is planned that the Center would be Africanized six years after the beginning of the program.

Beginning with the first graduating classes those students who appear to have the greatest promise of becoming counterparts to the ORT instructors would be selected. Counterpart recruitment outside the Center could also

be envisaged. While it is not planned to have dormitory facilities at the school this could be worked out through agreement between the Governments concerned. It this were the case the budget would have to be revised.

The agricultural equipment which would be used in the Center would correspond to that utilized in the region. One of the first tasks of the future Chief of Party of this project would be to draw up an inventory of equipment used in the region based on a study which should be carried out over a period of approximately three weeks. This study would not only deal with the immediate needs and equipment used in the region but would also concern itself with that equipment which would be used in a future modernization program of the agricultural sector.

IV. BUILDING REQUIREMENTS

Classroom needs:

3 classrooms
1 preparation room
1 audio-visual room
1 lecture hall
1 technical studies office
1 library
1 instructors room
1 stockroom (tools, parts, raw materials)
1 agro-mechanics shop (open air)
1 motor overhaul shop
1 machine shop
1 welding and metalwork shop
1 electricity shop
1 Diesel injection laboratory (air-conditioned)

Administrative space needs:

1 office for project head
1 secretarial office

Miscellaneous:

Sanitary facilities
Cloakroom

Total area: approximately 1500 m2 - 2000 m2 (16,000-20,000 sq.ft.)

V. PERSONNEL

ORT Personnel

1 Chief of Party
1 Technological studies and workshop head
1 Mechanics, forge and welding instructor

5 Agro-mechanics (theory and shop) instructors
1 Diesel-injection specialist
1 Storekeeper

Locally recruited staff:

1 Secretary
1 Typist
1 Caretaker
1 Gardener
4 Laborers
1 Night watchman
2 Chauffeurs
1 Assistant storekeeper

Part-lime Local Staff:

(from 2 - 10 hours per week)
1 Sports instructor
1 Accounting and stock records instructor
1 French teacher (report writing)

BUDGET ESTIMATE FOR FIRST TWO YEARS	U.S.$
A. **Buildings**	90,000
B. **Expatriate staff** (chief of party and workshop head)	288,000
C. **Local Staff** (secretary, typist, night watchman, chauffeur)	41,000
D. **Equipment, Material, Tools:**	
Raw materials, spare parts	36,000
Agro-mechanics shop	72,000
Motor overhaul shop	6,000
Machine shop	28,000
Welding and metalworking shop	8,500
Electricity shop	5,000
Diesel laboratory	16,000
Hydraulic shop	7,000
Training aids (shop and class)	40,000
Manuals, films, paper	9,000
Office, library, instructors room & technical studies office furniture	20,000
F. **Housing for expatriate staff** (including water, gas, and electricity)	84,000
E. **1 utility vehicle, 1 school bus**	10,000
G. **Travel of staff and families and transportation of personal effects**	30,000
H. **Operating costs of school**: post, cables, telephone, vehicle maintenance, medical needs, contingency	99,500
I. **Inspections, consultations, per diem**	2,500
GRAND TOTAL	$892,500

FEDERAL REPUBLIC OF CAMEROON

I.

INVENTORY OF TECHNICAL AND VOCATIONAL TRAINING FACILITIES IN CAMEROON

A. INSTITUTIONS AND RESOURCES ADMINISTERED BY THE MINISTRY OF EDUCATION, YOUTH AND CULTURE

A1. Institutions for long-term technical training courses.

6 technical lycées giving industrial and commercial training and schools of the same type, first and second cycle, 3 of them private.

A2. Institutions for short-term technical education and similar institutions.

54 colleges of technical, industrial and commercial training, of which 44 are private.

A3. Para-industrial and craftsmanship training.

26 rural craftsmanship sections.

Youth and popular education centers in the towns.

3 civic and vocational training centers in the rural areas.

A4. Training for girls and women (home economics and dressmaking).

A4.1 2 schools of home economics.

A4.2 9 home economics sections.

(The figures are approximate, since numerous private sections exist which are not declared to the Office of Private Education).

A5. Courses of advanced training and social development in the technical lycées.

B. INSTITUTIONS ADMINISTERED BY THE MINISTRY OF LABOR

B1. Center for accelerated vocational training at Bassa.

B2. Centers for accelerated vocational training for office employees in Yaoundé and Douala.

C. INSTITUTIONS ADMINISTERED BY OTHER MINISTRIES

C1. Mechanical training center at Douala, under the Office of the President of the Republic.

D. VOCATIONAL TRAINING PROVIDED BY PRIVATE ENTERPRISE

E. TRAINING GIVEN THROUGH BILATERAL AND MULTILATERAL AID

E1. Activities of the *Association pour la Formation des Cadres de l'Industrie et de l'Administration en Langue Française (AFCA)*; an organization for training industrial and administrative executives in French-speaking countries.

E2. Miscellaneous: projects of several countries, the ILO, UNESCO and the Institute for Panafrican Development.

F. TRAINING ADMINISTERED BY OTHER CAMEROON ORGANIZATIONS:

City councils and the U.N.C. political party; mainly women's training centers for home economics, dressmaking and secretarial training.

A. INSTITUTIONS ADMINISTERED BY THE MINISTRY OF EDUCATION, YOUTH AND CULTURE

Introduction

The Constitution provides that higher education, scientific research, and secondary and technical education are the responsibility of the Federal Government, primary education remaining the responsibility of the various federal authorities.

The Ministry of Education, Youth and Culture is in charge of most of education within the Federal Government. However, it should be noted that it is not responsible for:

- the National School of Administration and Judiciciary, which is the responsibility of the Assistant Minister of the Civil Service
- Social and middle-level medical education attached to the Secretariat of the Ministry of Public Health and Population;
- the Inter-service Military School under the supervision of the Ministry of the Armed Forces;
- the Federal Police College, attached to the Department of Security
- the Federal School of Post and Telecommunications, attached to the Ministry of Transportation, Post and Telecommunications.

In East Cameroon, primary education is directed by the Secretary of State for Education. Middle-level agricultural, forestry, zoological and cooperative education are the responsibility of the Secretary of State for Rural Development and Animal Husbandry.

In West Cameroon, responsibility rests mainly with the Secretary of State for Primary Education.

Technical education in East Cameroon is based on that of France. Moreover, the existance of home-economics and rural artisan sections, lasting 2 years, should be noted.

Additional information is shown in the annexes as follows:

Present structure of education in East Cameroon : Annex 1.

Organisation chart of the Ministry of Education, Youth and Culture : Annex 2.

Structure of English language education in West Cameroon : Annex 3.

The trends in enrollment in technical education (Items A1 and A2 only) are given in the following charts.

TRENDS IN ENROLLMENT IN TECHNICAL EDUCATION

(NUMBERS OF STUDENTS)

[illegible]

[illegible] of course / School year	1st A. or 6th		2nd A. or 5th		3rd A. or 4th		4th A. or 3rd		Second		First		Final		Total	
	T	G	T	G	T	G	T	G	T	G	T	G	T	G	T	G
-66	3,546	(1,290)	1,531	(576)	1,308	(302)	577	(86)	278	(109)	23	(6)	61		7,324	(2,639)
-67	3,277	(1,359)	2,106	(825)	1,438	(434)	938	(179)	403	(85)	286	(62)	98	(4)	8,346	(2,947)
-68	3,659	(1,564)	2,391	(915)	1,503	(468)	1,251	(248)	467	(111)	291	(67)	123	(18)	9,685	(3,391)
-69	4,304	(1,929)	2,962	(1,222)	1,718	(567)	1,327	(337)	480	(137)	346	(72)	135		11,272	(4,279)

[illegible] in School year 1967-68

-68	5 30	340	340	160	30	Total: 1,370 of which 250 girls

[illegible] included.

[illegible]

A1. INSTITUTIONS FOR LONG-TERM TECHNICAL EDUCATION

ENROLLMENT DISTRIBUTION BY YEAR OF STUDIES

First Cycle

A1.1 PUBLIC EDUCATION

Year 1967/1968
(East Cameroon)

Year of Studies	6		5		4		3		Total		
Institution	B	G	B	G	B	G	B	G	B	G	T
Technical Lycée Douala	109		116		114		106		436		436
Commercial Technical Lycée for Girls, Yaounde		86		45		41		34		206	206
Commercial Technical Lycée for Boys, Yaounde	89		45		43	1	40	1	217	2	219
Total (Public)	189	86	161	45	157	42	146	35	653	208	861

A1.2 PRIVATE EDUCATION

Collège Alfred Saker Douala*											
Collège des Nations Douala*											
Vocational Training School R.F.C. Douala	23		26		19		26		94		94
Total (Private)	23		26		19		26		94		94
Grand Total	212	86	187	45	176	42	172	35	747	208	955

* These two schools do not have the first cycle

B = Boys G = Girls

Year of studies		Second			First				Final class				Total
		Commercial	Industrial		Commercial	Industrial			Commercial	Industrial			
			I	II	B	TE	T	TI	B	TE	T	TI	
EDUCATION													
ycée Douala	B	42	26	103	39	26	62		20	19	40		377
	G	55			28				2				85
Technical Lycée	B	24			10				6				40
unde	G	33			19				14				66
Technical Lycee	B	55			33				20				108
	G	4			1				2				7
	T	213	26	103	130	26	62		64	19	40		683
	G	92			48				18				158
EDUCATION													
ed Saker	B				27								27
	G				2								2
Nations	B	95			19								114
	G	19			17								36
raining	B			11			8						19
Douala	G												
	T	114		11	65		8						198
	G	19			19								38
		327	26	114	195	26	70		64	19	40		881

Preparation for the baccalaureat economique
Preparation for the baccalaureat technique
Preparation for the brevet or baccalaureat de technicien
Preparation for the baccalaureat technique economique
Boys G Girls

A2. Institutions for short-term technical education (CET) and similar private schools

These schools give a four-year course (including one year of practical training in industry) leading to the industrial and commercial CAP diploma. The list of these institutions is given below. While it has been possible to give the trades in which the students are trained in the public schools, this information was impossible to obtain for the private schools. This list includes the private institutions for technical education opened during the school year 1968/69.

A2. SHORT-TERM TRAINING (East Cameroon)

4-year course (1 of which in industry) for the CAP diploma

A2.1. PUBLIC

No	INSTITUTIONS	No of students in 1968	Attended by	Founded in	Trades taught
	I. Center South				
1	CETI d'Ebolowa	164	Boys	1954	Masonry, carpentry
2	CETI Girls Yaoundé	132	Girls	1956	Dressmaking
3	CETI Boys Yaoundé	119	Boys	1956	General mechanics Auto-mechanics Auto electricity
	II. Coast				
4	CETIC Bonadoumbe Douala	153	Mixed		Shorthand-typing Asst Bookkeeper
5	CETI Girls Douala	124	Girls		Dressmaking
6	CETI D'Edéa	152	Boys	1954	General mechanics Electrical fitter Refrigeration technicians
7	CETI du Nkongsamba	114	Boys	1954	Sawmill-Metalworker technicians Carpenter
	III. North				
8-9	CETI and CETC Garoua	136	Mixed	1954	Mason, carpenter Auto mechanics Shorthand - typing
	IV. West				
10	CETI Bafoussam	158	Boys	1954	Mason Auto mechanics

A.2.2 PRIVATE (figures for 1968)

No	YEAR / INSTITUTION	1st		2nd		3rd		4th		TOTAL	
		B	G	B	G	B	G	B	G	B	G
	I CENTER SOUTH										
	a) Catholic										
1	C.E.T. for Girls AKONOLINGA		31	–	26	–	13			–	70
2	C.E.T. Table BAFIA	39	62	–	23	12	8	27	–	78	93
3	C.E.T. Ste Therese Melanie EBOLOWA		38		26		14	–			78
4	C.E.T. St Joseph KRIBI	44		24		10		14		92	
5	C.E.T. des Filles Nkolve YAOUNDE		58		40		25		6	–	129
6	C.E.T. Marie Vianney Nlong YAOUNDE		45		25		6		6		82
7	C.E.T. Private NKONGSAMBA		32		12						44
8	C.E.T. St Paul (ESC Pieux Normaliens) YAOUNDE		16		11						27
9	C.E.T. des Filles Sacres Coeurs YAOUNDE		36		30		13				79
10	C.E.T. [illegible]		45		23		8				125
11	C.E.T. de la Retraite YAOUNDE		44		32		28		21		125
	CATHOLIC TOTAL	83	407	24	248	23	115	41	33	170	803
	b) Protestant										
12	C.E.T. Frank Loria EBOLOWA	18		12		3		6		39	
13	Seminaire Adventiste NKONGSAMBA		16		4	4	1	–	1	4	22
	PROTESTANT TOTAL	18	16	12	4	7	1	6	1	43	22
	c) Private, non-denominational										
14	C.E.T. MBALMAYO	40		2						42	
15	C.E.T. Charles Atangana YAOUNDE	211		45		36		28		320	
16	Practical Secretarial Course YAOUNDE	90	135	68	90	5	8	11	8	174	241
	PRIVATE NON-DENOM. TOTAL	341	135	115	90	41	8	39	8	536	241
	TOTAL CENTER SOUTH	442	558	151	342	70	124	86	42	749	1066

* Figures for 1966-1967

No	INSTITUTION / YEAR	1st		2nd		3rd		4th		TOTAL	
		B	G	B	G	B	G	B	G	B	G
	II EAST										
	a) Catholic										
17	C.E.T. Bakker ABONG MBANG		49		27					–	76
18	C.E.T. St-Joseph BERTOUA	38		26		18		15		97	–
19	C.E.T. NGEULEMENDOUKA		35		27		11			–	69
20	C.E.T. Private YOKADOUMA	–	42	–	–	–	–	–	–	–	42
	CATHOLIC TOTAL	38	122	26	54	18	11	15		97	187
	b) Protestant									–	–
	c) Private non-denominational										
	TOTAL EAST	38	122	26	54	18	11	15		97	187
	III COAST										
	a) Catholic										
21	C.E.T. St Esprit DOUALA		67		29		18				114
22	C.E.T. de la Salle DOUALA	88		72		58		54		272	
23	C.E.T. [illegible] DOUALA		33		18		19				70
24	C.E.T. St Jean MBANGA	95		60		41		44		240	
	CATHOLIC TOTAL	183	100	132	47	99	37	98		512	184
	b) Protestant										
25	C.E.T. GEREC NDOUNGUE	69		19		13		9		110	
	c) Private non-denominational										
26	Private School of Commerce and Typing DOUALA	78	60	62	14	39	6	20	1	199	81
27	School of Applied Science & Orientation DOUALA	111	183	117	115	96	79	97	27	421	404

YEAR / INSTITUTION	1st		2nd		3rd		4th		TOTAL	
	B	G	B	G	B	G	B	G	B	G
III COAST (con.)										
c) Private non-denominational										
28 Bali Secretarial School DOUALA	27	89	45	88	30	38	32	34	134	249
29 Private Practical Commercial School DOUALA	126	44	134	26	99	9	117	20	476	99
30 Commercial and Financial Study Center DOUALA	35	11	56	5	56	4	48	8	195	28
31 Technical Center for Commercial Education DOUALA	64	34	78	38	61	27	47	9	250	108
32 Practical Training Center for Workers DOUALA	90		50		32		35		207	
33 Commercial and Financial Study Center Annex EDEA	32	10	55	0					87	22
34 Commercial Correspondence Accounting and Secretarial Training NKONGSAMBA	50	50	60	4	26	2	27	3	203	39
TOTAL PRIVATE NON-DENOMINATIONAL	613	367	637	296	439	165	423	102	2172	1030
TOTAL COAST	925	567	788	343	551	202	530	102	2794	1214
IV NORTH										
V WEST										
a) Catholic										
35 C.E.T. Ste Marie BAFANG		74		26		23				123
b) Protestant										
c) Private non-denominational										
36 Private School of Technical Education BAFOUSSAM	218	25	82	20	20		4		324	45
TOTAL WEST	218	99	82	46	20	23	4		324	168
COUNTRY TOTAL	1623	1346	1047	785	659	360	635	144	3964	2635

See Statistics Yearbook 1967-68

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PRIVATE INSTITUTIONS FOR TECHNICAL EDUCATION

OPENED DURING THE SCHOOL YEAR 1968/1969

NAME OF INSTITUTION	PLACE
Modern and Technical Institute	YAOUNDE
Private School of Typing	N'SAMBA
Private Secretarial Courses	MBOUDA
Normal and Private Secretarial School	BERTOUA
Technical School for Certificate Diploma	YAOUNDE
Private School of Commercial and Typing	BAFANGO
Sacre Coeur Private Technical School	BAFOUSSAM
Technical and Commercial Training Center	N'SAMBA

Source: Office of Private Education

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A3. **Rural craftsmanship sections (SAR)** (from information supplied by the Department of Technical Education)

Aim :

To enable the future craftsman and citizen to live healthily and happily in rural surroundings as a result of his work. The SAR should be the natural follow-up to primary education, forming a vital link to ensure the transition between school and adult life.

Recruitment :

This is done after the pupil has left primary school. The pupils should have passed the age limit for admission to the sixth grade and, if possible, have the CEP.

Length of training and qualification provided:

The period of study is two years. Young people who have attended classes regularly during this period and who have given satisfaction receive a certificate indicating the trade of the future craftsman. This certificate does not have the value of a diploma.

Type of training :

Vocational training provides for periods in various sections in order to acquire the necessary principles for skilled work. The basic crafts are usually woodwork, metalwork and building construction. Local living conditions, however, govern the choice of sections.

During the first year, the apprentice tries all the different types of rural practical work before making a specific choice during the second year.

General instruction is primarily designed to teach a skill, and has as a second priority the broadening of the student's basic knowledge.

No	PLACE	YEAR							
		1st		2nd		3rd		TOTAL	
		B	G	B	G	B	G	B	G
	I. CENTER SOUTH								
1	AKONOLINGA	25	-	8	-	-	-	33	-
2	BAFIA	68	-	32	-	-	-	100	-
3	EBOLOWA	47	-	20	-	-	-	67	-
4	ESEKA	37	-	19	-	-	-	56	-
5	KRIBI	27		22	-		-	49	-
6	MBALMAYO	49		20		-	-	69	-
7	NANGA-EBOKO	25		26	-	-	-	51	-
8	NDIKINIMEKI	30		25				55	
9	SA'A	46		31		-	-	77	-
10	SANGMELIMA	45		35		-	-	80	
11	YAOUNDE	24		10				34	
	TOTAL I	423		248				671	
	II. EAST								
1	ABONG MBANG	64		2				86	
2	BATOURI	19		4				23	
	TOTAL II	83		26				109	
	III. COAST								
1	EDEA	60		31		2		93	
2	MBANGA	43		18				61	
	TOTAL III	103		49		2		154	
	IV. NORTH								
1	FORT FOURREAU	10		12				22	
2	KAELE	21		5				26	
3	GAROUA	19		17				36	
4	GUIDER	17						17	
5	MAROUA	31		2				33	
6	MOKOLO	20		16				36	
7	NGAOUNDERE	17		5				22	
8	TCHOLLIRE	10		18				28	
9	YAGOUA	10				1		11	
	TOTAL IV	155		75		1		231	
	V. WEST								
1	DSCHANG	55		30				85	
2	FOUMBAN	27		25				52	
	TOTAL V	82		55				137	
	COUNTRY TOTAL	846		453		3		1302	

A4. Education for girls and women (home economics and dressmaking)

A4.1. Institutions giving courses leading to the CAP diploma

a Home economics school at Sangmelima, with 40 girls

b Home economics school at Maroua, number of students not available.

A4.2. Home economics sections (SM)

Purpose :

The essential aim of the training given in the home economics sections is to give young women the knowledgee, necessary for their personal grooming as well as taking care of their families and future homes. These young women are to become enlightened citizens who will be able to improve their living conditions and participate in the material, moral and intellectual development of their community.

Recruitment :

Students are selected from young women in the regional schools who have passed the age limit for admission to the sixth grade. The CEP diploma is not required

Period of training :

The course of study lasts for two years. Students who have attended classes regularly during this period are classified by order of merit and receive an official certificate as rural homemakers, signed by the Director of Technical Education. This certificate is not considered a diploma.

It should be noted however, that the certificate may serve as a reference when the holder wishes to seek employment with a family, as a mother's help, etc.

Type of training :

This comprises general education (French, arithmetic, elementary hygiene, child care and domestic science) and practical training (dressmaking, cooking, washing, ironing, mending, knitting and house-cleaning).

DISTRIBUTION OF HOME ECONOMICS STUDENTS BY INSTITUTIONS

1967-68

NO	PLACE	YEAR OF COURSES			
		1st Year	2nd Year	3rd Year	TOTAL
	I. SOUTH CENTER				
1	BAGUIO	22			22
2	BOLOGNA	72	32		104
3	KIBI	27			27
4	TOTAL I	121	32		153
	II. BASE				
1	ABONG MBANG	30			30
2	BATOURI	65	89		154
3	BETARE OYA	5	1		6
	TOTAL II	100	90		190
	III. COAST				
1	[illegible]	10	2		12
	TOTAL III	10	2		12
	IV. NORTH				
1	GAROUA	14	10		24
	TOTAL IV	14	10		24
	V. WEST				
1	FOUMBAN	5	1		6
	TOTAL V	5	1		6
	COUNTRY TOTAL	350	135		385

Source: Statistical Yearbook 1967-68

A5. Courses of advanced training and social advancement in the technical lycees

These courses are intended for adolescent or adult workers already employed who wish to improve their position within the enterprise. During the part-time or evening courses given in a public technical education school, they can prepare the examination for the Brevet Professionel or BEI diplomas (or by correspondence in certain private enterprises). This is a recent development, and at the time of the survey no precise statistics were obtainable.

B. INSTITUTIONS ADMINISTERED BY THE MINISTRY OF LABOR

Training is carried out under the supervision of the Ministry of Labor, and is intended for adults (over 18).

Method :

Accelerated vocational training.

B1. FPR Center at Bassa

1967-68

SECTION	LENGTH	CANDIDATES	ACCEPTED
Auto Repairs	9 months	459	15
Sheet-metal - chassis	9 months		15

The range of trades is limited, and the number admitted to the courses is inadequate in relation to the demand as the figures indicate.

The range of trades taught should be broadened.

Inquiry showed that the most urgent needs were for electrical technicians and general maintenance workers.

B2. FPR Center for office employees, Yaoundé and Douala

The center at Yaoundé has been operating for 4 years, and recently the one at Douala was opened. The training is of the FPA type, but in reality, is advanced training.

Period of training : 9 months
Number of trainees : about 30
Sections : office employees, shorthand-typists

An employment agency is foreseen for those who have completed their training.

There are 2 entry examinations. One is for those who did not finish their studies and the other for employees already employed desireing advancement.

C. INSTITUTIONS ADMINISTERED BY OTHER MINISTRIES

C1. Mechanics' Training Center at Douala, under supervision of the Office of the President of the Republic

This center was to open with the new school year, in the fall of 1969, in new buildings. It will be run by the National Civil Engineering Machinery Pool, previously the Public Works Pool, at Douala-Bassa.

Another pool exists at Yaounde.

These vehicle and equipment pools are independently administered, and rent equipment to the administrative services. Their training problems are the following:

— Replacement of 15 French technical assistants, of middle and higher level.

— Training of skilled and highly skilled workers, up to foreman level.

— Training the users of hired equipment, chiefly heavy machine drivers.

Mr Castel is in charge of this training center.

At present there is a course in maintenance mechanics of a low technical level lasting about 3 months. Students of CEP level are selected following a series of psycho-technical tests. On completion of the new buildings, which were visited by the survey team, training courses for engine repair mechanics will begin. The candidates will be of CAP level; the method will be accelerated vocational training and the length of the course will be one year. The course will not include injection theory.

This center has been largely financed by the French Fund for Aid and Cooperation (FAC).

D. VOCATIONAL TRAINING PROVIDED BY PRIVATE ENTERPRISE

This type of training is framented in Cameroon, as illustrated by the following examples:

D1. ALUCAM Collège, Edéa

This company, producing 50 000 tons of aluminum per year and employing approximately 600 people, has undertaken the Cameroonization of its executives and supervisors.

The College recruits students having the CAP or BEI diploma for advanced training courses and specialization, plus the general courses already given. Sometimes, recruitment is at the BEPC level, for a two or three year training course for foremen and supervisors.

D2. EDC (Cameroon Electricity Company)

A joint-stock company with capital of 500 million CFA francs, founded in 1963. Address: PO Box 4077, rue Dupleix, Douala.

Purpose of the company: the production, transportation and distribution of power and water.

Three types of training are given:

1st cycle: basic training. Courses leading to various examinations for CAP diploma (independent candidates).

Enrollment: about 10.

Period of training: 13 to 17 weeks, depending on the type of CAP. Mainly electricians.

2nd cycle: specialization in the following trades:
- mechanic;
- electrician;
- electrical mechanic.

Enrollment: 24

Period of training: 7 to 15 weeks, depending on the subject.

3rd cycle: intended for officials at a higher level who are following a course in electronics.

Enrollment 1967/68: 3 officials

In addition to these three types of full-time training, there is also a correspondence course preparing students for the BP and BEI diplomas. These courses of general vocational training are intended for employed workers who wish to improve their position.

D3. REGIFERCAM (Cameroon National Railroad)

Complete training is given at 2 levels.

1st grade: 3 years' training.

A diploma of completion of apprenticeship is awarded to students who have obtained the average grades required by the official regulations.

Subject	Enrollment (approx.)
Fitters	20
Diesel mechanics	20
Electrical fitters / Electromechanics	30
General mechanics	30

2nd grade: 4 years' training

This higher apprenticeship course is intended to train foremen of diesel mechanics or electricians, and district supervisors.

Number of students: about 30.

Students who obtain the average grades required by government regulations receive a diploma of completion of apprenticeship, and are then sent for a training course abroad.

D4. RENAULT C.E.A.C.

Joint-stock company with capital of 200 million CFA francs, founded in 1950.

Address : PO Box 8, Yaoundé.

The Renault-Saviem Technical Training Center for Central Africa (CEREPAC) provides 2 cycles of training.

1st cycle : lasts 3 months ; attended in 1967/68 by 7 trainees.

Purpose : advanced automobile technical training.

The following courses are given :

a) basic training for auto mechanics ;

b) Renault technical training.
Both these courses are given by the permanent staff of the center.

c) general training, provided by the AFCA.

Qualification: no diploma is awarded, but a certificate of completion of training period.

2nd cycle : lasts 6 months ; attended in 1967/68 by 10 trainees.

Same type of training, but at a higher and more advanced level. Operates on a regional basis. Trainees include nationals of Cameroon, Congo, Chad and Gabon.

Qualification : certificate of completion of training period.

D5. UNALOR (Union Allumettière Equatoriale)

PO Box 988, Douala.

Purpose :

To train mechanics able to maintain and operate match production machinery.

Enrollment : 12, of whom 6 are nationals of Cameroon, 4 of the Ivory Coast and 2 from Upper Volta.

A certificate is awarded each student at the end of training, depending on his grades.

E. TRAINING PROVIDED BY BILATERAL AND MULTILATERAL FOREIGN AID

E1. AFCA

French, private, non-profit association, formed by French enterprises for advanced training of their staff.

AFCA has an agreement with the Government, under which the AFCA makes available to the Government its programs, training methods and courses as conceived and applied for the advanced training of supervisory employees in industry, commerce, public administration, agriculture and skilled crafts.

In addition to being assisted by the provision of money and experts, by the French Fund for Aid and Cooperation, the AFCA is assisted by the European Economic Community, which is financing the program in small entreprises in Cameroon.

Programs and activities of AFCA for 1969

a) **Programs:**

- Cycle of general practical training
- Cycle of training for supervisory heads
- Cycle of written communications
- Shorthand - English - sales training
- Stock management - bookkeeping - general organization techniques - personnel management - advanced training of supervisors and executives psycho-technical service.

b) **Activities** for the first 5 months of the school year 1968/69 at Douala and Yaoundé.

1) **Supervisors and foremen:** 177 trainees from 67 enterprises attended in evening or part-time classes. The 67 enterprises are broken down as follows:

- primary sector 3
- secondary sector 22
- tertiary sector 42

2) AFCA Carries out the training of hostesses for Douala airport (English, French),

3) Seminars for management staff from the public and private sectors.

4) **Craftsmanship:** evening courses and on-the-job counselling are a part of the management training for craftsman.

5) **Others:** training for women and girls, correspondence courses, educational psychology.

Mr Xavier Bolon, the AFCA representative in Cameroon, appreciates that his organization does not offer industrial training, and urged that ORT should do so. AFCA is mainly concerned with administrative training.

Addresses: Immeuble BP, Carrefour Persides, BP 438, Douala. Tél: 3658
Carrefour Ellig-Essono, BP 4012, Yaoundé. Tel: 4110

E2. Miscellaneous

The following data is valid as of November 1, 1968.

a) Aid from France

For the school year 1967/68, France supplied 99,300,000 CFA francs in the

technical education sector. On November 1, 1968, there were 571 French nationals working in the public education system, either technical assistants or military personnel. In private education, there were 17 persons who had a supplementary contract, and 58 military personnel. In addition, 18 volunteers were employed in general or technical education.

b) Aid from the Federal Republic of Germany

None of the German volunteers has teaching responsibilities. The Bonn Government subsidizes the agricultural training center and the experimental farm at Wum, in West Cameroon (434 million CFA francs, for building construction and for five years' operations). The directors and technicians are all German nationals. The Cameroon authorities have contributed 57 million CFA francs to the project, which was agreed in 1965 and which entered its active phase only in mid-1967.

A credit of 124 million CFA francs was reserved in 1962 for the construction of a commercial school at Muntengene, near Tiko. Discussions have still not produced results. 80 million has been put aside for equipping the future nursing school at Bamenda, to be built with FED funds in 1969 (European Development Fund).
For the moment, all German aid goes to West Cameroon, with the exception of the school at Garoua.

c) Aid from Great Britain

The only assistance furnished by the U.K. consists of a few teachers and gifts of books. The British Council supplies three teachers for the Lycée at Buéa.

d) Aid from Canada

This is now developing and becoming more varied. In 1967/68, 64 teachers were made available to Cameroon, of whom only 2 were for West Cameroon. These teachers were completely financed by Canadian aid with Cameroon supplying only local transportation and furnished accommodation. Aid in kind (school supplies, educational films) is sent to the schools, both public and private, where the Canadian teachers are employed. Printing paper has been offered to the regional center at Yaoundé which produces school textbooks.
Other aid agreements cover the planned construction and equipment of a rehabilitation center for the disabled and physically handicapped at Otele, and the extension and equipment of the CES at Bonaberi.

e) Aid from Taiwan

This consists of agricultural instructors assigned to 5 training centers.

f) Aid from the United States

The College of Arts, Sciences and Technology at Bambili, which cost 150 million CFA francs, was completed this year. There remains only one American teacher. Aid to the Technical College at Ombe is also about to end, with the return of three trainees to this school. There is one teacher in the Lycée at Buea.
The number of Peace Corps Volunteers serving in Cameroon is steadily diminishing: 9 teachers in East Cameroon, 24 in the West.

g) Aid from Switzerland

This takes the form of two financial agreements (for farm schools at Maroua and Bankara Goyang), and the organization of two advanced courses for private school teachers during the summer of 1968 (320 participants).

A technical cooperation agreement between Cameroon and Switzerland was signed in November 1968 by Mr Simon Nko'o Etoungou, the Foreign Minister, and the Swiss Ambassador. Under this agreement, Switzerland will finance part of the cost of equipping the Federal College for Educators and Social Workers (EFEAS), and will provide an architect and a building engineer, a director and assistant director for a period of 3 years.

h) Aid from Ireland

This consists of numerous missionaries sent to teach in West Cameroon.

i) Aid from Israel

Israeli aid is essentially directed towards youth outside the school system. However, simple vocational training is provided in the 6 youth clubs run by the Israelis, for a total of about 1,800 young people. There are six Israeli experts taking part in this project. One of them teaches at the National Institute for Youth, Sport and Popular Education. An itinerant training course for construction foremen operates in West Cameroon. Others are planned.

j) Aid from Italy

There is none in the training and education sector. There is a possibility of a cultural agreement being entered into.

k) Aid from the Netherlands

It is concentrated in the east, where there are many Catholic missions (10 volunteers) and in West Cameroon (7), where the missions are also very active in education.

l) Aid from the Soviet Union

A loan was negotiated in 1966. An agreement was signed on November 11, 1967, for expanding the National College of Agriculture at Dschang and the Technical College of Forestry at Mbalmayo.

m) Aid from the European Development Fund (FED)

As of June 30, 1968, enrollment was as follows: primary schools and College at Ngaoundere: 6,507; expansion of Libermann College at Douala: 619; practical school of agriculture: 113; public health training in the south (including the Nurses' Training School at Bamenda): 2,729; plans for the expansion of Vogt College at Yaounde: 16; College of Technical Education 14.

n) Aid from the United Nations and specialized agencies

In May 1968 the following experts were in Cameroon:

Number	Country of origin	Recruited by	Appointed to
1	Tunisia	ILO	Workers' education
3	France (1) Belgium (2)	ILO	Centers of accelerated training for office staff Yaounde, Douala
1	Israel	ILO	National cooperative training center, Ebolowa
1	France	UNESCO	Manual workers' production center, Yaounde
6	France (4) Belgium (2)	UNESCO	Training school for rural elementary teacher Yaounde
1	Great Britain	UNESCO	Federal linguistic center Yaounde
1	(Not available)	UNESCO	Office of Secretary of State for Education, Buéa
1	Canada	WHO	Nurse - instructor Victoria

n1) Other aid from I.L.O.

The Sub-Regional Office of the I.L.O. is at Yaounde. The director, Mr Sidibe, is responsible for the following countries: Congo, (Brazzaville) Ruanda, Burundi, Cameroon, Gabon, Congo (Kinshasa), Chad, and the Central African Republic.

I.L.O. operations and projects in Cameroon:

n1.1. Creation of a National Assistance Center for Small and Medium Enterprise at Douala

The activities of AFCA in this field have already been mentioned. Other organizations, such as UNIDO, are also giving aid to small and medium-sized enterprises. ILO wishes to crystallize these various types of aid and to act as a coordinating body.

Purpose of the I.L.O. Center:

Training and advanced training of middle-level management for small and medium enterprises is carried out. The staff involved are usually administrative and not industrial or technical.

Buildings are available. 130

Financing: United Nations Special Fund.

Mr Sidibe wishes to include other organizations in these activities.

n1.2 Accelerated Training Centers for Office Personnel, Yaounde and Douala

This has already been mentioned among the accelerated training projects operated by the Ministry of Labor.

n1.3 Advanced Training Center for Administrative Staff of the Labor Ministry

Location: Yaoundé

Focus: regional (countries of the O.C.A.M. except Congo).

This center gives two types of courses:

- 2-week refresher course for Labor Inspectors
- 6-month training course for Labor Inspectors. Those who have completed the course may continue their studies at the I.I.A.T. (International Institute for Labor Administrators) in Paris.

n1.4 Creation of a Federal Center for the Development of Cooperative Enterprises

Financing:	Federal Republic of Cameroon Special Funds and I.L.O. (which will be responsible for carrying out the project).

The operating plan for this major project (comprising 10 experts plus consultants) has already been approved.

Director:	Ben Yakov, (Israel)
Purpose:	Encouragement of cooperative development in the villages.

n2 The main aid provided by UNESCO is now at the Institute of Applied Rural Pedagogy established in temporary buildings at Yaoundé. Permanent buildings are to be constructed, possibly with the help of IBRD, at Ngoumou, 40 km (25 miles) from Yaoundé. The purpose of this institution is to train educators for the rural communities, to give refresher courses to teachers, to train management staff for the normal courses, to devise a form of teaching better adapted to rural life, to prepare new programs and produce proofs of new textbooks. This is part of the Cameroon project for developing a system of primary education better adapted to the community, and for linking this system more effectively with other forms of education, such as apprenticeship in agriculture and encouragement of rural activities.

n3 The International Center of Statistical Training.

n4 The Panafrican Institute for Development (PID)

PID is a private, international, non-profit association, incorporated in Switzerland. Its headquarters are in Geneva.

Its first completed project is a school for management personnel, called the Panafrican Institute for Development, which began giving courses on March 29, 1965, in Douala, and which accepts French-speaking students from all the African countries.

The PID in Douala is attempting essentially to respond to the needs expressed by the governments and organizations of Africa, by training the necessary management personnel, thereby contributing to the planning and implementation of development.

In 2 years, the PID trains :

a) managers for rural development
b) regional managers for rural activities and adult education
c) regional managers for cooperative enterprises.

Applying an active pedagogical method, the PID has a full range of teaching aids which are used by both students and teachers.

Recruitment :

The level of recruitment is that of the 1st baccalauréat. Each candidate must be sponsored by one of the following bodies :

— the relevant ministries of his government,
— the private organizations directly concerned with development,
— the chambers of agriculture and commerce,
— the development organizations.

These bodies agree, in writing, to employ or to reemploy the candidates sponsored for PID training. No student is admitted unless he has the necessary guarantees of employment on completion of his studies.

The principal subjects taught are : economics, demography, psychology and sociology, organization and work methods, pedagogy, accounting, statistics and management, agriculture, rural engineering and ecology, health and nutrition, special economic theory, etc.

Qualification obtained : diploma of the PID, which entitles the holder to call himself «Cadre Technique du Developpement» in one of the following fields :

regional development, ecouragement of rural activities, adult education, organization, promotion and management of cooperatives.

The Institute is regional, as may be seen from the chart below, showing the number of graduates on August 31, 1968.

The first part of this survey deals with the "inventory of resources derived from the existing or planned education and training institutions". To accomplish this, a hypothetical educational structure was utilized.

Comparisons were made by the ORT team between the 5-year forecasts in the survey and the actual situation or shorter-term forecasts (1 to 2 years). In the public sector, the indications are very reliable. This encouraged the ORT members to use the SEDES survey as a sound basis for current work.

ENROLLMENT TREND

Country	1st graduating class	2nd graduating class	3rd graduating class	Total
Cameroon	18	9	7	34
Chad	1	5	7	13
Niger	3	2	6	11
Togo	3	6	2	11
C.A.R.	4	3	2	9
Upper Volta	–	2	5	7
Congo (Kinshasa)	1	2	1	4
Dahomey	1	1	2	4
Ivory Coast	–	–	2	2
Mali	–	1	–	1
Ruanda	–	1	–	1
Senegal	–	–	1	1

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II.

EMPLOYMENT SITUATION AND TRAINING NEEDS

The difficulties encountered in the domain of statistics and projections in this area are the same for the four countries. Cameroon appearing to be the most advanced. These countries do not have a well-developed statistical system, which is in itself an indication of a high degree of development. Where any such statistics are available, they deal mainly with commerce, international trade and national accounts.

The forecasts and evaluations in this report are based on :

1) consulting forecasts relating to human resources and investments ;

2) using partial and complete studies already made in this field ;

3) contacting the representatives of private enterprise.

Very often, the studies mentioned under 2) above, were used as a basis for drawing up the national development plan.

A. EMPLOYMENT SITUATION

In 1966, the entire wage-earning sector of Cameroon had less than 140,000 wage-earners. (Source : "Analyse du sous-developpement en Afrique Noire : l'exemple de l'économie du Cameroun", by Philippe Hugon, PUF 1968).

East Cameroon			West Cameroon			Total		
Sector :								
Public	Private	Total	Public	Private	Total	Public	Private	Total
46,000	59,000	105,000	11,000	22,750	33,750	57,000	81,750	138,750

From 1966 to 1970, the jobs created may be estimated at fewer than 50,000 divided approximately, 5,000 in the public sector, 16,000 in industry, 10,000 in commerce and 10,000 in other services.

The foregoing figures, while probably imprecise, were those for 1967 (established in August 1968, obtained from the Ministry of Labor and Social Legislation (see Annex V).

Taken overall, the figures indicate that the total number of wage-earners (permanent and seasonal workers) is about 117,000. Two points must be made here :

1) the figures for the public sector do not include government employees ;

2) the figures for the private sector are under-estimated, as the declarations were not submitted in time.

Data are available for the number of employees paid by the state as of July 1, 1968 (see forecast table, Annex VI).

Even making the necessary corrections for the public sector and extrapolating for the private sector in 1968, the result is not the total of 189,000 wage-earners as indicated for the end of 1968.

B. PERSONNEL NEEDS

For Cameroon, the survey entitled « Les problèmes d'emploi et de formation » ("Problems of employment and training"), published by the Society for Surveys on Economic and Social Development (SEDES, Paris), was used as a basis for the Five-Year Plan for 1965/66 - 1970/71.

Only workers of a skilled or highly skilled level were coveral. The needs and resources of the modern sector of the economy were dealt with, the requirements in supervisory personnel in the traditional sector (farmers, stock-raisers, small craftsmen and businessmen, urban and rural), being considered as part of the needs of the modern sector.

Criteria for classifying resources and needs :

— ordinary and specialized manual workers,

— skilled and highly skilled workers.

These workers hold jobs which require a general knowledge of the trade and, occasionally, detailed technical and practical knowledge. They must be able to organize their work on the basis of simple instructions. Initial training: CAP, supplemented by considerable experience.

— Foremen and supervisors :

responsible for allocating and checking the work. They coordinate the efforts of a group of workers.

— Technicians :

They assist management staff in their technical work, but have no responsibilities connected with directing the enterprise. Reference diploma : technician or advanced technician.

— Management or Senior Management :

They take part in directing the enterprise and need to display a great deal of initiative. Reference diploma : higher educational institutions or universities.

The first part of this survey deals with the "inventory of resources derived from the existing or planned education and training institutions". To accomplish this, a hypothetical educational structure was utilized.

Comparisons were made by the ORT team between the 5-year forecasts in the survey and the actual situation or shorter-term forecasts (1 to 2 years). In the public sector, the indications are very reliable. This encouraged the ORT members to use the SEDES survey as a sound basis for current work.

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Theoretical needs in "Technicians" for the period 65/66 – 70/71

Public and Private

Sectors		East Cameroon	West Cameroon
1. Commercial trajning		564	89
2. Industrial training		463	
dont :			
Forestry and timber industry	33		13
Engineering and shipbuilding	120		49
Construction and Public works	128		12
Electricity	66		5
Transportation machines	32		15
Mines and quarries	22		1
Miscellaneous	62		40
3. Medical Tranning		369	182
4. Agricultural Tranning		195	379
5. Pedagogic Tranning		1263	334
dont			
Teachers	108		
Teachers of general education	731		
Technical instructors and assistants	265		
Physical Education Teachers	125		
Private school teachers	34		
6. Administrative and Financial Tranning		424	42
7. Other types of training		51	

From "Problems of Employment and Training", SEDES

C. Contacts with employers

During their visit, the members of the survey team were able to meet :

1. Mr Tedjong, Secretary General of the Cameroon Chamber of Commerce, Industry and Mining, in Douala.
2. Mr Paul Soppo Priso, public works contractor and President of the Association of Public Works Contractors.
3. Mr J. Leaute, President of the GICAM (an inter-professional group for the study and coordination of economic interests in Cameroon) and his successor, Mr A. Halie,
4. Mr Girma, Secretary General of the Cameroon Association of Export-Import Traders.

While the Chamber of Commerce was unable to supply figures on the economic requirements in middle-level management staff and technicians, it confirmed that its training activities were limited to advanced training courses for white-collar workers, but at a low level. The project for the Advanced College of Commerce, financed by the FED and located at Douala, seems to have been shelved, although the Governement had already made the land available.

By contrast, discussions with the other employers' representatives were very instructive and informative. To ensure the smooth development of the enterprises, it is necessary for the middle-level management staff to be Cameroon nationals — technicians and advanced technicians. The deficiencies in this sphere are obvious (see chart of the GICAM).

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ESTIMATE OF REQUIREMENTS (NEW JOBS) IN PRIVATE ENTERPRISE IN EASTERN CAMEROON FOR QUALIFIED PERSONNEL AT ALL LEVELS

Years 1969-70-71

Sector	Supervisors	Foremen Technicians	Employees and/or skilled and highly skilled workers
1. Manufacturing	20	160	600
2. Public works, construction and associated industries *	?	50 ?	300 ?
3. Commerce	20	150	300
4. Banking	5	50	60
5. Provision of services (transit lighterage, insurance, hotels, shipping companies)	10	50	50
6. Transportation (including railroad)	15	35	100

** The present situation in this branch of activity makes the prospect of new jobs unlikely*

Source: Survey made at the end of January 1969 by GICAM (an inter-professional group for the study and coordination of economic interests in Cameroon).

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This estimate of needs is based on the present industrial and commercial situation assuming no new investments, no expansion, no new enterprise.

IMPLEMENTATION OF THE FIVE-YEAR PLAN

(July 1966 - June 1971)

PERSONS EMPLOYED IN VARIOUS SECTORS AT THE END OF JUNE 1968

Millions of CFA francs	Forecasts in Plan (1966-67)	Actual Investment (1st and 2nd year)	Percentage of Plan	Planned Invest (last 3 years)	TOTAL	% of Plan
Animal husbandry	750	50	7	725	775	103
Fishing industry	1 575	250	15	1 350	1 600	101
Mining	2 062	2 120	100	2 760	3 830	185
Replacements	25					
Power	6 280	2 075	33	6 140	8 215	130
TOTAL	10 667	4 495	30	10 975	14 420	130
Agriculture	5,056	2 653	52	1 675	4 328	85
Replacements	1 480	590		330	920	
Manufacturing industries	20 106	6 045	30	12 138	18 183	90
Replacements	6 310	1 350		2 500	3 850	
TOTAL	25 162	8 698	35	13 813	22 511	89
Replacements	7 790	1 940		2 830	4 770	
GRAND TOTAL	35 829	13 193	36	24 788	36 931	102

Source: African Industry in 1969 (Special issue of the Bulletin de l'Afrique Noire)

This indicates that 3 sectors will undergo marked expansion:

- the fishing industry,
- the power industry,
- manufacturing industries.

III.

CONCLUSIONS AND RECOMMENDATIONS

The list of educational projects submitted to the IBRD for financing was communicated to the ORT team verbally. The general pattern observed in this list denotes a widespread and erroneous trend in the conception of education in Cameroon.

The team recommends that the following measures be included in the third Five-Year Plan :

- a slowing down in the growth of the CEGs (Centers of General Education). There are far too many students in the 6th grade, many more in October 1968 than the 2nd Plan had envisaged for October 1971.
- an increase in the number of technical schools, with more and better equipment and, in particular, a higher standard of teaching.

In the list of educational projects submitted to the IBRD, 15 were concerned with general education and only 4 with technical education. These four projects were :

a. Expansion of the Technical Lycée at Douala, with modernization of equipment and installation of laboratories.

b. Expansion of the CET at Edea (metal working section)

c. Expansion of the CET at Ebolowa (auto mechanics and electrical installer sections)

d. Expansion of the College of Arts and Technology of West Cameroon.

Of a total sum of 3 billion CFA francs requested from the IBRD to finance educational projects, only 400 million are programmed for technical education and vocational training.

The following observations and recommendations are submitted for consideration :

1. Implementation of the project for a Higher Federal School of Technology or Federal Polytechnic Institute.

Paragraphs IIB and IIC have demonstrated the need for foremen and technicians in industry. The first part of the survey, the "List of Training Facilities", also demonstrates that the training capacity of all the existing institutions for personnel of this level could never produce the figure needed. The Cameroon Government and FAC made this discovery long before the ORT team, following a survey mission on the training of technicians and engineers carried out four years ago. The plan for creating a higher Federal School of Technology is being studied by the Government authorities and by the permanent mission for French Aid and Cooperation at Yaoundé. What does seem quickly possible is training of technicians with a beginning enrollment of 45 students. Recruitment would be at the BEPC level and the course would last 4 years. First-year students of the technical lycées could be admitted in the third-year.

This school is meant mainly for supplying the needs of the public sector. The private sector will be supplied by students graduating from the technical lycées and who would then have one year of on-the-job training.

The ORT team recommends further study of the following points:

- A detailed analysis of requirements in technicians for the period 1970-1975 (quantities and trades).
- Available numbers of suitable candidates at different levels — BEPC, second and first of technical lycée.
- The study for this project should be entrusted to an organization with considerable experience in this field.

The ORT team notes that the Cameroon authorities responsible for this project would like to obtain greater benefit from this school. The buildings and the equipment in the workshops, laboratories and classrooms (which are bound to be costly if the education given is to be worthwhile) would be used to add to the school the two following elements:

- a training center for Technical Teachers (both theory and shop)
- a center for the development of training aids and methodology technical education.

In the chart "Distribution of teaching staff" (Annex A/1), the danger of the present situation is clearly shown. It was found that in the CETs, Africanization of the teaching staff was almost complete, but that the same was not true for the Technical Lycées. But the Cameroon teachers, even when they possess the required qualifications in the subject, and this is not often the case, have not had pedagogic training. It is not surprising, therefore, that there are poor results in the various examinations in technical education (Annex B/1), or of the dangerously high number of dropouts from technical courses (Annexes C/1 and C/2).

2. UNESCO project for training teachers

This project has already been mentioned in paragraph E2 (n2), and the ORT team discussed it with Mr Matić, the UNESCO representative in Cameroon. The innovation in this project is the conception of a form of teaching better adapted to rural life (craftsmanship and agriculture), in short, what ORT calls Educative Manual Work (TME). It is probable that the collaboration of ORT in such a project would improve the effectiveness of this kind of "normal school". The conditions would have to be agreed upon. In fact, there is a need for a "Center for the Design and Manufacture of Didactic Material", similar to the one created by ORT, in Mali in 1962, and now in operation at the ORT Central Institute at Anières, near Geneva.

3. Tourism and the hotel industry

The ORT team held discussions with Mr Paul Fokam Kamga, Minister of Information and Tourism, and also President of the Organization for the De-

velopment of African Tourism (ODETA), whose headquarters are in Yaoundé. The importance of tourism for Cameroon is evident. However, very little effort has been devoted to the development of reception of visitors and tourists. The increase in overseas tourists is being matched by a similar increase in domestic tourism.

The tourist industry requires qualified personnel for transportation (travel agents, shipping agents, lighterage, reception hostesses), and for visitors and tourists, accomodations, i.e., the hotel industry (kitchen, restaurant, reception). The interview with Mr KAMGA resulted in agreement that, with so much to be done, an exploratory survey should be made in this field at least to define the requirements.

4. **Fishing and waterborne traffic**

Between 1966 and 1970, the fishing industry will receive 1574 million CFA francs out of a total of 1976 million, set aside for fishing in the Five-Year Plan. The investments made through the end of 1968 represented an amount of 500 million CFA francs. Almost one billion CFA francs of additional investments have been planned up to 1971, which should enable the Plan's objectives to be attained.

Production in the maritime fishing industry in East Cameroon has grown from an average of 3,000 tons between 1956 and 1961 to an average of 8,000 tons in 1963, 1964 and 1965, and an average of 11,000 tons in 1966 and 1967.

There are at present 6 fishing firms in Cameroon.

The industrial fishing fleet, which had 23 vessels at the beginning of 1969, includes the 4 modern trawlers of SOPECOBA Cameroon, the latest of which was bought in 1966; 6 vessels belonging to the Cotonnec line; 6 PECAM vessels, one of which is a steel-hulled trawler; 3 boats of the African Industrial Fishing Company (SAPI); 2 trawler-refrigeration vessels put into service by SIPEC and 2 shrimping/refrigeration boats of the Cameroon Shrimp Company.

Installation of equipment envisaged under the Plan, comprising the establishment of an industrial fishing company (1200 million CFA francs for 3 trawler/refrigerator ships, 5 shrimping trawlers and 3 deep-sea vessels) and the creation of a deep-freezing installation (384 million CFA francs), has been under way since 1968.

A development of this kind requires that highly skilled workers and technicians will be needed i.e., refrigeration technicians, diesel mechanics, radio-operators and navigators, maintenance mechanics, boilermaker and ship repair specialists.

5. While there are a few "school-factories" (as mentioned in Paragraph D, "Private Enterprise"), the system of apprenticeship linked with the Chambers of Trades does not exist.

The I.L.O. should focus on this situation and draw up a model apprenticeship contract between the employer and the young person who wishes to learn a trade in industry. Supplementary courses could be organized by the Department of Technical Education to give the apprentice the knowledge that the company is unable to provide.

6. The trades taught in the C.E.T.s and technical lycées are not sufficiently numerous. To keep abreast of the labor market, the trades must be diversified. ORT is convinced :

   — that an electronics section in the technical lycées would correspond with real needs,

   — that an automation school, or at the very least an automation section, would have proved extremely useful to the brewery at Douala, to the Chococam Company, etc.

   Since computers exist, and are used increasingly in Cameroon, the creation of a training program in this field would be desirable.

7. ORT would recommend the creation of an organization to coordinate vocational training (similar to the ONFP in the Ivory Coast).

   Training policy, once defined, will gain in effectiveness if the diverse facilities available, are closely coordinated. The creation of a training structure should not be undertaken on a haphazard basis. This organization would ensure that investments in vocational training phased over a period of time would be harmonized. This office would supervise all vocational training institutions, apart from those classified as technical education proper, and would oversee the development and creation of such institutions.

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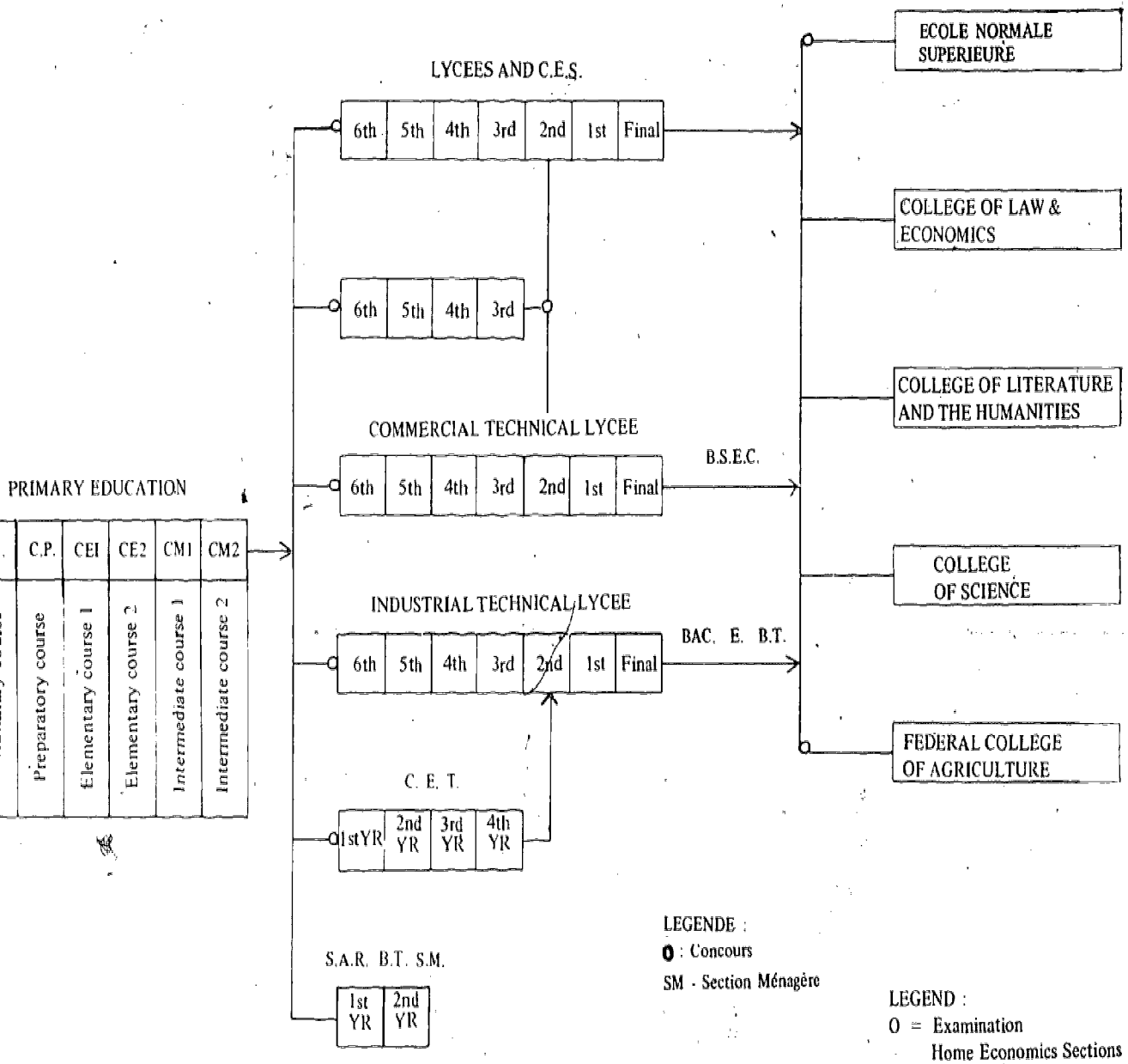
ANNEX I : PRESENT STRUCTURE OF EDUCATION IN EAST CAMEROON

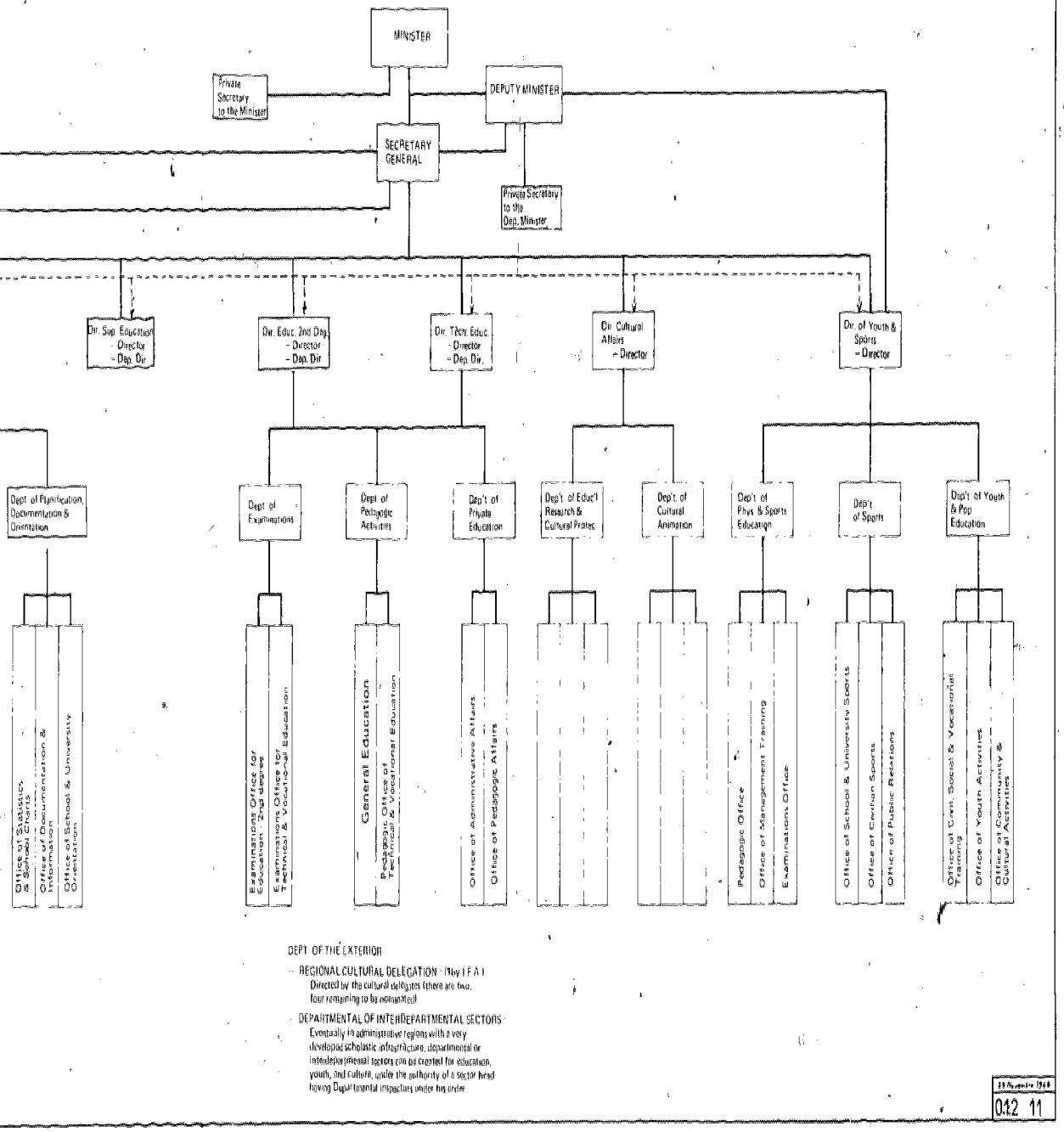


Source : Statistical Yearbook 1967/68

FEDERAL REPUBLIC OF CAMEROON

ANNEX II

CULTURE

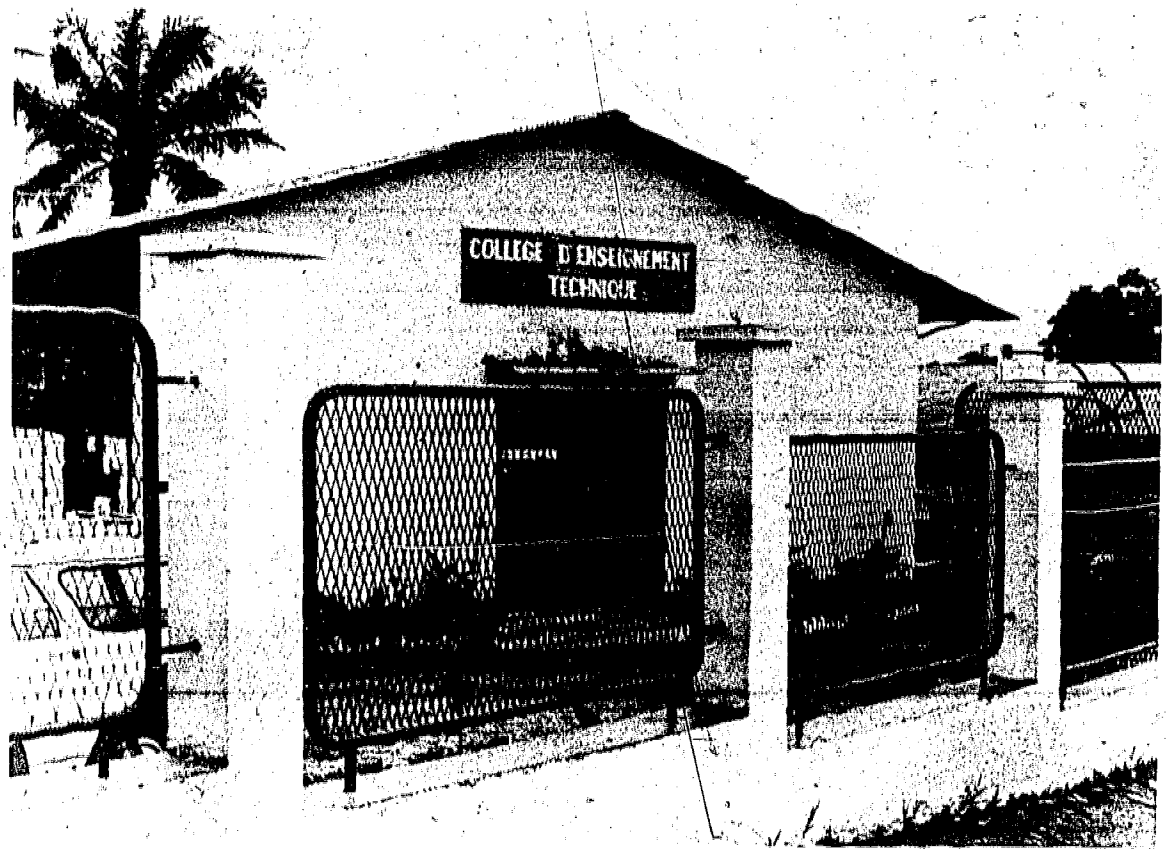


DEPT OF THE EXTERIOR

- REGIONAL CULTURAL DELEGATION - (May I F A I
  Directed by the cultural delegates (there are two, four remaining to be nominated)
- DEPARTMENTAL OF INTERDEPARTMENTAL SECTORS -
  Eventually in administrative regions with a very developed scholastic infrastructure, departmental or interdepartmental sectors can be created for education, youth, and culture, under the authority of a sector head having Departmental inspectors under his order

012 11

Source: Ministry of Education, Youth and Culture



The Technical College - Yaoundé

ANNEX III

STRUCTURE OF ENGLISH-LANGUAGE EDUCATION IN WEST CAMEROON

I—PRIMARY EDUCATION (7 years)

A) Grades I, II and III : Juniors,

B) Grade IV : transitional, after which pupils take an examination, "Entry to Senior Primary Schools",

C) Grades V, VI and VII : Seniors. At the end of Grade VII pupils take the "First School Leaving Certificate", equivalent to the CEP diploma, and some also take the "Common Entrance Examination", which is competitive and enables those who pass it to continue their studies. The first 1000 successful examinees are admitted to the special entrance examination, accompanied by a monetary grant, for the bilingual lycée at Buéa and the bilingual college at Yaoundé (70 entrants).

D) For pupils who do not continue their studies, the creation of craft schools is envisaged, first on an experimental, then on a general basis, giving a two-year practical instruction in agricultural, industrial or home-making subjects.

II—SECONDARY EDUCATION

A) Secondary Schools : (5 years) : grades I to V ; at the end of Grade V, pupils take the "General Certificate of Education, Ordinary Level".

B) Colleges of Arts, Sciences and Technology : first year and final year, after which students take the "General Certificate of Education, Advanced Level". The instruction is of pre-university standard (choice of only 3 subjects). The "General Certificate of Education" is British, which is the source of examination papers and where the students' papers are corrected.

III—TECHNICAL EDUCATION

This is given in the Technical and Commercial College, where the courses of study last for 4 or 5 years, terminating in an examination.

IV—HIGHER EDUCATION

A 2-year course of higher education has been started at the CAST in Bambili, by establishing a section attached to the "Ecole Normale Supérieure" at Yaoundé and an agricultural section.

V—TEACHER TRAINING METHODS

A) Old system :

Probationary teachers are recruited directly from those obtaining the First School Leaving Certificate. After 4 or 5 years' teaching, they become "confirmed teachers", and are then able to enter the elementary teachers' training schools (ETTS) (3-year course of studies). Those who fail the final examination of the ETTS return to teaching, but without the title of "Grade III", which is awarded to those who pass the examination and who, after a further 2 years of teaching, are eligible for entry to the high elementary teachers' schools (2-year course of studies). Success in the final examination here gives the students the title of "Grade II". Grade I qualification, which is equivalent to the General Certificate of Education, advanced level, is achieved with a one-year course.

B) New system :

This is gradually being put into effect, and represents an attempt to bring the previous system more in line with the French system. In future, the "Grade III" centers will recruit their students at the end of primary education and will train teachers in 4 years (recruiting has already begun), while the "G.II" centers will recruit from those leaving the third grade of secondary or technical schooling, and will provide training in 2 years. In addition, it is intended to create a pedagogic section at the CAST at Bambili, where classes of 50 students holding the GCE, "O" level, will prepare Grade I for 2 years. The teachers will be employed in the above-mentioned centers and in the first three grades of secondary and technical education.

ACTIVE POPULATION

YEAR : 1967

DATA AVAILABLE IN AUGUST 1968

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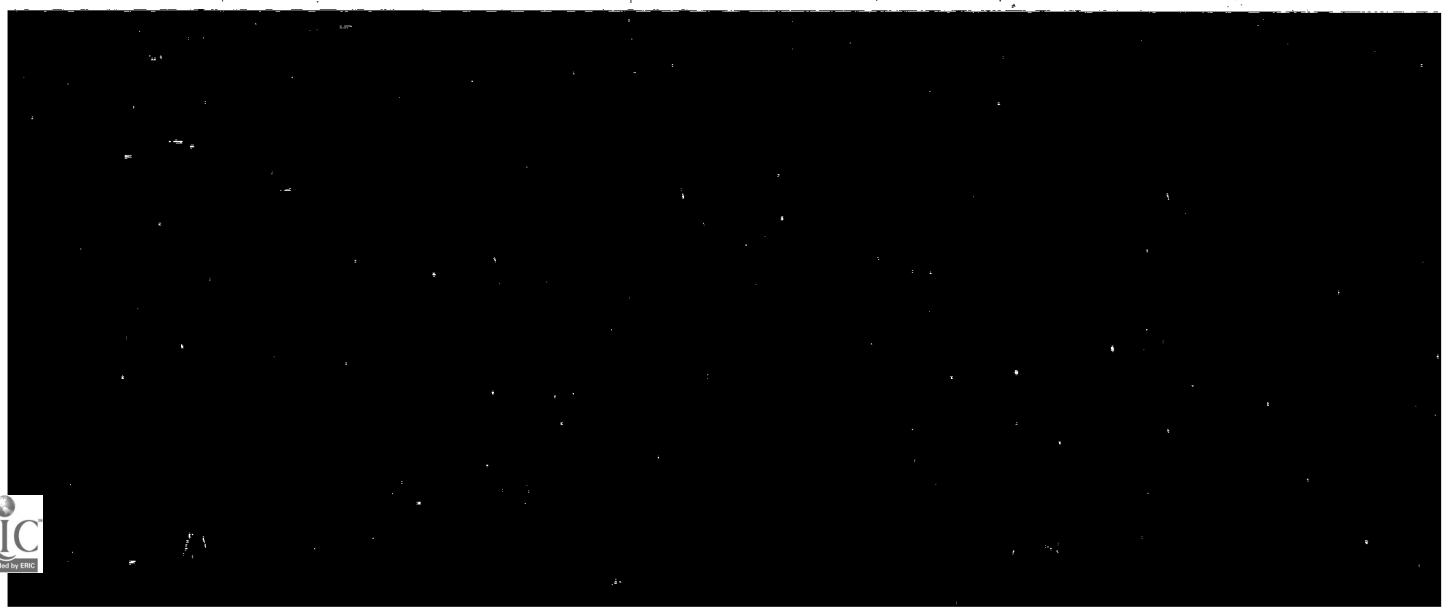
GROUPS OF ACTIVITIES	EMPLOYERS			
	Corporations		Individuals	
I. PUBLIC SECTOR				
– General Administration	99			
– Industrial or commercial type of service	11			
– Other Public bodies	51			
– PUBLIC SECTOR TOTAL	511			
II. PRIVATE SECTOR	A	NA	A	NA
A. PRIMARY ACTIVITIES				
· Fishing	-	3	-	-
· Forestry	1	22	-	5
· Agriculture, livestock	3	52	5	27
TOTAL	4	77	5	32

Chart 1



ANNEX IV (Cont. 1)

GROUPS OF ACTIVITIES	EMPLOYERS				EMPLOYEES			
	Corporation		Individuals		Permanent		Seasonal	
B. SECONDARY ACTIVITIES	A	NA	A	NA	M	F	M	F
- Electricity	1	19	–	–	2.077	51	94	–
- Petroleum & fuels	4	13	3	6	589	21	134	–
- Extraction of metallic ores	–	1	–	–	120	2	50	–
- " building materials	–	2	1	1	87	1	57	–
- " & processing of ores	–	–	–	–	–	–	–	–
- Manufacturing industries	3	97	11	39	10.837	653	557	37
Construction & Public Works	–	102	1	16	14.814	91	1.090	13
TOTAL	8	202	16	62	28.524	819	1.982	50
C. TERTIARY ACTIVITIES								
- Commerce	25	342	63	140	8.823	639	5.704	29
- Transportation, roads	1	34	1	11	3.274	12	165	–
- " rail	–	1	–	–	3.102	12	92	–
- " sea & rivers	–	9	–	1	9.756	15	1.960	–
- " air	–	9	–	–	769	46	20	1
- auxiliary	–	14	–	–	3.446	22	–	–
- Banking & insurance	1	40	2	1	1.055	206	16	9
- Litigation	–	1	3	4	35	5	–	–
- Liberal professions	–	36	11	5	1.527	119	32	–
- Private education	10	37	10	1	4.583	364	4	–
- Hotels - Restaurants - Bars	4	34	16	13	1.214	42	27	3
- Domestic staff	2	18	1	3.425	6.789	16	4	4
- Miscellaneous	5	21	11	4	792	20	1	–
TOTAL	48	596	118	3.615	36.487	1.934	8 025	46
PRIVATE SECTOR TOTAL	60	875	139	3.709	81.896	3.288	16.328	2.824
OVERALL TOTAL	221	875	139	3.709	93.551	4.134	17.360	2.857
					97.635		20.217	

Chart 1B

NUMBERS IN PERMANENT EMPLOYMENT

ANNEX – IV (Cont. 2)

BREAKDOWN BY SECTOR
JOB CATEGORY AND ACTIVITY GROUP (1)

	NATIONALS										NON-NATIONALS										TOTALS		OVERALL TOTAL
	UNSKILLED		SKILLED		WHITE COLLAR		SUPERVISORS FOREMEN		MANAGEMENT		UNSKIL.		SKILLED		W-C		SUPER. FOREMEN		MANAGEMENT				
	M	F	M	F	M	F	M	F	M	F	M	F	M	F	M	F	M	F	M	F	M	F	M+F
SECTOR *																							
tration	2.268	3	2.227	72	2.353	341	248	18	68	9	8	–	12	–	150	36	50	1	3	–	7387	480	7.867
l ercial ervice	388	–	278	–	263	42	21	–	36	2	–	–	1	–	2	5	–	–	3	–	992	49	1.041
ublic	1.079	4	666	36	1.431	259	44	3	22	7	3	–	1	–	6	2	13	3	11	3	3276	317	3.593
CTOR TOTAL *	3.735	7	3.171	108	4.047	642	313	21	126	18	11	–	14	–	158	43	63	4	17	3	11655	846	12.501
E SECTOR Y ACTIVITIES																							
	39	–	168	–	23	–	–	–	–	–	2	–	16	–	1	5	24	–	4	–	277	5	282
	2.870	72	1.752	–	210	2	141	–	3	–	14	–	26	–	3	8	6	–	91	3	5116	85	5.201
ire, livestock	8.802	421	1.416	3	478	6	371	4	41	–	183	–	12	–	7	–	9	9	173	2	11492	445	11.937
	11.711	493	3.336	3	711	8	512	4	44	–	199	–	54	–	11	13	39	9	268	5	16885	535	17.420

g workers' assistants and drivers.
t including 400 taxi and bus owners employing about 500 workers in the Coastal Inspectorate.

GROUPS OF ACTIVITIES	NATIONALS										NON - NATIONALS										TOTALS		OVER ALL TOTAL
	UNSKILLED WORKERS		SKILLED WORKERS		WHITE-COLLAR WORKERS		SUPER VISORS & FOREMEN		MANAGEM. STAFF		UNSKIL. WORKERS		SKILLED WORKERS		WHITE COLLAR WORKERS		SUPER VISORS FOREMEN		MANAGEM. STAFF				
B. SECONDARY ACTIVITIES	M	F	M	F	M	F	M	F	M	F	M	F	M	F	M	F	M	F	M	F	M	F	
Electricity	276	–	1.001	–	449	10	224	4	5	–	–	–	15	–	1	7	63	27	43	3	2.077	51	2.128
Petroleum & fuels	167	–	126	1	132	5	50	–	19	–	5	–	20	1	6	4	9	7	55	3	589	21	610
Extraction of metallic ores	65	–	37	–	8	–	8	–	–	–	–	–	–	–	–	2	–	–	2	–	120	2	122
of building materials	50	–	31	–	4	–	–	1	–	–	1	–	–	–	–	–	–	–	1	–	87	1	88
" & processing of ores	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
Manufacturing industries	3.980	185	5.257	235	753	93	182	4	35	1	6	–	153	–	28	48	158	43	285	45	10.837	653	11.490
Construction & public works	7.002	1	5.648	2	1.043	12	135	2	7	–	352	–	173	7	6	33	283	4	166	29	14.815	90	14.905
TOTAL	11.540	186	12.100	238	2.389	120	599	11	66	–	364	–	361	8	41	94	513	81	552	80	28.525	818	29.343
C. TERTIARY ACTIVITIES																							
- Commerce	2.308	10	2.397	51	2.977	190	240	5	52	2	32	–	52	5	81	178	176	139	508	59	8.823	639	9.462
- Transportation, roads	545	–	2.144	–	494	–	28	1	19	–	5	–	8	–	14	11	3	–	14	–	3.274	12	3.286
- " rail	392	–	1.546	–	942	10	131	–	13	–	–	–	15	–	28	2	–	–	35	–	3.102	12	3.114
- " sea & rivers	629	–	161	–	112	5	18	1	2	–	10	–	5	–	8	9	18	–	15	–	978	15	993
- " air	204	–	216	–	198	14	20	–	4	–	–	–	20	–	60	29	–	1	47	2	769	46	815
- " auxiliary	2.645	–	159	–	455	2	39	–	2	–	–	–	6	–	88	11	4	–	48	9	3.446	22	3.468
- Banking & insurance	79	1	79	–	670	108	81	6	74	–	1	–	1	–	57	83	–	2	113	6	1.155	206	1.361
- Law	4	–	4	–	22	2	1	–	–	–	–	–	–	–	–	1	–	1	4	1	35	5	40
- Liberal professions	131	–	90	2	1.223	89	55	6	4	5	–	–	–	–	1	9	1	1	22	7	1.527	119	1.646
- Private education	95	26	87	29	4.091	638	121	8	150	6	1	–	–	–	13	45	6	1	19	9	4.583	762	5.345
- Hotels - restaurants - bars	167	–	371	6	578	18	38	1	15	–	1	–	2	–	17	26	1	1	24	12	1.214	64	1.278
- Domestic staff	94	–	90	–	6.605	–	–	–	–	–	–	–	–	–	–	12	–	–	–	–	6.789	12	6.801
- Miscellaneous	273	1	361	1	96	7	38	–	4	1	2	–	–	–	1	4	2	6	15	–	792	20	812
TOTAL	7.566	38	7.705	89	18.463	1.083	810	28	339	14	52	–	109	5	368	429	211	152	864	105	36.487	1.934	38.421
PRIVATE SECTOR, TOTAL	30.817	717	23.141	330	21.563	1.211	1921	43	449	14	615	–	524	13	420	527	763	242	1.684	190	81.897	3.287	85.184
OVERALL TOTAL	34.552	724	26.312	438	25.610	1.853	2234	64	575	32	626	–	538	13	578	570	826	246	1.701	193	93.552	4.133	97.685

Source : Ministry of Labor and Social Legislation.

ANNEX V

ESTIMATED TREND IN NUMBERS OF PERSONS ON THE GOVERNMENT PAYROLL

(July 1, 1968 to July 1, 1974)

CLASSIFICATION	NUMBERS AT July 1, 1968	ESTIMATED RECRUITMENT OF NEW EMPLOYEES IN							ESTIMATES OF DECREASING GOVERNMENT PAYROLL AT						FORECAST ON						
		68-69	69-70	70-71	71-72	72-73	73-74	TOTAL	68-69	69-70	70-71	71-72	72-73	73-74	TOTAL	1.7.69	1.7.70	1.7.71	1.7.72	1.7.73	1.7.74
MANAGEMENT																					
A2	372	121	180	90	103	97	90	591	1	2	1	6	–	6	16	492	670	759	856	953	1 037
A1	1 130	294	246	187	228	213	217	1 385	41	28	17	22	18	26	152	1 383	1 601	1 771	1 977	2 172	2 363
B2	627	200	259	236	221	234	243	1 393	126	14	15	15	17	24	211	701	946	1 167	1 373	1 590	1 809
B1	1 757	259	485	400	398	404	379	2 341	125	78	81	90	74	80	528	1 891	2 298	2 617	2 925	3 255	3 554
C	3 509	392	720	605	650	590	617	3 574	58	85	72	73	77	94	459	3 843	4 478	5 011	5 588	6 101	6 624
D	8 575	601	1 058	1 056	976	971	918	5 576	71	115	117	118	171	172	764	9 105	10 048	10 987	11 845	12 645	13 387
EMPLOYEES UNDER CONTRACT	217	46	53	54	55	57	58	323	14	1	1	1	3	3	23	249	301	354	408	462	517
Unclassified	88	17	25	18	19	20	26	125	4	28	5	4	6	8	55	101	98	111	126	140	158
Univ. degree	510	32	84	52	55	57	61	341	2	38	13	8	16	22	99	540	586	625	672	713	752
BAC.	571	62	135	120	116	120	122	675	7	47	19	18	23	35	149	626	714	815	913	1 010	1 097
BE. BEPC.																					
DAILY WORKERS																					
BE. BEPC-CAP	3 594	2 390	841	825	820	800	794	6 470	37	57	39	31	43	40	247	5 947	6 731	7 517	8 306	9 063	9 817
CEPE	12 275	303	526	443	454	478	459	2 663	84	123	143	139	140	133	759	12 494	12 897	13 197	13 515	13 853	14 179
Helpers	4 817	189	373	333	334	318	330	1 877	64	81	102	111	115	132	605	4 942	5 234	5 465	5 688	5 891	6 089
TOTAL	38 042	4 906	4 985	4 419	4 429	4359	4 314	27 412	634	697	625	633	703	775	4 067	42 314	46 602	50 396	54 192	57 848	61 387

Source : Department of Human Resources of the Ministry of the Plan.

ANNEX VI

PRIVATE EDUCATION IN CAMEROON

(Source : Cameroon Ministry of Education)

The importance of the public and private sectors are very different according to whether it is short-term or long-term education. The following are 1968 figures :

Education	Public	Private
Short-term	1,250	600
Long-term	1,550	290
of which 1st cycle	860	94

The different sects of private education are divided as follows.

Education	Catholic	Protestant	Non-denominational
Short-term	2,080	180	4,350
Long-term	—	30	260
of which 1st cycle	—	—	95
Total	2,080	210	4,610

The number of private educational establishments is contantly growing, especially in the field of technical commercial education.

Private education in Cameroon constitutes a special case as compared with the other Central African countries included in this survey, and therefore merits close study and detailed treatment.

1. **In East Cameroon,** the legislation on private education is contained in several laws, decrees and circulars : the laws of June 26, 1963 ; July 9, 1964 and August 29, 1968 ; the decrees of January 20, 1966 and August 23, 1968 are the principal legislation. The essential provisions of these laws, which were summarized in Note No. 329 of September 10, 1968, are as follows :

   — Organization of private education : statutes, types of education (Catholic, Protestant, non-denominational, Franco-Arab), conditions for opening an institution, and relations with the State. Each type of education is represented by a national delegate appointed by the appropriate church or organization and approved by the Government authorities.

   — Definition of the professional categories of teachers in private education and the salaries appertaining to them.

   — Procedure for the transfer of private institutions to the State (mainly those concerned with primary education), whether in the public interest or at the request of the founders.

   The Catholic educational system appears to be the best organized. The central administrative body possesses a planning board and a schools statistics service as well as a pedagogic office. At middle-level, there is a diocesan administration

board with a counsellor, and serious efforts are made to provide systematic upgrading courses for the teachers. Much remains to be done in this sphere, despite the aid from Switzerland and the support of CODIAM, as the Archbishop of Yaoundé has not been able to find financial backing for his projected upgrading courses for primary schoolteachers.

The Protestant education administration acts more as a coordinating body between those in charge of education in each church or mission and as a representative in dealings with the Government authorities. Most of the eight Protestant churches and missions in Cameroon have their own scholastic system. The two largest groups, which also have the best-organized schools are the Council of Baptist and Evangelical Churches of Cameroon (CEBEC) and the Cameroon Presbyterian Church (EPC). It should be noted that the institutions providing long-term technical training are operated by the Cameroon Federation of Evangelical Churches and Missions (Collège Evangélique de Libamba, Collège Alfred Saker in Douala, etc.) while the institutions giving short-term training belong to the individual churches or missions.

Administration of the non-denominational private education system seemed to be less well structured, even allowing for the absence of a general body with effective authority over the schools. In fact, the Director of Private Education is elected by the founders of the various schools, and has no adequate means of exercising effective control over the schools. However, the Ministry of Education, Youth and Culture is keen to consolidate the authority of the Director. The proliferation of schools of all kinds proceeds unhindered despite high fees and the lack of residential facilities. The fact is that the denominational schools whether public or private, are unable to deal with the bottleneck existing at the point of transition from primary to secondary education, and many parents are forced to turn to the non-denominational private institutions, and even these are unable to satisfy the demand, some of them tending increasingly to select their students. This bottleneck is of concern to European parents as well as those of Cameroon. A new non-denominational private school was opened recently in Yaoundé on the initiative of European parents (Collège Eustel de Coulanges), although some of them had already sent their children to the Montesquieu private school. While a fair number of schools are set up by "patrons" and obtain good results in the examinations (which leads the Government to grant them subsidies and encouragement bonuses), there are others which are far too commercial in nature, where the founders neglect the pedagogic organization and where the results are negligible in relation to the sacrifices of the parents. This situation is a cause of acute concern to the education authorities and has led them to give more attention to the supervisory services in private education, another reason being that some religious congregations open schools without being able to provide the qualified teaching staff required.

The Franco-Arab system of private education, set up mainly in the north with Government aid in response to the demands of Moslem parents, is not yet greatly developed, and poses no particular probelm for the moment.

2. **In West Cameroon**, each mission group nominates a Secretary of Education, who is accepted and paid by the Government. Teaching in the private schools is supervised by official inspectors. The Protestant educational system is the best organized.

ANNEX VII

INTERNATIONAL CENTER FOR TRAINING IN STATISTICS (CIFS)

The Center was created in Yaounde in 1962, under the auspices of the United Nations Economic Commission for Africa. Students are drawn from the French-speaking countries of Africa, and are trained as middle-level technicians in the statistics service.

The Center has two divisions:

1. The "technical assistants" division, which recruits holders of the probatoire (formerly 1st part of the baccalauréat), an equivalent diploma or a technical assistant's diploma. The training period lasts for two years.
2. The "technical agents" division, which recruits holders of a diploma of completed secondary studies, 1st cycle, or its equivalent, or employees of the statictics service capable of profiting from this level of training.

Admission is by examination only. The students accepted receive grants from the international organizations (UN Special Fund, EEC grants, etc.) or from the governments of their own countries. Attendance at the Center is conditional on the obtaining of a grant and on the guarantee of employment in the country of origin after training.

At the beginning of the school year in October 1969, the CIFS had 75 students, 31 of them in the "technical agents" division and 44 in the "technical assistants" division (24 in the 1st year and 20 in the 2nd year). The students come from Burundi, Cameroon, the Central African Republic, the Comoro Islands, Congo (Brazzaville) Congo(Kinshasa), Dahomey, Gabon, Haute Volta, Madagascar, Mali, Niger, Ruanda, Chad and Togo.

In addition to the Cameroon teaching staff (officials from the senior administration of the statistics service), there are members of various bodies concerned with bilateral aid: Belgian and French technical aid and Swiss volunteers.

ANNEX A

DISTRIBUTION OF TEACHING PERSONNEL OF TECHNICAL EDUCATION INSTITUTIONS

EAST CAMEROON

	PUBLIC				PRIVATE				TOTAL			
	National Tech. Ass.				National Tech. Ass.				National Tech. Ass.			
	of which		of which		of which		of which		of which		of which	
	T	F	T	F	T	F	T	F	T	F	T	F
Professors Ph. D. S.	–	(–)	1	(–)	1	(–)	–	(–)	1	(–)	1	(–)
Certified Professors CAPES-CAPET	3	(1)	8	(1)	–	(–)	1	(–)	3	(1)	9	(1)
Teachers (Diploma)	–	–	–	–	–	–	–	–	–	–	–	–
Licenced Teachers	5	(2)	12	(6)	2	(–)	3	(1)	7	(2)	15	(7)
Teachers C.E.S. – C.E.G.	6	(–)	19	(11)	2	(–)	1	(–)	8	(–)	20	(11)
Teaching Assistants Lycée Technique	1	(–)	22	(8)	–	(–)	1	(–)	1	(–)	23	(8)
Teaching Assistants C.E.T.	15	(3)	15	(2)	2	(–)	5	(5)	17	(3)	20	(7)
Engineers	2	(–)	8	(–)	–	(–)	2	(–)	2	(–)	10	(–)
Technical Teachers	26	(8)	6	(6)	–	(–)	–	(–)	26	(8)	6	(6)
Bac. BT. BP. BSEC	4	(–)	5	(1)	8	(1)	25	(8)	12	(1)	30	(9)
Probative – B.E.C. – B.E.I.	1	(–)	2	(–)	11	(1)	6	(5)	12	(1)	8	(5)
Assistant Technical Teachers	15	(3)	–	(–)	2	(–)	1	(1)	17	(3)	1	(1)
B.E. – B.E.P.C. – C.A.P.	21	(8)	–	(–)	136	(31)	24	(17)	157	(39)	24	(17)
Others	8	(5)	12	(1)	24	(3)	23	(11)	32	(8)	35	(12)
TOTAL	107	(30)	110	(36)	188	(36)	92	(48)	295	(66)	202	(84)

EAST CAMEROON

TECHNICAL EDUCATION SECONDARY LEVEL EXAMINATION RESULTS

EXAMINATIONS		1964-1965			1965-1966			1966-1967			1967-1968			1968-1969		
		P	A	%	P	A	%	P	A	%	P	A	%	P	A	%
C.A.P.	Industrial	168	47	28,0	450	190	42,2	523	160	30,6	632	317	50,2			
"	Commercial	705	67	9,5	758	235	31,0	929	55	5,9	876	214	24,4			
"	Special		–	–	33	19	57,6	105	33	31,4	123	28	22,8			
C.F.A.	Stenography		–	–	157	25	15,9	123	21	17,1	175	26	14,8			
Homemaking Certificate		119	72	60,5	142	103	72,5	177	76	42,9	274	182	66,4			
B.E.I. Certificate of Industrial Education		49	9	18,4	60	21	35,0	72	24	33,3	117	29	24,8			
Brevet d'Enseignement Commercial	Accounting				28	24	85,7	50	31	62,0	171	55	32,2			
	Sect. Training	–	–		22	9	40,9	91	31	34,1	99	34	34,3			
	Total	36	25	69,4	50	33	66,0	141	62	44,0	270	89	33,0			
Technical Probative		30	13	43,3	28	13	46,4	25	9	36,0	29	10	34,5			
Brevet Professionnel	Commercial	–	–		–	–	–	69	15	21,7						
	Industrial	–	–		–	–	–	7	1	14,3						
	Total		–	–		–		76	16	21,1	68	23	33,8			
B.S.E.C.	Accounting		–			–		17	13	76,5	39	20	51,3			
	Sect. Training					–		7	3	42,9	26	16	61,5			
	Total	–		–	–	–	–	24	16	66,7	65	36	55,4			
Certificate of Technician		28	8	28,6	40	4	10,0	44	7	15,9	39	20	51,3			
Mathematics and Technical Diploma		13	5	38,5	19	2	10,5	20	4	20,0	18	9	50			

Source : Statistics Yearbook 1967-68.

TECHNICAL EDUCATION – SECONDARY LEVEL

East Cameroon

Year of studies		Enrolled	Promoted	Repeat	Drop-outs
1966-67					
1st or 6th th	Number	3 177	2219	149	809
	Percent		69,8	4,7	25,5
2nd or 5th	Number	2 106	1431	172	503
	Percent		67,9	8,2	23,9
3rd or 4th	Number	1 438	1150	72	216
	Percent		80,0	5,0	15,0
4th or 3rd	Number	938	395	101	442
	Percent		42,1	10,8	47,1
Total 1st Cycle	Number	7 659	5195	494	1 970
	Percent		67,8	6,5	25,7
Second	Number	403	271	72	60
	Percent		67,2	17,9	14,9
First	Number	186	98	20	68
	Percent		52,7	10,8	36,5
Final	Number	98	27	25	46
	Percent		27,6	25,5	46,9
Total 2nd Cycle	Number	687	396	117	174
	Percent		57,6	17,1	25,3
Total	Number	8 346	5591	611	2 144
	Percent		67,0	7,3	25,7
1967-68					
1st or 6th	Number	3 569	2785	182	692
	Percent		76,1	5,0	18,9
2nd or 5th	Number	2 391	1619	177	595
	Percent		67,7	7,4	24,9
3rd or 4th	Number	1 503	1172	99	232
	Percent		78,0	6,6	15,4
4th or 3rd	Number	1 251	463	155	633
	Percent		37,0	12,4	50,6
Total 1st Cycle	Number	8 804	6039	613	2152
	Percent		68,6	7,0	24,4
Second	Number	467	343	17	107
	Percent		73,5	3,6	22,9
First	Number	291	131	3	157
	Percent		45,0	1,0	54,0
Final	Number	123	65	4	54
	Percent		52,8	3,3	43,9
Total 2nd	Number	881	539	24	318
	Percent		51,3	2,7	36,1
Total	Number	9 685	6578	637	2470
	Percent		67,9	6,6	25,5

YEAR 1968-69 (PROJECTION)

Technical Education-Second Degree — East Cameroon

Year of Studies		Enrolled	Promoted	Repeat	Drop-outs
6th or 1st	Number	4 304	3 271	215	818
	Percent		76,0	5,0	19,0
5th or 2nd	Number	2 960	2 014	207	741
	Percent		68,0	7,0	25,0
4th or 3rd	Number	1 718	1 340	103	275
	Percent		78,0	6,0	16,0
3rd or 4th	Number	1 327	491	159	677
	Percent		37,0	12,0	51,0
Total 1st Cycle	Number	10 311			
	Percent				
Second	Number	480	356	14	110
	Percent		74,0	3,0	23,0
First	Number	346	156	3	187
	Percent		45,0	1,0	54,0
Final	Number	135	71	4	60
	Percent		53,0	3,0	44,0
Total 2nd Cycle	Number	961			
	Percent				
Total	Number	11 272			
	Percent				

Statistics Yearbook 1967-68

I

INVENTORY OF FACILITIES FOR TECHNICAL EDUCATION AND VOCATIONAL TRAINING IN THE CENTRAL AFRICAN REPUBLIC

A. INSTITUTIONS AND COURSES ADMINISTERED BY THE MINISTRY OF NATIONAL EDUCATION

A1. and A2. Institutions providing long-term (2nd cycle) and short-term (1st cycle and preparation for CAP) technical education

a) Technical Lycée at Bangui and the College of Technical Education attached to it.

b) Art Trades School at Bangui.

A3. Para-industrial and handicraft training

a) Apprenticeship centers

b) 10 handicraft schools

A4. Training for women (home economics and dressmaking)

A4.1. L'Ecole Notre-Dame and the Lycée Caron.

B. INSTITUTIONS ADMINISTERED BY THE MINISTRY OF LABOR

Center for vocational and advanced training

C. INSTITUTIONS AND COURSES ADMINISTERED BY OTHER MINISTRIES

C1. Training center at Baoro (closed)

C2. Training center for middle-level management personnel for public works

C3. National School of Postal Service and Telecommunications

D. VOCATIONAL TRAINING PROVIDED BY PRIVATE ENTERPRISE

E. TRAINING PROVIDED BY BILATERAL AND MULTILATERAL FOREIGN AID

E2. UNESCO and ILO

a) INPPPE (National Permanent Institute for Advanced Training of Teaching Staff)

b) Handicraft training

E3. AID ORT Center

A. INSTITUTIONS AND COURSES ADMINISTERED BY THE MINISTRY OF NATIONAL EDUCATION

Introduction

In October 1968 the Central African Republic instituted an exclusively government-controlled education system. The ministry is composed of the Cabinet, the Department of Education, the Departments of Primary Education, Secondary Education and Technical Education. In addition, there is a department concerned with rapid and television education.

The Department of Education is assisted by a mission of UNESCO experts and by a center for research and pedagogic activities.

In the schools, optional religious instruction may be given outside the normal school hours. Those in charge of the religious group either give the religious instruction themselves or entrust it to teachers who undertake it voluntarily.

No child may be refused entry to any of the state schools solely on account of his religion or his race.

The construction and operation of private schools are at their users' own cost; such schools may not be opened without Government permission, and are under its direct control.

State education is given by staff recruited or approved by the Government. The education officials are subject to various special regulations concerning education in the Central African Republic, and are responsible solely to the Ministry of National Education.

— Organization of Edueation, see Annex I.

Numbers of persons receiving education in the CAR, see Annex II.

A1. and A2. Institutions providing long-term (2nd cycle) and short-term (1st cycle and preparation for CAP) technical education

a) Technical Lycée at Bangui and the College of Technical Education annex

These form one institution, which will be referred to below as the Lycée Technique.

In common with all technical lycées, it provides technical education at two levels; first cycle (short-term training), lasting three years, and second cycle (long term training), which is a continuation of the first and also lasts three years.

Training is of two kinds:

— **industrial**, for both levels, in the following trades:

auto mechanics
electricity
sheet metal work
general mechanics

masonry/heavy construction
carpentry

— **commercial,** in the following specialties:

bookkeeper and secretary, for both levels
office employees, for the first level.

The diplomas obtained at the end of these courses are:

— the CAP industriel or the CAP commercial for the students of the CET,

— the BEC for the long-term training.

The BEI experiment was a failure. The intention was to train students from a BEPC level ,but the only candidates recruited were of a lower standard.

The training for the technician's diploma also met with no success, since the level of the examination is too high in relation to the standard of the candidates. It has been replaced by the Brevet d'Enseignement Professionnel (BEP), recently created in France.

Attemtps to recruit students from the end of the 5th grade onwards for the College of Technical Education (CET) have proven satisfactory.

Equipment

It is virtually impossible to attract young people into technical education with equipment that is frequently old and almost always inadequate.

When the ORT team visited the school, the buildings were very well kept. The machinery was properly protected with grease and dust covers.

Mr Pichon, the director of the Lycée, has made efforts to adapt the training program to the realities of Africa. This is no easy task, for several reasons. There has, however, been one beneficial innovation: the weekly timetable for the workshop has been extended from 14 to 18 hours, in order to make up for the numerous holidays and to make allowance for the lack of technological aptitude. Mr Pichon also said that in spite of all his efforts, private enterprise has consistently refused to cooperate with his lycée. He acknowledged that to some extent the private firms had reasons for being apprehensive about staff trained at the Lycée Technique, as they are particularly mobile (tending to take jobs in administration, grants for study abroad, wishing to be appointed immediately to a responsible position).

Mr Pichon has now been replaced by Mr Philippe Gleizes as Director of the Lycée Technique. Mr Gleizes was present on the second day of the Conference (October 30, 1969), but was not in a position to take an active a part as he had just arrived in the country.

No. of students in 1968

Course	No. of grade		No. of students B	G
Lycée technique (industrial section)	6th	2	48	27
	3rd	1	24	–
	2nd Elect.	1	12	–
	2nd Auto.	1	10	–
	2nd Masonry	1	17	–
	1st Elect.	1	5	–
	1st Auto.	1	7	–
	1st Masonry	1	7	–
Total, L.T. industrial section		9	130	27
L.T. (commercial section)	3rd Comm.	1	28	1
	2nd Acct.	1	12	–
	2nd Sect.	1	–	6
	1st Acct.	1	10	1
	1st Sect.	1		6
Total L.T. Commercial section		5	50	14
CFT (industrial section)	1st Elect.	1	14	–
	1st Auto	1	14	
	1st Sheet metal	1	10	
	1st Masonry	1	19	
	2nd Elect	1	13	
	2nd Auto	1	13	
	2nd Sheet metal	1	8	
	2nd Masonry	1	19	
	2nd Carpentry	1	11	
	3rd Elect.	1	11	
	3rd Auto	1	16	
	3rd Masonry	1	11	
	4th Diesel	1	7	
Total CFT industrial section		13	166	
CFT (commercial section)	1st	1	13	9
	2nd	1	26	11
	3rd	1	17	2
Total CFT commercial section		3	56	22
Grand Total		30	402	63 = 465

In June 1969, the total number of students was 574.

Source: Statistical Yearbook 1967-68

b) The Arts and Crafts School at Bangui

This school gives a 3-year training course to students recruited after tests at the end of the 5th grade, the final diploma being the CAP, in one or more of the following trades or crafts:

Sculpture (ivory or wood), bookbinding, leatherwork, wrought iron, jewelry, ornamental work, and basketwork.

The students' work supplies a school cooperative which does a brisk trade. The school makes efforts to obtain good jobs for its graduates.

Numbers (1967/68): 1st year, 20; 2nd year, 15; 3rd year, 18. Total: 53.

A3. Para-industrial and craftsmanship training

a) Apprenticeship centers

The statistical yearbook for 1967 68 states that these centers exist in the main provincial towns, and that the total number of students is 1090, of whom 288 are girls.

b) Handicrafts schools

These provide a rural training following primary schooling. The schools are equipped for woodworking and supervised by the inspectors of primary education. Each operates as a school cooperative with its own statutes. The period of training is, in principle, 2 years, but in practice is often extended by a year.

Successful completion of apprenticeship is attested by the award of a certificate. This training does not often correspond to rural needs. Projects for training in rural handicrafts is dealt with later in this report.

Place	Level	Number of courses	No. of students
BOUAAR	First year	1	40
ALINDAO	First year	1	23
BANGASSOU	First year	1	40
BOSSANGOA	First year	1	40
BOZOUM	First year	1	40
BERBERATI	First year	1	40
SIBUT	First year	1	40
MBAIKI	First year	1	40
BAMBARI	First year	1	19
BRIA	First year	1	40
	171	TOTAL	362

A4. Training for women and girls (home economics and dressmaking)

A4.1. The Notre-Dame school and the Lycée Caron train young women for a CAP diploma in dressmaking and for a diploma of equivalent standard in home economics.

Total number: 193.

The students of the Lycée Caron tend readily to regard the possession of a CAP diploma in dressmaking as giving entry to the civil service, as a dressmaking instructor. In addition, they seek jobs in the capital, where employment of this kind is saturated, and refuse employment in the provinces.

B. Institutions administered by the Ministry of Labor

Accelerated Vocational Training Center (CFPR) at Bangui

Same type as the accelerated vocational training centers in Chad and Cameroon. It gives nine months training to young men recruited after tests which are, in principle, at the level of the CM2 diploma. The true level of those graduating is that of a skilled worker. The number of sections functioning each year has been very variable; for example, during 1965/66, only a plumbing section was functioning.

From the date of its creation up to December 1967, the CFPR has admitted 465 trainees, distributed into 37 training courses in 15 different vocational activities:

auto mechanic	15 trainees
stonemason	87 »
reinforced concrete technician	27 »
carpenter	95 »
construction carpenter	20 »
plumber	10 »
driver-repair mechanics	55 »
constr. electricians	45 »
shoemaker - harness-maker - saddler	30 »
asst. driver constr. & public works	15 »
asst. mining prospector	30 »
asst. moulder-corer	21 »
repair technician for agric. & road-making machinery	15 »
maintenance electricians	15 »
flooring technician	14 »

Since November 1, 1963, advanced training courses have been provided in the evenings in the following subjects:

Construction electricity
Automobile electricity
Training & advanced courses for supervisors & foremen

Numbers on July 1, 1969, were:

Commercial section	17 boys	18 girls
Electrical section	15 »	
Flooring section	15 »	

[redacted], Director of the CFPR, talked of his wish to open sections for construction (carpentry and concrete forms). He has attempted to construct workshops from his own resources, but these resources are inadequate. The center has about 2 1/2 acres of land which could be used for buildings, if financing could be found.

C. Instutitions and training courses administered by other Ministries

C1. Training center at Baoro, linked to the Ministry of Public Works

Until July 1966, this center trained operators for road-building and other heavy equipment. It closed because the number of people available at this level of training was not sufficient.

C2. The training center for middle-level public works staff

Created through joint financing by FED and FAC.

C3. National School of Postal and Telecommunications Services

This is a regional school for the training of lower and middle-level technicians for the postal and telecommunications services. It has two sections:

- a postal section, recruiting 10 to 15 students each year at CEP 3 and BEPC level, giving them 4 or 8 months of training respectively for the jobs of clerks, postal clerks and specialists.
- a telecommunications (telegraphy) section, recruiting, according to need, future welding technicians (competitive examination at 5th grade level, one year's training), team leaders for telephone line installation (recruitment of CAP holders, 1 year's training), installation technicians (competitive examination among holders of BEPC, 2 years' training) and installation inspectors (recruitment at secondary level, 2 years' training).

This school is complementary to the National Telecommunications School at Fort-Lamy in Chad.

A project for regionalization of the National School of Postal and Telecommunications Services has been presented by the Minister to the Special Fund and submitted to the International Telecommunications Union. This envisages extension of the existing college and greater facilities for admitting trainees from neighboring countries. The staff requirements, in fact, are large and, for the five next years, the CAR needs 35 inspectors (3 years' training), 79 installation technicians (1 year's training), 52 team leaders (9 months' training) and 96 welding technicians (9 months' training).

The requirements for technicians will increase as telecommunications develop in Central Africa.

D. Vocational training provided by private enterprise

D1. Courses given by the Chamber of Commerce at Bangui

Begun in October 1966, these evening courses are intended for employees who wish to study for the various commercial CAP diplomas and are under the supervision of the Director of the Technical Lycée.

D2. Technical training center operated by the banks

The same system as in Chad.

D3. Training provided by private enterprise

Apart from "on the job" training, some firms provide training and advanced courses for the benefit of their employees. These firms are SCKN, CCSO, SEEE and Berliet.

E. Training given within the framework of bilateral and multilateral foreign aid

E2. UNESCO and ILO

a) The National Permanent Institute for Advanced Training of Teaching Personnel (INPPPE)

This CAR-UNESCO-UNICEF project, which is administered by Mr Jérémie Ikolil, provides upgrading courses and advanced training for teachers of all subjects included in primary education.

Length of courses: 3 months; capacity of institution: 50 teachers at a time.

After the 3-months' training, the teachers return to their schools, which, incidentally, are "pilot" primary schools. Included in the subjects taught are: psycho-pedagogy, French and mathematics; school organization (legislation); audio-visual methods and educational manual work (TME).

The ORT experts visited the school accompanied by Mr Ikoli and Mr Hoche, who is a UNESCO teacher. The buildings are old, and poorly adapted to their purpose. A request for financing has been submitted to AID for the construction of a new school. The spirit and atmosphere found there are undeniably good, but there is much to be done, especially in the field of educational manual work and the fabrication of audio-visual aids for instruction.

This program is dealt with later under the heading "Recommendations".

b) Handicraft training

The rural handicraft schools have already been mentioned under A3.b.

These centers were built with financing from the FED. The United Nations Development Program has been asked by the Central African Government to provide equipment and technical assistance (ILO) for these workshops.

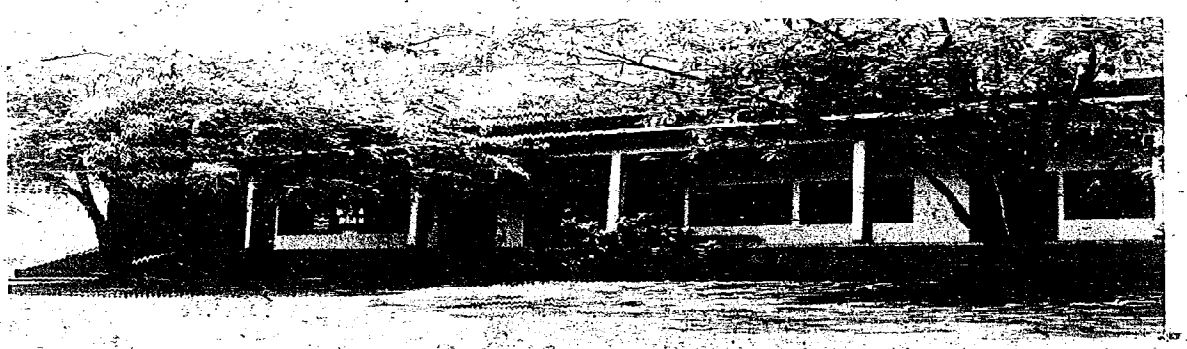
An extremely useful report on the vocational training in [illegible]crafts was prepared in June 1969 by Mr A. Lawrence, United Nat[illegible]n Representative in the Central African Republic. This report pr[illegible]ual insights into handicraft training problems.

E3. AID/ORT training center

Within the framework of a project financed by AID, ORT is providing training to personnel responsible for the maintenance and use of the national pool of heavy agricultural and road-construction machinery. This equipment, normally under the responsibility of Europeans, will in future be operated and maintained by African technicians who have completed their training with ORT. At the same time, the experts train instructors as counterparts. Within a short time, the role of ORT will be limited essentially to providing advice for a limited period to the local staff.

Training is provided in classrooms, workshops and on-the-job. The center has, to date, trained 24 agricultural tractor operators, 3 mobile greasing unit operators, 2 loader operators, 36 trainees at the agricultural center at Grimari, agricultural mechanics courses, and the advanced training of: 13 mechanics foremen, 24 heavy equipment operators, 16 agricultural tractor drivers, plus more than 50 agricultural equipment operators, trained on-the-job, during the "Operation Bokassa" agriculture campaign. At present, the center is ensuring the training of: 9 harvester-thresher operators, 30 trainees at the agricultural center at Grimari in agricultural mechanics courses, 5 trainees who will assure the continuation of this project, and one agriculture inspector.

The Lycee Technique - Bangui



The Lycee Technique - Bangui

4th quarter 1968	214	290	214

Vacancies for stenographers, stenotypists, bookkeepers and assistant bookkeepers holding diplomas, administrative and commercial assistants continue to go unfilled.

POSTAL AND	Engineers & inspectors (A scale)	10
TELECOMMUNICATIONS	Inspectors (B scale)	44
SERVICE	Clerks, specialists (C scale)	167
	Postal clerks (D scale)	56

			Textiles	30
			Electricity	15
			Misc.	51

Mr Sebiro is of the opinion that middle-level and senior staff should be trained in a regional school for all of Central Africa.

Details of all the efforts made by the Chamber of Industry and Crafts to attract young people into private entreprise were given by Mr Sebiro.

During the Conference in Bangui, Mr Grisoni recommended a project for a school for hotel training, as well as hunting guide training, and a taxidermy section. The essential parts of his presentation will be found in the project proposal for the hotel school.

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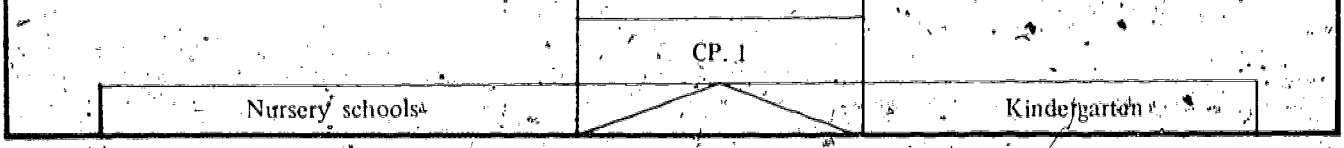
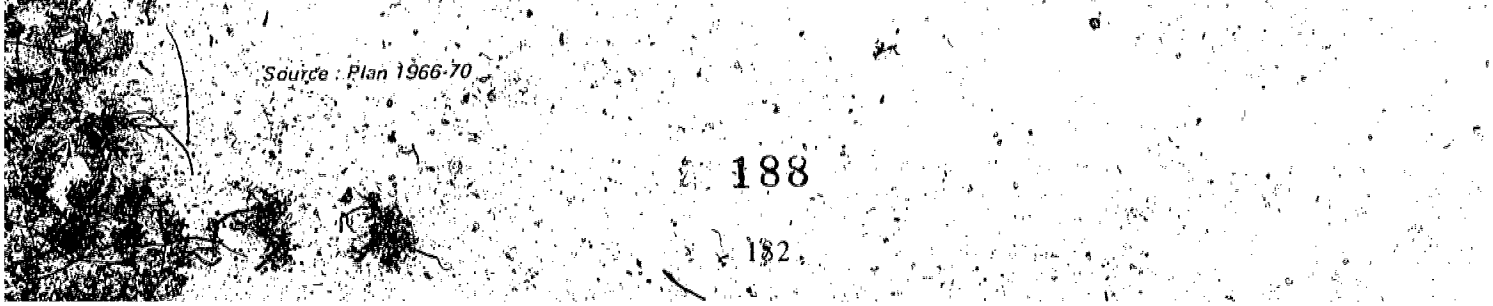


Source : Statistical Yearbook 1967-68

* numbers not available

** approximately

Source : Statistical Yearbook 1967-68



Source : Plan 1966-70

ANNEX IV

EMPLOYEES RECORDED [illegible]

UPPER – SANGHA

ational ry	Total no. of employees	Centralafricans		Other Africans		Nationals of [illegible]		TOTALS	
		M	F	M	F	M	F	M	F
istrative Personnel	38	4				30	4	34	4
ers and technicians	31	5		1		21	4	27	4
isors and foremen	95	54		2		39		95	
ollar workers	382	346	1	27		7	2	380	3
workers	422	397		23		2		422	
ed workers	2809	2795	11	3				2798	11
ices	60	60						60	
ALS	3838	3661	12	56		99	10	3816	22

National Employment Office

ANNEX IV (Cont'd)

Occupational category	Total no. of employees	Central Africans		Other Africans		Nationals of other countries		TOTALS	
		M	F	M	F	H	F	M	F
Administrative Personnel	7					6	1	6	1
Managers and technicians	3					2	1	2	1
Supervisors and Foremen	4	1				3		4	
White-collar workers	320	203	1	4				317	1
Skilled workers	125	125						125	
Unskilled workers	494	494						494	
Apprentices	2	2						2	
TOTALS	955	825	1	4		11	2	952	3

Source : National Employment Office

CHAMBER OF AGRICULTURE
ANIMAL HUSBANDRY, WATER
AND FORESTS,
HUNTING AND TOURISM
P.O. Box 850 -- Tel. : 33-23
BANGUI

ANNEX V

CENTRAL AFRICAN REPUBLIC
Unity — Dignity — Work

PROGRAM FOR MIDDLE-LEVEL MANAGEMENT TRAINING

Agriculture

In the field of agriculture, our national chamber intends to pursue its efforts to create a framework of management for the rural communities. For this purpose, if funds permitted, the Chamber would send large numbers of young men, especially those who have not integrated into city life, for a period of agricultural training. The young men in question would be those who left school with no higher level of education than a CM 2 or a CEPE, who have not succeeded in finding work, and who daily swell the ranks of the unemployed. These young people, having finished their training, would work alongside their state trained colleagues, and in certain communities they would be appointed as agents of the Chamber of Agriculture, placed at the service of the Administration.

If funds permitted, these agents could be paid by the Chamber of Agriculture, which is represented in each province of the country.

Animal husbandry

The program proposed for agriculture could also be extended to the breeding field. The Chamber of Animal Husbandry would thus not be a fictitious institution, but would be capable of making its own contribution to the Breeding Service, which in any case does not have enough agents to cover the needs of the whole country.

Water, forests, hunting

The problem of regeneration of our forests must be seen from the long-term viewpoint. For this reason the Government is attempting to stimulate studies on the subject, and it is the duty of our population to realize the significance of this effort. Thus, it would be useful if the Chamber of Water, Forests and Hunting act in what could truly be called "cooperation" with the Administration by training supervisors for basic operations, who could then assist the Administration's agents in projects for reafforestation, game reserves and national parks.

The agents of the Chamber would not be officials or agents of the authorities. These prerogatives belong to agents of the Administration. The agents of the Chamber would be mandated representatives from the region concerned, and their role would be to explain to the inhabitants of the region the importance of reafforestation of a game reserve or of a national park.

Tourism

If the tourist industry is to thrive and grow, it must be understood by the populations in those areas where tourists are likely to visit. The Chamber of Tourism, therefore, considers that in each province a tourist office should be created in which the local mayors and their assistants, with the leading citizens and tradespeople, could meet to discuss such matters as the conservation of sites and building of trails leading to waterfalls and other places of interest to tourists.

If an awareness of tourism is instilled into the minds of the rural population, this could lead to spontaneous initiatives for building tourist villages in rural areas, where the visitor may find the rest he seeks "far from the madding crowd".

The Chamber of Tourism would like to appoint to each tourist office an agent specially trained for the job, to draw the attention of the general public to the great interest that this industry merits.

Obviously, these tourist offices should, once created, be linked to the Central African Tourist Office. The nature of this association would have to be defined by the Administration, in particular the Department of Tourism.

To sum up, we do not think that the program outlined here would duplicate that of the Administration, but would complement it.

Consequently, if finances were available, we would propose to appoint agents as follows :

Agriculture :

Ouham	2 agents per community for 22 communities
Ouham Pendé	2 agents per community for 23 communities
Ouaka	2 agents per community for 16 communities
Kémo-Gribingui	2 agents per community for 14 communities
Basse-Kotto	2 agents per community for 16 communities
M'Bomou	2 agents per community for 9 communities
Ombella-M'Poko	2 agents per community for 9 communities
Lobaye	2 agents per community for 14 communities
Nana-Mambéré	3 agents for the province
Bamingui-Bangoran	2 agents for the province
Haute-Kotto	3 agents for the province
Haute-Sangha	3 agents for the province

Animal Husbandry

Ouaka	3 agents
Nana-Mambéré	4 agents
Ouham-Pendé	2 agents
Vakaga	1 agent

Water, Forests, Hunting

Lobaye	2 agents per community for 4 communities
Basse-Kotto	2 agents per community for 5 communities
Vakaga	3 agents for the province
Kémo-Bamingui	5 agents for the 2 provinces

Tourism

Bamingui-Bangoran	3 agents
Vakaga	3 agents
Haute-Kotto	2 agents
M'Bomou/Haut M'Bomou	4 agents

The whole program, if suitably implemented, would constitute not so much a training program for management in the conventional sense, but a vocational training project for encouraging young people to return to the land.

Recapitulation

Agriculture	247 agents
Breeding	10 agents
Water, Forests, Hunting	18 agents
Tourism	12 agents
TOTAL	287 agents

Automobile mechanics shop - Rapid vocational training Center - Bangui

ANNEX VI

EXCERPT FROM THE REQUEST OF THE CHAMBER OF COMMERCE OF BANGUI (C.A.R.)

The Central African Republic at present has no **school for training middle-level managers in commerce.**

We are thus obliged to send those of our countrymen capable of benefiting from this type of training to a foreign country, with all the uncertainties that this implies with regard to their reintegration into the life of the country.

Commerce in Central Africa is carried on chiefly by big European firms, or else by Africans from other countries, Centralafricans being more agricultural than commercial.

In view of these problems, we have decided to create a commercial school for training middle level managers, not only by theoretical education but also by practical instruction.

The methods used will not aim solely at training persons with the idea of integrating them into the existing network of private enterprises, a policy which could lead, within a comparatively short time, given the number of students, to sending them straight from school into unemployment. The school will be for the training of future independant tradesmen or store managers.

After the normal cycle of studies and a period of practical training, the graduate students of the school would be working among technical or commercial assistants trained in France through the agency of the technical schools of the chambers of commerce in Paris and Marseilles, who would assist and advise them with regard to the choice, location and management of their future business.

Needless to say, our organization will supply financial aid to launch these Centralafrican businessmen.

The practical part of the training would be provided by creating a large department store, which would achieve two objectives:

1) the rational distribution of the country's own products, at present faced with numerous difficulties:

2) the practical training of our students, who, when they have finished their theoretical studies, would fill the posistion needed for the proper operation of the store (collecting goods for sale, transportation, sales, management, administration, direction, accounting, public relations, etc.)

The importance of this projeet and the motives which led us to devise it do not escape us, and the establishment of a practical program for its implementation requires a survey by a specialized organisation, to serve as a basis for the future commercial school and its department store, which would form one unit.

ANNEX A

C.A.R. TECHNICAL EDUCATION – 1967-1968.

Distribution of Teaching Personnel by Grade and Nationality

Lycée Technique in BANGUI

Grade	Centralafricans		French		Other Nationalities		Total	
	M	F	M	F	M	F	M	F
		–	3	2	–	–	3	2
Steno - Typist Teacher	–	–	1	1	–	–	1	1
Language Teacher	–	–	1	1	–	–	1	1
Mathematics Teacher	–	–	5	–	–	–	5	–
Letters Teacher	–	–	5	–	–	–	5	–
Nat. Sc. Teacher	–	–	–	1	–	–	–	1
Ind. Design Teacher	–	–	4	–	–	–	4	–
PTA - Masonry	–	–	4	–	–	–	4	–
PTA - Genl. Mechanics	2	–	2	–	–	–	4	–
PTA - Auto Mechanics	1	–	4	–	–	–	5	–
PTA - Electricity	–	–	5	–	–	–	5	–
Head of Works	–	–	1	–	–	–	1	–
PTA - Diesel	–	–	1	–	–	–	1	–
Phy. Educ. Instructor	1	–	1	–	–	–	2	–
PTA - Woodwork	1	–	1	–	–	–	2	–
Asst. Head of Works	–	–	1	–	–	–	1	–
Total	5	–	39	5	–	–	44	5

Craftsmanship Sections

Home Making Teacher	–	–	–	–	–	1	–	1
Asst. Technical Teacher PTA	–	–	–	2	–	–	–	2
Rural Technicians	–	–	–	1	–	–	–	1
General Education	–	–	–	5	–	–	–	5
Drawing Instructor	–	–	–	1	–	–	–	1
Teacher Trainees	10	1	–	–	–	–	10	1
Workers Instr.	–	2	–	–	–	–	–	2
C.E.G. Teacher	–	–	–	1	–	–	–	1
Monitors-Instruc	2						2	
Head PTA	6						6	
Total	18	3	–	10	–	1	18	14

Source : Statistical Yearbook 1967-68.

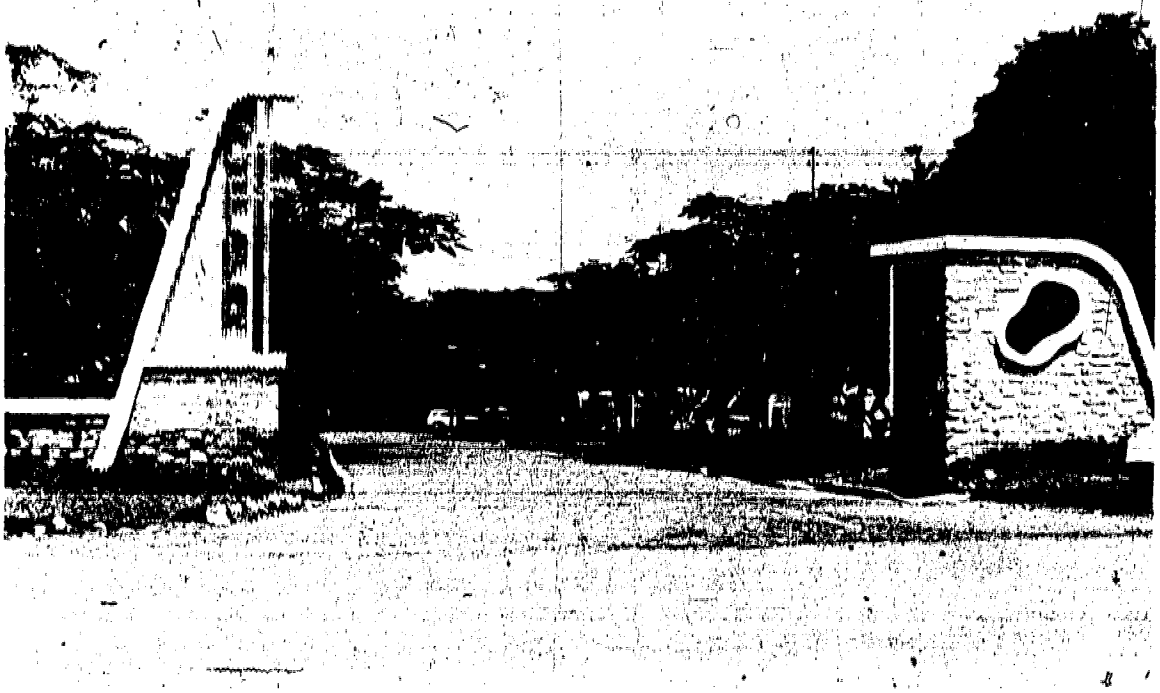
ANNEX B/2

C.A.R. EXAMINATION RESULTS - 1968

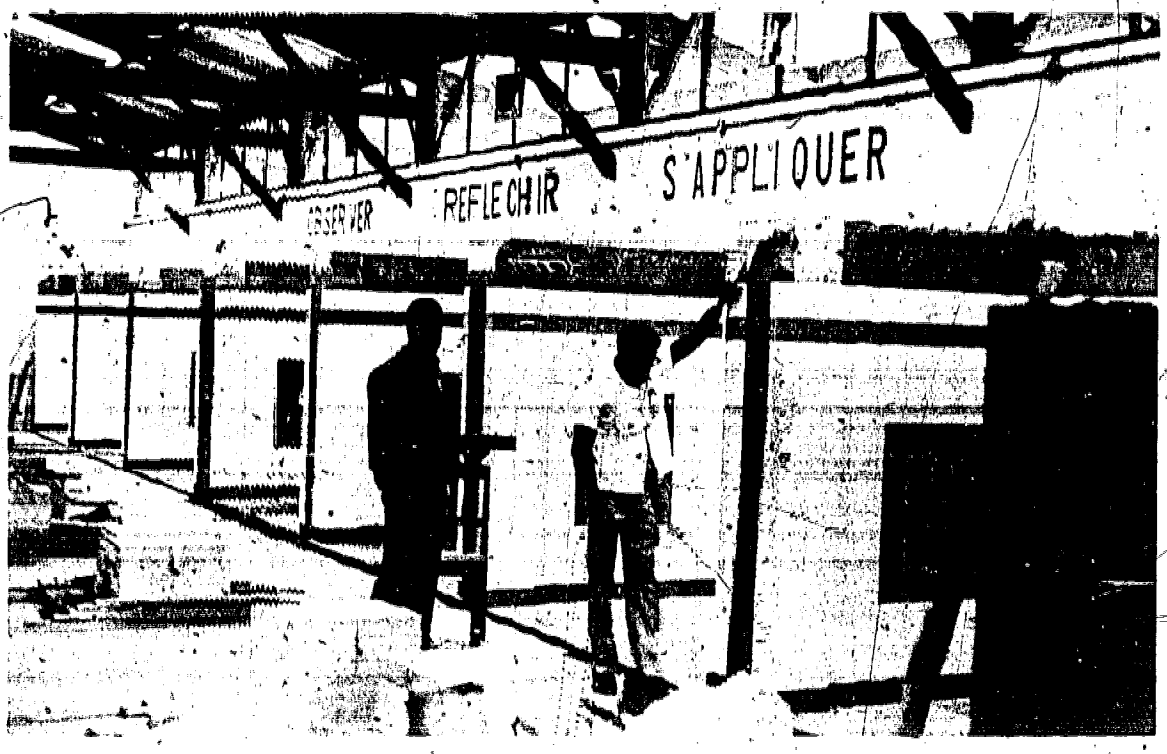
Certificat d'Aptitude Professionnelle Commercial (CAPC)

Trades	Institutions	Sex	Centralafricans			Europeans		
			Presented	Passed	%	Presented	Passed	%
Office Workers	Lycée Technique	B	15	6	40	2	2	100
		G	1	1	100	-	-	-
	Free Candidates	B	11	2	18,1	-	-	-
Asst.-Bookkeeper	Lycée Technique	B	13	4	30,7	-	-	-
	Free Candidates	B	9	-	-	1	-	-
		G	-	-	-	1	-	-
Bank Employees	Free Candidates	B	17	7	41,1	-	-	-
Steno-Typist	Lycée Technique	G	2	2	100	1	1	100
TOTAL		B	65	19	29,2	3	2	66,6
		G	3	3	100	2	1	50
Brevet d'Enseignement Industriel (BEI)								
Auto Mechanics	Lycée Technique	B	5	2	40	2	1	50
	Free Candidates	B				1	1	100
Electricity	Lycée Technique	B	4	1	25	1	-	-
Construction	Lycée Technique	B	6	2	33,3	1	1	100
TOTAL		B	15	5	33,3	5	3	60
Brevet d'Enseignement Commercial (BEC)								
Options	Institutions	Sex	Presented	Passed	%	Presented	Passed	%
Bookkeeping	Lycée Technique	B	10	3	30	-	-	-
		G	-	-	-	1	1	100
Secretarial Training	Lycée Technique	G	4	1	25	2	1	50
TOTAL		B	10	3	30	-	-	-
		G	4	1	25	3	2	66,6

Source: Statistical Yearbook 1967-1968



Entrance to the rapid vocational training Center - Bangui



Filework - Rapid vocational training Center - Bangui

REPUBLIC OF CHAD

I

INVENTORY OF FACILITIES FOR TECHNICAL EDUCATION AND VOCATIONAL TRAINING IN CHAD

A. Institutions and courses administered by the Ministry of National Education and Culture

A1 & A2. Institutions providing long-term (2nd cycle) and short-term (1st cycle or CAP diploma) technical education

a) Industrial Technical Lycée at Fort-Archambault, and the Technical Education School Annex.

b) Commercial Technical Lycée at Fort-Lamy.

A3. Para-industrial and handicrafts training

— Nine apprenticeship centers throughout the country.

— P.M.: the Arts & Crafts Training Center at Fort-Archambault.

A4. Training for women (homemaking and dressmaking)

2. Six advanced training centers for women, 2 of them at Fort-Lamy, 1 at Laï, 1 at Mongo, 1 at Doba and 1 at Koumra.

B. Institutions administered by the Ministry of Labor

B1. The Vocational and Advanced Training Center (CFPP)

C. Institutions administered by other ministries

C1. National Public Works School at Fort-Lamy, under the supervision of the Ministry of Public Works.

C2. National Telecommunications School at Fort-Archambault.

D. Vocational training provided by private enterprise

D1. Training centers of public or private companies with head offices outside Chad.

D2. Training provided by Chad companies in Chad.

E. Training provided within the framework of bilateral and multilateral foreign aid

E1. Training center for rural handicrafts at Fort-Archambault.

A. INSTITUTIONS AND COURSES ADMINISTERED BY THE MINISTRY OF EDUCATION

Introduction

The national education system

A Ministry of National Education and Culture, organized along French lines, was created in 1957. Its structure was reinforced in 1960, when Chad became independent.

It consists of the Minister, his technical advisors and his cabinet. The administrative part of the Ministry constitutes the general managing body for education.

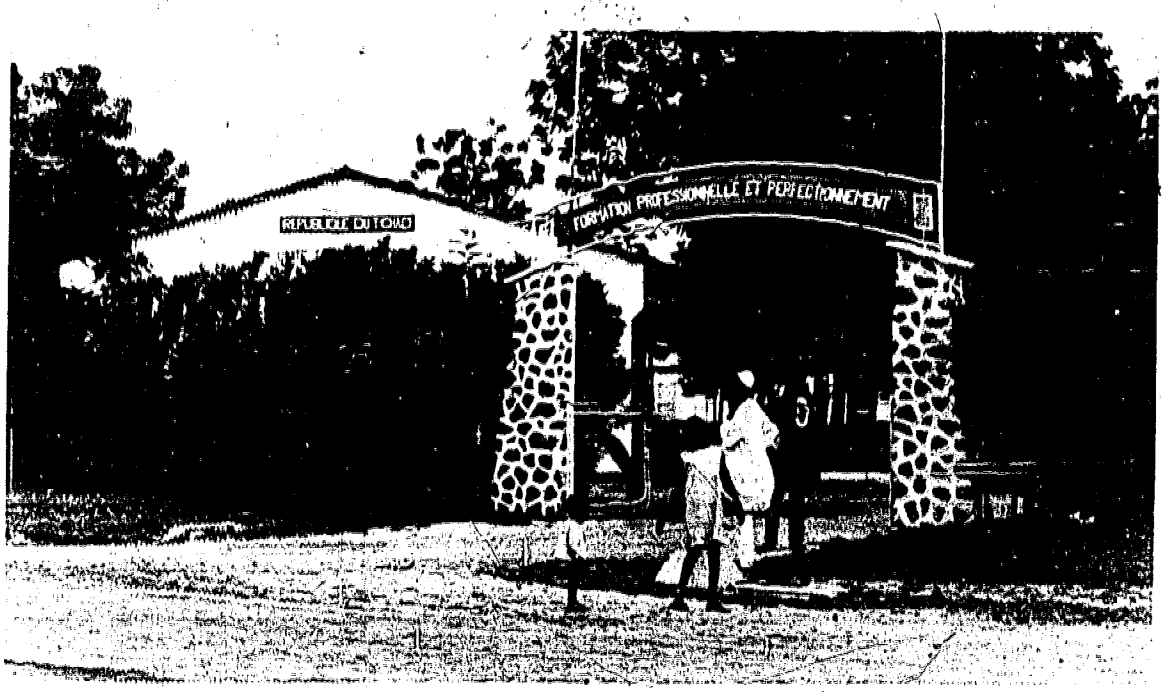
For the organization chart of the Ministry : Annex I.

The educational system comprises *primary education*, which has six grades (preliminary courses 1 and 2, elementary courses 1 and 2, middle-level courses 1 and 2) ; *secondary education*, consisting of the first cycle (from the sixth to the third grade) and the second cycle (second, first and final grades).

The general education centers (CEG) supply the first cycle of secondary education, while the general and technical Lycées cover both cycles (Annex II).

Private education is almost non-existent (see statistical summary below of education in Chad).

Public education is free; resident students are entitled to full board.



Vocational training Center - F.T. Lamy

EDUCATION IN CHAD - 1967-68

Statistical summary

Type of education	No. of institutions	No. of courses	Number of students			
			in Chad		in other countries	
			B	G	B	G
Pre-school education						
public	2	6	181	109	–	–
private	10	14	353	321	–	–
Primary education						
public	634	2 302	127 074	30 183	–	–
private	106	...	13 962	7 480		
Secondary education						
C.E.G. 1st cycle						
public	18	133	4 015	185		
private	2	6	132	45		
Lycées 1st cycle						
public	5	76	2 785	162		
private	2	8	136	126		
Lycées second cycle						
public	–	25	548	56		
private	–	2	30	2		
Normal education						
public	4	25	617	49		
private	–	–	–	–		
Technical education						
Public C.E.T.		11	229	9		
Public Lycées	2	4	65	2		
Specialized education	7	–	418	4	233	7
Higher education	–	–	–	–	121	–
Pre-school education	12	20	534	430		
Primary education	740	–	141 036	37 663		
Secondary genl. education	27	250	7 646	576		
Normal education	4	25	617	49		
Technical & specialized education	7	–	712	15	233	7
Higher education	–	–	–	–	121	–

Source : Statistical yearbook 1967-68

A.1. & A.2. Institutions providing long-term (2nd cycle) and short-term (1st cycle and CAP) Technical Education

a) The Industrial Technical Lycée at Fort-Archambault

This was created in 1966 by merging the former Technical School at Fort-Lamy and the Technical Lycée at Fort-Archambault. More accurately, the former Technical Lycée was a kind of CEG, going from the 6th to the 2nd grades, which also provided somewhat limited training for fitters followed by a course for automobile mechanics.

The present Industrial Technical Lycée provides technical training at two levels:

— at the first level, recruitment takes place by examination among students completing the 5th grades of the Lycées and CEGs. After three years' study, they take the CAP diploma in the following subjects:

general mechanics, electrical installations, automobile mechanics maonry, carpentry-cabinet-making.

The training is thus for skilled workers.

— at the second level, the students are recruited after the 3rd grade of the Lycées and CEGs up to the technician baccalauréat. There is no preparation for the baccalauréat E, former choice of "mathematics and technology".

All the programs and the examinations for diplomas, etc., are based on the French system. All the students are resident, and almost all are Chad nationals.

The number of hours of instruction varies according to the courses; between 36 and 39 hours per week, although the official regulations fix the timetable at 30 hours per week.

ENROLLMENT IN 1968-1969

	No. of courses	No. of students
Short-term training		
1st yr CAP	1	38
2nd yr CAP	1	29
3rd yr CAP	1	30
Long-term training		
2nd T.T.	1	11
1st T.T.	1	5
Final T.T.	1	4

A basic reform of technical education is in the process of taking place. A joint mission from UNESCO and the French Secretariat of State for Cooperation, working within the UNESCO/World Bank program, has drawn up reports which bear directly on this problem.

b) Commercial Technical Lycée at Fort-Lamy

This institution provides training at two different levels:

at the first level, recruitment is by competitive examination among students completing the 5th grade in the country's Lycées and CEGs. After three years' study they take the CAP diploma in one of the 3 occupations: office employee, assistant bookkeeper, and stenographer-typist.

at the second level, recruitment is from the students of the Lycées and CEGs, after the 3rd grade and who want to study economics. After a first year of studies, called second A (B), they may opt either for the Baccalauréat «B» or for the Baccalauréat de Technicien (B.Tn) (Serie G1 and G 2). The total period of this second cycle, therefore, is 3 years, as for all the Baccalauréat.

ENROLLMENT IN 1969-1970

	No. of classes	No. of students
Short-term training		
1st year CAP	3	90
2nd year CAP	2	47
3rd year CAP	3	75
Long-term training		
Second	3	79
1st B	1	29
1st G1	1	20
1st G2	1	14
Final B	1	10
Final G1	1	24
Final G2	1	25

The equipment is minimal. Two classrooms are equipped with Japy typewriters. There are none of the various types of filing cabinets, nor modern equipment such as telephones, intercoms, switchboard, etc.

There is no doubt that students who have completed their courses are not thoroughly prepared to work effectively in an office.

A3. Para-industrial and handicraft training

Apprenticeship centers

These were originally pre-apprenticeship centers; Decree No. 1517/EN of May 26, 1952, gave them the title of apprenticeship centers. Several modifications have been made since, particularly the abolition of grants for apprentices. The reform of this system is under review.

Purpose:

The centers, nine in number, were created to provide training in manual work (rural workers and artisans) for adolescents who had finished their primary education without having obtained their CEP, or who were too old to compete in the examination for entry to the 6th grade.

The training is intended to give them the skills of a specialized manual worker, able to make simple objects and furniture and to do repairs and maintenance in a village. These centers enable a certain number of young men to settle in rural areas.

Subjects taught, length of training and qualification:

Carpentry is taught in all the centers, masonry in two, bookbinding in one.

The official length of the courses is 3 years. But this varies in practice from 2 to 3 years, depending on the center and the subject. The students receive a certificate of completed apprenticeship.

Program:

This comprises approximately:

15 hours of shop work per week,

15 hours per week devoted to general education, industrial draftsmanship and vocational technology.

ENROLLMENT FOR 1966-1967

(Data for 1967-1968 are not available)

Town	1st year	2nd year	3rd year	Total
1 ABECHE	13	8		21
2 BONGOR	*	*	*	*15
3 DOBA	3	9	10	22
4 FORT-LAMY	11			
5 KOUMRA	15	25		40
6 LARGEAU	*	*	*	19
7 MAO	16			16
8 MOUNDOU	10	9	5	24
9 PALA	20			20
TOTAL				199

* Not available

Source: [illegible]

Average enrollment per center: 18

Age of students: from 10 to 22 and above

DISTRIBUTION OF STUDENTS BY SUBJECT 1966/67

Town	Carpentry	Masonry	Bookbinding	Total
1 ABECHE	6	10	5	21
2 BONGOR	7	8		15
3 DOBA	22			22
4 FORT LAMY	11			11
5 KOUMRA	10			40
6 LARGEAU		19		19
7 MAO	16			16
8 MOUNDOU	24			24
9 PALA	20			20

Source: School Statistic 1966-1967 Fort Lamy

Teaching personnel

The centers employ 13 instructors. These instructors hold a CAP diploma, are highly qualified, devoted to their work, but without any training.

Ratio of students to teachers: 15.4 to 1.

Remark

The training presently provided in the apprenticeship centers is the subject of considerable discussion by the various Chadian authorities and by the expatriate experts. The question is being reviewed in the Ministry of National Education, and also in the National Education Planning Center. Recommendations for reform have been made by several experts, notably those of ORT and of the BIRD/UNESCO cooperation program.

A4: Advanced Training Centers for women

There are six of these, two of which were visited by the ORT experts at Fort-Lamy. The students are adult women who take courses in reading and writing, home economics and child care.

Attendance at these courses fluctuates to such an extent that it was difficult to obtain accurate enrollment (approximately 500). Their importance for this survey is secondary, although their function of enlightenment and modification of attitudes appears to be quite effective.

B. INSTITUTIONS ADMINISTERED BY THE MINISTRY OF LABOR

The Vocational and Advanced Training Center (CFPP)

Created in 1959, with the name «Center for Accelerated Vocational Training» (CFPR), this Center has expanded its activities since 1968, date of arrival of the present Director, Mr Simon.

The chief purposes of the Center are to provide accelerated training for certain trades, to retrain workers for new jobs, or to enable them to acquire a higher standard of skills.

The training given is exclusively for adults over the age of 18, who must hold the CEP diploma.

The training methods are based on those of the AFPA.

The number of students registered and graduated in recent years is given in the following table:

	1959/60	1960/61	1961/62	1962/63	1963/64	1964/65	TOTAL
Mechanics							
No. of students	12	12	14	15	10	Perf.	63
Graduates	7	6	9	10	10	–	42
Repeaters	5	5	3	4	0	–	17
Dropouts	0	1	2	1	0	–	4
Electricity							
No. of students			15	12	17	11	55
Graduates			3	7	0	4	14
Repeaters			7	5	13	7	32
Dropouts			5	0	4	0	9
Sheet-metal work							
No. of students		15	15	13	15	13	71
Graduates		5	5	8	12	6	36
Repeaters		6	4	1	3	7	21
Dropouts		4	6	4	0	0	14
Radio-electricity							
No. of students			25	18	20		63
Graduates			11	3	13		27
Repeaters			14	3	5		22
Dropouts			0	12	2		14
Total							
No. of students	12	27	69	58	62	24	252
Graduates	7	11	28	28	35	10	119
Repeaters	5	11	28	13	21	14	92
Dropouts	0	5	13	17	6	0	41
Success in entrance exam*	[illegible]	[illegible]	40%	68%	62%	42%	
Success in entrance examination	58%	41%	40%	48%	56%	42%	
Students passing							

	Passing entrance exam	Passing final exam
Mechanics	[illegible]	60.6
Electricity	30.5	25.4
Sheet-metal work	63	51.3
Radio-electricity	55.1	42.8
Total	50	47

Source: Vocational and Technical Training Center – from documents given to the ORT expert Mr. [illegible] in [illegible]

* *These figures were not able to be confirmed in June 19[illegible] by Mr. Simon, Director of the C.T.P.*

In 1968, 7 vocational training sections were started :

- Machine-tools : 10 trainees
- Sanitary installations : 16 trainees
- Assistant bookkeepers : 16 trainees
- Fitters : 20 trainees
- Masons : 21 trainees
- Stenographers-Typists : 24 trainees
- Secretaries : 22 trainees

Total : 129 trainees

Also started were :

- 2 advanced training and evening courses for commercial employees
- 2 introductory courses in auto-mechanics for students of the ENA.

The Chamber of Commerce provides a partial accelerated commercial training course from BEPC level in the following occupations :

- Stenographer-Typists
- Office employees
- Assistant bookkeepers

Close relationship exists between the Center and private enterprise, which may partly explain the high rate of continuance in the various occupations, as shown in the table below.

	Former students	Mechanics 1960-1964	Electricity 1962-1965	Sheet-metal work 1961-1965
1	Employed in their occupation	40	40	35
2	Retraining or repeating	10	10	25
3	Left their occupation	13	5	21
4	Total number of students trained	63	55	[illegible]
5	Average monthly earnings	14 876	12 798	14 312

Source : Report CEM-TT UNESCO

The CFPP, however, raises as many problems as it solves. The Chadian authorities have asked for the extension of the period of training. But the Center might then be «competing» with the existing technical education establishments. Some employers were not convinced of the effectiveness of accelerated training. In any case, in deciding the way in which this Center ought to be developed, it should be remembered that originally it was created to fill a gap. It could play an important role in providing advanced accelerated training for adults already employed and in short-term vocational training.

A study of the needs was made by Mr Simon (Director of the CFPP), and socio-professional advisor. The study is being applied in accordance with the consultative commission of vocational training and with the Commission of

Vocational Training of the Chamber of Commerce and Industry of Chad. When the 1970 budget was presented, the employers approved the utility and effectiveness of the C.F.P.P.

C. INSTITUTIONS ADMINISTERED BY OTHER MINISTRIES

C.1. National Public Works School at Fort-Lamy

This School was created by the law of January 15, 1965, and placed under the the supervision of the Ministry of Public Works. In September 1966, it received its new title, the old one being the National School of Technical Assistants. The students are recruited exclusively by competitive examination amongst holders of the BEPC diploma.

Created to meet a regional demand for civil engineering technicians, the School gives 4-years training for technicians in the public sector, in the following subjects :

- topography (surveying)
- public works - construction
- public works - rural engineering.

The College does not train technicians for the private sector, but its statutes authorize private employers to employ its graduates on condition that they reimburse the costs of training.

The first 2 years are common to all the courses, and cover general studies.

In the third year, there is a choice between public works and topography

In the 4th year, there is a further choice in the public works section, between construction and rural engineering.

1. TREND OF ENROLLMENT

	1st year		2nd year		3rd year		4th year		Graduated	
School year	C	F	C	F	C	F	C	F	C	F
1964-65	24	6								
1965-66	23	7	22							
1966-67	13	6	11	7	8	1				
1967-68	19	6	9	7	6	8	8	[illegible]		
1968-69	16	8		7	[illegible]	[illegible]	6	9	7	1
1969-70	17	11		9	14	7	3	4	5	8

Topography mainly from the [illegible]

The value of the equipment, at the time of procurement, was about 12 million CFA francs. It is well adapted to the needs of the School, but a few additional items are still required.

Practical work in the laboratories and in the field constitute an essential part of the programs. The means and methods used are such as to train good technicians in the various trades taught.

The full-time staff of the School are supplied by the French Fund for Aid and Cooperation (FAC). There is a director, an assistant director and a number of technical assistants.

The 25 part-time staff members come mainly from the various branches of the public sector (public works, rural engineering, land survey, justice, lycée). The employment of part-time staff has the advantage of permitting a type of training which is close to actual working conditions, since the students already have a contract with their future employers.

According to the School representative, the number of technicians that Chad can absorb in the trades taught is roughly between 20 and 35. If it is assumed that the employment capacity in Niger and in the Central African Republic (both of them are interested) is of the same order, then the total requirement might be assessed at about a hundred technicians. These needs should be met in 8 to 10 years. Amongst the graduates of the first graduating class, 2 Chadians were admitted as student-engineers at the National Institute of Construction and Public Works, and from the second graduating class, 2 Chadian and Central Africans were admitted to the National Superior School of Public Works.

C.2. The National Telecommunications School at Fort-Archambault

Opened in 1963, the School changed its status in 1967 and became a public institution, governed by a Board of Directors composed of the Director of the Postal Services and representatives of the Ministries of the Plan, of National Education and Culture, of Finance, and of National Defense.

The School trains technical specialists in telecommunications and, as demand in the private sector is slight in this field, the problem of training of technicians in this sector has not arisen. This School actually specializes in training radio operators.

The courses last 3 years. At the end, the students receive the diploma of the School and are integrated into the postal and telecommunications services with the rank of supervisors of postal and telegraph services. Students are admitted on the basis of a competitive examination, and must have the BEPC diploma.

TREND OF ENROLLMENT

School year	Numbers of Students 1st year	2nd year	3rd year	Diplomas obtained
1963-64	14			
1964-65	10	14		
1965-66	8	10	14	13
1966-67	10	8	10	9
1967-68	9*	10**	9***	9

* of which 4 foreigners ** of which 2 foreigners *** all foreigners

As can be seen, this school is already regional in character.

The teaching staff is composed of 2 experts from the International Telecommunications Union (ITU), whose services are supplied within the framework of UNDP. Appointments as assistant instructors are held by former students of the school.

The buildings, which are old, have been adequately renovated. Their capacity is 45 students, in full-time residence. The equipment is comprehensive and of good quality.

The training is such that drop-outs during the courses and failures in the final examinations are almost non-existent. These results are remarkable. There follows an excerpt from the UNESCO report, (EFM/13), which sets forth the primary reasons which explain the success of the School:

> « The close relationships which exist between students and teachers, thanks to which they receive instruction and counselling adapted to their individual needs.
>
> The fact that the teachers are not obliged to observe weekly timetables of fixed classes, which means that they are available to the students at any time that they may be needed.
>
> The flexibility of the curricula, which allows the students the time that they themselves need in order to understand the matter studied.
>
> The use of teaching methods which call more for intelligence than memory.
>
> The considerable amount of time given to shop work, which avoids an artificial distinction being made between manual and intellectual application.
>
> The confidence placed in the students and the corresponding responsibilities given to them, as witnessed by the fact that they have unsupervised access to laboratories containing expensive equipment.

Personal qualities indispensable to technicians who will, in their future occupations, be called on to work admost or entirely without supervision, and on their own initiative are developed in this way».

D. VOCATIONAL TRAINING PROVIDED BY PRIVATE ENTERPRISE

Either because of the shortage of skilled employees, owing to the absence of technical training in the trades required by the employers, or because the employers are barred from engaging persons with certain kinds of training (as already noted), several companies have decided to provide training or advanced courses for their own employees.

Considerable changes have taken place in recent years, in particular the disappearance of certain courses. The situation at the time of the survey, as far as could be ascertained, was as follows:

DI. Training centers run by public or private companies with head offices outside Chad

a) UAT - Air Afrique

The training of commercial and administrative employees is carried out at Abidjan in a course lasting approximately 5 to 6 weeks. General and specialized training is given to all Chadian students recruited, on an unlimited basis, but obviously on condition that their abilities have been tested by the employer and by the Psycho-Technical Institute.

The training of management personnel - (a training period for the commercial and administrative employees of Air Afrique) takes place in Paris (Le Bourget). The general training is mainly psychological, while the technical training specializes in: traffic, counter work, and accounting. The course lasts about two weeks, full time, and the number of students depends, naturally, on the number qualifying at Abidjan.

b) SHELL

These are training courses lasting for 8 days to 3 months, depending on the subject and the needs of the company. They are given at Brazzaville.

c) MAFRAMI (Brossette and Valor Company)

At the request of the Chadian Company, employees at a level equal to that of the BEPC diploma take a 4-month training course at the «Maison de l'Amitié Franco-Africaine et Malgache» at Lentilly (Rhône), France.

d) The S.C.O.A. at Fort-Lamy

Like all the establishments of this company, the S.C.O.A. in Chad attempted to use the school which the UCCNOA organized at Cotonou. Chadians were sent there, but only one completed the course.

D2. Training provided by Chadian Companies in Chad

a) The Chadian Water and Electricity Company (STEE)

The ORT team was not able to visit this center, and the information below was taken from the report of an earlier mission.

The company employs 160 workers, of whom about 60 are technicians and skilled workers.

For the past 3 years it has a center at Fort Lamy for vocational training and advanced training courses, which is a miniature of the school at Gurcy-le-Châtel, in France.

The purposes of this center are:

training of network electricians
training of shift leaders
training of power station supervisors.

The chief problem facing the management is that about half the employees are not only illiterate but do not speak any French. Even those with a higher standard of education cannot be sent directly to Gurcy-le-Châtel. There is thus a clear requirement to combine technical literacy with an increase in vocational knowledge.

The courses comprise:

6 months' technical introduction
on-the-job training for electrical installation technicians in a year or 18 months;
specialized training (electricians, mechanics, etc.), a period that had not yet been begun in 1968.

For the moment, only the Fort Lamy Center has these courses, which will later be extended to other electrified areas: Abéché, Moundou and Fort-Archambault.

Almost 40 technicians are following these courses.

b) COTONFRAN

This company groups 22 plants and 2 repair shops and other establishments.

The training of administrative employees and purchasing agents for COTONFRAN has been undertaken at Fort-Archambault with students at the BEPC level, after psycho-technical tests. The period of training is 3 months of theory plus an on-the-job training period from June 15 to September 15. COTONFRAN has printed its own technical courses, and instruction is based on these manuals. The company admits to each training course, a number of trainees in response to felt needs. There is still great difficulty in recruiting young men for the bush services.

Because of the urgent need to give advanced training to existing employees and because of the lack of recruitment by schools or training centers, a vocational training section was created at Bongor. Its purpose is to provide advanced training courses for those already employed and to train new employees. Recruitment for new students is done at the age of 15. Training lasts from 3 to 4 years according to the trade studied:

general mechanics with welding and automobile mechanics, all of which is adapted to the needs of factories and workshops.

12 students are presently in the section at Bongor.

c) **NSCKN (New Commercial Company of Kouilou-Niari)**

This company no longer provides any training. After having spent 10 million CFA francs in 2 years for training employees, Mr Maillard, the director, abandoned the commercial training, as only one trained employee remained, all the others having succeeded in getting jobs in administration. The ORT experts met with Mr Maillard, who is also President of UNITCHAD (the employers' association), and Economic and Social Advisor to the Chad Government; and he explained why he had abandoned the training project. On the other hand, he was encouraging about the training provided by the Chamber of Commerce, though making it clear that he regarded the accelerated vocational training as inadequate.

d) ***Banking Technical Training Center at Fort-Lamy***

Counterpart of the Paris Center, it provides training at 2 levels :

— Preparation for CAP diploma for bank employees ; an evening course lasting 3 years, 6 hours per week ;

Preparation for Brevet Professionnel d'Employé de Banque (second degree training), by correspondence.

Method of recruitment: volunteer employees capable of following the training and recommended by their employer.

The costs of this training are borne entirely by the banks, including the payment of overtime wages to the employees. Despite this, attendance is poor and results are disappointing. Three teachers are in charge of this training, and at the moment an effort is being made to adapt the program to African requirements.

Numbers :	1st year CAP	21
	2nd year CAP	10
	3rd year CAP	26

Examination results : 6 candidates, only 3 passed.

For the Brevet Professionnel, 6 students registered, only 4 of whom are following the correspondence course regularly. There is no organized examination as yet.

It is apparent from the above table that the capacity of 30 students per class is not yet fully utilized. The proportion of drop-outs is high. The results obtained in the first years demonstrate the deficiency in general education received by students before their admission.

The School is in a new, modern and well-constructed building, which has a two-story administrative wing (offices of director, deputy director, secretariat, records, students' library, geology and topography sections), with a floor surface of 372 sq.meters, and a three-story wing containing classrooms and laboratories, with a floor area of 1009 sq. meters. In addition to six classrooms, this second wing houses a hydraulics laboratory, and a chemistry and physics laboratory.

E. TRAINING PROVIDED WITHIN THE FRAMEWORK OF BILATERAL AND MULTILATERAL FOREIGN AID

E1. Training center for rual handicrafts at Fort-Archambault

The decision to establish this center was made in 1962, and it was opened in May 1963, with financial aid and the help of one expert from ILO.

Purpose: to train rural mechanics (cartwrights, blacksmiths), who could then know how fo carry out simple work with wood and iron, in order to meet the demand for repairs and maintenance of animal-drawn farm equipment. The zone of influence of this center extends over the whole of the cotton-growing region (5 provinces in the south of Chad), where mechanized agricultural utilization is developing rapidly.

Origin of students: in collaboration with the village authorities, students are drawn from among young farmers of 20 to 30 years of age in areas under going modernization. These young men have promised to return to their villages after training.

Type and duration of courses: Training lasts for 9 months and is divided into two parts:

- 6 months in the workshop (FPA method). The practical training is supplemented by training in arithmetic, so that the artisan is able to keep his accounts and ensure proper commercial management;
- 3 months in the field, where the students are taken by a workshop truck. These trucks stop in villages where the students come from and carry out work at the request of the local population.
- During their training, students receive free accommodation and food but no salary nor indemnity.

Number of trainees and results were as follows:

Up to 1968, 37 artisans were trained, of whom 34 are back in their villages carrying on their trade.

Precautions taken for resettling the artisans in the village

a) A study of figures has been made, with reference, on the one hand, to the minimum amount of equipment (ploughs, carts, yokes, bicycles, domestic furniture) to be made or repaired each year, and, on the other hand, to the level of income in cotton necessary to enable a village population to support a rural craftsman.

b) The Development Bank provides each trainee leaving the center with an establishment loan of 100,000 CFA francs, at 4 per cent interest, repayable in 3 years. In fact, these loans are frequently not reimbursed, the craftsmen tending to overlook this question.

Other activities of the Center:

In addition to the training described above, the Center has provided training for 12 trainees, either as rural handicrafts monitors, or as workshop monitors. The results are not very satisfactory.

Further development of this system:

A second, identical Center has been opened at Pala, in the south-west of the country.

II

EMPLOYMENT SITUATION AND TRAINING NEEDS

A. EMPLOYMENT SITUATION

1. In 1962, the active population was estimated at 1,400,000 persons, divided as follows:

527,000 farmers
444,000 settled cattle-breeders
300,000 nomadic cattle-breeders
64,000 artisans and traders
45,000 wage-earners.

2. In 1958, a survey made by an inspector from the Ministry of Labor gave a total of 29,246 wage-earners, broken down as follows:

approximately 17,000 unskilled laborers (3,000 of them on farms)
8,921 white-collar workers
5,488 blue-collar workers
495 technicians and managers.

3. A census of the industrial enterprises existing in 1966 (power, construction and water companies) was carried out under the "UDEAC" program.

In the *modern sector* the numbers of permanent employees appear to have developed as follows:

1960	2,993	1963	4,153
1961	3,329	1964	3,938
1962	3,459	1965	4,439
		1966	4,247

4. In 1965, a survey was made by Madame S. Bousquet, with the object of supplying basic information to provide the base for manpower and training planning. The following data were obtained:

structure of the labor force (Chadians and foreigners):
by sector of activity,
by level of qualification,
by trade;
previous employment trends;
foreseeable trends (new requirements for skilled workers);
training facilities currently in use or envisaged in the near future.

The survey was also intended to propose a scale of needs with regard to training and advanced training, with as objective the "Chadization" and the development of certain sectors of activity.

The summary results of the study indicate :

Sectors	Percentage of replies	Numbers employed 1963	1964	1965
1. Services (hotels, cinemas, etc.)	(80%)	264	317	310
2. Liberal professions (banking, insurance, medicine)	(70%)	223	245	250
3. Transportation	(90%)	903	937	935
4. Construction and Public Works	(75%)	1 721	1 222	929
5. Industry	(90%)	2 348	2 240	2 137
6. Commerce	(75%)	1 333	1 444	1 386
		6 792	6 404	5 647

This would indicate the following weighted balance for 1965 :

1.	Services	388	
2.	Liberal professions	357	
3.	Transportation	1,040	4,655
4.	Construction and Public Works	1,240	for the industrial
5.	Industry	2,375	sector, extrapolated
6.	Commerce	7,248	

The table for jobs in the industrial sector broken down by occupational level for the year 1965 is :

Laborers and specialized laborers	2,009
Assistant manual workers	712
Semi-skilled workers, Grades 1, 2 and 3	1,416
Skilled workers 1 & 2, highly skilled workers	83
Heads of workshops, team leaders	98
Technicians	77
Management	43
TOTAL	4,438

It can be seen that the total is close to that of 4,655 permanent wage-earners in the industrial sector, and, especially, to the total of 4,439 given by the UDEAC survey for the same year. It may thus be assumed that there are some 4,500 wage-earners in the modern industrial sector.

5. Inquiry by the Ministry of Labor in September 1966

Numbers of employees by sector:

Sectors	Total	Skilled	Unskilled
Commerce	1 014	514	500
Misc. industries	827	457	370
Construction and Public Works	2 229	1 029	1 200
Transportation	460	160	300
Agriculture	5 212	1 712	3 500
Food industries	388	88	300
Hotel industry	212	182	30
Mining and quarrying	115	45	70
Banks and insurance	166	90	76
Public and industrial services	1 740	890	850
Totals	12 363	5 167	7 196

6. The number of employees, as supplied by the Family Allowance Fund, is given as 11,000.

In conclusion, it can be said that, apart from Madame Bousquet's survey, which remains the only document, constituting a scientific study (but containing certain weaknesses, which will be referred to later), it is possible only to guess at the true number of employees according to distribution by occupations and, within each occupation, by hierarchic level.

It should be noted that, of the 45,000 persons employed in on-agricultural activities, 29,000 are employees, 9,630 of them in the administrative services (according to the Budget figures for 1968). The labor force employed in the modern sector of the economy, at the end of 1967, was 14,500 (figures from the Employment Office). The other employees are engaged on a seasonal basis.

Distribution of employees
by main sectors of economic activity

Sector of economic activity	1961		1967	
	No. of employees	%	No. of employees	%
Agriculture	2 809	22	4 504	31
Industry	1 238	10	1 906	13
Construction	1 530	12	1 371	9,5
Transportation	1 050	8,3	953	6,5
Commerce	2 556	21	1 710	12
Services	3 375	26,7	4 086	28
TOTAL	12 558	100,0	14 530	100,0

Source : Employment Office Annual Reports, 1965, 1967, Republic of Chad.

Remarks :

The labor force in Chad includes a large number of foreigners :

Origin of workers employed in the modern sector

More significant is the fact that the ratio of foreign workers is "directly proportional" to their level of qualifications, as shown by the following table:

	1966	1967	
Foreigners	2 237	1 880	
Chadians	12 635	12 650	
TOTAL	14 872	14 530	

Source : information supplied by the Employment Office, Ministry of Labor.

OCCUPATIONAL LEVEL

				en % of total		
	Chadians	Foreigners	Total	Chadians	Foreigners	Total
Directors and senior managers	40	317	357	11	89	100
Middle-level managers	115	257	372	31	69	100
Office employees	1 939	617	2 556	74	26	100
Skilled workers	984	157	1 141	86	14	100
Unskilled workers	9 552	532	10 084	95	5	100
TOTAL	12 650	1 880	14 530	88	12	100

Source : According to information supplied by the Employment Office, Ministry of Labor.

B. Requirements in technical workers

The Bousquet survey was used as the basis for estimating the training requirements for the five years of the 1966-1970 Plan for the Republic of Chad. The survey clearly shows the most urgent needs in training and advanced training courses, as follows :

1) Skilled and semi-skilled personnel :

a) Tertiary sector

- Typists
- Shipping and Customs clerks
- Bookkeepers
- Secretaries
- Store managers and sales staff

b) Manual and technical work

- Mechanics (general mechanics, auto mechanics)
- Sheet-metal workers/welders
- Bodywork technicians
- Diesel mechanics
- Refrigeration technicians
- Electricians
- Hotel staff
- Auto fitters/Repair technicians
- Plumbing fitters
- Carpenters/Cabinet makers
- Stonemasons
- Rodsman

Parallel to each of these training sections, an advanced training section should be envisaged.

In Section III of the Five-Year Plan, the requirements set down for the period 1966-1970 (by training level initially needed) are as follows:

Occupation level	Requirements given
CAP industrial	850
BEI	120
CAP commercial	350
Brevet commercial	200

The annual goals established by the Plan, from 1969, are:

95 CAP industrials (auto mechanics, general mechanics, electricity, masonry, carpentry)

27 BEI (auto mechanics, general mechanics, industrial draftsmanship, electro-mechanics)

45 CAP commercial (office employees, assistant bookkeepers)

30 BEC or BSEC (bookkeeping, secretarial work)

It is extremely doubtful that these goals will be attained during this period.

Following is an excerpt from a pertinent official source:

«If the needs of the Plan are to be met solely in respect of technical industrial training, the number of recruits in 1969 and 1970 would have to be 164 at the Technical Lycée level and 478 at the technical school level. Such an increase in enrollment is neither possible nor desirable. It is impossible because of the inadequate reception facilities and rudimentary equipment of the Industrial Technical Lycée at Fort-Archambault and undesirable because of the difficulties of finding employment after training".

Table — Training and employment of students with industrial technical training

TRADES	1966				1967			
	N	T	D	P	N	T	D	P
General mechanics	50	0	50	—	45	0	45	—
Auto mechanics	20	2	18	—	30	6	24	
Masons	10	2	8	2	10	5	5	5
Carpenters	10	0	10	—	15	0	15	—
Electricians	12	2	10	2	15	1	14	1
Totals	102	6	96	5	115	12	103	7

N Needs
T Trained students (with diploma)
D Theoretical deficit
P Students employed

The table below shows the requirements formulated by the Plan, the numbers of students trained at the Technical Lycée in 1966 and 1967, the theoretical deficit in relation to the stated needs and, finally, the number of students employed at the end of their training period.

The rate of employment in relation to the number of students trained is 66.6 per cent, but the rate of employment in relation to the stated needs would be only about 5.6 per cent.

The explanation of this discrepancy lies in over-estimation of the needs. Apparently, the analyst of the labor market took as vacancies those posts allotted to employees trained on-the-job and who had not reached the level of training initially required. In fact, these theoretical jobs have never come on to the labor market.

C. Contacts with employers

It should therefore be borne in mind that the figures for the goals not only exaggerate the potential absorption capacity of the labor market, but are incapable of achievement for financial reasons. In 1966-67, not one technician's diploma was awarded. According to Mr Rossignol (report of mission to Chad, May 30-June 10, 1967), there were about 40 jobs for technicians and 80 for skilled workers still to be filled.

Persons contacted :

Mr Maillard, General Director of the NSCKN, President of UNITCHAD
Mr Dejoux, Director of the Chamber of Commerce
Mr Pradel, Director of the BIAO (bank)
Mr Simon, Director of the CFPP
Mr Abtour, Director of the Hotel "La Tchadienne"
The ORT expert on a previous mission met with :
Mr Wintenberger, Director of Colas Routiere
Mr Guerini, Director of SETUBA.

The employers stressed the shortage of electricians, refrigeration technicians fitters, turners and diesel mechanics in particular. Most operating firms are very small and in view of the narrowness of the market, this leads to the following paradoxical situation : a few firms operating in several fields — yet specialization is not desirable in a small company.

III

CONCLUSIONS AND RECOMMENDATIONS

R1. In the second part, "Employment situation and training needs", it can be seen to what extent this area is subject to estimates, approximations and errors.

A scientific survey is necessary, carried out by a team comprising technicians and training staff. During the Bangui conference, ORT learned that this survey had already been undertaken. Those responsible for this effort should be encouraged, since these basic data are necessary for any proposal to reform technical education and vocational training.

R2. In the commercial sphere, a few existing large companies may suffice for the export and import trade of the country, but all of the internal commerce and distribution must be structured and developed. The first thing to be done would be to define the commercial networks and to train Chadians for internal trade. A study mission is recommended.

R3. As already mentioned, the reorganization and reshaping of the Technical and Industrial Lycée at Fort-Archambault has reached an advanced stage and its financing by the IBRD is almost certain. Readers are recommended to read the report of UNESCO mission EFM/13 of June 1968. Nevertheless, the Chad authorities are urged to reconsider this reform in the light of the regional projects which will result from the Bangui conference of October 1969.

R4. While the buildings of the Technical and Commercial Lycée at Fort-Lamy may be suitable, the training programs and the teaching methods are poorly adapted to the goal in view. There are a few equipment problems, but these are minor compared with the didactic and pedagogic problems of this school.

R5. A previous ORT report has already drawn attention to the usefulness of manual training in primary education. During the study mission, the ORT technicians were shown several projects relating to this subject (orientation courses from the 4th to the 6th grade, introduction of primary school teachers to educational manual and agricultural work). These initiatives should be encouraged. Only difficulties in obtaining financing hinder the effective introduction of this new system in the Republic of Chad.

R6. The apprenticeship centers should be reviewed and renovated, taking into account the following factors:

- the quality of candidates when recruited,
- new pedagogical methods,
- courses offered and prospects for employment.

R7. The regional character of the National School for Public Works should be intensified. This is not difficult, since the school's capacity easily permits the admission of students from other countries of central Africa.

R8. The creation of the "Commission Training and Employment" must be accelerated so that it can begin work without delay. The country needs this commission

in order to carry out the following recommendations:

1) to find as wide a basis as possible for training, in order to facilitate reorientation and to provide the different specialized workers required by a narrow labor market;

2) to decide, after studying the question, whether it would not be better to limit the number of trainees and to concentrate more on the quality of their training;

3) to develop the persons already employed at every level.

By assuming additional tasks such as analysis and job definition and by being allotted an annual budget, this committee would become a national office for vocational training (ONFP).

R9. **Tourism and the hotel industry**

The first Five-Year Plan, for 1966-1970, was unable to define the requirements in hotel staff. This is quite understandable, since the operating methods of the new chain of hotels were not defined at that time.

The Ministry of the Plan confirmed that the investments envisaged in the first Plan have in fact been made, with the exception of the hotel in the Douguia, region, which is still in the planning stage. But the problem of operating chains of hotels, now built or being built, remains untouched. While it may be possible that financing be found for the development of these tourist regions, there are still absolutely no plans for the systematic training of staff.

The problem of training hotel staff comprises both the training of new employees and the advanced training, if not the initial training, in many cases, of employees already engaged.

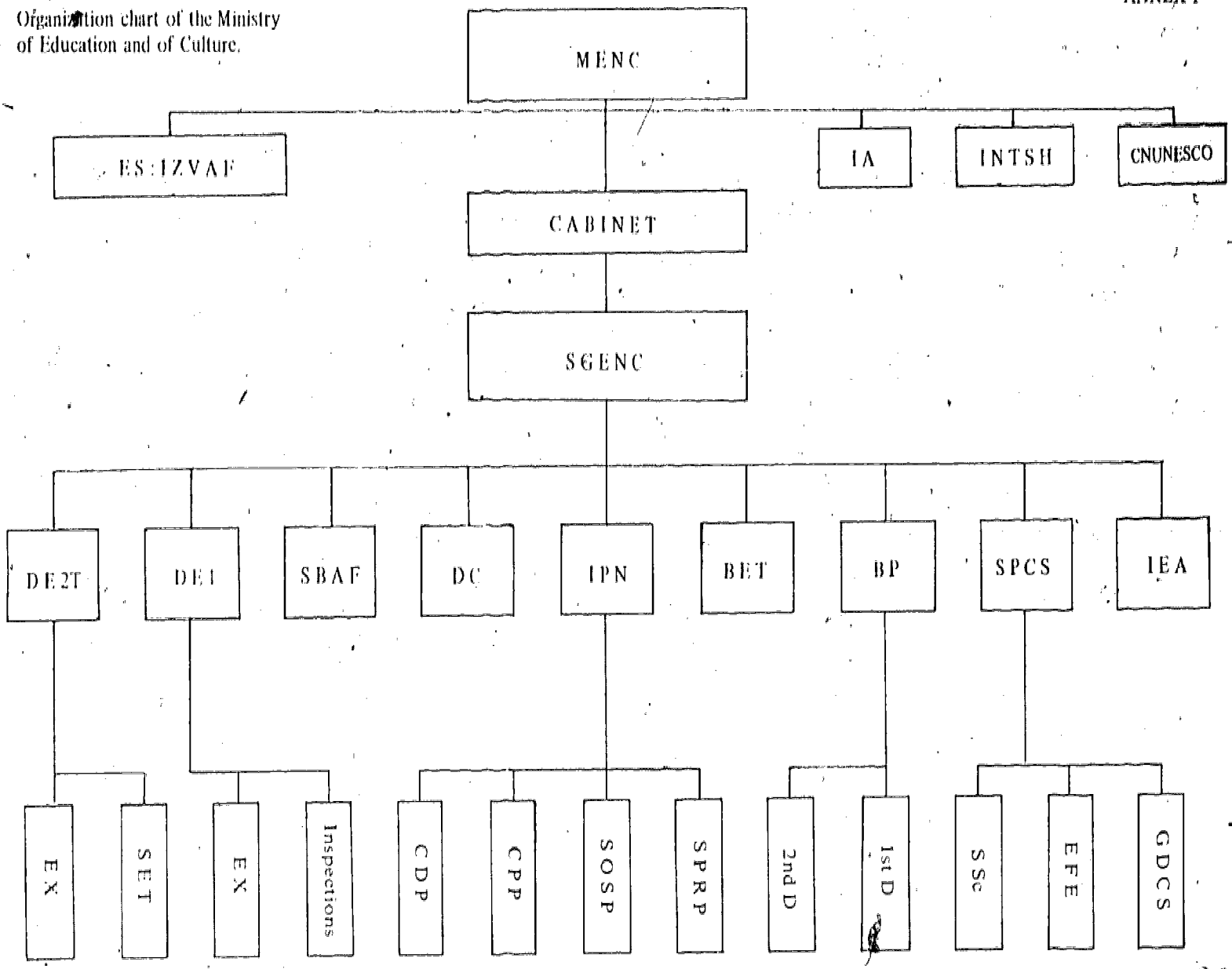
The director of the Hotel "La Tchadienne", Mr Abtour, is categorical: "up to now", he said, "nothing effective has been done with regard to hotel training". On-the-job training was tried with young men of CEP or Brevet level, but the results were not satisfactory because of the students' lack of general education.

Two-year training courses for holders of the BEPC at the Hotel School at Nice did not give satisfactory results. Moreover, such a course interests very few Chadians, since the holder of a BEPC has aspirations far above the possibilities of the hotel industry. Yet the hotels in Chad have 358 beds, 108 of them in "La Tchadienne".

The immediate needs are for 60 hotel employees (kitchen, restaurant and reception).

ANNEX I

Organization chart of the Ministry of Education and of Culture.



See key to abbreviations following page

ANNEX 1

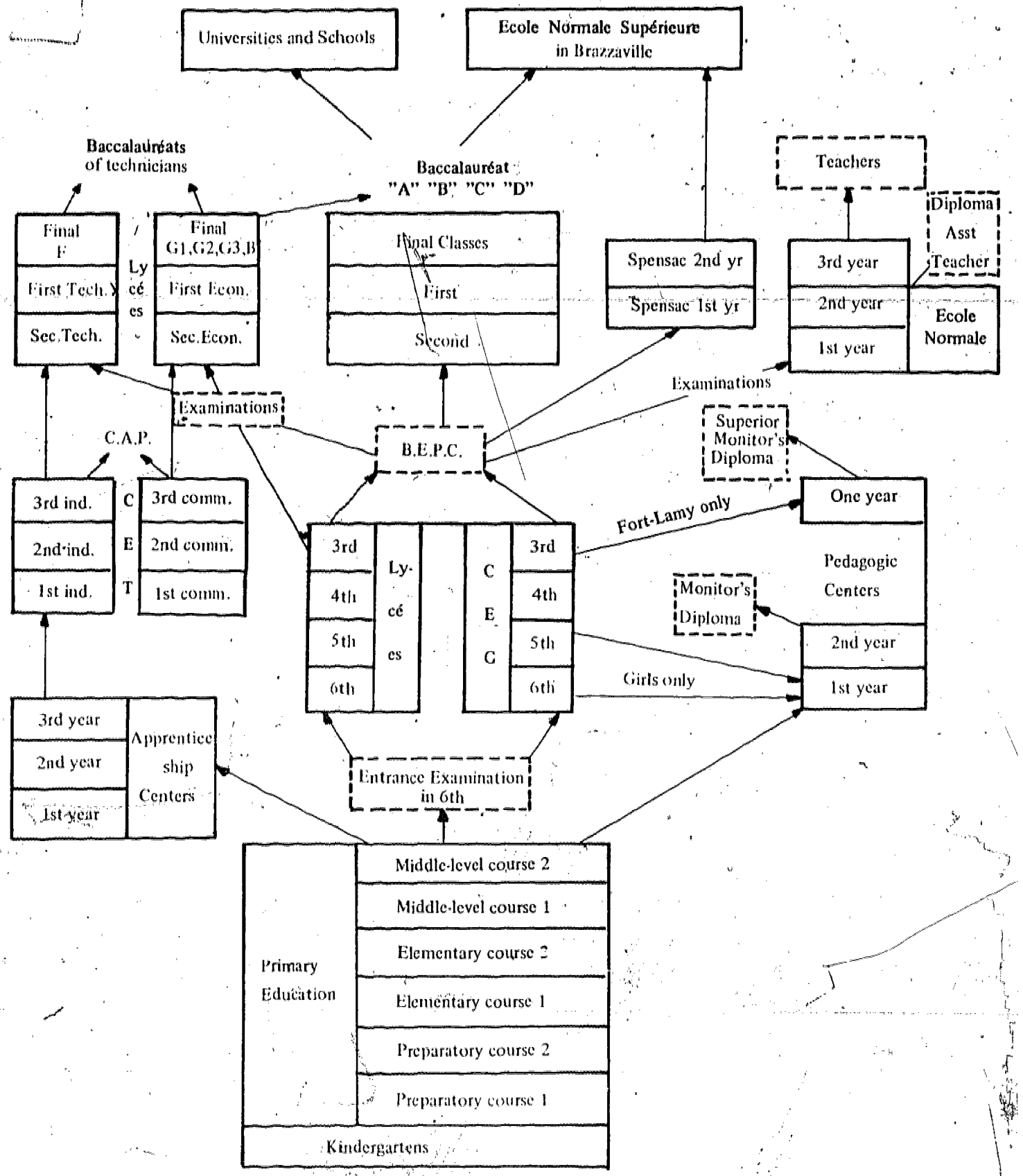
CHAD

ANNEX I — Organization of the Ministry of National and Education of Culture.

Key to abbreviations

MENC	: Ministère de l'Education Nationale et de la Culture
ES	: Enseignement supérieur
IZVAF	: Institut d'Enseignement Zootechnique et Vétérinaire d'Afrique Centrale
I.A.	: Inspection Académique
I.N.T.S.H.	: Institut National Tchadien des Sciences Humaines
CNUNESCO	: Commission National de l'UNESCO
SGENC	: Secrétariat Général de l'Education Nationale et de la Culture
D.E.2.T.	: Direction de l'Enseignement du Second Degré et de l'Enseignement Technique
D.E.I.	: Direction de l'Enseignement du Premier Degré
SBAF	: Service du budget et des affaires financières
DC	: Direction de la Culture
IPN	: Institut Pédagogique National
BET	: Bureau d'étude et des textes
BP	: Bureau du personnel
SPCS	: Service de la planification et de la carte scolaire
IEA	: Inspection de l'Enseignement de l'Arabe
EX	: Examens
SET	: Service de l'Enseignement Technique
CDP	: Centre de documentation pédagogique
CPP	: Centre de perfectionnement pédagogique
SOSP	: Service d'orientation scolaire et professsionnelle
SPRP	: Service des programmes et de la recherche pédagogique
1er D	: 1er degré
2ème D	: 2ème Degré
SSc	: Statistiques scolaires
EFE	: Etudes des financements de l'Education
GDCS	: Groupe de développement des constructions scolaires

ORGANIZATION CHART OF THE EDUCATION SYSTEM IN CHAD ANNEX II



* For the best students only.

Spensac : Section préparatoire à l'école normale Supérieure d'Afrique Centrale.

Source : Ministry of National Education and of Culture.

ANNEX A

PUBLIC TECHNICAL EDUCATION 1969

Distribution of Technical Education Personnel by Title and Nationality

Titles of Functions	Chadians		French		Total	
	M	W	M	W	M	W
Administrative Personnel						
Heads of Institutions			4		4	
Vice Principal			1		1	
Bursar	2				2	
General Supervisor	3				3	
Resident Supervisor	3				3	
Secretary				4		4
Total	8	—	5	4	13	4
Teaching Personnel						
Certified Teacher			3	2	3	2
Licenced Teacher			5	3	5	3
Teaching Head			1		1	
Secretarial Teacher				3		3
Bookkeeping Teacher			2		2	
General Education Teacher (CET)			2		2	
C.E.G. Teacher				3		3
School Directress				1		1
Teacher				2		2
Assistant Technical Teacher	8		4		12	
Theoretical Technical Education Teacher			1		1	
Engineer	1				1	
Worker Instructor	2				2	
Head of Contractual Work			1		1	
Drawing Teacher	1			1	1	1
Sculpture Teacher	1				1	
Physical Education Instructor	2				2	
Art Monitor	4				4	
Called from the Contingent			8		8	
General Total	21	—	23	9	44	9

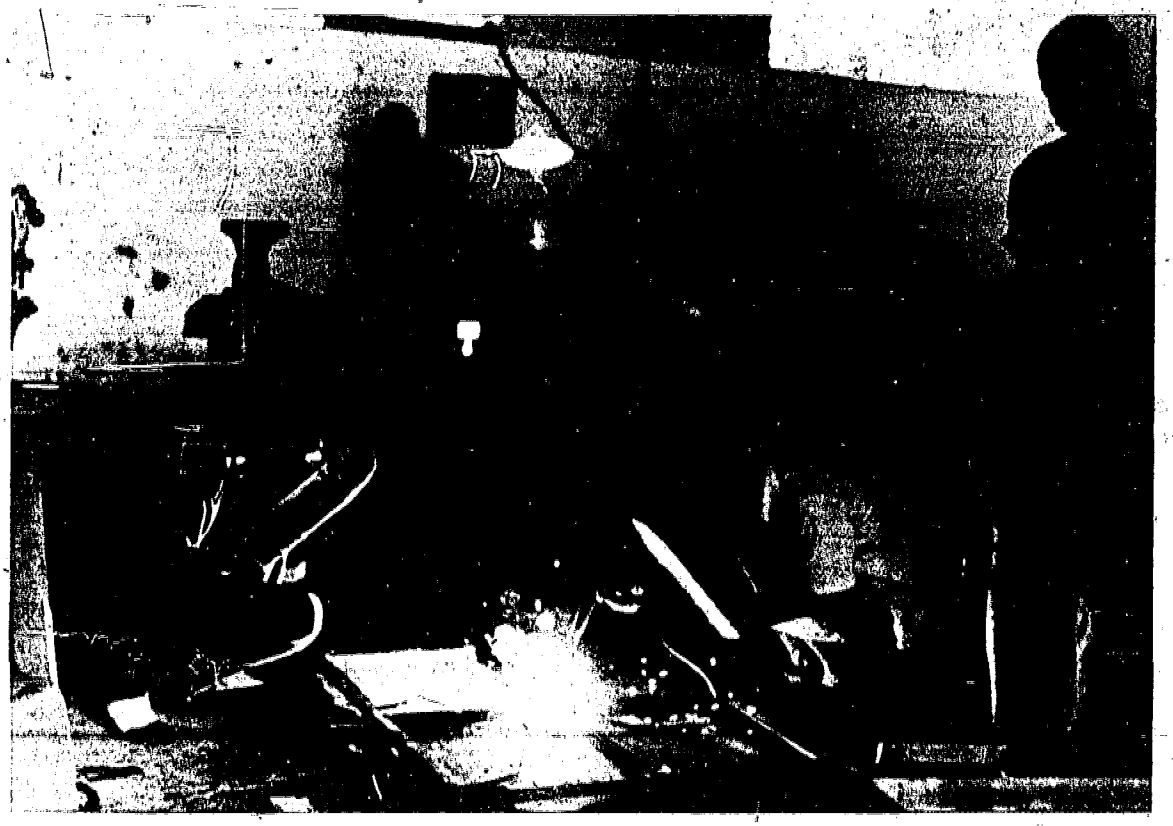
Foregoding includes that of the two Lycées Techniques, plus the two Art Centers (Fort-Lamy and Fort-Archambault).

EXAMINATION RESULTS SINCE 1948
(These figures are comprised of only Chadians)

Years	C.E.P.T.	B.E.P.C.	Number Admitted C.A.P. comm.	C.A.P.ind.	Bacc.
1948	60				
1949	91				
1950	95				
1951	122				
1952	169	1			
1953	170	10			
1954	220	15			
1955	288	34			
1956	364	25			
1957	611	38			
1958	520	37	2		
1959	938	62	7	17	
1960	967	92	12	10	
1961	1 356	86	17	12	2
1962	2 346	173	9	14	6
1963	1 816	190	10	13	2
1964	3 959	259	4	13	5
1965	2 913	231	6	1	17
1966	5 856	366	17	12	19
1967	5 299	305	7	12	22
1968	4576	658	17	24	55

EXAMINATION RESULTS IN 1969

Type of diploma	CHADIANS				FOREIGNERS			
	Presented		Passed		Presented		Passed	
	B	G	B	G	B	G	B	G
CEPT	10 126	1 059	3 790	359				
BEPC	1 510	75	630	20	72	30	51	21
CAP Office Employee	46	1	19	1	1			
CAP Bank Employee	28		3		3	1		1
CAP Assistant Bookkeeper	51		14		6			
CAP Auto-Mechanics	7		4					
CAP Electricity	9		3					
CAP Masonry	5		4					
CAP General Mechanics	12		4					
CAP Carpentry	2		1					
Bac A2						2		
Bacc A3	9		8					
- " - A4	36		27		8	7		
- " - C	6	1	6		2	1	1	
- " - D	90	2	44	1	10	3	8	
- " - G1	17		5		2	1	2	
- " - G2	14		10		2	1		
Mechanics Cont.	4		2					



Welding shop
Vocational training Center - F.T. Lamy

The Commercial Lycée Technique - F.T. Lamy

I

INVENTORY OF FACILITIES FOR TECHNICAL EDUCATION AND VOCATIONAL TRAINING IN GABON

A. INSTITUTIONS AND COURSES UNDER THE MINISTRY OF NATIONAL EDUCATION

A.1. Institutions providing long-term technical training (2nd cycle)

a) Technical Lycée at LIBREVILLE

b) School of Public Commerce at PORT GENTIL

A.2. Institutions providing short-term technical training

a) Schools of technical education (LIBREVILLE, OYEM, MOANDA, and TCHIBANGA)

b) 1 private commercial section at BITAM

A.3. Para-industrial and handicrafts training

2 public Apprenticeship Centers

A.4. Traning for women and girls (homemaking and dressmaking)

A.4.1. 3 Technical Schools of Feminine Arts (MOUILA, FRANCEVILLE and MAYOUMBA)

A.5. The University Institute of Technology

B. INSTITUTIONS ADMINISTERED BY THE MINISTRY OF LABOR

B.1. Centers of rapid vocational training (LIBREVILLE and PORT GENTIL)

B.2. "Sainte Marie" private center for rapid vocational training

B.3. Rapid vocational training center for commercial and clerical staff

C. INSTITUTIONS ADMINISTERED BY OTHER MINISTRIES

C.2. Post Office vocational training center at LIBREVILLE, administered by the National Office of Postal and Telecommunications Services

D. TRAINING PROVIDED BY PRIVATE ENTERPRISE

E. OTHER ORGANIZATIONS

A. INSTITUTIONS AND COURSES ADMINITERED BY THE MINISTRY OF NATIONAL EDUCATION

Introduction

The Ministry of Education is responsible for the implementation of government policy with regard to education. It also carries on research in methodology and organization. The Ministry administers numerous state-operated educational institutions and also supervises the private schools.

Private education is governed by legislation, which provides for uniform education throughout the country; use of the official language (French), conformity with official programs, a single system of examinations and tests and maintenance of professional and moral standards. In return for these requirements, the state makes a considerable contribution to private education through subsidies.

A National Education Council and a National Council for Technical Education bring together those concerned with public and private education. The school year is identical with that of France.

In technical education, the programs and methods are identical a neary identical to those employed in France. The person responsible is the Director of Technical Education.

In the first plan, for 1966/70, an overall structure for technical education was proposed (see Annex I). Schooling is compulsory up to the age of 16, resulting in a level of admission to the CETs or Lycée at the 4th grade.

TREND OF ENROLLMENT IN TECHNICAL EDUCATION SINCE 1961

Year	No. of students	Increase
1961	165	100
1962	271	164
1963	385	233
1964	1 001	607
1965	1 236	749
1966	1 441	873
1967	1 504	912
1968	1 539	933

Source: Statistical Yearbook 1967-68

A.1. Institutions providing long-term technical education (2nd cycle)

a) The Albert Bernard Bongo Lycée Technique at Libreville (not including the CET annex)

In this school, students are oriented, on completion of the 4th grade, either toward the industrial or the commercial section. The examinations at the end of training are those for the BEC (brevet d'enseignement commercial), the BEI (brevet d'enseigneemnt industriel), the BSEC (brevet supérieur d'enseignement commercial), the brevet de technicien (technician's diploma) and the baccalauréat technique et économique (baccalaureat in technology and economics).

The buildings of the Lycée Technique were renovated in 1968, but with little effect on the workshops. A dormitory for 650 students is on the school grounds.

LYCEE TECHNIQUE LIBREVILLE
Number of students per section School year 1967-68

Section	1st year		2nd year		3rd year		4th year		TOTAL		
	B	G	B	G	B	G	B	G	B	G	T
Secretarial training		23		11		7		6		47	47
Accounting	46		45	6	24	2	17	2	132	10	142
Economies (BSEC)	17								17		17
BAC Economies	30	7	50	3	8	1			88	11	99
BAC Technique	23		16		6				45		45
Brevet of technician			11						11		11
General mechanics	55		56		13		17		141		141
Auto mechanics					25				25		25
Carpentry					12		8		20		20
Total	171	30	178	20	88	10	42	8	479	68	547

Source: Statistical Yearbook 1967-68

The breakdown by sections shows examinations taken and the length of the courses:

The complete BEI takes 4 years from the 4th grade.

The complete BEC takes 4 years from the 4th grade.

The baccalauréat takes 3 years from the second grade.

The second plan, covering the years 1971 to 1975, contains provisions for reorganizing the Technical Lycée at Libreville, which is to become exclusively a technical institution of second degree, and will thus train students for the BEI, baccalauréats techniques and brevets de techniciens. The CET will become a separate institution (see Annexes II and III, "New structure of the Technical Lycée").

b) School of Commerce at PORT GENTIL

This was opened in November 1967. Construction was completed in February 1969. At the end of 1968 there were 16 students in the 1st year of studies (2nd grade). The school's capacity is 40 students trained for posts similar to those of technical officials and middle-level management, in public administration or private enterprise.

A.2. Short-term technical training

a) Public schools of technical education

These schools give 3-year courses for various types of CAP diplomas. Efforts have been made to create new programs adapted to Gabon's specific requirements even when this implies departing from present directions. The various courses of training are as follows for the four CETs.

NUMBER OF STUDENTS PER YEAR, COURSE AND SECTION

Section	1st year		2nd year		3rd year		4th year		TOTAL		
	B	G	B	G	B	G	B	G	B	G	T
General mechanics	39	1	78		28				145	1	146
Auto mechanics	15		58		54				127		127
Metalwork	10		19		11				40		40
Electricity			15		17				32		32
Carpentry	10		27		28				65		65
Masonry	10		11		11				32		32
Diesel mechanics							13		13		13
Total	84	1	208		149		13		454	1	455

Numbers in the different schools are as follows :

	1st year		2nd year		3rd year		4th year		TOTAL
	B	G	B	G	B	G	B	G	
CET LIBREVILLE	60	1	120		111		13		305
CET OYEM	15		22		24				61
CET MOANDA	10		30		12				52
CET TCHIBANGA									

There was an apprenticeship center at TCHIBANGA until 1968. During the school year 1969, it was transformed into a technical education school (CET), specializing in masonry and cabinet-work. The Technical Education Department desires to create in Gabon what the "Ecole Boulle de Paris" is in France. This is a challenging innovation which merits external financial aid.

b) Protestant private commercial training section at BITAM

This section gives a short-term commercial training course, with the following enrollment : 1st year : 7 boys, 4 girls 2nd year : 8 boys; for a total of 19 students in 1968.

A.3. Public apprenticeship centers

The apprenticeship centers were orginally intended for training rural craftsmen, but the instruction almost immediately became oriented towards training for the CEAP (certificat élémentaire d'aptitude professionnelle) in carpentry.

In 1968, there were 12 centers still in existence, with a total of 338 students and a 2-year training course. During the school year 1968-69, 10 centers were reorganized, one of them at Tchibanga, becoming a CET. They have been integrated into the system of terminal education. Today the centers are becoming diversified in order to conform more closely to local needs and to provide training of more practical use than in the past.

In July 1968, a request for financial and technical aid was made to the United Nations to further this purpose.

The remaining 2 centers (Libreville and Fougamou) are the basis of interesting innovations being carried out by the Technical Education Department.

A.4. Technical education for women and girls (home economics and dressmaking)

A.4.1. The Technical School of Home Economics

3-year courses for the CAP diploma. There is a public school at MOUILA, and two private Catholic schools at FRANCEVILLE and at MAYOUMBA, the enrollment being:

	1st year	2nd year	3rd year	TOTAL
MOUILA	24	12	3	39
FRANCEVILLE	37	17	5	59
MAYOUMBA	30	15		45
Total	91	44	8	143

A.5. The University Institute of Technology (IUT) at Libreville (formerly a polytechnic institute)

This institute is included here, although it is in a class by itself, because it is a member organisation of FESAC, and because of its regional character. It began operations in 1964 for the purpose of training technicians and public works engineers in 4 years, the entry standard being the BEPC for the former and the baccalauréat for the latter. However, there was no detailed study of the market before the institute was created, and the conception of the institute, as well as its functioning, have remained vague. In 1968, the final phase of construction was begun. A special recruiting campagn was undertaken in 1969, at baccalauréat level, with the aim of training senior technicians. There are about a dozen students, most of them from Congo-Brazzaville.

Diploma: University Diploma of Technology, equivalent to the Brevet de Technicien Supérieur. Cameroon will send students in September, 1970.

B. INSTITUTIONS ADMINISTERED BY THE MINISTRY OF LABOR

B.1. Centers of accelered vocational training at LIBREVILLE and PORT GENTIL

Length of training: 9 months

Diploma obtained: F.P.R. Certificate.

At Libreville: 120 students in the following sections: stone-masonry, reinforced concrete, auto mechanics, automobile body (being created), carpentry, electricity, electro-mechanics, refrigeration. The last 3 sections are under the direction of ORT technicians, financed by USAID. These 3 sections, appear to achieved excellent results, quantitative as well as qualitative. There is close collaboration between the ORT Chief of Party and the Ministry of Labor, and this has resulted in better employment of students after training.

At Port Gentil: the same system, with 45 students in sections for metalworking, auto mechanics and general mechanics.

B.2. The accelerated vocational training center "Sainte Marie"

This center has recently been modernized, enlarged, and the training programs revised. The length of the courses is longer (2 years) with sections as follows: carpentry, general mechanics, electricity, auto mechanics.

B.3. Vocational training center for commercial and clerical staff

Same system of training with an enrollment of approximately 100 students to which can be added those taking advanced training courses.

C. INSTITUTIONS ADMINISTERED BY OTHER MINISTRIES

C.2. Postal services vocational training center at LIBREVILLE, administered by the National Office of Postal and Telecommunications Services, with 16 students.

D. TRAINING IN PRIVATE ENTERPRISE

Training and advanced courses are organized by private companies, but very often the Ministry of National Education is not informed of their activities. The most well known are :

The COMILOG-COMUF company training center at MOANDA, with 2 technical teachers for 55 students. These students have been given refresher courses in various subjects during 1968, in groups from 6 to 11, and at a minimum level of the CAP diploma.

The Mobil Company

The Shell Company

The SEEG (Gabon Water and Electricity Company)

The SPAEF petroleum company

The SER refineries.

No functional relationship exists between these private enterprise training centers and the public schools. Yet it would obviously be in the interest of each to allocate their tasks and make them complementary instead of parallel.

F. OTHER ORGANIZATIONS

AFCA provided some additional training in the final grades of the Technical Lycée, mainly on human relations. The same organization gives basic on-the-job training to employees of the Ministry of Public Works at LIBREVILLE.

II

EMPLOYMENT SITUATION AND TRAINING NEEDS

A. EMPLOYMENT SITUATION

The employment prospects up to 1980 in the monetary sector appear to be compatible with the maintenance of other desirable activities, and, especially, with the needs of the subsistence sector.

The employment situation in 1967 can be derived from the statistics of the Gabon Social Security Fund (CGPS), which do not include government officials or members of the army or police force. In that year, 1,067 employers had 51,761 workers (excluding domestic staff), of whom 9,523 were engaged in forestry, 7,020 in commerce and banking, 6,983 in construction and public works, 6,698 in government services, 3,094 in the timber industry, and 2,848 in the extraction of minerals and other materials. Approximately half the employees worked in the Estuary area and almost a quarter in maritime Ogooué.

Employment in the Monetary Sector	Employment 1964	Projection 1970	Projection 1980
Agriculture, livestock, fishing	260	1 100	1 500
Forestry	11 240	14 700	25 000
Mining (including oil extraction)	3 560	4 050	5 750
Power (including refineries)	300	550	600
Industry	4 770	6 750	10 400
Construction and public works	5 000	6 400	8 200
Commerce	3 830	6 850	10 050
Transportation and other services	5 240	4 300	5 400
Administration, private education			
Semi-public organizations	14 100 (1)	16 800	21 700
Domestic staff	2 500	3 000	3 900
TOTAL	50 800	64 500	92 500 (2)

Source: Five-year Plan 1966-70

(1) 11,530 for the administrative services, including the army and the police force; 1,150 for private education, 1,420 for semi-public organizations.

(2) Provided the railroad is constructed. The figure becomes 77,400 if it is not.

B. TRAINING NEEDS

The above table shows the employment prospects for 1980. In view of the fact that the building of the railroad is highly probable, the Plan estimates that the theoretical training objectives between now and 1980 should be as follows for the specialist training establishments :

THEORETICAL TRAINING OBJECTIVES

Type of training	Skilled, highly skilled	Foremen, Supervisors	Technicians	Managers, Senior Managers	TOTAL
Industrial	4 300	875	900	600	6/675
Commercial	2 000	440	400	440	3 280
Agricultural and forestry	140	355	85	110	690
Teaching	1 800	300	100	100	2 300
Medico-social	520	590	10	130	1 250
Other types of training	180	50	110	70	410
	8 940	2 610	1 605	1 450	14 605

These specialized training centers should be supplemented by training within the enterprise of some 4,000 skilled and highly skilled persons and 250 to 300 supervisors and managers.

In a draft of the possible balance of needs and human resources in the modern sector, the first Plan showed that while it might be hoped that in 1970 there would be sufficient manpower to implement the first Plan, from 1970 onwards, assuming that the railroad would be constructed, it would be necessary to call on manpower from outside the country. However it should be noted that the use of expatriate manpower would be envisaged by the Gabonese authorities, only as a last resource. If the requirements for 1980 are considered in terms of quality, the first Plan states, "Bearing in mind the school enrollment that will be available at the required level, and probable availabilities, the training deficit in special institutions will be some 5,000 specialists, and the deficit in training in private enterprise will be 3,000 to 5,000. The total manpower deficit, resulting from lack of qualified personnel will thus be 8,000 in 1980".

C. CONTACTS WITH EMPLOYERS

The ORT team met with the following persons :

Mr M'BORO, Director of the Ministry of Labor

Mr MIKANGA, his deputy

Mr NDIMAL, Head, Division of Manpower, Employment and Accelerated Vocational Training

Mr BOUGLE, President of UNIGABON

Mr NIAZY, ILO expert, advisor to the CFPR at Libreville

Mr HOUDIN, Secretary General of the Chamber of Commerce.

Mr NDIMAL, with Mr MARCOVICI, ORT Chief of Party, and Mr NIAZY, carried out a survey on manpower problems in the interior. Below is an excerpt from their preliminary report:

"With regard to the training given by our centers, private enterprise has sometimes expressed regret at the limited number of sections. For this reason, the problem of training and avanced courses for marine diesel mechanics has arisen. It must, in fact, be recognized that Gabon is a maritime country, with numerous rivers and an extensive seacoast. Waterborne traffic, already heavy, is bound to increase in the years to come, with an accompanying increase in the number of marine engines in use. Consideration should certainly be given to the possibility of providing this training."

Mr NIAZY, who has spent some years in Gabon, confirmed that almost always the large companies have trained their workers themselves (specialists and skilled workers). On the other hand, they have done no training of middle-level and senior management staff.

ORT's experience during its years of work in Gabon has had positive results. The great majority of the men who have been trained have remained in the jobs to which they were appointed, and many of them have been promoted. These results can be ascribed to a unique approach to problems, and to training methods that are particular to ORT.

It is agreed generally that Gabon requires middle-level management staff, especially technical management, in all fields and for a variety of reasons, the chief of which are the small population, the desertion of the private for the public sector, the efforts to be made with respect to the Gabonization of management, and, finally, the enormous economic potential of the country.

Annex V presents an overview of industry in Gabon showing present numbers of employees and, in the column "Remarks", the immediate personnel needs of these firms.

D. THE NATIONAL COMMITTEE FOR COORDINATION OF TRAINING AND EMPLOYMENT (CNCFE)

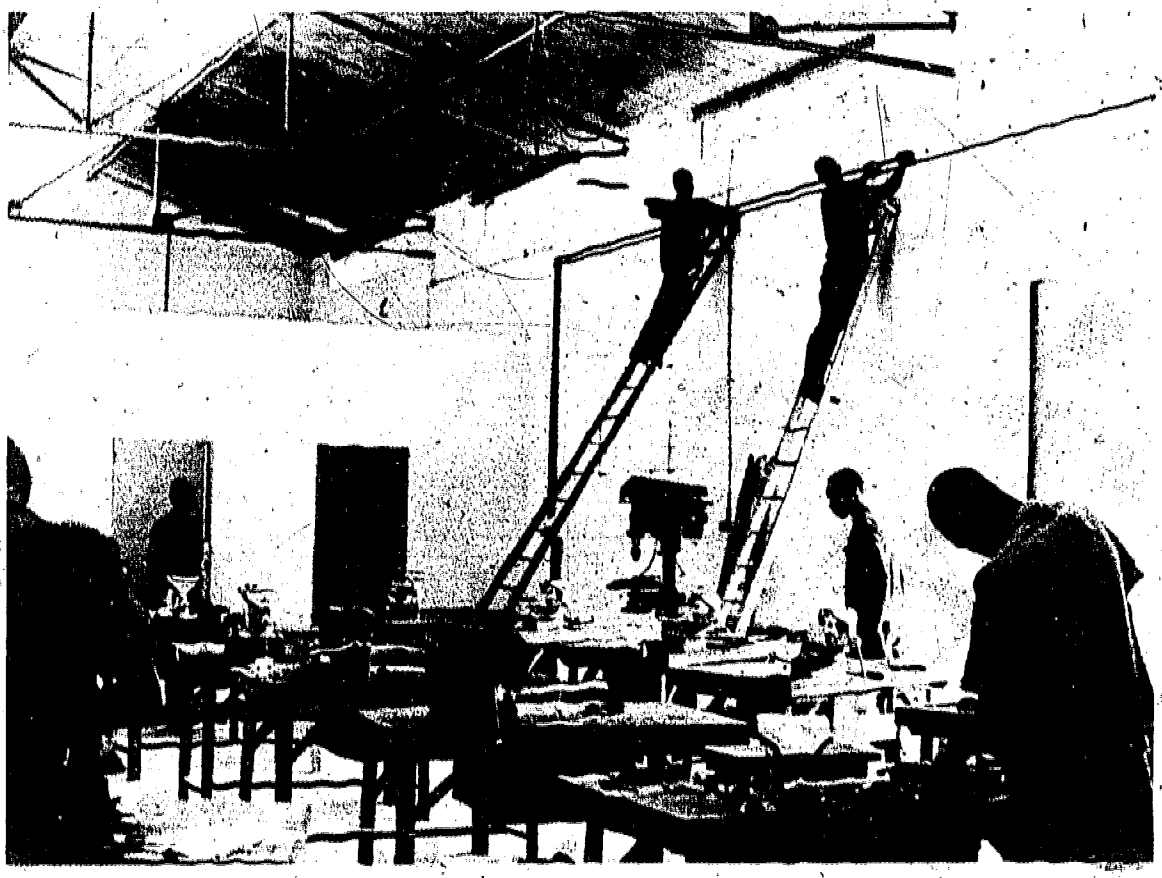
This report has already set forth, in its recommendations, the creation of a national office for vocational training. In Gabon there already is a coordinating organism whose objective is to make a thorough survey of manpower planning in relation to training programs.

The CNCFE, which is directly responsible to the President of the Republic, was created in November 1968. The chairman is the Minister of the Plan.

Functions of the Committee

From time to time it reviews the requirements of employees to be trained or given advanced courses. From the results, it works out the modifications to be made, in capacity and level, to the existing local training facilities, and the need for training abroad.

The Committee follows the trends of distribution and structure of the working population, and proposes measures aimed at redressing imbalances which would adversely affect the progress of the national development plans.



Electrical installation
AID/ORT refrigeration and electromechanics training Center - Libreville

III.

RECOMMENDATIONS

1. The problems of vocational training and technical education in Gabon are quite different from those in the other three countries. The mainspring of economic development is industry, not agriculture, and the population of Gabon is small. For these reasons, the Gabonese authorities should take a different approach to manpower problems, and should be encouraged to modify the structure of technical education, seeking educational methods better adapted to the problems of Gabon. Though the French and the Gabonese share this point of view, much remains to be done. The desire to adhere at all costs to French diplomas has not brought good results. The situation is exacerbated by retention of outmoded diplomas (such as the BEI), retaining only the title.

   The Gabonese authorities should define occupations which would better meet the needs of the economy, and develop middle-level manpower (supervisors and foremen), rather than upper-level or skilled workers. There are several automated plants in Gabon, and there will be still more with the advent of the railroad, the port of OWENDO and the establishment of processing plants. On the other hand, manpower is scarce. It would clearly be useful to create automation sections covering mechanical, hydraulic, pneumatic and electronic automation.

2. **The Normal School of Technical Education (ENET)**

   In Gabon, as in the other countries, the provision for training corresponding to the requirements of new industries, and even the maintenance of the existing training capacity, depends on the country having at its disposal, in the shortest possible time, a teaching staff composed of its own nationals. A project for an ENET is already under way and well advanced.

   The feasability of regionalizing this project should be studied. In view of the urgent nature of the problems in this field, attention of the authorities is drawn to the possibility of sending a number of local teachers, presently employed, but lacking pedagogic training, for a short technical and pedagogical training period in their own subject in a specialized institute. There exist institutes with considerable experience in this field, which have already proven their worth in other African countries.

3. **Tourism**

   The first Five-Year Plan, for 1966-1970, contains projects for tourism which "respond to considerations of prime necessity". They are :

   a) development of Pointe Denis

   b) creation of the National Park of WONGA-WONGUE

c) a luxury hotel in Libreville

d) a hotel at NDJOLE.

The second Plan will probably place greater stress on tourism. The problem of training hotel staff, already evident, will become acute, and the only possible solution appears to be (as in the other three countries), the creation of a hotel school, including perhaps, the training of reception staff, at regional level.

4. Fishing and waterborne traffic

The fishing industry is not very developed in Gabon. It is estimated that the average consumption of fish per head is only about 37 1/2 lbs annually, which is considerably less than that in other coastal countries of Africa, notably Ghana and Nigeria. Fishing is a part-time occupation in the lagoons and rivers near the Atlantic coast, and also in the rivers and lakes of the interior during the low-water season (from June to September). There are three small commercial fishing companies at Port Gentil, the largest being the Société de Pêcheries Gabonaises. Of an overall catch estimated at 2,100 tons per year, the share of these three companies is 1,250 tons. The Five-Year Plan provides for some 250 million CFA francs for the development of the fishing and canning industries.

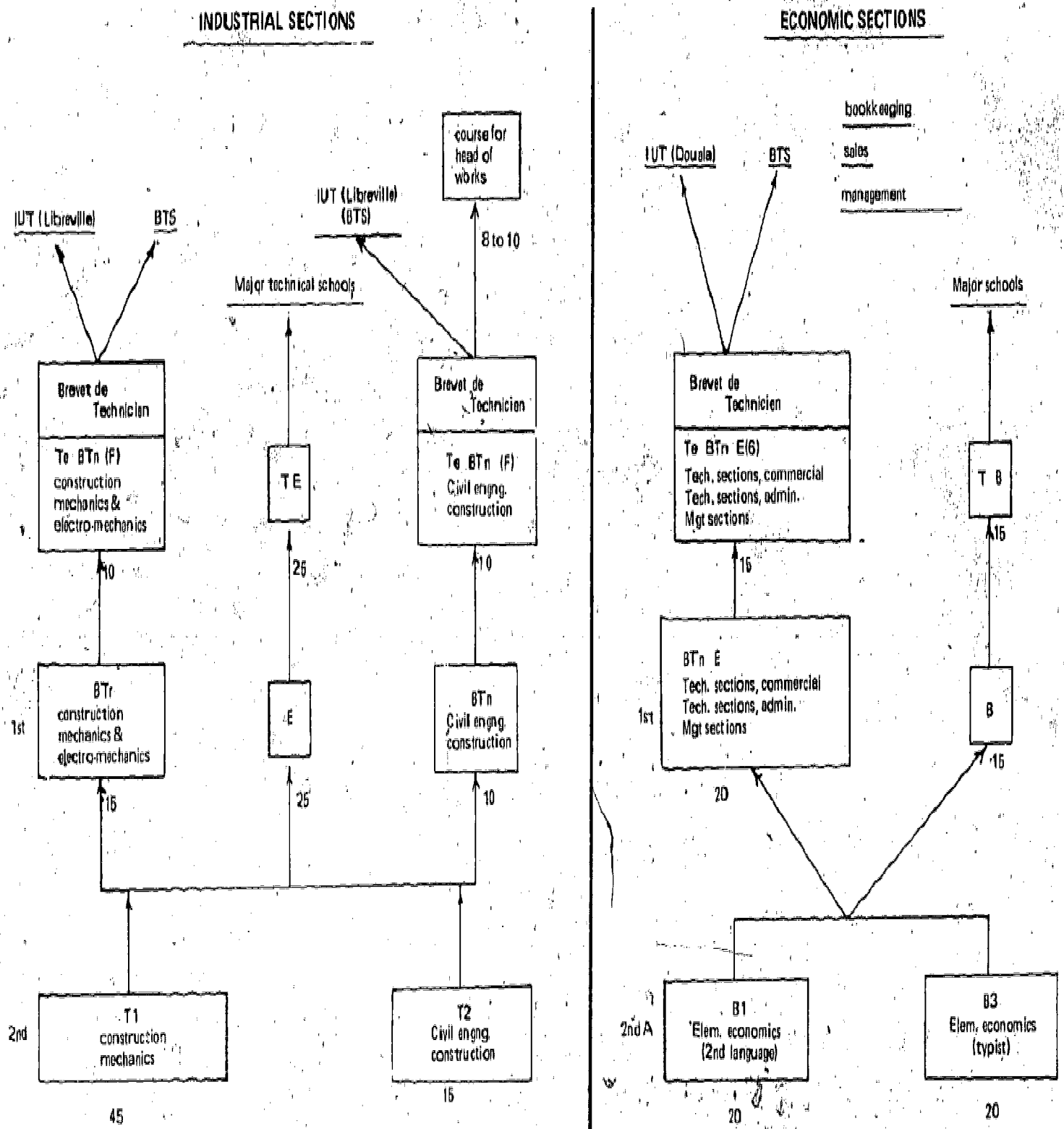
The interior of Gabon is covered with lakes and navigable waterways, which, as Mr NDIMAL pointed out (see II C), will result in an increase in the number of marine engines in service.

For this reason, the training (and advanced training) of mechanics for marine diesel engines is recommended. With the new port of OWENDO, other merchant marine trades will develop: repair mechanics, radio operators, navigators, etc. It would be useful to obtain the cooperation of maritime shipping companies in the project for creating a merchant marine school, which would be economically viable only on a regional scale.

Lycée Technique - Libreville

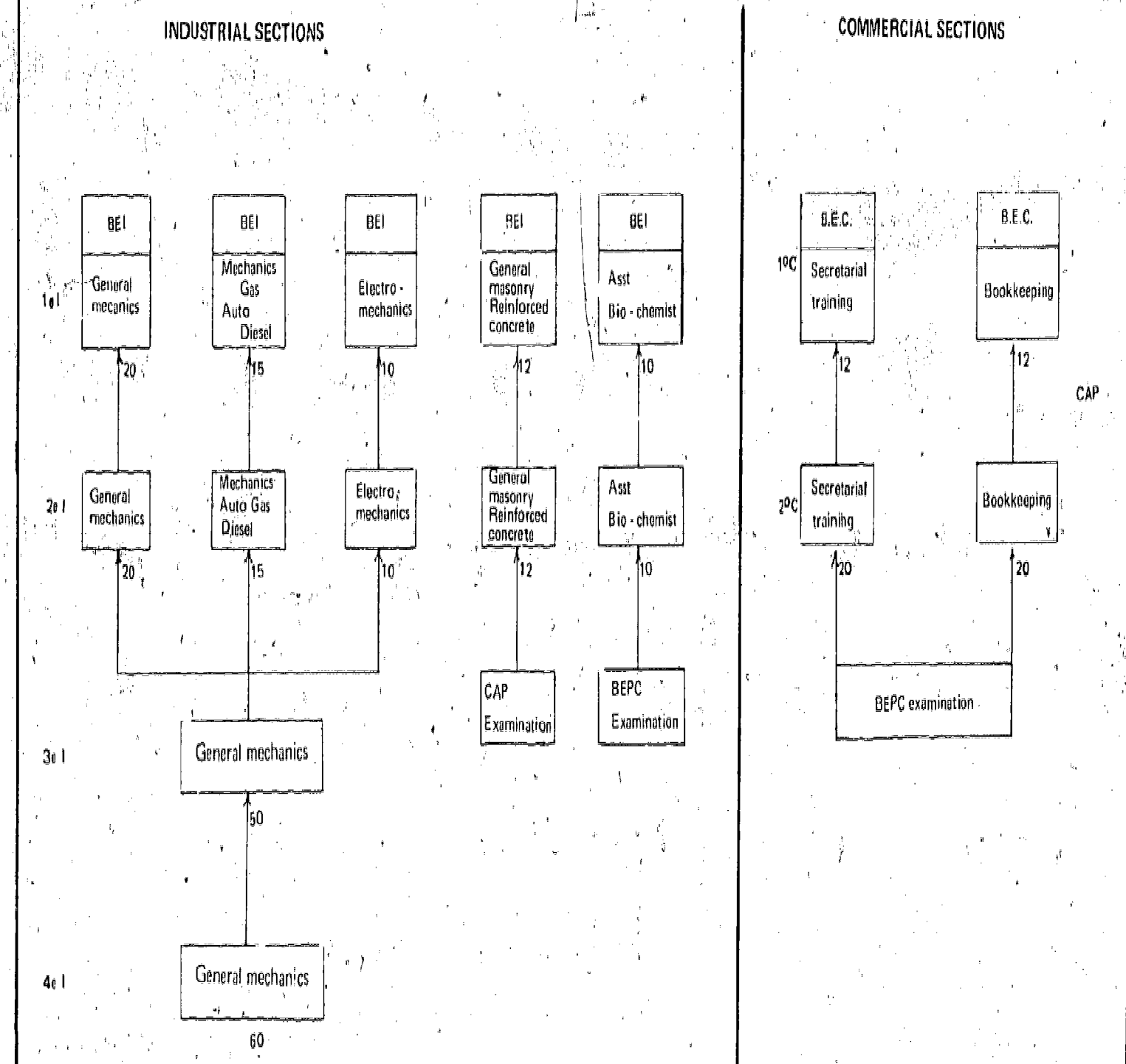
ANNEX I

LYCEE TECHNIQUE AT LIBREVILLE (2nd Cycle)



ANNEX II

LYCEE TECHNIQUE AT LIBREVILLE



ANNEX III

ESTABLISHMENT OF TECHNICAL COLLEGES

DURING 2nd FIVE-YEAR PLAN

LIBREVILLE

- Carpentry-Framework
- Industrial electricity
(4th-yr radio-electricity
or industrial refrigeration)
- Constructional electricity
Shipyard mechanics

180

OYEM

Repairs-maintenance
Electro-mechanics automobiles
(CAP in 4 yrs)
Auto body repairs
House-painting - Glazing - Flooring

120

MAKOKOU

Company school
(subjects : mining,
railroading)

100

PORT - GENTIL

Forge work - Metal construction
(4th-yr tracing
Welding (arc & oxy-ac.)
General mechanics

Plumbing

180

TCHIBANGA

Carpentry Cabinet-making
Masonry - Reinforced concrete

Agricultural supervisons
and extension workers

120

MOANDA

General mechanics
Repairs - Maintenance
Electro-mechanics auto
(CAP in 4 years)
Sheet-metal work Welding

100

ANNEX IV/1

TABLE OF PRIVATE ENTERPRISE NEEDS

PLACE	COMPANY	ACTIVITIES	NUMBER OF EMPLOYEES				OBSERVATION
			Gabonese	Europeans	Other Africans	Total	
PORT-GENTIL	SOAEM	Lighterage goods shipping haulage transportation	445	14	-	459	Present staff needs* 2 Bookkeepers 2 Consignment clerks 2 Customs clerks 2 Sec.-stenog. 3 Lighterage clerks 2 Head storekeepers 60 Wood-stackers 2 Boilermakers 2 Mechanics
	CMCR	Consignment ships - lighterage Handling - River transportation Haulage	437	14	6	457	- Shipping employees speaking English - Qualified bookkeepers - Diesel mech. - Driver w. multiple licences - Dock workers/Stevedores - Boilermaker
	SOGACO	Import - Commerce General trade	113	10	-	123	1 Bookkeeper 2 Managers
	SNOV	Maritime consignment Haulage - shipping	127	8	-	135	Diesel mech. Bookkeeper - shipping clerk
	GABOMA	Retail trade Shipping	45	3	1	49	4 Commercial managers

* These needs are illustrative only. They fluctuate quickly and can only be considered on a short-term basis.

They fluctuate quickly and can only be considered on a short-term basis.

ANNEX IV/2

TABLE OF PRIVATE ENTERPRISE NEEDS

PLACE	COMPANY	ACTIVITIES	NUMBER OF EMPLOYEES				OBSERVATION
			Gabonese	Europeans	Other Africans	Total	
PORT-GENTIL	Ets. A. GALLAIS	Sawmill	73	3	–	76	– Mineral Grinder Saw operator –
	CCDG	Automobiles	8	1	–	9	1 Bookkeeper 1 Typist
	FOREX	Oil wells	59	21	1	81	– Mechanics (general and diesel)
	OBAE	Commercialization of Okoumé	215	7	2	224	Nil
	MOBIL OIL AE	Petroleum	26	1	3	30	1 Shipping clerk
	Sté. A. ABELA	Maritime transportation	222	13	13	248	Camp leader (hotel school project)
	Ets DUCROS	General electricity Plumbing Roofing	36	4	1	41	– 2 Plumbers / zinc roofers – 1 Coil-winder repairman – 1 Electro-mechanic
	AIR-GABON	Airline	38	31	–	69	Nil
	S E E G	Water and electricity	191	30	2	223	Senior technicians (industrial electricity)
	U I A E	Petroleum installations – Metal structures – Naval shipyard – General mechanics – Machine - tools	144	12	1	157	– Skilled tinsmiths – Skilled welders

ANNEX IV/3

TABLE OF PRIVATE ENTERPRISE NEEDS

	COMPANY	ACTIVITIES	NUMBER OF EMPLOYEES				OBSERVATION
			Gabonese	Europeans	Other Africans	Total	
GENTIL	ELF – SPAFE	Oil prospecting and extraction	735	148	25	908	–
	SER	Oil refining	165	60	14	239	–
A.	REGION AGRICOLE	Agriculture	6	–	–	6	– 1 Secretary
	SOACO	Construction	80	4	1	85	– 2 Carpenters – 1 Head of carpentry shop – 2 Frame-makers (for concrete) – 2 Scrap workers – 1 Construction electrician – 1 Plumber – 1 Mechanic
	Ets PANAYOTIS	Transportation	46	4	–	50	– 1 Skilled mechanic
	BOUDA L. MARIE	Construction	11	–	–	11	
	SEEG	Water and electricity	10	–	–	10	
	CECA – GADIS	Commerce	39	2	–	41	– 3 Senior managers – 1 Senior bookeeper – 1 Sales supervisor
	DAT	Transportation	36	2	–	38	
	SOMAGA	Commerce	10	1	1	12	Nil
				60	14		– 2 Frame-makers (for concrete) – 1 construction electrician

ANNEX IV/4

TABLE OF PRIVATE ENTERPRISE NEEDS

COMPANY	ACTIVITIES	NUMBER OF EMPLOYEES				OBSERVATION
		Gabonese	Europeans	Other Africans	Total	
SOGACO	Commerce	27	2	2	31	Nil
MAFOUMBI	Construction	10	–	–	10	
RICORDEAU	Forestry	25	–	10	35	- 1 Mechanic - 1 Driver
CHEIK-KEBE	Bakery Pastry					- 1 Baker
SOGIC	Commerce	15	4	–	19	Store managers
CFS	Forest products	90	3	–	93	Nil
CGPPO		150	7	1	158	- 1 Skilled mechanic - 1 Electrician - 1 Engine fitter
SAEN	General trade Bakery	131	11	3	145	- 1 Diesel mechanic - 1 Baker/pastrycook
MARANGELIS	Commerce	18	2	1	21	- Manager/bookkeepers
HATTON & COOKSON	General trade	27	1	4	32	- Store managers
SOTRAHO	Construction - Commerce	100	12	3	115	- 1 Constr. electrician - 1 Refrig. electrician - 3 Workshop carpenters - 2 Frame-makers carpenters - 1 Auto-diesel & gas mechanic

ANNEX V/5

TABLE OF PRIVATE ENTERPRISE NEEDS

COMPANY	ACTIVITES	NUMBER OF EMPLOYEES				OBSERVATION
		Gabonese	Europeans	Other Africans	Total	
SOTRAHO (cont.)						– 1 Typist – 1 Asst store-keeper for auto parts – 1 Plumber – flooring worker
SATOM	Construction and public works	42	1	–	43	
SAPLE	Road maintenance	24	1	–	25	Glazier-painter sign painter
COMILOG	Mining	811	117		928	
COMILOG	Cablecar	720	57	1	778	– 2 refrigeration technicians
COMUF	Uranium mining	1200	100	1	1301	– 2 Asst bookkeepers – 2 Typists – 1 Refrig. technician – 1 Telephone operator – 1 Anaesthesist
MGM	Commerce	11	2	3	16	
Ets HERISSE	Mechanical transportation	22	2		24	– 1 Polyvalent electrician (construction-automobile)
SOMIFER	Roadworks	11	1	1	13	Nil
MISSION BIOLOGIQUE	Livestock breeding	7	1		8	–
Ferme d'Ipassa	Road-building Laboratories	59	2	–	61	Trained construction workers

ANNEX A

GABON – PUBLIC TECHNICAL EDUCATION – PERSONNEL

Qualification	GABONESE			FOREIGNERS		
	Men	Women	Total	Men	Women	Total
Director				1		1
Certified teacher				8		8
Licenced teacher				5	3	8
Professeur d'						
Theoretical Technical education teacher	1		1	8	1	9
Asst. technical Teacher	3		3	21	3	24
Teacher CEG	7		7	4	3	7
Teacher E.P.S.				2		2
Engineer				2	1	3
Professor EPS	2		2	1		1
Teaching asst.				2	2	4
Head of practical work	1		1	1		1
Public works worker	1		1			
Worker teacher	20		20			
Head of education					1	1
Teacher CEG					1	1
Teacher'	15		15	2	1	3
Orientation counsellor					1	1
University administration attaché				1		1
Sewing teacher		1	1			
General monitor				1		1
Miscellaneous				1		1
Total	50	1	51	60	17	77

Total private education personnel Men 4 Women 8 Total 12

Source: Statistical yearbook 1967-68

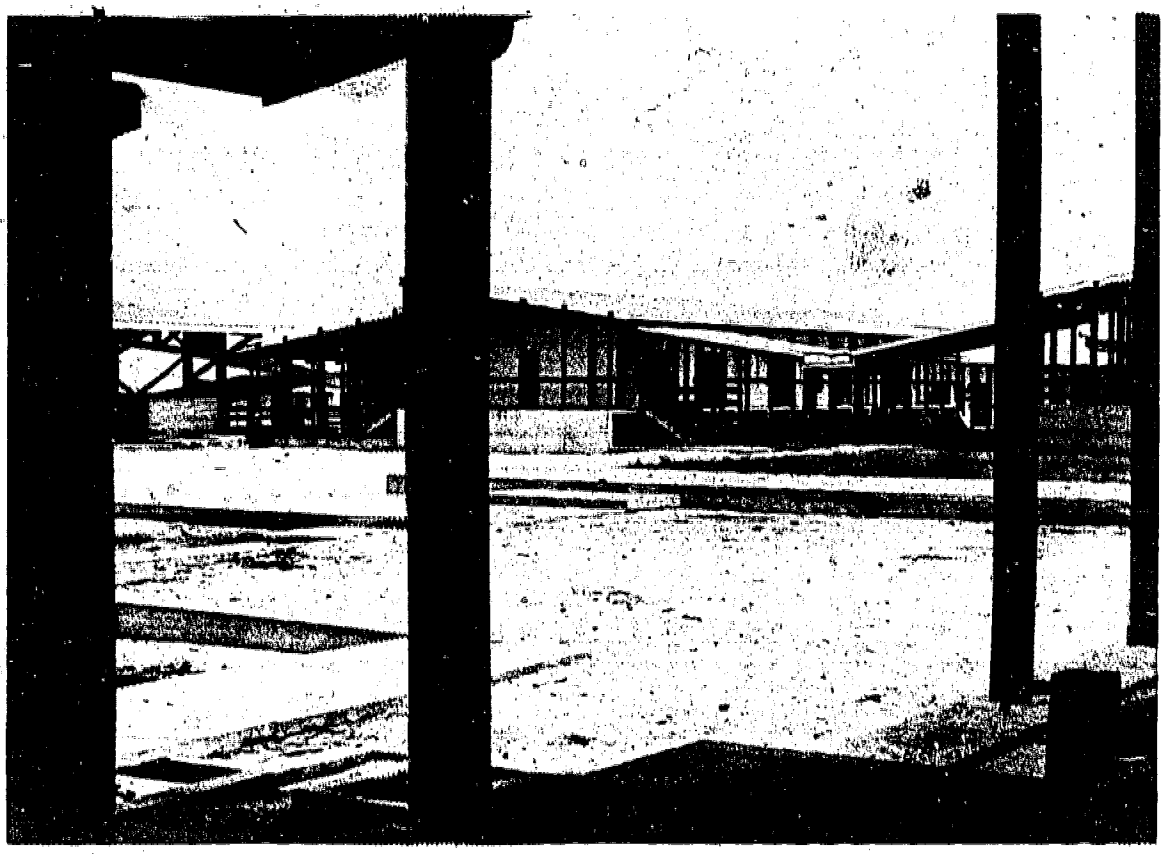
ANNEX B

EXAMINATION RESULTS OF JUNE AND OCTOBER 1967

Type of examination	NUMBER OF CANDIDATES						PERCENTAGE PASSED
	TAKEN			PASSED			
	B	Total	G	B	Total	G	
Baccalauréat		149			64		43,0%
					(40 nationals)		
Examination final class of 1st yr.		225			87		38,7%
B.E.P.C.		816		318	403	85	49,4%
					(362 nationals)		
C.E.P.E.				1817	2844	1027	
B.S.E.N. 1st part	21	23	2	8	9	1	39,1%
B.S.E.N. 2nd part	20	20	–	15	15	–	75,0%
B.S.E.N. 3rd part	15	15	–	10	10	–	66,7%
CFECN		RNP		58	65	7	
B.E.C.		"		4	6	2	
B.E.I.		"		8	8	–	
CAP (Commerce)		"		15	20	5	
CAP (Industry)		"		92	92		
CAP (Home making)		"		–	2	2	
CEAP (Professional)		"		41	41	–	
Head Monitor		"		145	168	23	
CEAP (Teacher)		"		74	87	13	
CAP (Head teacher)		"		20	22	2	

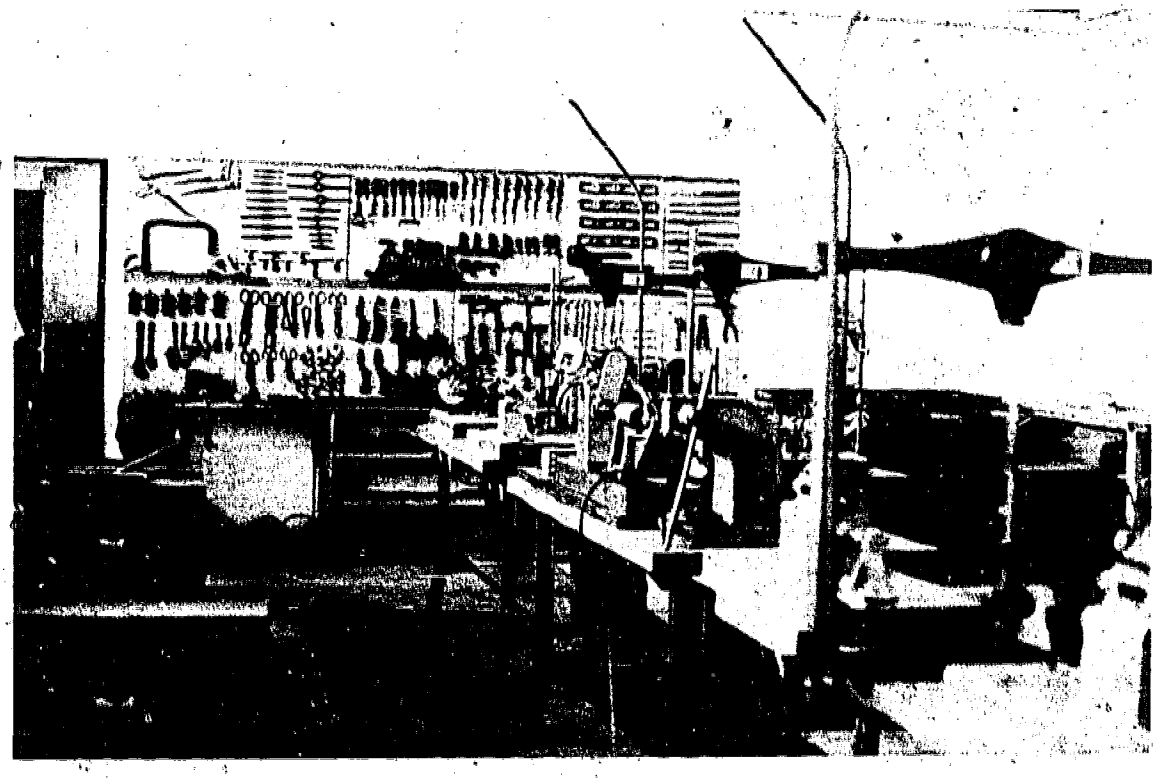
Note : RNP (Information not available)

Source : Statistical yearbook 1967-68



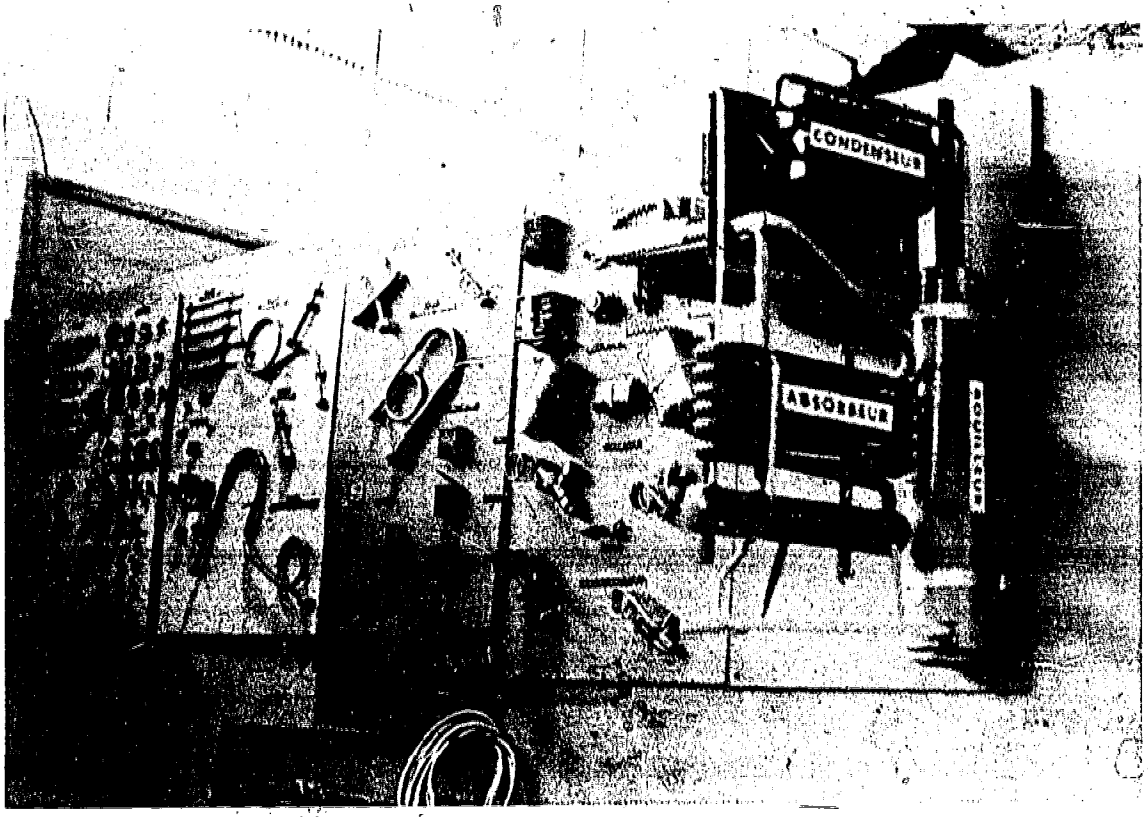
Lycée Technique - Libreville

Compressor installation
AID/ORT refrigeration and electromechanics training Center - Libreville

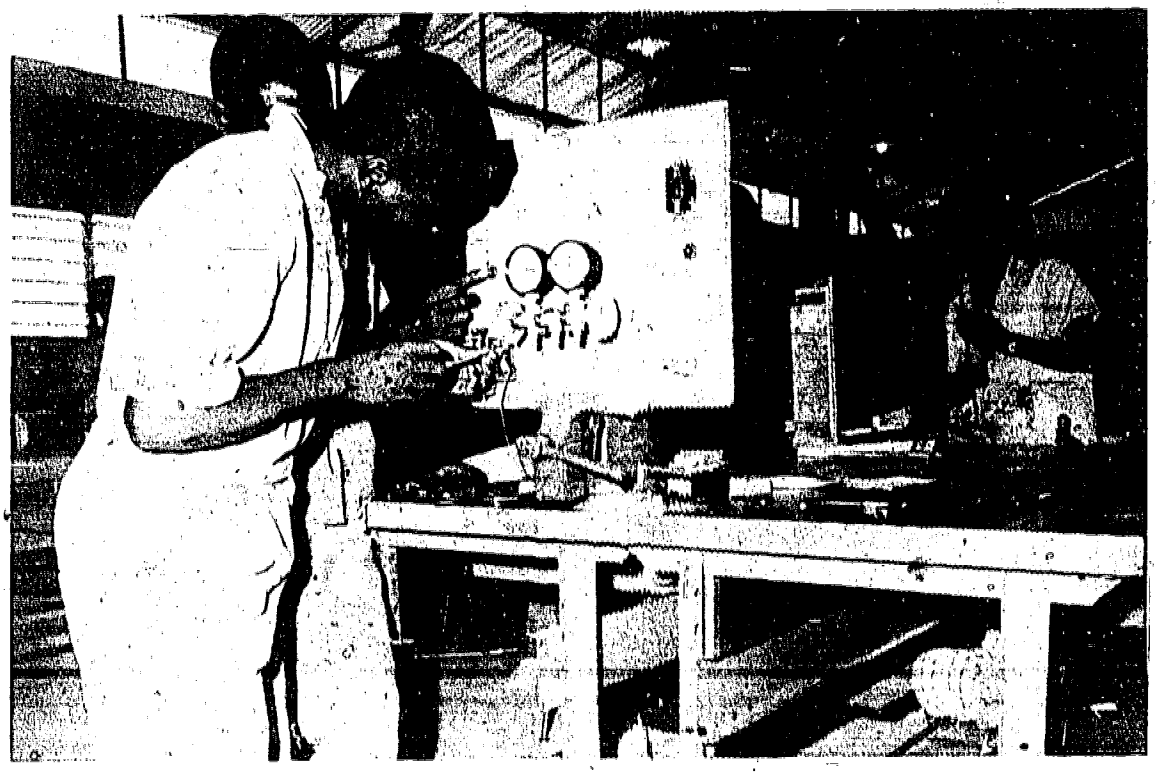


Electromechanics shop
AID/ORT refrigeration and electromechanics training Center - Libreville

Compressor installation
AID/ORT refrigeration and electromechanics training Center - Libreville



Refrigeration training aid
AID/ORT refrigeration and electromechanics training Center - Libreville



Installation refrigeration training aid
AID/ORT refrigeration and electromechanics training Center - Libreville

PART FOUR

UDEAC CONFERENCE ON VOCATIONAL TRAINING IN CENTRAL AFRICA

BANGUI

October 29 & 30, 1969

SUMMARY MINUTES

The Conference on Vocational Training in Central Africa was opened by an address by the Minister of Civil Service and Labor of the Central African Republic at 9.30 a.m. on October 29, 1969 (Annex II).

The Secretary General of UDEAC, His Excellency Charles Onana Awana, after welcoming the delegates, spoke of his visit to the ORT Central Institute at Anières, near Geneva, where he regretted that there were no trainees from the UDEAC countries or Chad.

Mr Eugene B. Abrams, ORT Director of Technical Assistance, then spoke, thanking all those who had helped ORT in the preparation of the preliminary report and described the history and the aims of this survey mission.

After adoption of the agenda (Annex I), Mr Michael Anchovey, Deputy Secretary General of UDEAC, was elected chairman of the conference, a task which he later turned over to Mr Mackpayen, President of the Chamber of Commerce of Bangui.

Discussions began with the study of the item "List of training facilities and needs", presented by Mr S. Guedj, of ORT. The heads of the delegations expressed their thanks to ORT for assembling the information and stressed the regional outlook in the various recommendations as being original in conception.

No comment on the substance of the report was made by any of the delegates. The changes and innovations having occurred since June 1969, as well as clarifications and corrections of details, have been included in the final report.

In the study of Point 7 of the agenda, a divergence of viewpoints appeared among some delegates, who wondered whether the regional outlook should take precedence over the national approach. Mr Anchouey reminded the meeting that the conference was taking place under the auspices of UDEAC and that, consequently, regionalization should have priority over national interests. This viewpoint was supported by the chairman, who stated that the regional or national choice was one for the heads of State. He had thus decided to deal with point 7 from the regional point of view. The national programs could be studied, if time allowed, either during the meeting or in talks between the delegations and the ORT representatives.

Point-by-point study of the General Conclusions and Recommendations. (1)

1. – The recommendation to establish a system of apprenticeship with the Chamber of Trades by drawing up a contract of apprenticeship between the employer and the apprentice was adopted unanimously. A Cameroon delegate pointed out

(1) This section should be read with the General Conclusions and Recommendations which appear in Part One (Ct. page 12).

difficulties that such a system will encounter in his country, where a "certain mobility" permits private enterprise to train their own workers while giving them complete discretion concerning their grading and wages. This was one reason why the list of types of training provided by private enterprise could not be exhaustive.

2. – Chad was not particularly interested in this recommendation, but Gabon, the Central African Republic and Cameroon were generally in favor of it, and asked the ORT representatives how the system could be put into effect. It was decided that the development of electronics sections would be done in the existing technical lycées, that is, on a national basis. With regard to automation and the training of programmers and analysts, it was hoped that a regional school would be created, in view of the extent of the investment.

3. – This is in reality a double point, as the recommendation applies, on one hand, to the creation of national offices for vocational training and, on the other hand, to the creation of a regional office for vocational training for Central Africa. Chad supported the proposal for the creation of a national office, but abstained on the regional office. Gabon and the Central African Republic accepted the entire recommendation. Cameroon was in agreement with the first part, in spite of the national difficulties which it might raise. The help of ORT was requested by Cameroon for dealing with the psycho-sociological difficulties mentioned in the recommendation. With regard to the second point, the Cameroon delegate, while approving it, wondered what its effect would be on the national offices. Mr Anchovey acknowledged that a regional vocational training office within UDEAC ran the risk of expanding UDEAC's size and of increasing the number of its institutions. He proposed instead that there should be a series of regular meetings with the ORT representatives, during which there could be an exchange of information and technical assistance. This led to a request for the use of the phrase "First Conference" in the closing communique.

4. This point gave rise to long discussions revolving about definitions of the term "technician". The required explanations were made, i.e., that there are three grades of technician, which are, in ascending order: technician, senior or engineering technician, and engineer (university-trained).

Universities or advanced technological schools to be created would be responsible for training engineers. The university technological institute trained, and would in future train more senior technicians; and while some sections of the technical Lycées train people for the technicians diploma, it was hoped that a regional establishment would train technicians for the whole of Central Africa. This last proposal received the unanimous consent of all those taking part. Cameroon even stated that, in view of the large extent of her needs in this field, it would be desirable to be able to depend on a regional school for training technicians in addition to the national polytechnic institute now being planned in Cameroon.

5. – There was unanimity concerning the creation of a regional normal technical education school for training of PTAs and PTETs. The delegates emphasized that, while waiting for the completion of this project, there was an urgent need to give advanced training to the local teachers currently employed and to provide preliminary training for the future students of these schools.

6. All the countries taking part in the conference warmly supported the recommendation for a regional center for didactic methods and the fabrication of audiovisual and other teaching aids.

7. – The delegate of the Central African Republic recommended the creation, not only of an inter-state hotel school but also a school for hunting guides and a school of taxidermy.

Details of the Chadian delegate's speech have been embodied in the various project proposals. The Cameroon delegate said that training was even more urgent than had been thought, and that on-the-job training had already been begun in his country.

The French Cooperation Aid Fund is sending four technicians during the month of November 1969 to carry out a survey mission in Central Africa, in order to pinpoint tourist itineraries and possibilities in the area and, especially to study the setting up of facilities.

There was unanimity on this recommendation.

8. The project to create a regional school for training watchmakers and repair technicians for precision instruments received the unanimous agreement of the delegates. The question of the level of recruitment for this establishment was raised. It was decided that the watchmaker-mechanics for repairing clocks and watches would be recruited at the level of the 5th or 4th grade, for a training period of 3 years; mechanics for repairing precision instruments would be recruited at a higher level, for the same length of training period, or would be given a 1-year specialized course, after training as watchmaker repair mechanics.

9. – The project for creating a school for merchant marine trades, able to supply not only Cameroon, Gabon, Chad and the Central African Republic, but also the Congo and Equatorial Guinea, was warmly received by all the delegations. The Gabon delegate asked the ORT representatives to allow for several levels of training and to bear in mind the existing training facilities in these countries when drawing up the project proposals. Assurance was given on this point.

10. This point is of particular interest to Chad and the Central African Republic. Both countries urged that a survey mission should be financed as soon as possible, to investigate and define the commercial networks in the interior of the country, in order to lay the basis for a new structure and to ascertain the training requirements needed for development of a modern money economy network.

11 and 12. These points were adopted unanimously.

The conference ended with unanimous approval of the final communique (Annex III).

ANNEX I

AGENDA

Wednesday, October 29, 1969

9.30 - 11.30

1. Opening address by the Minister of Civil Service and Labor of the Central African Republic.
2. Address of welcome from the Secretary General of the U.D.E.A.C., Mr ONANA AWANA.
3. Adoption of the agenda.
4. Introduction of draft report by Mr ABRAMS.

15.00 - 17.30

5. Election of chairman of the meeting.
6. Inventory of training facilities and needs (Mr Guedj).

18.00

UDEAC reception - Safari Hotel, 13th floor

Thursday, October 30, 1969

9.00 - 12.30

7. Regional and national prospects in the field of technical education and vocational training.

15.00 - 17.00

8. Conclusions and recommendations.

18.00

ORT closure reception

ANNEX II

ADRESS OPENING BY THE MINISTER OF CIVIL SERVICE AND LABOR OF THE CENTRAL AFRICAN REPUBLIC ON OCTOBER 29, 1969

Excellencies and Colleagues,

Mr Secretary General,

Gentlemen,

In the name of His Excellency, General Jean-Bedel Bokassa, President of the Central African Republic, and of his Government, it is my pleasant duty to welcome to this country the representatives of governments and of private enterprise of the countries which are our friends. You may be assured of the fraternal friendship of the people of the Central African Republic.

Gentlemen, the theme of your conference contains in itself the outlines of a problem that has been preoccupying most of our countries since they gained independence and in particular my own country, where an unusual experiment is in progress under the title "Operation Bokassa". In a word, the task facing the reknowned head of the Central African Republic, His Excellency General Jean-Bedel Bokassa, and his Government is the mobilization of the entire population, creation of a mentality directed towards development and progress which will enable each citizen of this country to become aware of his or her own increasing potential and an effective role in the building of this nation. The vocational training necessary to provide leaders amongst the people is one of the conditions *sine qua non* for success in the enterprise of nation-building in which every one of us is passionately engaged.

The obstacles in the path of vocational training are, indeed, a grave handicap to our development. We therefore do not hesitate to seek solutions from organizations whose competence and experience in this field are well known.

We are pleased that the motive power for this meeting came from one of these organizations, for which no praise is too high — I am speaking of ORT (Organization for Rehabilitation through Training).

Although, when we take stock of the various sources of aid from which the countries of our sub-region benefit, we may regret our tardiness in turning to the services and assistance of ORT, we know that the activities of this organization have been demonstrated in other countries of the third world in general, and in Africa in particular, with singular success and the achievement of fruitful and fertile cooperation.

In the name of all of you, I would like to thank the Government of the United States of America which, through the Agency for International Development, has kindly financed this conference, providing once again a proof of its wish to assist the emerging countries.

The presence of all areas of the labor world (public, semi-public and private) at this conference is sufficient indication of the importance attached by our heads of state, anxious for complete coordination in all fields, to the problem of vocational training, which is indubitably the foundation of development.

Gentlemen, the proposed agenda contains two essential points:

— examination of a report presented by the ORT survey mission which visited our countries;

— the regional and national prospects in the field of technical education and vocational training.

I am certain that you will examine these problems with competence and mutual understanding.

Before taking leave of you, I would like to assure you of the wholehearted hospitality of the city of Bangui, and I beg you to consider yourselves at home here. The city of Bangui is honored by your presence and will do everything possible to make your stay as pleasant as possible during your deliberations.

I now declare open the First Conference on Vocational Training in Central Africa.

ANNEX III

FINAL COMMUNIQUE

The First Conference on Vocational Training in Central Africa, held at Bangui on October 29 and 30, 1969, completed its work after reviewing the preliminary report prepared by the ORT experts at the request of the United States Agency for International Development.

This conference brought together representatives from the Federal Republic of Cameroon, the Central African Republic and the Republic of Gabon, all members of the U.D.E.A.C. and from Chad.

The Republic of Congo (Brazzaville) sent an observer.

The participants examined a series of recommendations dealing, in particular, with the creation of various vocational training centers of a regional character.

The technical discussion of the proposals took place in an atmosphere of mutual understanding.

The delegates of the member states of the U.D.E.A.C. and of Chad expressed the hope that the recommendations made would begin to be implemented with the least possible delay.

The participants and the ORT representatives thanked the Government and the people of the Central African Republic for the warmth of their welcome and the hospitality extended to them during their stay in Bangui.

BANGUI, October 30, 1969

ANNEX IV

LIST OF PARTICIPANTS

DELEGATIONS:

1. CAMEROON: Mr. Loung, Director of Higher Education
   Mr. Nya Ngatchou, Director of Human Resources
2. C.A.R.: Mr. Gleizes, Director, Bangui Lycée Technique
   Mr. Grisoni, Director of Tourism, Bangui
   Mr. Mackpayan, President, Chamber of Commerce, Bangui
3. CHAD(1): Mr. Adoum, Director General of Higher Education
   Mr. Michel, Chief, Technical Education Service
4. CONGO (Brazzaville)(2): Mr. Sega
5. GABON: Mr. M'Boro, Director, Ministry of Labor
   Mr. Mibindon, Director of Technical Education

SECRETARIAT:

UDEAC: His Excellency Charles Onana Awana, Secretary General, UDEAC.
Mr. Michel Anchouey, Deputy Secretary General, UDEAC.

ORT: Mr. E.B. Abrams, Director, Technical Assistance Department
Mr. S. Guedj, Assistant to the Director, Operations Department

OBSERVERS:

Mr. M. Bigoundou, UDEAC
Mr. G. Oyaya, UDEAC
Mr. J. McLaughlin, Regional AID Officer, Yaounde
Mr. R. Ellert-Beck, AID, Dakar
Mr. Ph. Maslin, F.A.C.
Mr. Cannas, I.L.O.
Mr. Goren, Israeli Embassy
Mr. D. Cohen, Chief of Party, AID/ORT, Bangui

(1) Non-member of UDEAC
(2) Observer

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ABSTRACT.

This notebook of career counseling materials is a compilation of career information on nursing and the allied health fields. The first section provides general information useful in choosing a health career on such topics as career planning, career mobility, employment prospects, financial aid, terminology in health job titles, and an annotated bibliography of health career information. The major portion of the guide consists of career information on 66 health occupations organized under 11 occupational categories: Dental, dietary, administration, medical laboratory, medical machine services, medical practitioners and assistants, nursing, public health and health education, records and office services, rehabilitation, and other. Types of information provided for each health occupation include description of occupation, desirable personal qualities, educational requirements and list of Illinois educational programs, employment prospects, salary, career mobility, list of reading materials, addresses of professional organizations, and further sources of information. (NJ)

HEALTH CAREERS PLANNING GUIDE -- ILLINOIS

prepared by

Area Health Education System

Region 3-B

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(Contractor: University of Illinois)

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Public Health Service
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NURSING

PUBLIC HEALTH & HEALTH EDUCATION

RECORDS & OFFICE SERVICES

REHABILITATION

OTHER

INTRODUCTION

All high school and college students are faced with the task of making future career plans. For a few students this is an easy, smooth, more or less continuing process, but for most students it is a difficult job requiring the help of others. A recent major study conducted by the American College Testing Program found that students appreciate career guidance and would like more such help.* Our increasingly complex world of work with its larger number of career options requires that students make greater efforts in order to become aware of their alternatives. To the extent that they become aware of their alternatives and understand themselves in relation to these alternatives they will increase the likelihood of making realistic, satisfying decisions.

In the last decade the number of persons employed in the health occupations has risen sharply. It will continue to rise for the foreseeable future. At the same time, further specialization in the realm of health care has resulted in the creation of new health occupations. It has been difficult for students, counselors, and teachers to stay informed about these new occupations and their required educational and training programs. This lack of current information in the health fields has prevented students and counselors from being aware of all career possibilities.

Recognizing that this is a bad situation, the Illinois Area Health Education System (AHES) has undertaken as one of its programs the development of career counseling materials which are designed to make up for this lack of health career information, and thereby aid in career planning done by students with the assistance of counselors, teachers, parents, and others.

The health career counseling materials that have been assembled here are from many sources and respond to these informational needs. Most of this information is about the ALLIED HEALTH fields and nursing. The allied

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*American College Testing Program, National Study of Student Career Development: Summary of Results, ACT Research Report No. 61, Iowa City, Iowa, November 1973

health fields are those which are allied with and provide assistance to doctors, dentists, and other very highly trained health practitioners. There are many allied health fields; some of the more commonly known are dental assisting, medical technology, physical therapy, and speech therapy.

This career information has been placed in a looseleaf notebook so that the Illinois AHES staff can easily update it. This notebook is in the offices of the counselor responsible for career counseling. In some cases, health occupations teachers will have copies.

It is hoped that students, counselors, and teachers will make copies of material that interests them (none of the information is copyrighted).

Questions concerning allied health career planning may be addressed to:

Karl Runkle
Counselor, Allied Health Professions
2 Student Services Building
University of Illinois
Champaign, Illinois 61820

INFORMATION PROVIDED AND HOW TO USE IT

Most of the contents of this volume is career information on the allied health fields. "Allied health" is a broad classifying term for the work activities that aid the functioning of doctors, dentists, and nurses. It also includes the work of those who perform environmental health work. The allied health occupations discussed in this volume require educational preparation that is specifically health-related.

Important General Information

Before reading about the specific health fields you are interested in, it would be better to read the first section of the Guide, "Important General Information." It will give you an understanding of matters which are essential to your making good use of the specific health careers information. The key parts of the first section are:

Introduction - 1-A
Career Planning - 1-C
Career Mobility - 1-D
Suggestions Concerning High School Courses - 1-E
What You Need to Know About Educational Programs - 1-F
Employment Prospects - 1-G

Information on Specific Health Careers

A variety of information for you to think about as you plan your future is given for each of the occupations described in sections 2 - 12 in the Guide. An effort has been made to provide you with honest, realistic information so that you can reach a broad understanding of each health occupation that interests you. As you find other information, you will notice that some of it resembles advertising. It is hoped that the material in this Guide will help you to evaluate other health career literature.

Below are the types of information given for each health occupation, and in some cases, comments about that information:

Type of Information	Comments
-description of the occupation	(In many cases this material is taken directly from the Health Careers Guidebook, 3rd edition, 1972, by the U.S. Department of Labor and the National Health Council)
-desirable personal qualities	(Abilities, interests, and personality qualities that are generally considered helpful for persons interested in particular occupations)
-educational requirements & list of educational programs in Illinois	(Sometimes the educational programs for different levels of practice in the same field are listed on the same page, rather than following the description of that specific level of practice. Example: educational programs for medical record administrators and medical record technicians, page 10-B-2)
-employment prospects	
-salary	
-career mobility	(This refers to the presence or absence of opportunity for advancement within a health field or into a related field; this is an area of great concern when planning your career)
-list of reading materials	
-addresses of professional organizations	(Almost every health field has its own professional organization which performs a number of functions, including providing career literature)
-suggestions on how to learn more about the occupation and your interest in it	(Reading career literature, talking with health workers, and doing health-related work are excellent ways to determine your interest in an occupation)

CAREER PLANNING

The purpose of this Health Careers Planning Guide is to provide you with information which will be useful as you consider the possibility of a health career. The best way to approach planning your career is to give the matter some careful thought. Decisions affecting your career that are made as a result of chance or that are forced on you by circumstances may turn out to be unhappy ones. Giving serious attention to your future will not guarantee you happiness in your work, but it will make happiness more likely.

This section on "Career Planning" is not a complete guide to all aspects of career planning. (See your counselor for help in determining and carrying out the important aspects of your planning efforts.)

What is career planning? Briefly, it is a process, a series of activities aimed at looking for answers to the following questions as they relate to careers in which you are interested:

-What are my interests?

-What are my abilities?

-What beliefs and principles ("values") are important to me?

-What are my goals in life?

-What opportunities do I have now and might I expect in the future to explore more fully and to develop my abilities?

-What are the various occupations really like; what are the important aspects of these occupations as far as I'm concerned?

The above questions are important; finding answers to them is a difficult job.

There is an excellent, very practical book available which may assist you. It is:

What Color Is Your Parachute?
A Practical Manual for Job-Hunters and Career-Changers

by Richard N. Bolles
(revised every year or two--the most recent edition is 1976)

Ten Speed Press
Box 4310
Berkeley, California 94704

($4.95 in paperback)

Chapter 5 of this popular book (pages 89-104) has proven extremely useful to many industrious students, as well as to older persons, who have wished to plan their careers and their lives, so that they can make a living doing what they like to do. (In addition, Parachute describes in depth how to find the kind of job that is right for you, considering all the qualities that make up your unique self.) The book explains a variety of methods which can help you determine:

-your goals in life

-what your skills are (the things you do well, and that you are interested in, that you like doing)--there is no sense spending years of your working life doing things that you don't like

-how long it will take you to achieve your goals

There are many things you can do to explore your interests while in high school or college. The subjects you study in school may indicate to you which general fields are appealing. Reading career information is important. Teachers, librarians, and counselors can probably recommend books, magazines, and newspapers that will increase your understanding. Take a look at what you do outside of class. If you are involved in extracurricular activities, you probably have some talents and gain some satisfaction out of them. What are those talents and satisfactions? How do you spend the rest of your time? Do you have a job? What are your hobbies? What do you daydream about? Answers to questions such as these might be clues to interests you are not aware of.

It is good to discuss your interests with parents, counselors, teachers, friends, and others. The most helpful people to talk with are those who are willing to really listen to you. You will probably value the thoughts of those who make an effort to understand what you think and how you feel (even if they don't see everything the way you do).

You need to examine the occupations that appeal to you--close up. It is very important for you to take the initiative in finding work which is related to your interests. Many hospitals and other health care facilities have need for paid and volunteer part-time and summer workers.

In addition to (or in place of) work experience, talk to people who have jobs that interest you. For example, you may like laboratory work, but how do you know you would like working in a medical laboratory? You would have to find out about the different kinds of work in a medical laboratory. Or you

may want to work in a setting where you can help sick people in a more direct, personal way, but how do you know you would enjoy being a physical therapy assistant, a nurse, or a medical social worker? It is quite possible to get a more accurate idea after you have decided which of the items listed below are important to you:

A) Considerations about the nature of work	B) Considerations related to work
Use of abilities	Job title
Sense of accomplishment	Glamor
Challenge	Prestige
Creative or aesthetic outlet	Pay
Intellectual stimulation	Fringe benefits
Working with ideas	Security
Working with things	Hours of work
Working with others	Surroundings
Competition	Safety hazards
Service to others	Geographic location
Control over others	Transportation
Responsibility	Availability
Independence	Credentials required
Working by oneself	Age and sex requirements
Visible results	Union membership
Variety	Discrimination
Physical activity	Occupational inheritance
Outdoors	Socioeconomic trends
Excitement	Social contacts
Risk or adventure	Way of life

*This list is from: Daniel Sinick, Occupational Information and Guidance, Houghton Mifflin Company, Boston, 1970, p. 13.

Hospitals, clinics, nursing homes, and social welfare agencies are good places to find experienced workers to talk with. For instance, if you are interested in dietetics, phone a hospital, nursing home, or other institution having a food service and ask a dietitian or dietetic technician if you can come for a visit. When talking to the dietitian (or to any kind of health worker), do not hesitate to ask questions aimed at finding out if he/she derives from work the things in Considerations A) and B) which you believe are important for your happiness. You will be able to see if the answers you get match the "picture" you have of that kind of work. If you talk to several dietitians (or whatever kind of health practitioner you talk to) and find that their views of their work are a lot different from what you expected, you will probably start to re-evaluate that career interest. If your ideas

about the field are confirmed, then you have reason to feel greater certainty that you have a realistic view of that field.

You will find that most people like to talk about their careers, they will be glad to share their experiences with you. You may want to include questions such as these in your conversation:

-"What do you do during a typical work day?".
-"How did you happen to get into this kind of work?"
-"What kind of educational and other preparation do you have?"
-"What do you like best about your work?"
-"What do you dislike most about your work?"
-"What advice do you have for a young person considering this kind of work?"

Following are some examples of how work experience can aid your career planning. If you have an interest and ability in mechanical work, you might find it helpful to determine whether or not your interest in repairing electrical equipment is such that you might be happy as a biomedical engineer or biomedical engineering technician. As a repairman of complex biomedical equipment in a hospital, you might find that your mechanical interests are well-suited to your job duties, or on the other hand, that you would rather try automobile mechanics. Or it is possible that your hospital work experience tells you that you would rather use your mechanical talents only for your personal pleasure--like working on your car.

A second example. If you think you might like nursing, or speech therapy, occupational therapy, or any of the other therapeutic or rehabilitative fields, it is wise to acquire some form of work experience in a hospital, nursing home, or other setting which brings you into close (and at times, difficult) personal contact with people. Some people who have wanted to help people in therapeutic relationships have discovered through trial work experiences that they were unable to handle the strong emotional demands that such relationships placed on them. Strange as it may seem, some people have found that they cannot stand to be around sick people so much of the time. On the other hand, others have found great personal satisfaction in rehabilitation or nursing careers.

Although only a few health occupations have been mentioned in these examples, important personal learning can come from any health-related work. Through work experience you can find out how it feels to take orders and give orders,

work independently or teamed with others. You can learn how much income and prestige various kinds of workers obtain, and you will then be able to ask yourself what your income and status needs are. And there is much more you can discover about yourself.

Last of all, you should accept the fact that most young people--because their horizons are expanding--frequently change their ideas about many things (the same is true with many older people, too). This is what growing up is all about. As you change, it is quite possible that your ideas about work will change. Work will continue to change also: in a few years health occupations will emerge which do not exist now. All of this makes career planning harder, but not any less important. It is best to plan flexibly--not narrowly. Putting "all your eggs in one basket" can prove costly if your career interests change, or if circumstances prevent you from carrying out your plans.

CAREER MOBILITY

The means for fulfilling your hopes or aspirations in your work is through career mobility -- either within your field or into another field. Career mobility can help you to become more, by making it possible for you to:

1) perform more complex job duties
2) assume more job responsibility
3) gain access to further opportunities
4) receive greater status
5) earn more money

If you are looking into the possibility of education and work in a health field, you ought to ask yourself questions such as these:

"What might be the consequences of choosing this particular field?"

"What will my beginning salary be, and what might it be after five or ten years of work?"

"Does my field of interest offer the opportunity for assuming greater responsibility as I become more capable?"

"After a few years of work, can I quit in order to devote time to my family or to pursue some other endeavor, then return to work later on? Can I work part-time?"

"If I decide to change my field of work after a while, what is the likelihood of entering a related field? What sacrifices might such a change require of me?"

"If such a change requires me to acquire additional education, are there relevant educational programs or proficiency and equivalency tests available to me?"

In order to move from one job to a better one 1) you must be given an opportunity to receive the necessary education and/or experience you need to qualify for that new job, and/or 2) if you already are capable of doing well in that better job, you need to find out if you have the opportunity to prove that you are capable. Through the use of certain examinations, you may be able to demonstrate that you are capable of doing a higher level of work. Find out about:

Equivalency Tests - geared to find whether a given individual can be considered to have achieved the level of knowledge represented by specific educational programs or courses at given academic levels. Grades on such examinations are used for exemption of individuals from required courses, for exemptions with course credits, or for entrance with or without advanced standing into course programs.

Proficiency Examinations - measure the competence of individuals with respect to specific work or related activities or with respect to academic achievement. Proficiency examinations for academic course work are sometimes called equivalency examinations, while examinations to determine work proficiency levels may be called performance evaluation tests or work sampling tests.

All students should be aware of these equivalency examinations:

General Equivalency Diploma Examination (GED) tests for academic knowledge at the high school level; those passing this test are awarded a high school equivalency diploma which enables them to qualify for jobs and college entrance requiring a high school diploma.

College Level Examination Program (CLEP) tests for college-level achievement in many subject matter areas; these examinations enable students to receive college credit and advanced placement in college and university academic programs.

An agency of the federal government has recognized that there is a great need for developing examinations which will help the career advancement of capable health workers:

Division of Associated Health Professions
U.S. Department of Health, Education, and Welfare
Federal Building, Room 416
9000 Rockville Pike
Bethesda, Maryland 20014

This agency is working to develop exams in a number of allied health fields, but it is a slow task. After the tests are developed, they must be approved for use in each health field by the professional organizations which have the major voice in setting standards in those fields. For a variety of shortsighted reasons, some professional organizations have been slow to encourage these needed changes affecting career mobility.

Even if you intend to work for only a short time in a health job you should think about career mobility because for unforeseen reasons, you may later choose to or out of necessity have to remain in that job much longer than you had anticipated.

Beware of a Dead-End

In many of the health occupations which require only on-the-job training or two years or less of education after high school, wages are very low if you are the sole supporter of a family. In some cases added years of work

experience do not bring much increase in salary. In addition, opportunities for advancement may be sparse or non-existent.

There is a lack of good employment opportunity in some health fields, in some employing institutions, and in some geographical areas. Remember that the occupation and/or the employer have an effect on whether you are engaged in dead-end work or instead have a chance at better opportunities.

These above questions are worth asking -- probably it will not be possible to answer all of them. But even so, it is good to raise such questions, if in the questioning process you develop the habit of being aware of all your options. Knowing your alternatives will make it possible for you to make better career choices.

SUGGESTIONS CONCERNING HIGH SCHOOL CLASSES

In most of the health fields described in the following pages, little has been said about high school classes that would be useful preparation for later education and work. Some health fields require considerable intellectual understanding in the biological and physical sciences; other fields require the ability to understand and show concern for people. Success in some fields calls for a combination of both these qualities.

Most educational programs of two years in length or less (in junior and community colleges, vocational schools, technical schools, and hospitals) do not require you to have taken any specific classes in high school. Obviously some high school classes are more directly related to particular health fields than are other high school classes. If you think you might be interested in a medical laboratory career, algebra, biology, and chemistry would help you to better understand your later course and laboratory work. If you have an interest in medical office or medical records work, classes in business would be useful. If you are interested in working more directly with persons receiving health care, courses in the behavioral (such as psychology) and social sciences could be an asset. Are you interested in art, music, literature, speech, or drama? If your school offers these classes they can be of advantage to you should you enter a health field dealing directly with patients. And regardless of your interests, courses that give you an opportunity to read are good preparation for college work. Teachers, counselors, parents, and others to whom you can go for good help may be of use to you as you decide which classes make the most sense. In addition, community college faculty members and counselors are willing to discuss your high school classes as they relate to your college plans.

For students thinking about a health career requiring a bachelor's degree (usually four years) or more, there are particular high school classes which you should take because they are required for entry into many colleges and universities. Examples of often required high school classes are those in the biological and physical sciences, mathematics, English, and foreign language. Carefully studying the catalogs of colleges you are considering -- with the help of a counselor or someone else who understands what the catalogs say -- is a good way to learn what high school classes colleges expect you to have taken.

WHAT YOU NEED TO KNOW ABOUT EDUCATIONAL PROGRAMS

The educational and training programs listed in this guide are conducted by the following kinds of institutions: community (junior) colleges, colleges and universities, hospitals, public schools, schools specializing in health curricula, the armed forces, and proprietary schools (privately-owned, profit-making schools). All of the programs described are given in Illinois except for some of those sponsored by the armed forces. The listings of Illinois health programs are complete as of September 1975.

Learning About Your Chances of Admission

To get more information about the educational and training programs listed in this handbook, write to the directors of those programs. For instance, if you are interested in the dental hygiene program at Parkland College and the environmental health program at Illinois State University, you can address your letters to:

Director, Program in Dental Hygiene
Parkland College
Champaign, Illinois 61820

and

Director, Program in Environmental Health
Illinois State University
Normal, Illinois 61761

Admission into many of the educational programs in the health professions is competitive. Therefore, it makes sense for you to visit in person, to phone, or to write to the directors of all the programs you are considering. Since the deadlines for applying to some educational programs are 9-12 months before classes actually begin, make these contacts early.

Educational institutions having health-related programs in which many more students are interested in enrolling than the schools will admit, are faced with the task of selecting the students for their programs. This selective admissions situation is very common. In order to gain acceptance into a competitive educational program, you must have the kinds of qualifications required. Those qualifications vary somewhat among different programs and different educational institutions. Following is a list of commonly used considerations: grades, rank in class, ACT and other test scores, completion of prerequisite course work, residency, the results of a personal interview, letters of recommendation, and relevant work experience.

In order to estimate the likelihood of your being accepted into an educational program, it would be helpful to request the following information from the program director:

-How many students applied to the program last year?

-How many students will be accepted this year?

-What were the average grades of those accepted last year?

-What was the lowest grade average accepted?

-Are science grades considered to be important?

-What are all the other selection criteria (standards)?

-Are the selection criteria weighted? (For example, do certain criteria have greater importance than certain others?)

It is likely that some program directors will not disclose all of this information, and some will not have all of this information. But, these are fair questions, and it is in your best interest to find the answers. The more information you can gather, the better you can judge your chances of being accepted into the programs in which you are interested.

Good Job Prospects Do Not Mean There Are Plenty of Educational Prospects

It is commonly known that the employment situation in the health professions is generally good, and will almost surely continue to be good for the foreseeable future. But it is not widely understood that the educational programs in hospitals, community colleges, and colleges and universities have limits on the numbers of students they can admit. Often these programs have two or three, even as many as ten times the number of applicants than they have space for. Thus, the fact that there are jobs for health workers should not be interpreted to mean that educational programs in these fields have space for an equally large number of students. That means that you should be aware of other educational programs and/or related health fields as possible alternatives.

Determining the Quality of the Educational Program

All of the educational programs listed on the following pages are offered by legitimate public, private, and proprietary institutions. However, some educational programs have not received approval by professional associations which set standards for educational programs in their respective disciplines. This does not necessarily mean that such programs are inferior, but it should motivate the student to investigate more thoroughly before deciding on that particular program.

It is often difficult to determine the true significance of educational programs which are approved or not approved by professional organizations. Yet it is in your best interest to find out the advantages and disadvantages of selecting a particular program for your future place of work and further education and career prospects. For help in evaluating programs and schools you are considering, you may talk with counselors, teachers, and local health practitioners, and write to the schools and appropriate professional organizations.

Educational Programs Outside of Illinois

Students considering a field requiring a bachelor's degree or more education (the competition for admission into such educational programs is often intense) may want to learn about educational programs offered in colleges and universities outside of Illinois. Probably the best way to do this is to write to the professional organization(s) listed for each field. The professional organization should be able to send you a list of all schools in the nation offering educational programs in that particular field. In turn, you can write to the schools that interest you.

If you are considering out-of-state programs in fields where competition for admission is fierce, you may have very little chance of acceptance at public universities. This is because they give preference to qualified students from their own states. Therefore, when looking out-of-state, you are better off applying to private colleges and universities because they have no residency requirements.

Certification; Licensure; Registration

You may encounter these three terms. They are interrelated and they are complicated. Their specific meaning varies with each health profession. Only general definitions are given here; detailed information as these terms relate to fields in which you are interested can be obtained from the appropriate professional organizations. (Students should not feel that they have to understand these terms--they are not important to your career planning.)

In many health professions individuals are required to demonstrate that they are competent in their field before they are allowed to work. Depending on the field, there are two ways in which individuals may show that they are capable: certification and licensure.

Certification - a mechanism set up by professional health organizations for granting recognition to individuals for having met certain qualifications. Such qualifications may include: a) graduation from an approved educational program, b) passing a qualifying examination, and/or c) completion of a given amount of work experience.

Licensure - a mechanism set up by agencies of government for granting recognition to individuals for having met certain qualifications. The qualifications often resemble those required for certification.

Registration - a mechanism set up by a professional health organization or governmental agencies for maintaining an official list of individuals who have demonstrated that they are qualified to work in their particular health profession. Qualification for obtaining registration may include those required for certification.

EMPLOYMENT PROSPECTS

It is natural for students to want to know if they will be able to find employment in a particular health occupation after completing their education. It is not possible to guarantee students that they will find a job, or that there will be job openings in a specific part of the state or the nation.

A number of studies have tried to forecast how many dental assistants, physical therapists, nurses, and other kinds of health workers will be employed at future dates. Unfortunately, these studies cannot always accurately make predictions. It is relatively easy to predict how many medical technologists a small city with two hospitals will need in 1980 or 1985, but it is not possible to know whether those two hospitals will have the money in 1980 or 1985 to hire all the medical technologists they need.

On the other hand, experts agree that some form of national health insurance will come some time in the 1970's, and that will make it possible for people to get medical attention who could not afford it in the past. And because of national health insurance it is likely that middle income people will utilize health services more frequently than before. Finally, our birth rate is declining and the average age of the population is increasing. This larger percentage of older people will also result in more use of health facilities. All of this adds up to a greater need for health workers in the coming years. Some health professions will expand faster than others, and a number of new professions will emerge as the health fields continue to become increasingly specialized.

Some information on employment prospects -- in 1974 and for the next ten years -- has been obtained for a number of the health fields discussed in this guide. That information is located in the "Further Information" section of those fields.

HEALTH OCCUPATIONS WHICH ARE NOT EMPHASIZED IN THIS GUIDE

Health Occupations Which are Only Briefly Discussed

Only descriptions of the fields and listings of educational programs are given for the following health occupations: chiropracter, dentist, optometrist, osteopathic physician, pharmacist, physician, podiatrist, and veterinarian. More information on these professions can be obtained from the professional associations listed along with the occupational descriptions.

Health Occupations Which Are Not Discussed

A number of occupational possibilities in the health care field are not discussed. They represent functions which are essential but not unique to the health field; entry into them requires no special health-related education. Some of these occupations require other kinds of educational preparation beyond high school; others can be learned on the job. These occupations fall in the general categories of: clerical, communication, data processing, financial management, maintenance, personnel, public relations, and purchasing and receiving.

There are a few health occupations employing small numbers of people for which there are formal educational programs in Illinois but which are not described in this guide. Information about fields and educational programs which are of particular interest to the reader may be requested from the appropriate organizations in the section "Organizations Which Have Health Career Information," located in the "General Information" section.

FINANCIAL AID FOR EDUCATIONAL PROGRAMS

There are many kinds of financial help available to students in health-related educational programs. However, it is difficult to discover all the sources of financial aid for which you may be eligible.

For high school students, the first step to take in obtaining financial aid is to apply early in your senior year. While you are learning about colleges so that you can choose the one you will attend, write to the Financial Aids Office of each college. (Students intending to get education or training at a hospital or other kind of institution should ask those institutions about financial aid.) Ask for complete information on all forms of financial assistance, as well as for an application for financial aid. If you are able to select a college, and make application for financial aid early in your senior year of high school, you will have the best chance of getting aid.

A good booklet which will help you plan your college expenses and give you general advice on how to get the aid you need is:

Meeting College Costs, A Guide for Parents and Students

Your counselor or a college financial aids office may have a copy. If not, you can get one free of charge from College Board Publications Orders, Box 2815, Princeton, New Jersey 08540.

Colleges determine the financial aid for which you qualify on the basis of your need. Usually, they determine your need by analyzing either a form your parents fill out--Parents' Confidential Statement, or another form--Student's Financial Statement.

There are several kinds of financial aid. The most common ones are:

scholarships	
grants	(money given which does not have to be repaid)
loans	
college work programs	(college jobs for which you are paid)

Full information on aid should be requested from a college financial aids office. Following are aid possibilities of special significance to the health professions:

-assistance from the federal government for students interested in certain health professions (programs a) and b) were not funded as of August 1975)

a) Health Professions Student Loan Program and Nursing Student Loan Program
b) Health Professions Student Scholarship Program and Nursing Student Scholarship Program

c) Public Health/National Health Service Corps Scholarship Training Program
d) armed services assistance programs for enlisted persons
e) GI Bill (for returned service personnel)
f) Social Security (for those whose parents are disabled, dead, or older and retired

- hospital auxiliaries (the auxiliary groups in hospitals raise money, which is often granted to persons preparing to enter a health profession)

- voluntary health associations (heart, cancer, etc. organizations give money to persons desiring education to enter a health profession)

- health professional associations (for the health professions mentioned in this book, see the heading "Professional Organization Where More Information May Be Obtained" in the "Further Information" sections; addresses of associations are given which can supply you with information on aid designed especially for persons in that health field)

- Illinois Hospital Association--provides scholarships to students preparing for entering into several health professions

- labor unions, larger businesses, foundations, religious organizations, cultural organizations, civic groups, and service organizations may provide financial assistance. Ask a counselor about this. It would also be worthwhile to contact such organizations because they may not have publicized the fact that they provide aid.

(this information was prepared with the help of Frechettia Ford, Assistant Coordinator, Human Resources, Illinois Hospital Association)

TERMINOLOGY USED IN HEALTH JOB TITLES

The list of health occupations is long; the job titles are somewhat confusing. Many titles contain the words "technologist," "therapist," "technician," "assistant," or "aide." Generally, although there are a number of exceptions, this is what those terms imply about the education required for entry into a given health field:

"technologist" "therapist"	educational preparation at the bachelor degree level
"technician" "assistant"	educational preparation at the associate degree level (2 years) or one year of college or hospital training
"aide"	on-the-job training or short-term specialized training

MILITARY TRAINING PROGRAMS IN HEALTH FIELDS

The military services provide a multitude of health training programs for servicemen and women. The American Medical Association has approved a number of these military training programs in six fields. (Many Army, Navy, and Air Force health training programs are not approved by the American Medical Association; however, that does not mean that these programs are of poor quality.) Completion of one of these programs while in the armed forces will help the person who wants to work or continue his education in that health field after completion of military service. Those who have completed AMA-approved programs in the services are considered to have similar educational credentials as those graduates of non-military educational programs and are eligible to take the same necessary certification exams in their respective fields. Those who have completed non-AMA-approved programs usually are ineligible to take these examinations, which can result in their having more difficulty finding employment in their field.

Below is a list of health training programs, and which branches of the military services offer them:

Military Training Programs in Health Fields Which are Approved by the American Medical Association

Physician's Assistant (primary care)	Army, Navy, Air Force
Certified Laboratory Assistant	Army, Air Force
Medical Technologist	Army, Navy, Air Force
Nuclear Medicine Technician	Navy
Physical Therapist	Army
Radiologic Technologist	Army, Navy, Air Force

Additional information on these other military health training programs, and programs for former medical corpsmen is contained in the booklet, Compendium of Military Allied Medical Education, published by the American Medical Association in February 1975. It is available free of charge from:

American Medical Association
Department of Allied Medical Professions and Services
535 North Dearborn Street
Chicago, Illinois 60610

Below is a description of Army, Navy, and Air Force opportunities for earning college credit for courses taken in allied health fields:

ARMY: "The United States Army and Baylor University have entered into an agreement that makes it possible for students successfully completing selected enlisted courses at the Academy of Health Sciences, Fort Sam Houston, Texas, to obtain undergraduate credit. This agreement applies to 25 enlisted medical programs of instruction and encompasses 135 course offerings.

Students who attend these designated classes can be concurrently enrolled at Baylor University, if they desire, and thus become eligible to obtain a regular transcript of their credits to use as a permanent record of their educational experience."

NAVY: "The Navy Medical Department has an agreement with George Washington University for the enrollment of students in Navy medical technical courses as students at the University. The latter evaluates the courses, assigns academic credits for them, keeps scholastic records on all students, and, when all required credits are obtained, grants an associate degree in an allied health specialty. The University has a liberal policy of accepting transfer credits from other colleges and will grant credit for the College Level Examination Program (CLEP) and United States Armed Forces Institute (USAFI) courses so that the student, following the technical portion of his training, may complete degree requirements in a variety of ways. Courses which the student takes in an academic setting on his own time are heavily subsidized."

AIR FORCE: "The major training institution for allied health personnel in the Air Force is the School of Health Care Sciences, Sheppard AFB, Texas. This institution is affiliated with Midwestern University, Wichita Falls, Texas and the University of Nebraska, Omaha, Nebraska.

In addition to the above affiliations, all allied health students at the School of Health Care Sciences are enrolled with the Community College of the Air Force (CCAF) -- a multi-campus institution with its administrative center at Randolph Air Force Base, Texas, made up of existing, but previously unaccredited, schools of the Air Training Command and the USAF Security Service. The primary goal of CCAF is to integrate Air Force technical training and related college level education (off-duty) into consistent, meaningful patterns of career growth towards obtainable objectives. The heart of this effort is the Career Education Certificate (CEC) program. This program consists of eight main areas in which CCAF students are in the Health Care Sciences area. The CCAF Career Education Certificate is modeled after two-year associate degree programs of study, and while it is not a degree, it is felt that each program of study is equivalent to those programs available in the best vocational oriented colleges and trade schools."*

* Ralph C. Kuhli, "Status of Accreditation of Military Allied Medical Education," speech given at Second National MEDIHC Conference, March 20-22, 1974, (mimeographed) p. 13. (This paper is available from the American Medical Association, where Mr. Kuhli is Director, Department of Allied Medical Professions and Services.)

Students with an interest in the details of military health programs should be able to get some information from local Army, Navy, and Air Force recruiters. In some cases, a recruiter may be able to guarantee in writing that, providing certain qualifying examinations are passed, the student will be allowed to enroll in a specific military health training program.

Further sources of information about the details of these programs are:

For U.S. Army health training programs, write or phone:

Mims C. Aultman, Colonel, MC, USA
Chief, Professional Education Coordination
Directorate of Personnel
Office of the Surgeon General
Department of the Army
Forrestal Building, Room 7C030
Washington, D.C. 20314

Telephone: (202) 693-6130

For U.S. Navy health training programs, write or phone:

James E. Wilson, Captain, MC, USN
Naval Medical Training Institute
National Naval Medical Center
Bethesda, Maryland 20014

Telephone: (301) 295-1390

For U.S. Air Force health training programs, write or phone:

William Greendyke, Colonel, MC, USAF
Director, Medical Plans and Health Programs
Department of the Air Force
USAF Headquarters
Washington, D.C. 20314

Telephone: (202) 693-5737

For students interested in medical laboratory work, there is an independent accrediting agency (not affiliated with the AMA) which considers certain armed forces medical laboratory training programs as equivalent to the course work it requires for becoming a medical laboratory technician. For information, contact:

American Medical Technologists
710 Higgins Road
Park Ridge, Illinois 60068

The U.S. Army provides a variety of educational programs in nursing. There are opportunities in the Army for receiving training as a practical nurse. There are also bachelor's degree programs and master's degree programs, including advanced specializations in midwifery, medical-surgical nursing, etc. The bachelor's and master's programs (for which competition for admission is great) are accredited by the National League for Nursing, making them acceptable for civilian employment. Full information on these nursing programs is available from:

Counselor, Army Nurse Corps
U.S. Army Recruiting Command
Building 108
Ft. Sheridan, Illinois 60037

Telephone: (312) 926-3815

NUMBERS IN HEALTH FIELD OCCUPATIONS

(Each occupation is counted only once. For example, all physicians are in medicine and osteopathy.)

HEALTH FIELD OCCUPATIONS	1973 ESTIMATED PERSONS ACTIVE
Administration of health services	48,200
Anthropology and sociology	1,600
Automatic data processing in health field	4,000
Basic sciences in health field	60,000
Biomedical engineering	11,500
Clinical laboratory services	162,800
Dentistry and dental auxiliaries	274,400
Dietetic and nutritional services	68,000
Economic research in health field	400
Environmental sanitation	17,000 to 20,000
Food and drug protective services	44,400
Funeral directors and embalmers	50,000
Health and vital statistics	1,350
Health education	22,500 to 23,000
Health information and communicat'n	6,700 to 9,300
Library services in health field	7,900
Medical records	54,000
Medicine and osteopathy	345,300
Midwifery	4,200
Nursing and related services	2,207,000 to 2,212,000
Occupational therapy	13,200 to 14,200
Opticianry	11,000
Optometry	24,200 to 24,400
Orthotic and prosthetic technology	2,500 to 3,500
Pharmacy	132,900
Physical therapy	24,600
Podiatric medicine	7,100
Psychology	27,000
Radiologic technology	100,000
Respiratory therapy	11,000 to 12,000
Secretatial & office services in health field	275,000 to 300,000
Social work	33,800
Specialized rehabilitation services	11,050
Speech pathology & audiology	26,500
Veterinary medicine	26,900
Vocational rehabilitation counseling	17,000
Miscellaneous health services	252,950 to 258,450
TOTAL	4,387,950 to 4,432,750

Dentist	105,400
Dental hyg.	21,000
Dental Asst.	116,000
Dental Lab. Tech	32,000
Physician (M.D.)	333,300
Physician (D.O.)	12,000
Registered nurse	815,000
Practical nurse	459,000
Nursing aide, orderly, attendant	910,000
Home Health aide	23,000 to 28,000
Ambulance attendant	207,000
Animal technician	5,000
Electrocardiograph technician	9,500
Electroencephalograph technician	3,500 to 4,000
Operating room technician	11,400
Ophthalmic assistant	15,000 to 20,000
Orthoptist	450
Physician's assistant	900
Surgeon's assistant	200

Source: *Health Resources Statistics: Health Manpower and Health Facilities*, Health Resources Administration, U.S. Department of Health, Education, and Welfare 1-L-1

MEN AND WOMEN EMPLOYED IN SELECTED HEALTH PROFESSIONS - 1970

Occupation	Total	Women	Men	Women as Percent of Total
1. Dental Hygienists	15,805	14,863	942	94.0
2. Dietitians	40,131	36,909	3,222	92.0
3. Health Record Technologists and Technicians	11,164	10,283	881	92.1
4. Medical Laboratory Technologists and Technicians	117,336	84,641	32,695	72.1
5. Nurses (RN)	829,691	807,359	22,332	97.3
6. Radiologic technologists and technicians	52,230	35,463	16,767	67.9
7. Therapists	75,161	47,563	27,598	63.3
8. Chiropractors	13,729	1,127	12,602	8.2
9. Dentists	90,801	3,110	87,691	3.4
10. Optometrists	17,219	692	16,527	4.0
11. Pharmacists	109,642	13,032	96,610	11.9
12. Physicians (MD's & Osteopathic)	280,929	25,824	255,105	9.2
13. Podiatrists	6,026	460	5,566	7.6
14. Veterinarians	19,435	985	18,450	5.1

SOURCE: U.S. Department of Labor

(This table listing the proportions of men and women in selected health fields is not meant to discourage young men or women from fields which are characterized by a large majority of the other sex. On the contrary, many fields are deliberately looking for promising young persons of the sex underrepresented in their field. This table is simply meant to inform the reader.)

HEALTH CAREERS CALENDAR

THIS CALENDAR gives you a quick check on how many years of education, after high school, you should count on for the representative health occupations listed here. The lines and symbols show what is customary—some people take only minimum required training; many take more.

- ● Requires no special training.
- ●——— Entails an apprenticeship, special course, or on-the-job training.
- ■——— Requires special training in college, in a hospital or special school, or in a professional school after 1 to 4 years of college.
- ○ Though the line shows the minimum period to qualify, more preprofessional years in college lengthen the total training time.
- □ First square means one can get a junior professional job after college. Subsequent squares indicate that more study—to or beyond the master's or doctor's degree—as well as experience is usually needed for advancement.
- ▬▬▬ Requires special training of varying periods of time.

This calendar pictures training information in condensed timetable form. To get a more detailed picture, read the *Health Careers Guidebook* Occupational Descriptions and consult your school adviser for information and personal guidance on training and the local outlook for the career you want.

YEARS OF EDUCATION AND TRAINING BEYOND HIGH SCHOOL FOR CAREERS IN SELECTED HEALTH OCCUPATIONS

Health occupations	Years of education and training								
	1	2	3	4	5	6	7	8	
Physicians, Dentists, Nurses, and Other Professional Health Workers									
Physician									
Osteopathic Physician									
Dentist									
Podiatrist									
Optometrist									
Pharmacist									
Speech Pathologist and Audiologist									
Orthotist and Prosthetist*									
Professional Nurse									
Veterinarian									

*See footnote at end of table.

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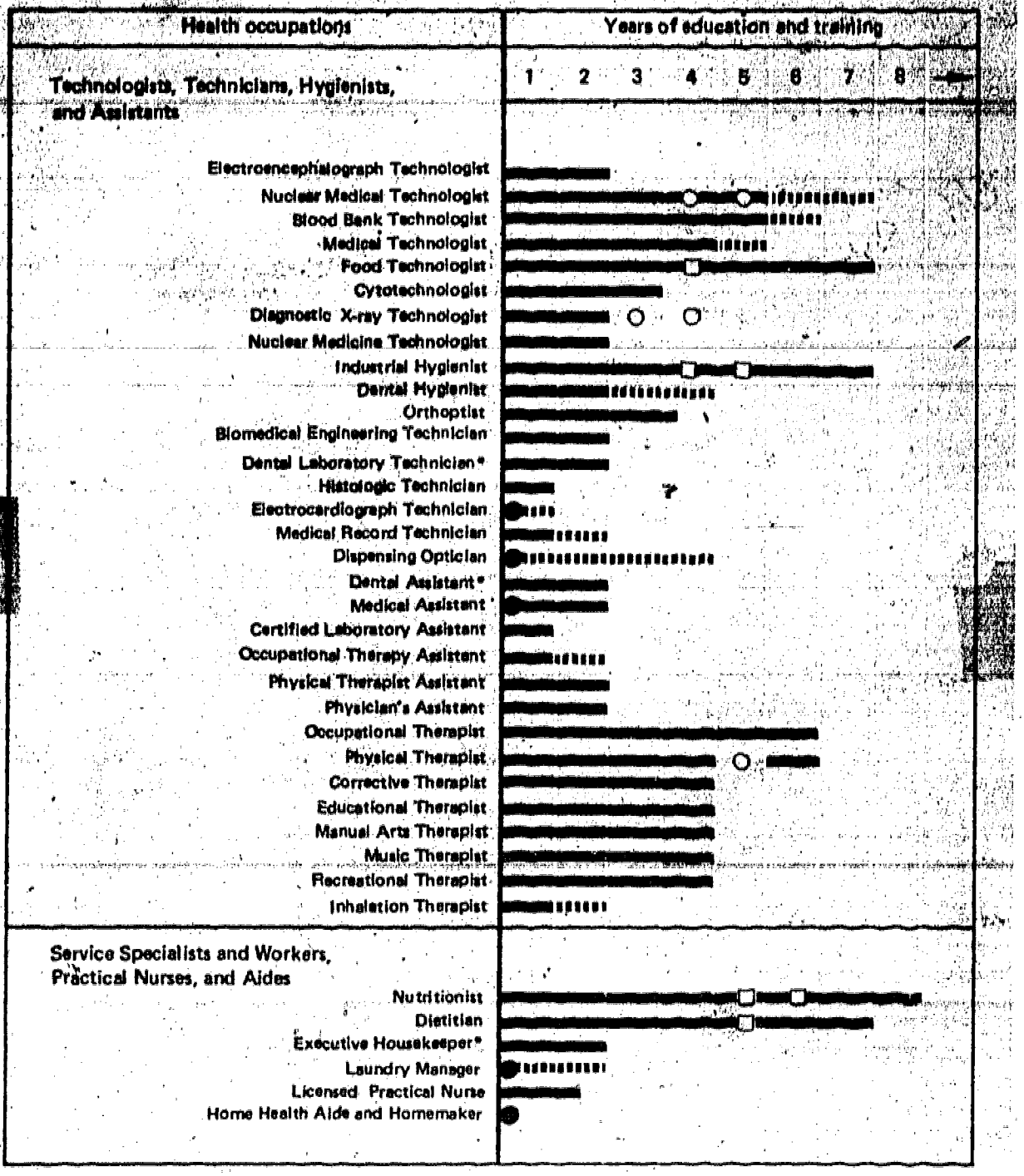
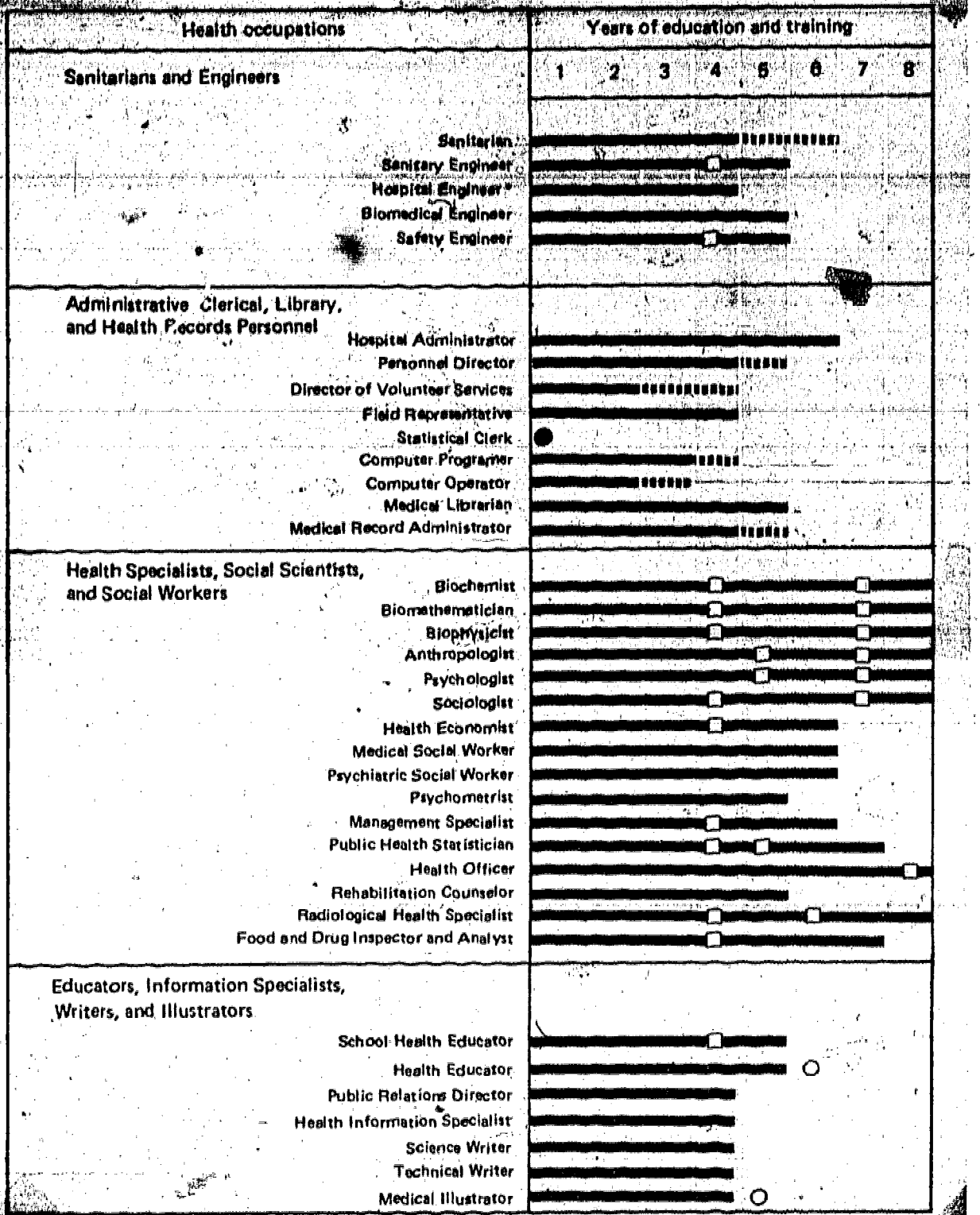
YEARS OF EDUCATION AND TRAINING BEYOND HIGH SCHOOL FOR CAREERS IN SELECTED HEALTH OCCUPATIONS –Continued



See footnote at end of table.

YEARS OF EDUCATION AND TRAINING BEYOND HIGH SCHOOL FOR CAREERS IN SELECTED HEALTH OCCUPATIONS --Continued



In certain areas, 1 to 4 years of apprenticeship, a special course, or on-the-job training are acceptable in lieu of formal training. Beginning in 1980, orthotists and prosthetists will be required to have a B.S. in the field.

Source: U. S. Department of Labor, HEALTH CAREERS GUIDEBOOK, 3rd ed., (Washington, D. C.: U. S. Government Printing Office, 1972.

ORGANIZATIONS WHICH HAVE HEALTH CAREER INFORMATION

Organization	Type of Information
1. American Hospital Association 840 North Lake Shore Drive Chicago, Illinois 60611	information on hospital educational and training programs and a great deal of knowledge about many aspects of the health professions
2. American Society of Allied Health Professions One DuPont Circle Washington, D.C. 20036	this association is comprised of 125 universities and professional health associations; it is concerned with educational programs and other aspects of the health professions
3. ASPIRA, Incorporated 2316 West North Avenue Chicago, Illinois 60647	career counseling to Spanish-speaking people
4. Department of Allied Medical Professions and Services American Medical Association 535 North Dearborn Street Chicago, Illinois 60610	much experience and information on many aspects of many health professions
5. Division of Associated Health Professions U.S. Department of Health, Education, and Welfare Federal Building, Room 416 9000 Rockville Pike Bethesda, Maryland 20014	current information on equivalency and proficiency examinations in the health professions and information on federal and other developments in the health professions
6. Board of Higher Education State of Illinois 119 South Fifth Street, Room 500 Springfield, Illinois 62701	information on health-related educational programs in Illinois 4-year colleges and universities
7. Illinois Community College Board 544 Iles Park Place Springfield, Illinois 62718	information on Illinois community (junior) college educational programs
8. Illinois Hospital Association 1200 Jorie Boulevard Oak Brook, Illinois 60521	has available some health career literature; well informed about the health professions in general, and in regard to Illinois
9. Medical Opportunities Program 715 South Wood Street, Room 314 Chicago, Illinois 60612 (312) 996-8050	health career information and counseling, primarily to minority students in high school and college

Organization	Type of Information
10. Minority Program Office College of Medicine University of Illinois at the Medical Center 1853 West Polk, Room 150 Chicago, Illinois 60612 (312) 996-8952	provides counseling regarding medicine, physical therapy, occupational therapy, dietetics, medical records administration, medical laboratory science, and medical art, primarily to minority students in high school and college
11. Operation MEDIHC c/o American Hospital Association 840 N. Lake Shore Drive, Room 430 Chicago, Illinois 60611	career counseling and help in finding employment in the health fields for veterans of the military services
12. Preprofessional Office College of Liberal Arts and Sciences 350 University Hall University of Illinois at Chicago Circle Chicago, Illinois 60680 (312) 966-3366	provides counseling information regarding health careers

ANNOTATED BIBLIOGRAPHY OF

CAREER INFORMATION IN THE HEALTH PROFESSIONS

1. Council on Medical Education, American Medical Association. Allied Medical Education Directory, 1974, 441 pp. $2.25

Write: Order Department
Council on Medical Education
American Medical Association
535 Norht Dearborn
Chicago, Illinois 60610

annual directory (published in the fall) of AMA-approved educational programs throughout the nation in 24 allied health professions.

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2. Board of Higher Education, State of Illinois. Health Program Directory, 1975, free

Write: Board of Higher Education
State of Illinois
119 South Fifth Street
Room 500
Springfield, Illinois 62701

authorative directory of Illinois educational programs in the health fields.

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3. Illinois Hospital Association, Nursing, 1973, free

Write: Illinois Hospital Association
1200 Jorie Boulevard
Oak Brook, Illinois 60521

leaflet describing four educational routes to a nursing career

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4. Kinsinger, Robert E., editor. Career Opportunities for Technicians and Specialists: Health Technicians, Chicago: J.G. Ferguson Publishing Company, 6 N. Michigan Avenue, 60602, 1974, 364 pp. $12.95

the best general source of student and counselor allied health career information for technician-level positions (usually requiring 1 or 2 years of post-high school education for entry) - well illustrated

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5. National Health Council, Inc. 200 Ways to Put Your Talent to Work in the Health Field, 1974, Single copies free

Write: National Health Council, Inc.
1740 Broadway
New York, New York 10019

brochure which briefly describes a large number of health careers

6. Odgers, Ruth F., and Wenberg, Burness G., editors. Introduction to Health Professions, St. Louis: the C.V. Mosby Company, 11830 Westline Industrial, 63141, 1972, 207 pp. $5.25

excellent general information on the health professions, particularly stressing those fields requiring a bachelor's degree or more education for entry

7. U.S. Department of Labor. Health Careers Guidebook, 3rd edition, 1972, 166 pp. $2.25

Write: U.S. Government Printing Office Bookstore
219 South Dearborn
Chicago, Illinois 60604

the best single source of general career information on the health professions

8. Weiss, Laura Burnstein, and Spence, Ann Bennett. A Guide to the Health Professions, 1973, 212 pp. $5.00

Write: Office of Career Services & Off-Campus Learning
Harvard University
Cambridge, Massachusetts 02138

excellent discussions of trends in health professions requiring a bachelor's degree or more education; good bibliography

9. Richards Rosen Press, Inc.
29 East 21st Street
New York, New York 10010

publishes a series of useful books on a number of health professions

10. Vocational Guidance Manuals
235 East 45th Street
New York, New York 10017

publishes a series of useful books on a number of health professions

11. Science Research Associates
259 East Erie Street
Chicago, Illinois 60611

publishes large series of good health professions briefs, entitled "SRA Occupational Briefs"

Basically, the job of the dentist is twofold: To treat ailments or abnormalities of the gums and teeth; and to try to prevent their occurrence or recurrence. He locates and fills cavities, extracts teeth if necessary, straightens crooked teeth, treats gum and mouth diseases, prepares the mouth when artificial teeth become a necessity, and provides dentures to meet the individualized needs of each patient.

The modern dentist is also interested in his patient's general health. He may detect symptoms which call for a physical checkup and work closely with the family physician to correct the trouble. He often works with school nurses and health departments in prevention programs.

Specialization and Prospects

Most dentists are in private practice; they have their own offices and charge fees for their services. Most of them provide a wide range of general care. However, there are a good many dentists who have taken additional professional training in a specialty field and who limit their practice to a specialty area. The eight recognized specialties in dentistry are:

- Endodontics (root treatment).
- Oral pathology (diseases of the mouth).
- Oral surgery (surgery of the mouth).
- Orthodontics (teeth straightening).
- Pedodontics (children's dentistry).
- Periodontics (treatment of the tissues or gums supporting the teeth and the underlying bone).
- Prosthodontics (making of artificial teeth or dentures).
- Public health dentistry (preventing and controlling dental diseases and promoting dental health through community efforts).

A dentist may choose to take a salaried post instead of going into private practice. For those who do, there are opportunities in industry, in hospitals, with one of the branches of the Armed Forces, the Veterans' Administration, public health, or dental research.

One special aspect of dentistry—dental public health—has been gaining wide recognition in recent years. This is concerned mainly with the preventive aspects of dental care and with public education on dental health and dental health services. The health department of most States and many localities, as well as the U.S. Public Health Service, carry on programs of this kind.

There is also growing interest in dental research. Several independent scientific societies, such as the American Association for the Advancement of Science and the International Association for Dental Research, encourage and promote investigations of oral disease. Hospitals, government agencies, and schools now have laboratories concerned with dental research.

Dentists will also find teaching opportunities in dental schools, and those interested in research will also want to become associated with a teaching center. Teaching and research are often combined on a part-time basis with either private or salaried practice.

Personal Qualifications

Good grades, especially in the sciences, and good eyes and skillful hands are prerequisites for dentistry. College students interested in testing their potentialities for dentistry may want to take advantage of the American Dental Association's Admission testing program.

The prospective dentist should also be in good health and have a genuine liking of people; he will be seeing them very frequently in pain and under great strain.

There is no reason why young women should not go into dentistry. Even though they have been in the minority, many more could find a place in the profession. (Currently, about 98 percent of the Nation's dentists are men.)

Education and Licensing

A student interested in dentistry should start early in planning for his career. Applicants for dental school must have a minimum of 2 years at an approved liberal arts college. Three or four years are required by many schools, and at the present, 75 percent of the students enrolled in dental schools have completed 4 years or more of preprofessional education prior to admission.

Both high school and college courses should be selected carefully, with emphasis on scientific subjects. Prospective dental students should seek guidance from faculty members. They are encouraged to write for advice to the admissions officer of the dental school they plan to attend.

Because dentistry takes a special combination of qualifications, dental schools require applicants to take a standard admission test. The details of this examination are explained as soon as an application is received; it is to the student's advantage—as well as the schools'—to learn without delay whether or not he has the necessary aptitudes.

Good grades in high school and college weigh heavily. All dental schools in this country offer a 4-year course leading to a degree of doctor of dental surgery (D.D.S.) or doctor of dental medicine (D.M.D.). The profession and licensing agencies do

not make a distinction between these degrees.

Before a dental school graduate can practice, he must pass an examination given by the board of dental examiners in his State. Annual registration is required in some States. A number of States have reciprocal arrangements recognizing licenses issued in other States. Some may require a practical examination.

The American Dental Association conducts the National Board of Dental Examiners. This board gives written examinations accepted in lieu of written State tests in all States except Delaware and Florida. All clinical and practical examinations are administered by State boards.

Dentists who plan to specialize, teach, or do research may continue their education with postgraduate courses, or they may enter a hospital as a dental intern or resident. There is a nationally recognized examining board for each of the dental specialties. To become a diplomate of a specialty board, the candidate must have at least 2 years of advanced educational training (3 years for oral surgery), meet certain other specific requirements, and pass a comprehensive examination.

Those who look forward to a career in the administration of dental public health programs will need to supplement their dental training and basic experience with an additional year's study leading to the degree of master of public health.

The Dentist's Future

Dentists starting out in private practice must face the fact that financial sledding may be difficult the first few years. Office equipment may cost several thousand dollars. Office hours will probably be long and irregular, at least in the beginning. Being one's own employer means shouldering responsibility for office rent, assistants' salaries, and so on. However, private practice offers good income and other long-term satisfactions.

A staff post in a health agency may not offer the potential earnings of private practice, but it does have the advantage of substantial economic security. An added advantage is the opportunity for promoting good health through community service.

Whether the dentist selects private practice, an institutional position in industry or a hospital, or public health service, he will find the investment in dentistry has been well made. He will be working in a highly respected and well-paying profession and have the satisfaction which comes from bringing healing and well-being to people. He can also count on a long period of usefulness.

The demand for dental services is much greater than the supply. Many dentists work more than the customary 40-hour week, and still cannot catch up with their waiting lists. Nearly half of the patients have to wait a week for their first appointment, and in general there is a great backlog.

Dentists in private practice have a wide range of income. Specialists tend to make more money than dentists in general practice, while dentists in middle-sized cities tend to earn more than those in either large metropolitan centers or very small communities. In general, most dentists in private practice have substantially higher earnings than do those in salaried positions.

For further information, write to:
American Dental Association
Council on Dental Education
211 East Chicago Avenue
Chicago, Illinois 60611

(Prerequisite: At least 2 years, and commonly 4 years, of college with and emphasis on the sciences)

Required Special Training: 4-year professional program in a college of dentistry

Dentist

School of Dentistry
Loyola University
Chicago 60611

Dental School
Northwestern University
Chicago 60611

School of Dental Medicine
Southern Illinois University
Edwardsville 62025

College of Dentistry
University of Illinois at the Medical Center
Chicago 60612

DENTAL ASSISTANT

Working with both patient and dentist, the dental assistant has a variety of responsibilities in the dentist's office. The duties of a dental assistant include both secretarial and technical tasks.

The dental assistant is responsible for maintaining accurate billing and appointment records for the dentists as well as keeping medical files up-to-date. In addition, patients are greeted and prepared for treatment by the dental assistant. This might include having X-rays taken by the dental assistant before the patient is seen by the dentist. In some states the dental assistant is legally permitted to place dental film in the mouth and expose X-rays as well as develop them and mount them properly for viewing.

In the laboratory the dental assistant may assist the dentist in making molds of teeth and pouring casts of inlays and crowns. In some cases the role of the dental assistant is expanding into other work settings such as the hospital operating room, the out-patient clinic, and in the treatment of handicapped patients.

In the dentist's office, however, the primary function of the dental assistant is to aid the dentist chairside, passing him instruments and materials while mixing fillings and preparing solutions for him. The sterilization and proper arrangement of the instruments constitutes a major responsibility of the dental assistant.

Qualifications and Education

Because of the close contact between the dental assistant and patients, a warm, friendly personality is needed for this type of work. Secretarial and bookkeeping skills are also an asset. Students interested in becoming dental assistants ought to be able to master tasks requiring skillful use of the hands and fingers. In addition, good physical and dental health as well as pefsonal cleanliness are necessary.

While in high school, students involved in dental assisting might find it helpful to take some science and secretarial classes.

Junior and community colleges, technical institutes, schools of dentistry, and universities offer dental assistant training. Some dentists, however, are willing to take on students with good potential and offer them on-the-job training. Whether training is obtained on-the-job or in a school, a high school diploma is essential. Community college programs are 1 or 2 years long and award either a certificate in dental assisting or an associate degree in applied science. Evening classes are occasionally offered for those employed during the day although the course of study will be longer as classes meet less frequently.

EDUCATIONAL PROGRAMS IN DENTAL ASSISTING - ILLINOIS

(Prerequisite: High school diploma or its equivalent for admission to college and university programs in dental assisting)

Required Special Training: 1 or 2-year dental assisting program in a community college, technical institute, school of dentistry, or university

Dental Assistant

Black Hawk College
Moline 61265

Bryman School
Chicago 60603

College of Lake County
Grayslake 60030

Elgin Community College
Elgin 60120

Illinois Valley Community College
Oglesby 61348

Kaskaskia College
Centralia 62801

Lake Land College
Mattoon 61938

Lewis and Clark Community College
Godfrey 62035

Loop College
Chicago 60601

Loyola University, School of Dentistry
Maywood 61053

Midstate College
Peoria 61602

Morton College
Cicero 60650

Olney Central College
Olney 62450

Parkland College
Champaign 61820

Prairie State College
Chicago Heights 60411

Robert Morris School
Carthage 62321

Rock Valley College
Rockford 61101

Triton College
River Grove 60171

Paradental Education
University of Illinois
College of Medicine
Chicago 60612

Waubonsee Community College
Sugar Grove 60554

DENTAL ASSISTING - Further Information

Employment Prospects

In 1974 there were approximately 125,000 dental assistants in the nation; it was not possible to determine the number employed in Illinois. Except for those men who served as dental assistants in the armed forces, more than ninety per cent of civilian dental assistants were women. In 1974 the employment outlook was good and was expected to remain so for the next ten years.

Salary

Starting salaries for trained dental assistants working in dentists' offices in Chicago were from $135-$150 per week in 1975. In other areas of Illinois beginning salaries for trained persons were about $80-$100 per week, and experienced assistants earned up to about $125 per week. Dentist-trained assistants with no formal training earned less than those with formal training. Salaries for those working in dental schools, in civil service, and other employment settings ranged from approximately $8,000-$14,000 yearly.

Career Mobility

It is not unusual for dental assistants to return to college for additional education to become dental hygienists or dental laboratory technicians. It is rare for an assistant to return to college and dental school for training as a dentist. Dental hygiene is an attractive possibility for persons wanting to work part-time.

Further Reading

The Dental Assistant, a journal published by the American Dental Assistants' Association

Kinsinger, Robert E., editor, Health Technicians, J.G. Ferguson Publishing Company, Chicago, 1970, pp. 54-61

Professional Organization Where More Information May Be Obtained

American Dental Assistants' Association
211 East Chicago Avenue, Suite 1224
Chicago, Illinois 60611

To Broaden Your Understanding

-talk with a dental assistant in your dentist's office
-talk about dental assisting with your dentist
-write to schools and the professional organization

DENTAL HYGIENIST

Dental hygienists work very closely with dentists in providing health care for the teeth and gums. The dental hygienist is the only other person, besides the dentist himself, who is legally allowed to work inside people's mouths.

Working under the supervision of a dentist, the hygienist's duties consist primarily of cleaning and applying fluoride to teeth, polishing fillings and dentures, charting the conditions of the mouth and teeth for diagnosis by the dentist, taking, developing, and mounting X-rays, applying medications as prescribed by the dentist, and giving instruction in dental health education. Hygienists may also be called upon to provide emergency first aid treatment when needed, and for this reason, many hygienists hold First Aid Certificates. Another important duty is that of maintaining an accurate recall system for reminding patients to return for a dental examination.

Although the majority of dental hygienists work in private dental offices, they are found in other settings. Some provide consulting to public school officials regarding student dental health. Others are employed in clinics, industry, voluntary health agencies, and the armed forces. Still others work in special clinics for the physically and mentally handicapped. Overseas employment is also possible because American firms hire hygienists to provide dental services to their American employees as well to help native dentists to organize preventative dental health care facilities.

Qualifications and Education

Students considering a career in dental hygiene should have good eyesight and be able to work well with their hands. Because patients experiencing pain and discomfort may tend to be nervous and anxious, the dental hygienist ought to be able to show an understanding of such feelings and be able to put patients at ease during treatment. Hygienists must also have considerable patience because they will be working with delicate instruments and tools. They must be able to work smoothly with the dentist as well.

A high school diploma or its equivalent is a necessary first step for training as a dental hygienist. Science courses might prove to be useful preparation for dental hygiene education after high school. Students can pursue their training by means of either a two-year or four-year program of study. A two-year program will offer an associate degree or certificate, whereas a four-year program will result in a bachelor's degree from a college or university. Completion of the two-year program is sufficient for a position in a dental office; however, a baccalaureate degree is usually required for a position in public health, a school health program, or for teaching in a school of dental hygiene.

(Prerequisite: High school diploma or its equivalent)

Required Special Training: 2- or 4-year dental hygiene program in a community college, school of dentistry, or university. All programs are 2 years in length, except that Loyola University offers a 4-year program. The 4-year program is designed for those students interested in teaching, research, or community health.

Dental Hygienist

Illinois Central College
East Peoria 61611

Lake Land College
Mattoon 61938

Loyola University, School of Dentistry (4-year program only)
Maywood 60153

Northwestern University Dental School
Chicago 60611

Parkland College
Champaign 61820

Prairie State College
Chicago Heights 60411

Vocational Technical Institute
Southern Illinois University
Carbondale 62901

William Rainey Harper College
Palatine 60067

DENTAL HYGIENIST - Further Information

Employment Prospects

In 1974, there was a need for dental hygienists in most parts of the nation. There were limited employment opportunities in a few metropolitan areas and in some areas where there were a large number of educational programs for the training of dental hygienists. Over the next decade, employment prospects appear good as the health care system of the nation continues to expand.

Salary

A salary study conducted by the American Dental Hygienists' Association in the spring of 1973 indicated an average annual salary of slightly more than $10,000 for full-time hygienists. Graduates of four-year dental hygiene programs earned somewhat more than this. The study indicated that hygienists with much work experience received salaries which were only slightly higher than those earned by inexperienced hygienists. In 1974, some dental hygienists in central Illinois earned $40 per working day. A number of dental hygienists worked only part-time, resulting in a wide variation in yearly income.

Career Mobility

Dental hygienists employed in clinical practice may--with experience and, oftentimes, further formal education--become teachers or administrators in dental hygiene education programs in community colleges and four-year colleges. The need for such persons is great. Some hygienists become dentists. While some educational institutions do provide for advanced placement, in 1974 there were no widely-accepted proficiency or equivalency examinations of professional knowledge available to persons wishing to enter dental hygiene, or to hygienists wishing to enter dentistry. Such examinations were being planned, and may in future years permit the qualified person to demonstrate his competence in professional course work, thereby shortening the required training period.

Further Reading

Kinsinger, Robert E., editor, Health Technicians, J.G. Ferguson Publishing Company, Chicago, 1970, pp. 44-53.

Odgers, Ruth F., and Wenberg, Burness G., editors, Introduction to Health Professions, C.V. Mosby Company, St. Louis, 1972, pp. 79-84.

Dental Hygiene, a journal published by the American Dental Hygienists' Association

Professional Organizations Where More Information May Be Obtained

American Dental Hygienists' Association
211 East Chicago Avenue
Chicago, Illinois 60611

To Broaden Your Understanding

-talk with a dental hygienist in a dentist's office

-talk about dental hygiene with your dentist

-write to schools and the professional organization

DENTAL LABORATORY TECHNICIAN

It is the responsibility of the dental laboratory technician to make and repair dentures, crowns, bridges, inlays, and other orthodontic appliances once made by dentists. The technician does not work directly with patients but rather under the supervision or following the prescription of a dentist.

In making many dental appliances, the technician forms models in hard plaster from impressions of the patient's mouth taken by the dentist. The chief duties of the dental laboratory technician include making metal castings for dentures and polishing them, constructing metal or porcelain crowns or inlays for partially destroyed teeth, fabricating bridges of gold and other metals, and making appliances to correct abnormalities such as cleft palate.

Whereas some technicians perform a wide range of duties, others specialize in the making of crowns and bridges, or in the arrangement of artificial teeth on dental appliances. Ceramists or porcelain specialists make natural-looking teeth from porcelain to replace missing teeth or to fit over natural teeth.

Dental laboratory technicians may find employment in a variety of work settings such as dental clinics, commercial laboratories, hospitals providing dental services, and Veterans Administration hospitals. Dental materials and equipment manufacturers also employ dental laboratory technicians as technical representatives or salesmen.

Qualifications and Education

A high degree of manual dexterity as well as good color perception, patience, and a liking for detailed work rank among the personal qualifications necessary for this field. Ceramists must have exceptionally good eyesight and be able to match color shades with perfection. Being able to follow instructions precisely is also important, since everything a dental technician constructs must follow the dentist's specifications.

There are no minimum formal education requirements needed to enter this field, although a high school diploma is helpful. Students interested in learning this skill through on-the-job training can work as an apprentice for three to four years depending upon their ability and previous experience. An alternate route requiring a high school diploma or its equivalent is enrollment in a 2-year program in dental laboratory technology, usually offered at junior or community colleges or vocational-technical schools.

EDUCATIONAL PROGRAMS IN DENTAL LABORATORY TECHNOLOGY - ILLINOIS

Required Special Training: Either a) on-the-job training in dental laboratory technology, which lasts 4 to 5 years [high school diploma not needed], or b) high school diploma or its equivalent plus 2-year dental laboratory technology program offered in a community college or vocational-technical school

Dental Laboratory Technician

Vocational Technical Institute
Southern Illinois University
Carbondale 62901

Triton College
River Grove 60171

DENTAL LABORATORY TECHNICIAN - Further Information

Employment Prospects

In 1975 employment prospects in dental technology were excellent for both men and women. A recent government survey predicted that in 1980 there might be a need for 10,000 more dental technicians than would have completed training. Since that survey, many employees have adopted dental insurance programs for their workers, resulting in an even greater demand for the services of the dental technician.

Salary

In Illinois in 1975, students who graduated from high school and went directly to the dental laboratory for on-the-job training received starting salaries of from $65 to $110 per week. Graduates of 2-year college dental technology programs received starting salaries of from $120 to $200 per week. Those experienced technicians who worked in a dental laboratory for more than two years made from $220 to $300 per week. Some earned $25,000 per year or more. Dental laboratory managers and owners earned up to $25,000 and more a year.

Career Mobility

Graduates of 2-year college dental technology programs and those who have had successful work experience as dental technicians may advance to head the departments of larger dental laboratories. In addition, it may be possible for them to become managers or owners of dental laboratories. There are opportunities for experienced technicians to become instructors in 2-year college dental laboratory technology education programs. Technicians who receive on-the-job training rather than the 2-year college training have poorer chances for advancement. Often times they are trained in only one phase of dental laboratory work, and therefore, are restricted from entering other aspects of laboratory work.

Further Reading

Kinsinger, Robert E., editor, Health Technicians, J.G. Ferguson Publishing Company, Chicago, 1970, pp. 60-69

NADL Journal, a journal published by the National Association of Dental Laboratories

Professional Organizations Where More Information May Be Obtained

Council on Dental Education
American Dental Association
211 East Chicago Avenue
Chicago, Illinois 60611

Illinois Dental Laboratory Association
550 Frontage Road
Northfield, Illinois 60093

National Association of Dental Laboratories
3801 Mt. Vernon Avenue
Alexandria, Virginia 22305

To Broaden Your Understanding

- talk with a dental laboratory technician (ask your dentist to give you the names of dental laboratories you can contact)

- write to professional organizations and schools

DIETITIAN

A dietitian applies the science and art of human nutrition to help people select and obtain food to nourish their bodies in health or disease throughout the life cycle. Thus, dietetics is an integral component of health promotion and disease management.

Dietitians are employed in food service (administrative dietitians), and in direct patient care (clinical dietitians or community dietitians). A dietitian can teach, manage, or conduct research. Dietitians are employed in hospitals, medical centers, nursing homes, food service management systems, businesses, government agencies, schools, colleges and universities, and various other agencies and institutions. However, hospitals offer the largest number of career opportunities.

The major types of dietitians are:

Administrative Dietitian

The administrative dietitian affects the nutritional care of people by managing the production of food in a food service system. The food service system gives people excellent care by providing optimal nutrition and quality food. The administrative dietitian does the hiring, training, and supervising of food service employees. This dietitian also purchases food and food service equipment, plans menus, and supervises food production. The administrative dietitian manages the money resources of the dietary department.

Clinical Dietitian

The clinical dietitian is a member of the health care team. He/she works with other health professionals in treating patients. The clinical dietitian evaluates the patient's nutritional needs, and designs and carries out a plan for improving his/her health. The patient's progress following the care plan is evaluated in a written report which is added to the medical record.

When functioning in an organization that provides food service, the clinical dietitian coordinates activities with the food service department. The clinical dietitian counsels individuals and families on nutritional principles and dietary plans. The factors used in counseling are the patient's knowledge about food selection, income level, and life style. The clinical dietitian participates in health team rounds and serves as a consultant to other health professionals regarding nutritional care.

Community Dietitian

The community dietitian works for public health, educational, and private agencies, in clinics, in outpatient departments of hospitals, and in informational sections of food industries. He/she counsels individuals and families regarding nutritional principles, diet, food selection, and economics. Each teaching session is adapted to the individual's life style and nutritional needs. The community dietitian works with organizations which are concerned about the nutritional needs of individuals and groups within the community.

General Dietitian

A dietitian who functions as a clinical and administrative dietitian may be classified as a general dietitian. A dietitian functioning both administratively and clinically would probably be located in a smaller hospital or health-related facility.

Qualifications and Education

Persons looking forward to becoming dietitians should have a sincere interest in people. The ability to communicate with others and understand their problems and needs are highly important skills. They should have an interest in foods and cooking, and enjoy teaching. Also essential is a special aptitude for sciences, especially biology and chemistry.

A college education is required, emphasizing foods and nutrition related to sciences and institutions management. Courses in the behavioral sciences, such as psychology, sociology, and teaching are also studied.

There are several methods by which the undergraduate may become a dietitian. One is through a major in college in foods and nutrition, generally in home economics. This is followed by a six month to one year dietetic internship to gain practical experience. Internships enable the student to select an area of specialization: general, management, clinical, or community. The dietetic traineeship is another method for the dietitian to receive practical experiences. It is an individualized experience program from 12 to 24 months in length. These traineeships are usually found in hospitals and food service systems. Another route to becoming a dietitian is through a coordinated undergraduate program. In such programs, classroom and practical experiences are coordinated in a four-year bachelor's degree program. The same areas of specialization offered in internships are offered in coordinated undergraduate programs. These coordinated programs are located in schools of home economics, or in schools of medicine and health sciences at many colleges and universities.

EDUCATIONAL PROGRAMS IN DIETETICS - ILLINOIS

Dietitian

Special Required Training: Either a) a bachelor's degree in dietetics, medical dietetics, or home economics with an emphasis in foods and nutrition or institutional management, followed by a dietetic internship of 6 to 18 months (depending on the sponsoring clinical facility) or an individualized dietetic traineeship of 12 to 24 months, or b) a bachelor's degree program in dietetics which has a "coordinated" curriculum in which academic and clinical experiences are combined in a 4-year program.

Persons interested in dietetics should contact universities in which they are interested and ask them if they have bachelor's degree programs in any of the following:

dietetics

foods and nutrition

food science

hospital dietetics

institutional management

medical dietetics

nutrition

restaurant management

All of these terms describe college major areas of study which may give you the academic preparation to 1) become a dietitian, or 2) be admitted to a dietetic internship or traineeship.

Below are listed only educational programs in dietetics. Students interested in becoming dietitians should not limit themselves to considering only these educational programs; instead, they should also keep in mind the programs listed above: for example: foods and nutrition, etc.

College or University	Degree Program
*Bradley University Peoria 61606	Bachelor's Degree
Curriculum in Medical Dietetics School of Associated Medical Sciences University of Illinois at the Medical Center Chicago 60612	Coordinated Undergraduate Program in Clinical and Community Dietetics, Bachelor's Degree
*Eastern Illinois University Charleston 61920	Bachelor's Degree
*Mundelein College Chicago 60626	Bachelor's Degree
Northern Illinois University Dekalb 60115	Coordinated Undergraduate Program in General Dietetics, Bachelor's Degree
*Olivet Nazarene College Kankakee 60901	Bachelor's Degree
*Rosary College River Forest 60305	Bachelor's Degree
College of Nursing and Allied Health Sciences Rush University Chicago 60612	Master's Degree
*Southern Illinois University Carbondale 62901	Bachelor's and Master's Degree
*School of Human Resources and Family Studies University of Illinois Urbana 61801	Bachelor's and Master's Degree

*In order to become a registered dietitian, these bachelor's degree programs must be followed by dietetic internship or traineeship.

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Employment Prospects

In 1974 employment prospects for dietitians were generally good in Illinois. There were excellent job prospects in downstate Illinois; the situation in Chicago was fluctuating. Nationally it appeared that there were insufficient numbers of dietitians. In 1972 an American Dietetics Association publication reported that there were about 30,000 practicing dietitians in the nation and that at least 10,000 more dietitians were needed by 1980.

Salary

A 1973 salary study conducted by the Illinois Hospital Association indicated that dietitians in Illinois hospitals had starting salaries of almost $800 per month. Average salaries of all hospital dietitians were $875 per month. Salaries were somewhat higher in the Chicago area than elsewhere in the state.

Career Mobility

The majority of dietitians are employed in hospitals. Other work opportunities for dietitians include employment as consultants to nursing homes, as administrators of dietary services, as teachers of dietetic education in colleges and universities, and as researchers. A combination of relevant work experience and graduate level education is desirable to gain access to these areas of the profession.

Dietetic technicians (with two years of community college course work) wishing to become dietitians must complete a bachelor's degree program in a college or university. The college or university will evaluate prior course work to determine what additional course work will be needed. In 1974 there were no proficiency or equivalency examinations of professional knowledge available to persons wishing to become dietitians, nor were any being developed.

Further Reading

American Dietetic Association, The Profession of Dietetics, The Report of the Study Commission on Dietetics, 1972

Odgers, Ruth F., and Wenberg, Burness G., Introduction to Health Professions, C.V. Mosby Company, St. Louis, 1972, pp.85-94

Further Reading, continued

Journal of the American Dietetic Association, a journal published by the professional dietetic organization

Professional Organization Where More Information May Be Obtained

American Dietetic Association
620 North Michigan Avenue
Chicago, Illinois 60611

To Broaden Your Understanding

-look into summer or part-time work in a hospital, restaurant, public health department, or welfare program

-talk with dietitians working in a hospital, food service, public health department, welfare agency, food processing company, airlines, etc.

-write to schools and the professional organization

Dietetic Technician

The dietetic technician is involved directly in food administration and nutrition care services.

The duties in food administration may include quality food production, developing standard recipes, managing a cafeteria, and training of personnel. The duties in nutrition care may include taking diet histories of patients, calculating modified diets, teaching patients normal nutrition, and visiting patients to evaluate the food.

Duties vary with the size and organization of the department of dietetics. In a large hospital, the dietetic technician works under the supervision of a dietitian. In a small hospital or related health facility, the dietetic technician is responsible for total food service to patients and works under the direction of a consulting dietitian or an administrator.

Dietetic technicians are in demand by hospitals and related health facilities. More recently, they have become engaged in teaching low-income families about food purchasing, preparation, and nutrition; directing food service in day care centers; and assisting nationals of other countries in adapting their menu patterns and in purchasing and preparing. These duties are performed under the direction of a nutritionist.

Qualifications and Education

An appreciation of quality food, interest in people, and skill in management are desirable qualifications for the dietetic technician. Preparation as a dietetic technician requires either successful related work experience or a 2-year associate degree program in a community college.

Dietetic Technician

Required Special Training: Either a) experiences which prepare him/her as a skilled worker in food service, or b) a high school diploma or its equivalent and a two-year associate degree program for training as a dietetic technician.

Central YMCA Community College
Chicago 60606

William Rainey Harper College
Palatine 60067

Malcolm X College
Chicago 60612

Employment Prospects

A 1972 publication of the American Dietetic Association stated that there was a need for a great increase in the number of dietetic technicians in the coming years. In 1974 there was a strong need for dietetic technicians, and it appeared that that need would continue in future years.

Salary

No current salary information was found. A 1970 publication indicated that beginning salaries for technicians around the nation averaged between $5,200 and $6,000 annually, and that those with five years of experience earned between $8,000 and $10,000 yearly.

Career Mobility

The dietetic technician may assume greater responsibility through working experience. As an example, the technician may be promoted to the position of kitchen manager, responsible for the preparation and quality of food. In other cases, the technician may gain administrative authority over the entire food service, or possibly only over scheduling, hiring, and firing of employees.

Dietetic technicians (with two years of community college course work) wishing to become dietitians must complete a bachelor's degree program in a college or university. The college or university will evaluate prior course work to determine what additional course work will be needed. In 1974 there were no proficiency or equivalency examinations of professional knowledge available to persons wishing to become dietitians, nor were any being developed.

Further Reading

American Dietetic Association, The Profession of Dietetics, The Report of the Study Commission on Dietetics, 1972

Odgers, Ruth F., and Wenberg, Burness G., Introduction to Health Professions, C.V. Mosby Company, St. Louis, 1972, pp. 85-94

Kinsinger, Robert E., editor, Health Technicians, J.G. Ferguson Company, Chicago, 1972, pp. 233-243

Professional Organization Where More Information May Be Obtained

American Dietetic Association
620 North Michigan Avenue
Chicago, Illinois 60611

To Broaden Your Understanding

- -look into summer or part-time work in a hospital, restaurant, public health department, or welfare program
- -talk with dietetic technicians working in a hospital, food service, public health department, welfare agency, food processing company, airlines, etc.
- -write to schools and the professional organization

Hospital Administrator

Whether the hospital is large or small, it must have an executive or administrator to take overall charge of the institution and to coordinate all its services.

The administrator's task is to see that all the hospital's objectives are carried out. He is directly responsible to the hospital's governing body, a group of community-minded men and women who set the broad policies under which the hospital operates.

The administrator is responsible for developing an effective team of physicians, nurses, dietitians, pharmacists, housekeepers, engineers, and others who work in the hospital and for seeing that adequate supporting facilities, services, and equipment are available. He holds a community trust; it is his obligation to see that the hospital provides an acceptable health services program.

The administrator must be well informed about all hospital functions and services and equipped to select and supervise the staff members who are in charge of all its departments. He must be aware of community health needs and health planning. He is concerned not only with the professional services needed to provide patient care services but also with those required for business and office operations, personnel management, public relations, volunteer service, purchasing, engineering and maintenance, and housekeeping.

He must be able to cope with the special situations and emergencies which arise daily in every hospital; he must be prepared to handle unexpected demands practically around the clock.

The administrator may have one or more assistants. In the larger hospitals, the administrator's executive staff is in charge of a major aspect of hospital service. The assistants frequently carry on special studies and prepare reports to help the administrator make his final decisions or recommendations to the governing board.

Most hospitals today, especially the larger ones, prefer to draw their administrative staff from the graduates of these schools. Beginners with a master's degree in hospital administration are usually appointed as administrative assistants or as hospital department heads. Both government and nongovernment institutions offer such positions.

Qualifications and Education

The young man or woman who wants to become a hospital administrator needs the basic capacities required for administrative work in any field. He or she should also have good health, vitality, the ability to work under pressure, and a sincere interest in hospital work.

Requirements include college graduation followed by a master's degree in hospital administration.

College work should be planned to include courses in economics, finance, statistics, psychology, and personnel administration. It would be wise to write several schools of hospital administration for advice about required or recommended subjects.

The graduate programs consist of a 2-year course of study. In some cases, a year in "administrative residence" in a hospital is included. Graduates of the 2-year program receive a master's degree in hospital administration.

Required Special Training: A 4-year bachelor's degree program in hospital or health services administration is necessary for assistant-level positions in hospital administration, and is sufficient for a variety of administrative positions in the health field. Generally, a master's degree in hospital or health services administration is required for the position of hospital administrator, and for a variety of higher-level administrative positions in the health field.

Center for Health Administration Studies Graduate School of Business University of Chicago Chicago 60637	(Master's degree in Business Administration and Health Administration)
Graduate School of Management Northwestern University Evanston 60201	(Master's degree in Management of Hospitals and Health Services)
Sangamon State University Springfield 62708 (begins at the 3rd year college level)	(Bachelor's degree in Health Services Management; Master's degree in Health Administration)
Governor's State University Park Forest South 60466 (begins at the 3rd year college level)	(Bachelor's degree in Environmental Science with an orientation in Health Services Administration; Master's degree in Environmental Science with an orientation in Health Services Administration)
University of Illinois at Chicago Circle Chicago 60607	(Ph.D. in Bioengineering with a concentration in Health Care Delivery)

Employment Prospects

Due to the expansion of educational programs for the training of hospital administrators, in 1974, nationally, a significant number of new graduates of these programs had some difficulty finding employment. However, with the likely coming of some form of national health insurance, future employment for administrative personnel in hospitals and other types of health care facilities appeared favorable.

Salary

In 1974, graduates of master's degree programs in hospital administration received beginning annual salaries averaging $14,000 to $16,000. Salaries in smaller communities and for positions of less responsibility were usually lower than salaries in larger communities and for positions of greater responsibility. A 1972 salary survey showed that the national average (median) base salary for chief administrators of 150-249-bed hospitals was $25,000-$30,000. The same survey found that administrators of smaller hospitals tended to earn considerably less, and those in larger hospitals had substantially higher salaries.

Career Mobility

Those with bachelor's and master's degrees in hospital or health services administration usually find their first hospital job as an administrative assistant or department head. Successful work experience is necessary for advancement to the positions of assistant administrator or chief hospital administrator. Persons interested in becoming the chief administrator should possess a master's degree as well.

Graduates of hospital or health services administration bachelor's and master's degree programs are not limited to hospitals in their search for employment. Increased federal involvement in creating a more comprehensive health care system has resulted in the development of health maintenance organizations (HMO's), comprehensive health planning agencies, and long-term care institutions. There are an increasing variety of employment opportunities in such organizations, as well as in professional health associations, state departments of health, and health insurance companies.

Further Reading

Hospitals, Journal of the American Hospital Association

Modern Health Care, a journal published by McGraw-Hill Book Company, Inc.

Odgers, Ruth F. and Wenberg, Burness G., Introduction to Health Professions, The C.V. Mosby Company, St. Louis, 1972, pp. 151-57

Professional Organizations Where More Information May Be Obtained

American College of Hospital Administrators
840 North Lake Shore Drive
Chicago, Illinois 60611

Association of University Programs in Hospital Administration
One Du Pont Circle
Suite 420
Washington, D.C. 20036

To Broaden Your Understanding

-write for information from: Comprehensive State Health Planning Agency
160 N. LaSalle Street, Suite 1627
Chicago, Illinois 60601

-obtain the name of a nearby health planner from the Comprehensive State Health Planning Agency and visit him/her

-talk to a local hospital administrator about his/her work and that of his/her staff

-write to professional organizations and schools

HEALTH PLANNER

In 1966 Congress passed a law known as the "Partnership for Health Act" to help states and regions within states to establish and carry out plans to provide better environmental and personal health care. The many comprehensive health planning agencies that have developed throughout the nation are designed to take positive action to redirect our health resources so that all people will receive complete medical care.

The health planner (also called the comprehensive health planner) directs the work of comprehensive health planning agencies. Specifically, he/she deals with the problems which groups of people have in acquiring adequate medical facilities in their communities. Typical of his work would be to resolve matters such as: deciding where to locate a new drug abuse treatment center, providing incentives for doctors so that they will serve rural populations, and maintaining quality control over hospital medical services.

Health planners are employed both by government as well as by private organizations dealing with affairs at the international, national, state, or local levels. Many health planners work in comprehensive health planning agencies, of which there are generally several in each state.

Qualifications and Education

Health planning is a complex matter. Therefore, persons interested in this field must be able to think analytically, organize effectively, make decisions on controversial questions, and successfully negotiate among differing viewpoints.

More than twenty universities in the country offer master's and/or doctoral degrees in health planning. Master's degree programs vary in length from 9-29 months. Only two universities (neither of which is in Illinois) have bachelor's degree programs in health planning.

Students interested in Illinois educational programs in health planning may contact those programs listed on pages 4-A-2 and 9-A-2 to learn which are appropriate to their interests.

HEALTH PLANNER - Further Information

Employment Prospects

In 1975 employment prospects for health planners were not good, but with the implementation of Health Service Agencies (HSA's) in 1976, it was expected that job opportunities would improve considerably. (In 1975 HSA's replaced comprehensive health planning agencies as the nation's federally authorized health planning units.)

Salary

Beginning health planners with master's degrees earned $12,000-$14,000 per year in 1975. Those with mid-level administrative responsibilities received $20,000-$25,000, and experienced top-level administrators had incomes of up to $30,000 and more.

Career Mobility

Health planners enter the field with varied educational backgrounds. There is an increasing need for planners with educational and work experience which is focussing either on management skills or on data analysis skills. Capable, experienced persons may advance to positions of increased responsibility and higher income.

Further Reading

American Journal of Public Health, a journal published by the American Public Health Association

Medical Care, a journal published by the American Public Health Association

Professional Organization Where More Information May Be Obtained

Health Planning Section
American Public Health Association
1015 18th Street, N.W.
Washington, D.C. 20036

To Broaden Your Understanding

- visit a health planner in a health planning agency, hospital, public health department, or other agency, and discuss his/her work
- obtain paid or volunteer work in an agency which carries out health planning activities
- write to schools and the professional organization

MEDICAL LABORATORY OCCUPATIONS

The physician has available to him a number of tests and devices with which he can make a general appraisal of a patient's condition—taking the patient's pulse, temperature, and blood pressure; listening to the heart and lungs with a stethoscope; looking into the nasal passages with a nasoscope or into the eyes with an ophthalmoscope.

With these he can detect gross changes in the functioning of the various organs and, in most common illnesses, make a diagnosis.

But there are many illnesses where the symptoms are not so easily detectable. These are illnesses in which there are changes in the body fluids and tissues not discernible by the naked eye or ear. They include chemical changes in the blood, urine, lymph; increase or decrease in the blood count for the various types of white or red blood cells; microscopic changes in the structure of the cells of a diseased tissue or organ; and the presence of parasites, viruses, or bacteria in the blood or diseased tissue.

To detect these the physician must submit specimens of blood, urine, or tissue to a variety of highly technical tests in the laboratory. Combining laboratory findings with other observations, he is then able to make an exact and accurate diagnosis.

Laboratory examination of body fluids and tissues serve other purposes as well. Blood tests must be made to determine blood types in the event of a blood transfusion. There are certain blood types which, if mixed in conception, will produce abnormal offsprings. These can be detected by laboratory tests. Some individuals react with violent allergic reaction to different kinds of medications, and laboratory tests are used to detect this type of sensitivity.

Aside from tests such as these, the physician also relies on electronic devices which detect abnormal functioning in bodily organs—the electrocardiogram for heart disorders and the electroencephalograph for neurological disorders.

Although the physician must have the results of these tests for evaluation and diagnosis, he does not perform them himself. They are performed by medical technologists and technicians in medical laboratories, under the supervision of medical specialists known as pathologists.

MEDICAL TECHNOLOGIST

The medical technologist performs laboratory tests to determine the presence or absence of disease. Laboratory tests alone are sufficient for identification of some disease, while in other cases they are used to confirm suspected disease. Laboratory analysis of specimens is accomplished by means of highly complex machines.

The medical technologist who works in a medical laboratory is supervised by a pathologist, a physician specializing in the study of disease. In addition to performing laboratory tests, many medical technologists have considerable supervisory responsibilities over the laboratory technicians and assistants who in many cases actually do the tests. Those technologists employed in small laboratories function in most all areas of laboratory work, but in large facilities, they may specialize in only one or two areas.

Following is a list of laboratory activities performed and/or supervised by the medical technologist:

- -matching blood samples of donors and recipients in blood transfusions;
- -growing "cultures" and identifying the bacteria found in a patient's blood, sputum, feces, or discharge from a sore or wound;
- -searching for and identifying, tapeworms, pinworms, and other parasites living in the body;
- -testing for the presence or absence of various chemicals in the blood or other body fluids;
- -testing for antibodies and other disease-fighting elements in the blood;
- -analyzing urine for evidence of illnesses such as diabetes, infection of the bladder, cancer of the bladder, etc.;
- -doing blood tests to detect illnesses of the blood, such as hemophilia, anemia, leukemia, and mononucleosis.

Medical technologists are gaining employment in more diverse work settings. A large number work in commercial medical laboratories. Others are found in clinics, public health departments, pharmaceutical companies, teaching and research facilities, and veterinarians' offices.

Qualifications and Education

Students considering a career in medical technology should have an aptitude in science, enjoy doing laboratory work, and have the ability to do reliable work. Medical technologists should also possess manual dexterity since they work with small instruments and delicate equipment. Other assets include normal vision and the ability to distinguish fine shades of color.

There is more than one way to become a medical technologist. The general requirement is a bachelor's degree stressing biology and chemistry, plus laboratory training. A complete discussion of medical technology educational programs is given on the pages "Educational Programs in Medical Technology - Illinois."

Required Special Training: Either a) 4-year bachelor's degree program including 16 semester hours of biology (4 hours of which must be in microbiology), 16 hours of chemistry, and 1 course in mathematics, plus a medical technology program of at least 1 year in length at a hospital or university or b) a 4-year bachelor's degree in a field other than medical technology, with the science and math course requirements listed under "a" plus 5 years of recent medical laboratory work experience (2 of these 5 years must have been under approved supervision). [Persons with bachelor's degrees in chemistry or biology may find work in hospital laboratories, specializing in chemistry, microbiology, or hematology lab work.]

The above are the requirements for training as a medical technologist which have been established by the American Society of Clinical Pathologists (A.S.C.P.). Persons meeting these requirements, after passing an ASCP examination, are designated as MT(ASCP) (medical technologists with ASCP certification). As in the cases of the medical laboratory assistant and the medical laboratory technician, the American Medical Technologists (A.M.T.), a smaller medical laboratory approval body, has set different training requirements for the medical technologist: either a) 90 semester hours of college or university course work plus 1 year of medical laboratory work or b) if one is already an M.L.T. (medical laboratory technician), 3 additional years of medical laboratory work experience. Persons meeting these requirements, after passing an A.M.T. examination, are designated MT(AMT) (medical technologists with A.M.T. certification). In 1975 there were no AMT-approved medical technology programs in Illinois.

The AMT-certified medical technologist may experience difficulty in being hired by some hospitals. In addition, if he/she does not have a bachelor's degree, and desires to pursue his career through promotion and/or further education, he ought to determine whether he must first have a bachelor's degree to be eligible for promotion or admission to educational programs.

* * *

The variety of medical technology programs in Illinois is confusing; they will be discussed in three groupings:

Group A The student wishing to become a medical technologist may take the required three years of college or university course work, which must include the above-mentioned biology, chemistry, and mathematics courses. This can be done in many Illinois colleges and universities, or by combining community college and college or university course work. During his/her third year of college, the student would apply for admission into one of the many 1-year medical technology programs in Illinois hospitals.

Nearly all of these hospitals are affiliated with certain colleges and universities. Students are not excluded from consideration for admission to hospital programs which are not affiliated with their schools, but generally, the hospitals admit qualified applicants from affiliated schools before they can consider applicants from other schools. Since hospital programs have space for only a small number of students (average is 10-14, and some accept fewer), admission may be difficult.

Students enrolled in the following colleges and universities may apply to and, if admitted, spend their fourth year of college (after which they will graduate with a bachelor's degree) in a hospital-based medical technology program:

Augustana College
Aurora College
Bradley University
College of St. Francis
DePaul University
Eastern Illinois University
Greenville College
Illinois State University
Illinois Wesleyan University
Lewis College
Millikin University
Mundelein College
Olivet-Nazarene College
North Central College
Northeastern University
Northern Illinois University
North Park College
Northwestern University
Quincy College
Rockford College
Roosevelt University
Southern Illinois University
Western Illinois University
Wheaton College

Note: Students from the University of Illinois and other colleges and universities not listed above (which will not grant academic credit for the 1-year hospital program in medical technology) must complete a bachelor's degree before they are eligible for admission to a 1-year hospital program in medical technology.

Following is a list of hospitals, arranged according to city, which provide 1-year instruction in medical technology:

Belleville

St. Elizabeth Hospital
Belleville 62221

Blue Island

St. Francis Hospital
Blue Island 60406

Champaign

Burnham City Hospital
Champaign 61820

Chicago

Augustana Hospital
Chicago 60614

Grant Hospital
Chicago 60614

Holy Cross Hospital
Chicago 60629

Illinois Masonic Medical Center
Chicago 60657

Louis A. Weiss Memorial Hospital
Chicago 60640

Mercy Hospital
Chicago 60616

Michael Reese Hospital
Chicago 60616

Rush-Presbyterian-St. Luke's Hospital
Chicago 60612

St. Anne's Hospital
Chicago 60651

St. Joseph Hospital
Chicago 60657

St. Mary of Nazareth Hospital
Chicago 60622

Veterans Administration
Research Hospital
Chicago 60611

Chicago Heights

St. James Hospital
Chicago Heights 60411

Danville

Lake View Memorial Hospital
Danville 61832

Decatur

Decatur Memorial Hospital
Decatur 62526

St. Mary's Hospital
Decatur 62525

Evanston

Evanston Hospital
Evanston 60201

Freeport

Freeport Memorial Hospital
Freeport 61032

Geneva

Community Hospital
Geneva 60134

Great Lakes

Naval Hospital
Great Lakes 60088

Harvey

Ingalls Memorial Hospital
Harvey 60426

Hinsdale

Hinsdale Sanitarium & Hospital
Hinsdale 60521

Joliet

Silver Cross Hospital
Joliet 60432

St. Joseph Hospital
Joliet 60435

Maywood

Loyola University Medical Center
Maywood 60153

Oak Lawn

Christ Community Hospital
Oak Lawn 60453

Oak Park

West Suburban Hospital
Oak Park 60302

Park Ridge

Lutheran General Hospital
Park Ridge 60068

Peoria

Methodist Hospital of Central Illinois
Peoria 61603

St. Francis Hospital
Peoria 61603

Quincy

St. Mary Hospital
Quincy 62301

Rockford

Rockford Memorial Hospital
Rockford 61101

St. Anthony Hospital
Rockford 61101

Swedish-American Hospital
Rockford 61101

Springfield

St. John's Hospital
Springfield 62702

Urbana

Carle Foundation Hospital
Urbana 61801

Waukegan

St. Therese Hospital
Waukegan 60085

Winfield

Central DuPage Hospital
Winfield 60190

* * * * * * * * *

Group B) The following two upper division state universities (offering instruction for 3rd and 4th year plus graduate students) offer medical technology programs:

Governor's State University Park Forest South 60466	(this program accepts only those with 2 years of college, including a strong science background; it provides 1 year of instruction plus 1 year in an affiliated hospital)
Sangamon State University Springfield 62708	(this program accepts only those with 2 years of college, including a strong science background; it provides 1 year of instruction plus 1 year in an affiliated hospital)

* * * * * * * * *

Group C) This final grouping of medical technology programs lists and describes programs which differ in varying ways from those listed earlier in this section. Each of them requires a strong college science background (requirements vary with each program, so the institutions should be contacted for details) in order to be considered for admission:

Chicago Medical School University of Health Sciences Chicago 60612	(accepts students with at least 2 years of college) 2-year program after which a bachelor's degree is awarded)
Medical Center Northwestern University Chicago 60611	(there are 2 undergraduate bachelor's degree programs -- one accepts students for the 3rd and 4th year of college instruction, the other for the 4th year only. In addition, there are two 2-year master of science degree programs in medical technology, one for persons with a bachelor's degree in medical technology and at least 2 years of medical laboratory work experience, the other for persons with a bachelor's degree in a field other than medical technology.)
College of Nursing and Allied Health Rush University Chicago 60612	(This program accepts students for the 3rd and 4th year of instruction after which a bachelor's degree is awarded)

School of Associated Medical Sciences
University of Illinois at the Medical Center
Chicago 60612

(accepts students with at least 2 years of college; program is 2 years in length, after which a bachelor's degree is awarded)

Employment Prospects

Since 1970 the number of medical technologists being trained in the nation has greatly increased. Until 1970 medical technologists had many job opportunities. However, in 1974, the large number of newly graduated medical technologists had created a job market in which there were very few openings in many urban areas. On the other hand there were positions in smaller cities and rural areas. In 1974 employment prospects for the coming years were hard to forecast. The U.S. Department of Labor in the Summer 1974 issue of Occupational Outlook Quarterly predicted that there would be "moderate employment expansion as a result of wide use of laboratory services by physicians."

Salary

Typical yearly salaries for inexperienced medical technologists ranged from $8,500-$10,000 in 1974. The Illinois Hospital Association reported in its December 1973 report, Hospital Salaries in Illinois that ASCP-certified medical technologists earned an average of $801 per month, while AMT-certified medical technologists received $660 per month. Experienced medical technologists with supervisory and administrative responsibilities earned salaries of $10,000-$25,000 per year, depending on the size of the medical laboratory. No information was found on the salaries of medical technologists employed in other settings.

Career Mobility

Within the hospital work setting medical technologists may, with experience and/or further education, specialize in fields such as blood banking and nuclear medicine or they may become laboratory supervisors and administrators. Medical technologists with master's degrees in education may become teachers of medical laboratory students in hospitals and colleges. Part-time work opportunities are often possible in hospital laboratories.

Increasing numbers of medical technologists are finding employment in large commercial laboratories where salaries are often higher than in hospitals laboratories. Other employers which offer opportunities for a variety of kinds of professional advancement include veterans administration hospitals, public health laboratories, the armed forces, physician-owned laboratories, and manufacturers of laboratory equipment and supplies.

A review of the several routes to becoming a medical technologist approved by the American Society of Clinical Pathologists (ASCP) and the American Medical Technologists (AMT) reveals that considerable efforts have been made by the profession to aid the upward

Career Mobility, Continued

mobility of laboratory assistants and technicians. There are equivalency examinations (the College-Level Examination Program [CLEP]) available to medical technology students who believe that they are academically competent in any of these four areas: clinical chemistry, microbiology, hematology, and blood banking. Those passing any of these tests can receive academic credit for that subject matter in many community colleges and colleges and universities. For persons with medical laboratory skills, but who lack the educational background needed to advance in the medical laboratory profession, there are proficiency tests in the same four areas mentioned above. Employers can use the results of these tests to assign work to laboratory personnel according to their abilities, including the promotion of these laboratory workers. Information about equivalency (CLEP) and proficiency tests can be obtained from the Educational Testing Service, Princeton, New Jersey 08540.

Lastly, there is a promising new proficiency exam developed by the U.S. Department of Health, Education, and Welfare, which offers medical Lab assistants and technicians with a combination of 4 years of medical laboratory work and/or education (college), the opportunity to be designated as qualified to assume the supervisory responsibilities of a medical technologist (A.S.C.P.). Full details about this proficiency exam may be obtained from: Mr. Douglas Wade, Division of Health Facilities, Illinois Department of Public Health, 1130 South Sixth Street, Springfield, Illinois 62761.

Further Reading

Laboratory Medicine, a journal published by the American Society of Clinical Pathologists

Odgers, Ruth F. and Wenberg, Burness G., editors, An Introduction to Health Professions, The C.V. Mosby Company, St. Louis, 1972, pp. 109-118

Williams, M. Ruth, An Introduction to the Profession of Medical Technology, Lea and Febiger, Philadelphia, 1971

Professional Organizations Where More Information May Be Obtained

American Society of Clinical Pathologists
2100 West Harrison Street
Chicago 60612

American Society for Medical Technologists
5555 West Loop South, Suite 200
Bellaire, Texas 77401

American Medical Technologists
710 Higgins Road
Park Ridge 60068

5-15-10

To Broaden Your Understanding

-visit a medical laboratory and talk with the assistants, technicians, technologists, other specialists, and the pathologist

-obtain work experience in a laboratory to determine if you are suited for laboratory work

-write to professional organizations and schools

MEDICAL LABORATORY TECHNICIAN

The newest member of the medical laboratory team is the medical laboratory technician (MLT). The technician is an intermediate-level worker, generally having slightly more responsibility than the certified laboratory assistant, but considerably less than the medical technologist.

The MLT is supervised by a medical technologist, who in turn is supervised by a pathologist. The technician performs tests on urine, feces, blood, and spinal fluid to determine the presence or absence of disease. Those technicians employed in small laboratories perform in most all areas of laboratory work, but in large facilities, they tend to specialize in only one or two areas.

In the area of microbiology, the technician prepares and stains slides for bacteriological study, applies sensitivity discs to culture plates, and records results. In hematology, the laboratory technician takes blood samples from patients, does blood counts, and performs other tests. In clinical chemistry, the work involves chemical analysis of body fluids. In blood banking, the laboratory technician carries out slide and test tube procedures to identify blood groups. In the urinalysis department, the technician centrifuges urine samples, prepares the samples for microscopic study, and performs certain tests.

The medical laboratory technician is employed in hospitals and clinics, private physicians' offices, and in commercial and pharmaceutical laboratories.

Qualifications and Education

As is the case with all laboratory workers, an aptitude in the sciences, manual dexterity, reliability, and accuracy are important for success in this field. The work is scientific in nature. It involves working with delicate instruments and glassware, it involves teamwork, and perhaps most important, it demands accurate testing procedures and honest record keeping. Important diagnoses are made by the pathologist based on the results of the tests made by the MLT.

Typically, the educational requirement for becoming a medical laboratory technician is 2 years in a community college program, stressing biology, chemistry, and medical laboratory techniques. However, there are other ways of becoming an MLT; they are described on the following pages under "Educational Programs for the Medical Laboratory Technician - Illinois."

(Prerequisite: High school diploma or its equivalent)

Required Special Training: Either a) 2-year training program in a community college to become a medical laboratory technician or b) if one is already a certified laboratory assistant (CLA) or a graduate of a 1-year military laboratory training program, the special training would be 60 semester hours of college work, including at least 3 hours in biology and 3 hours in chemistry (beginning in August 1976 this requirement will change to 6 hours of biology and 6 hours of chemistry) or c) 2-year associate degree or equivalent, including biology and chemistry courses, plus 5 years of medical laboratory work experience.

Medical Laboratory Technician

Belleville Area College
Belleville 62221

Central YMCA Community College
Chicago 60606

College of Lake County
Grayslake 60030

Illinois Central College
East Peoria 61611

Kankakee Community College
Kankakee 60901

Lewis and Clark Community College
Godfrey 62035

Malcolm X College
Chicago 60612

Moraine Valley Community College
Palos Hills 60465

Oakton Community College
Morton Grove 60053

Olive-Harvey College
Chicago 60628

Sauk Valley College
Dixon 61021

Triton College
River Grove 60171

Educational programs for training as a medical laboratory worker which are approved by the American Medical Technologists (A.M.T.) have different requirements from those approved by the larger medical laboratory approval body, the American Society of Clinical Pathologists (A.S.C.P.). A student completing an A.M.T.-approved program is eligible for A.M.T. certification. The A.M.T.-certified medical laboratory technician may experience difficulty in being hired by some hospitals, and may find that his educational preparation will not qualify him for admission into A.S.C.P.-approved training programs. However, his educational preparation is appropriate for continuing his laboratory education in an A.M.T.-approved program.

Required Special Training for A.M.T. Certification: Either a) at least 1 year of school and 1 year of laboratory experience, for a total of 2 years or b) 50-week Armed Forces course in medical laboratory techniques and 1 year of laboratory experience or c) 60 semester hours of college with appropriate science courses plus 6 months of medical laboratory experience.

There are no A.M.T.-approved programs in Illinois.

MEDICAL LABORATORY TECHNICIAN - Further Information

Employment Prospects

In 1974 employment prospects for medical laboratory technicians were good in Illinois, and it was believed that the employment outlook for the coming years would remain good.

Salary

Because of the relative newness of medical laboratory technician programs, in 1974, many Illinois hospitals employed few if any technicians. Therefore, it was not possible to obtain reliable salary information. Some hospitals paid their medical laboratory technicians the same wage as their medical laboratory assistants -- $2.50-$3.00 per hour. Other hospitals paid higher salaries. No information was found concerning the earnings of AMT-certified medical laboratory technicians.

Career Mobility

Technicians in the hospital laboratory may, with additional work experience, receive somewhat higher wages. With further experience and/or education, the technician may assume greater responsibility in the laboratory and receive a higher salary. With further specialized education, the technician may enter the field of cytology as a cytotechnologist.

A review of the several routes to becoming a medical technologist which are approved by the American Society of Clinical Pathologists (ASCP) and the American Medical Technologists (AMT) reveals that considerable efforts have been made in this profession to aid the upward mobility of laboratory technicians. There are equivalency examinations (the College-Level Examination Program [CLEP]) available to medical laboratory students who believe that they are academically competent in any of these four areas: clinical chemistry, microbiology, hematology, and blood banking. Those passing any of these tests can receive academic credit for that subject matter in many community colleges and colleges and universities. For persons with medical laboratory skills, but who lack the educational background needed to advance in the medical laboratory professions, there are proficiency tests in the same four areas mentioned above. Employers can use the results of these tests to assign work to laboratory personnel according to their abilities, including the promotion of these laboratory workers. Information about equivalency (CLEP) and proficiency tests can be obtained from the Educational Testing Service, Princeton, New Jersey, 08540.

Further Reading

Laboratory Medicine, a journal published by the American Society of Clinical Pathologists

Kinsinger, Robert E., editor, Health Technicians, J.G. Ferguson Publishing Company, Chicago, 1970, pp. 120-29

Williams, M. Ruth, An Introduction to the Profession of Medical Technology, Lea and Febiger, Philadelphia, 1971

Professional Organizations Where More Information May Be Obtained

American Society of Clinical Pathologists
2100 West Harrison Street
Chicago 60612

American Society for Medical Technologists
5555 West Loop South, Suite 200
Bellaire, Texas 77401

National Committee for Careers in the Medical Laboratory
9650 Rockville Pike
Bethesda, Maryland 20014

American Medical Technologists
710 Higgins Road
Park Ridge 60068

To Broaden Your Understanding

-visit a medical laboratory and talk with the assistants, technicians, technologists, other specialists, and the pathologist

-obtain work experience in a laboratory to determine if you are suited for laboratory work

-write to professional organizations and schools

MEDICAL LABORATORY ASSISTANT

The medical laboratory assistant is one of many persons working together in the medical laboratory. The assistant performs many routine procedures under the supervision of a medical technologist and a pathologist (a doctor specializing in the study of diseases).

The assistant performs laboratory tests on urine, feces, blood, and spinal fluid to determine the presence or absence of disease. Those assistants employed in small laboratories have duties in most all areas of laboratory work, but in larger facilities they tend to specialize in only one or two areas.

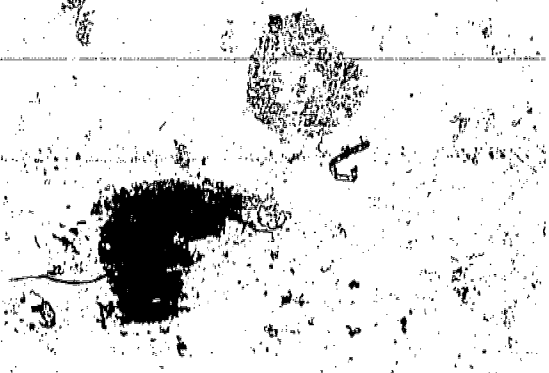
Specific tasks performed by the assistant include collecting blood specimens, grouping and typing blood, preparing and staining slides, and examining urine and other body fluids. Besides these specific laboratory procedures, the assistant cleans and sterilizes equipment, prepares solutions, identifies specimens, and keeps accurate records of the tests performed.

Laboratory assistants are employed by hospitals, clinics, private physicians, commercial and pharmaceutical laboratories.

Qualifications and Education

As is the case with all laboratory workers, an aptitude in the sciences, manual dexterity, reliability, and accuracy are important for success in this field. The work is scientific in nature. It involves working with delicate instruments and glassware, it involves teamwork, and perhaps most important, it demands accurate procedures and honest record keeping. Important diagnoses are made by the pathologist based on the results of the tests made by the medical laboratory assistant.

The most typical manner of becoming a medical laboratory assistant is completion of a one-year hospital or community college laboratory assistant training program. Alternate methods are described on the following page, "Educational Programs for the Medical Laboratory Assistant - Illinois."



EDUCATIONAL PROGRAMS FOR THE MEDICAL LABORATORY ASSISTANT - ILLINOIS

(Prerequisite: high school diploma or its equivalent)

Required Special Training: Either a) 1-year laboratory assistant program in a hospital or community college or b) 3 years of medical laboratory work experience or c) certain basic military medical laboratory courses (12-21 weeks in length) plus 1 year of medical laboratory work experience.

The above are the requirements for training as a medical laboratory assistant which have been set forth by the American Society of Clinical Pathologists (A.S.C.P.). Persons meeting these requirements after passing an ASCP examination, are designated as CLA's (certified laboratory assistants). As in the cases of the medical laboratory technician and the medical technologist, the American Medical Technologists (A.M.T.), a smaller medical laboratory approval body, has set different training requirements for the medical laboratory assistant. A.M.T. requirements are: experience and/or post-high school education totaling 2 years. Persons meeting these requirements, after passing an AMT examination, are designated as CT's (certified technicians).

The A.M.T.-certified medical laboratory assistant (CT) may experience difficulty in being hired by some hospitals, and should he/she desire to enter an ASCP-approved program to become a medical laboratory technician, a medical technologist, or a specialist in another medical laboratory field, he may find that his educational and work preparation do not qualify him for admission. However, his educational and work preparation are appropriate for continuing his laboratory education in an A.M.T.-approved program.

Medical Laboratory Assistant

Blessing Hospital
Quincy 62301

St. Elizabeth Hospital
Danville 61832

Sherman Hospital
Elgin 60120

Swedish Covenant Hospital
Chicago 60625

Triton College
River Grove 60171

Veterans' Administration
West Side Hospital
Chicago 60612

MEDICAL LABORATORY ASSISTANT - Further Information

Employment Prospects

In 1974 employment prospects for medical laboratory assistants were good in Illinois, and it was believed that the employment outlook for the coming years would remain good.

Salary

In 1974, a typical beginning wage for an ASCP-certified laboratory assistant was $2.50-$3.00 per hour. Salaries for experienced personnel were somewhat higher. No information was found indicating the earnings of AMT-certified assistants. A 1973 Illinois Hospital Association salary survey indicated that overall, ASCP-certified assistants in Illinois hospitals had average salaries of $583 per month.

Career Mobility

Assistants in the hospital laboratory may with additional work experience receive somewhat higher wages. With further experience and/or education, the assistant may become a medical laboratory technician; with considerably more education, he/she may become a medical technologist. Sometimes, an assistant obtains additional education and enters the specialized field of cytology as a cytotechnologist.

A review of the several routes to becoming a medical laboratory technician or a medical technologist which are approved by the American Society of Clinical Pathologists (ASCP) and the American Medical Technologists (AMT) reveals that considerable efforts have been made in this profession to aid the upward mobility of laboratory assistants. There are equivalency examinations (the College-Level Examination Program [CLEP]) available to medical laboratory students who believe that they are academically competent in any of these four areas: clinical chemistry, microbiology, hematology, and blood banking. Those passing any of these tests can receive academic credit for that subject matter in many community colleges and colleges and universities. For persons with medical laboratory skills, but who lack the educational background needed to advance in the medical laboratory profession, there are proficiency tests in the same four areas mentioned above. Employers can use the results of these tests to assign work to laboratory personnel according to their abilities, including the promotion of these laboratory workers. Information about equivalency (CLEP) and proficiency tests can be obtained from the Educational Testing Service, Princeton, New Jersey, 08540.

Further Reading

Laboratory Medicine, a journal published by the American Society of Clinical Pathologists

Kinsinger, Robert E., editor, Health Technicians, J.G. Ferguson Publishing Company, Chicago, 1970, pp. 120-29

Williams, M. Ruth, An Introduction to the Profession of Medical Technology, Lea and Febiger, Philadelphia, 1971

Professional Organizations Where More Information May Be Obtained

American Society of Clinical Pathologists
2100 West Harrison Street
Chicago 60612

American Society for Medical Technologists
5555 West Loop South, Suite 200
Bellaire, Texas 77401

National Committee for Careers in the Medical Laboratory
9650 Rockville Pike
Bethesda, Maryland 20014

American Medical Technologists
710 Higgins Road
Park Ridge 60068

To Broaden Your Understanding

-visit a medical laboratory and talk with the assistants, technicians, technologists, other specialists, and the pathologist

-obtain work experience in a laboratory to determine if you are suited for laboratory work

-write to professional organizations and schools

HISTOLOGIC TECHNICIAN

Histologic technicians prepare samples of human tissues so that they may be studied by a pathologist to determine whether or not disease is present. A major part of her/his work is to freeze tissues from patients, then to slice thin pieces of those tissues for careful mounting on microscope slides. The slides are then examined by a pathologist.

Qualifications and Education

The histologic technician operates delicate instruments in the preparation of human tissues. Thus, she/he needs to have good vision and manual dexterity. Because of the importance of the results of the tissues examined, the histologic technician must work carefully.

Educational preparation requires a high school diploma or its equivalent plus 12 months of training in a clinical pathology laboratory course or completion of a junior or community college histologic technician program, of which at least 6 months is devoted to clinical training.

EDUCATIONAL PROGRAMS IN HISTOLOGIC TECHNOLOGY - ILLINOIS

Histologic Technician

(Required: High school diploma or its equivalent plus either a) 12 months of training in a clinical pathology laboratory course or b) a junior or community college histologic technician program, of which at least 6 months is devoted to clinical training (there are no junior college or community college histologic technician programs in Illinois) or c) 3 years of work experience in histology in a medical laboratory.

Holy Cross Hospital
Chicago 60629

Memorial Hospital of Springfield
Springfield 62705

Mercy Hospital Medical Center
Chicago 60616

Methodist Hospital of Central Illinois
Peoria 61603

Mt. Sinai Hospital Medical Center of Chicago
Chicago 60608

St. Francis Hospital
Peoria 61603

St. John's Hospital
Springfield 62701

St. Joseph Hospital
Chicago 60657

University of Chicago
Hospital and Clinic
Chicago 60637

HISTOLOGIC TECHNICIAN - Further Information

Employment Prospects

In 1975, Illinois employment prospects were generally good. There were few jobs related to research projects due to decreases in federal funding of research projects, but positions were available in surgical and autopsy laboratories. Future employment prospects for well-trained histologic technicians appeared favorable.

Salary

Inexperienced histologic technicians in Chicago hospitals were paid between $575 and $850 per month in 1975. Salaries in smaller hospitals in downstate Illinois were lower. Salaries in teaching hospitals were lower than in private hospitals; however, the work in teaching hospitals provided greater breadth of experience and prestige. In many hospitals salaries for technicians did not increase significantly with added years of employment.

Career Mobility

Histologic technicians work in the histology laboratories of hospitals, research institutes, governmental institutions, and certain kinds of business such as the pharmaceutical and rubber industries. In some institutions, there is little opportunity for advancement. In other cases the beginning histologic technician may be assigned increased responsibilities and then supervisory duties, and receive considerably more pay. Those wishing to enter the related fields of cytotechnology and medical technology must return to school for further education.

Further Reading

Kinsinger, Robert E., editor, Health Technicians, J.G. Ferguson Publishing Company, Chicago, 1970, pp. 88-91.

Laboratory Medicine, a journal published by the American Society of Clinical Pathologists

Professional Organizations Where More Information May Be Obtained

American Society of Clinical Pathologists
2100 West Harrison Street
Chicago 60612

American Society for Medical Technologists
5555 West Loop South, Suite 200
Bellaire, Texas 77401

To Broaden Your Understanding

- -visit a medical laboratory and talk with the assistants, technicians, technologists, pathologists, and the histologic technicians about their work
- -obtain work experience in a laboratory to determine if you are suited for laboratory work
- -write to professional organizations and schools

CYTOTECHNOLOGIST

The cytotechnologist is a specialist among the medical laboratory technologists. She/he is trained in special laboratory techniques and procedures for detecting body cell changes which are particularly important in the early diagnosis of cancer. Working under the direct supervision of the pathologist, cytotechnologists screen slides of cell samplings under the microscope tracing clues to disease in the patterns of cytoplasms and nuclei stained with special dyes to make them stand out brightly. One of the most common laboratory tests performed by cytotechnologists is the "Pap" smear test on women -- a test to reveal early signs of cancer of the cervix or uterus.

Cytotechnologists are found in laboratories of hospitals and cancer research centers. Some are employed in the research departments of pharmaceutical companies.

Qualifications and Education

To be suited for a career in the medical laboratory one should have an aptitude and interest in the physical and biological sciences. Since the work frequently deals with life and death matters, it requires precision, dependability and a strong sense of responsibility. Adeptness in using the hands is essential, because the cytotechnologist works with small instruments and delicate equipment. Normal vision and an ability to distinguish fine shades of color are valuable assets.

Entry into specific training in cytotechnology requires at least two years of college with preparation in the biological sciences. Those who are already medical technologists or who have bachelor's degrees in any other field also are eligible for this training. Cytotechnology educational programs are primarily in hospitals, and are 12 months in duration.

Cytotechnologist

(Prerequisite: a) two years of college in the biological sciences, or b) a bachelor's degree in any field, or c) a background as a medical technologist (which requires a bachelor's degree)

Required Special Training: 12-month hospital educational program for preparation as a cytotechnologist

Mercy Hospital Medical Center
Chicago 60616

Michael Reese Hospital and Medical Center
Chicago 60616

Millikin University (4-year bachelor's degree program)
Decatur 62522

Mount Sinai Hospital Medical Center
Chicago 60608

University of Chicago
Lying-in Hospital
Chicago 60637

CYTOTECHNOLOGIST - Further Information

Employment Prospects

In 1975 employment prospects for cytotechnologists were generally good in Illinois with the exception of the Chicago area. Jobs were scarce in Chicago, and only somewhat more plentiful in the suburbs.

Salary

In 1975 starting salaries for inexperienced cytotechnologists were typically in the $700-$750 per month range in the Chicago area. Salaries in other parts of the state tended to be lower. The highest salaries were paid to those with considerable work experience and who had supervisory responsibilities. Those salaries were $12,000-$15,000 per year.

Career Mobility

Following successful work experience, cytotechnologists in larger hospitals may be promoted to supervisory positions in cytology. In smaller hospitals the relatively small cytology laboratory is supervised by a medical technologist. A few cytotechnologists teach in educational programs for the preparation of cytotechnologists. Those cytotechnologists with a desire for greater responsibility and higher income may increase their chances for advancement by completion of a bachelor's degree in a science area.

Further Reading

Kinsinger, Robert E., editor, Health Technicians, J.G. Ferguson Publishing Company, Chicago, 1974, pp. 36-41.

Laboratory Medicine, a journal published by the American Society of Clinical Pathologists

Professional Organizations Where More Information May Be Obtained

American Society of Clinical Pathologists
2100 West Harrison Street
Chicago 60612

American Society for Medical Technologists
5555 West Loop South, Suite 200
Bellaire, Texas 77401

American Society of Cytology
130 South 9th Street
Suite 1006
Philadelphia, Pennsylvania 19107

To Broaden Your Understanding

-visit a medical laboratory and talk with the assistants, technicians, technologists, pathologists, and cytotechnologists about their work

-obtain work experience in a laboratory to determine if you are suited for laboratory work

-write to professional organizations and schools

SPECIALIST IN BLOOD BANK TECHNOLOGY

Specialists in blood bank technology supervise the collection, processing, and storage of blood in transfusion and blood donation areas in hospitals, clinics, and special community blood bank centers. Their indepth knowledge of blood is used to assure the proper usage of blood and to solve routine as well as emergency problems involved in blood transfusion and blood donation. Proper classification of blood enables appropriate types of blood to be retrieved when needed. Specialists in blood bank technology interpret the meaning of technical information on blood to other health workers and supervise other blood bank personnel.

Qualifications and Education

Blood bank work requires that the individual exercise great responsibility. Pressure on the technologist may be constant and intense. The qualities of accuracy of work and ability to accept major responsibility are essential.

In order to qualify to become a specialist in blood bank technology, it is necessary to either be a medical technologist (which requires a bachelor's degree) or to have a bachelor's degree in one of the biological or physical sciences plus one year of work experience in a medical laboratory. The special educational program in blood bank technology is 12 months in length and is obtained at certain blood banks in hospitals, universities, and military installations. Experienced persons may be eligible to have this 12-month educational program waived.

Blood Bank Technologist

(Prerequisite: a) Be a medical technologist (which requires a bachelor's degree) or b) have a bachelor's degree in one of the physical or biological sciences plus one year of work experience in a medical laboratory.

Required Special Training: 12-month educational program in blood bank technology

Mount Sinai Hospital Medical Center Blood Center
Chicago 60608

Lutheran General Hospital, Blood Bank.
Park Ridge 60068

St. John's Hospital Blood Bank
Springfield 62701

SPECIALIST IN BLOOD BANK TECHNOLOGY - Further Information

Employment Prospects

Due to the absence of qualified specialists in many blood banks, it was expected that the employment outlook would remain very good during the next ten years.

Salary

In 1975 beginning specialists in blood banking earned from $14,000 to $16,000 yearly in Chicago. Experienced persons received $16,000 to $18,000. Salaries outside of Chicago were somewhat lower.

Career Mobility

With successful work experience, blood bank specialists may acquire supervisory and administrative responsibilities or may teach in an educational program for the training of specialists in blood bank technology. Most blood bank specialists enter the field from medical technology. Blood bank specialists desiring to conduct research may do clinical research in frozen blood cells, platelets, lymphocytes, and transplants; basic research in leukocytes, platelets, red cell enzymes; and industrial research consisting of the study of antibodies and the typing of sera.

Further Reading

None

Professional Organization Where More Information May Be Obtained

American Association of Blood Banks
1828 L Street, N.W.
Suite 608
Washington, D.C. 20036

To Broaden Your Understanding

-visit the blood donation and transfusion areas of a hospital or clinic and talk to a specialist in blood bank technology about his/her work

-visit a blood donation center and ask to assist in any way

-visit a medical laboratory and discuss the work done related to blood

-write to schools and the professional organization

RADIOLOGIC TECHNOLOGIST

The X-ray is widely used in modern medicine. With this powerful tool, the physician can take pictures of bones and inner organs of the body and detect abnormalities. He can also use its penetrating radiation to halt certain diseases.

In the old days, all X-ray work had to be done by the physician himself. Now that equipment has been improved and safeguarded, trained assistants can do many of the technical routines, conserving the physician's time for administering X-ray therapy and other types of radiation treatment, and for interpreting X-ray films. These assistants may be more familiar as "X-ray technicians." Radiologic technologists are in increasing demand, and for many more years the number of jobs probably will exceed qualified people to fill them.

Well-trained radiologic technologists have a wide choice of places to work. About one-third of them are employed in public or private hospitals. Others have jobs in private medical laboratories supervised and operated by physicians, in physician's offices or privately operated medical clinics, in public health laboratories, in industrial plants, and in dentists' offices or dental clinics.

The number of hours worked weekly depends to a large extent on the institution. For example, hospitals tend to ask for longer hours than do public health laboratories. If around-the-clock service is maintained, some technologists must be on call at all times, and this means that each member of the staff must take a share of weekend and night duty.

Women who'd like a job that can be combined, if necessary, with marriage and raising a family will be interested to know that radiologic technologists are often hired on a part-time basis. These part-time workers help at peak hours during the day or week, substitute for vacationing staff members, make themselves available for emergency calls, or serve small hospitals or clinics which do not have enough X-ray work to warrant a full-time job.

Because the radiologic technologist must work under the direction of a physician or dentist, he can advance in the job only by becoming skilled enough to supervise other workers who are less well trained. This means he will have to seek employment in large X-ray departments where a number of assistants are needed.

Qualifications and Education

Becoming a medical radiologic technologist calls for a combination of aptitudes. Since the technologist deals directly with patients, he must be gentle and sympathetic. He uses a great deal of equipment, which means he must be deft with his hands and intelligent about machinery. He needs to have a flair for science in order to master necessary techniques. Most important of all, he must be accurate and careful, since errors are not only costly, but may be dangerous to the patient.

Anyone planning to enter this kind of work should be in normal good health. The possibility of danger to the technologist from continued work with radiation used to cause great concern. However, advances in equipment, techniques, and training have reduced this possibility. Today the technologist can feel secure about his health if he follows accepted practices. All good hospitals have safety procedures and insist that employees follow them.

Training programs for those wishing to become radiologic technologists are at least 2 years in length. Hospitals, colleges, and the military services conduct these programs. Course work includes physics, anatomy, physiology, as well as various aspects of radiographic theory and practice.

(Prerequisite: high school diploma or its equivalent)

Required Special Training: 24-month (or longer) program in radiologic technology in a hospital, community college, or college (university)

Radiologic Technologist

Arlington Heights

Northwest Community Hospital
Arlington Heights 60005

Aurora

Copley Memorial Hospital
Aurora 60507

Belleville

Belleville Area College
Belleville 62221

Bloomington

Bloomington-Normal School of X-Ray Technology
Bloomington 61701

Centralia

St. Mary's Hospital
Centralia 62801

Champaign

Parkland College
Champaign 61820

Chicago

Chicago Medical School (4-year bachelor's degree program)
Chicago 60612

Cook County Hospital
Chicago 60612

Chicago, continued

DePaul University (4-year bachelor's degree program)
Chicago 60614

Edgewater Hospital
Chicago 60660

Englewood Hospital
Chicago 60621

Forkosh Memorial Hospital
Chicago 60618

Franklin Blvd. Community Hospital
Chicago 60624

Henrotin Hospital
Chicago 60610

Illinois Masonic Medical Center
Chicago 60657

Louis A. Weiss Memorial Hospital
Chicago 60640

Malcolm X Community College
Chicago 60612

Michael Reese Hospital and Medical Center
Chicago 60616

Mt. Sinai Hospital Medical Center
Chicago 60608

Northwestern Memorial Hospital
Chicago 60611

Chicago, continued

Provident Hospital & Training School
Chicago 60615

Ravenswood Hospital Medical Center
Chicago 60640

Roosevelt University (4-year bachelor's
Chicago 60605 degree program)

Roseland Community Hospital
Chicago 60628

South Chicago Community Hospital
Chicago 60617

St. Anne's Hospital
Chicago 60651

St. Joseph Hospital
Chicago 60657

St. Mary of Nazareth Hospital Center
Chicago 60622

University of Illinois Hospital
Chicago 60612

Woodlawn Hospital
Chicago 60637

Wright Junior College
Chicago 60634

Danville

Lake View Memorial Hospital
Danville 61832

Decatur

Decatur Memorial Hospital
Decatur 62526

Millikin University (4-year bachelor's
Decatur 62526 degree program)

Dixon

Sauk Valley College
Dixon 61021

East Peoria

Illinois Central College
East Peoria 61611

Elgin

St. Joseph Hospital
Elgin 60120

Evanston

St. Francis Hospital
Evanston 60202

Galesburg

Carl Sandburg College
Galesburg 61401

Glen Ellyn

College of DuPage
Glen Ellyn 60137

Grayslake

College of Lake County
Grayslake 60030

Hinsdale

Hinsdale Sanitarium & Hospital
Hinsdale 60521

Kankakee

Kankakee Community College
Kankakee 60901

Kewanee

Kewanee Public Hospital
Kewanee 61443

Macomb

McDonough District Hospital
Macomb 61455

Malta

Kishwaukee College
Malta 60150

Moline

Lutheran Hospital
Moline 61265

Moline Public Hospital
Moline 61265

Morton Grove

Oakton Community College
Morton Grove 60053

Oak Park

West Suburban Hospital Association
Oak Park 60302

Olney

Richland Memorial Hospital
Olney 62450

Palos Hills

Moraine Valley Community College
Palos Hills 60465

Peoria

St. Francis Hospital
Peoria 61603

Quincy

Blessing Hospital
Quincy 62301

St. Mary's Hospital
Quincy 62301

River Grove

Triton College
River Grove 60171

Rock Island

Rock Island Franciscan Hospital
Rock Island 61201

Rockford

Rockford Memorial Hospital
Rockford 61101

Swedish-American Hospital
Rockford 61101

South Holland

Thornton Community College
South Holland 60473

Springfield

Lincoln Land Community College
Springfield 62703

St. John's Hospital
Springfield 62701

RADIOLOGIC TECHNOLOGIST - Further Information

Employment Prospects

In 1974 there was a moderate need for radiologic technologists, nationally and in Illinois. It was expected that the same degree of need would continue over the next ten years.

Salary

In 1974, beginning radiologic technologists in the Chicago area earned about $675 monthly. In most cases, technologists in smaller cities and rural areas were paid substantially less. Experienced technicians earned considerably more than beginning ones.

Career Mobility

Radiologic technologists may assume greater responsibility and receive salary increases by entering through on-the-job training one of the following specialized areas within his/her field: administration, teaching, surgical procedures, xeroradiology, ultrasonics, or thermography. In addition, with further formal education, the radiologic technologist may become a nuclear medicine technologist or a radiation therapy technician. There are no proficiency or equivalency examinations available to persons desiring to move into nuclear medicine technology or radiation therapy technology. (Such examinations, which are available in a few other health fields, test for competence in the professional course work and/or knowledge gained through related work, and can result in shortening the required training period.)

Further Reading

Kinsinger, Robert E., editor, Health Technicians, J.G. Ferguson Publishing Company, Chicago, 1970, pp. 154-165

Odgers, Ruth F., and Wemberg, Burness G., editors, Introduction to Health Professions, The C.V. Mosby Company, St. Louis, 1972, pp. 127-134

Professional Organizations Where More Information May Be Obtained

American Society of Radiologic Technologists
645 North Michigan Avenue
Chicago, Illinois 60611

American Registry of Radiologic Technologists
2600 Wayzata Boulevard
Minneapolis, Minnesota 55455

To Broaden Your Understanding

- visit a hospital where a radiologic technologist works, and talk, and ask about his/her job

- write to schools and professional organizations

RADIATION THERAPY TECHNOLOGIST

The radiation therapy technologist is concerned with the treatment of patients with diseases such as cancer by means of radiation treatments. Under the direction of a radiologist (a physician specializing in the use of radiant energy for the diagnosis and/or treatment of disease), the radiation therapy technologist exposes specific areas of the patient's body to doses of X-ray and other forms of radiation. The intent of this treatment is to stop the spread of disease.

In addition, the technologist maintains the controlling devices and equipment used in treatment, and shares responsibility for keeping patient records.

Qualification and Education

Students considering this field must have good ability in the physical sciences and mathematics. It is essential that they learn to operate complicated equipment with precision. Finally, it is important to be warm and compassionate because many of the patients treated are seriously ill.

There are two types of training programs in radiation therapy technology. One type of program requires 24 months of special training; the other requires only 12 months, but assumes a related background. (There are no 12-month programs in Illinois.) More information on the educational qualifications and programs is listed in this section on the page entitled "Educational Program in Radiation Therapy Technology - Illinois."

Radiation Therapy Technologist

There are two types of programs:

1)"Two-year program"

Prerequisite: high school diploma or equivalent, including appropriate science and mathematics courses.

Required Special Training: 24-month program in radiation therapy technology

No such programs exist in Illinois

2)"One-year program"

Prerequisites: Either a) be a radiologic technologist or b) be a registered nurse with an educational background in radiation physics or c) possess equivalent qualifications.

Required Special Training: 12-month program in radiation therapy technology

Rush-Presbyterian St. Luke's Medical Center
Chicago 60612

Northwestern Memorial Hospital
Wesley Pavillion
Chicago 60611

Evanston Hospital
Evanston 60202

Employment Prospects

In 1974 radiation therapy technologists were in great demand both nationally and in Illinois. This relatively new field is expected to have many positions available in the next ten years.

Salary

In 1974 inexperienced radiation therapy technologists in the Chicago area received salaries of approximately $800 per month. Elsewhere in the state salaries were lower. Those with teaching responsibilities had beginning salaries in the vicinity of $1,000 per month; those with administration responsibilities earned $1,200 or more. Of course, salaries for experienced personnel were considerably higher.

Career Mobility

Radiation therapy technologists may, with accumulated experience or additional education become administrators in their field. Those with an interest in teaching may teach radiation therapy to students entering the field.

Further Reading

None

Professional Organizations Where More Information May Be Obtained

American Registry of Radiologic Technologists
2600 Wayzata Boulevard
Minneapolis, Minnesota 55455

Department of Allied Medical Professions and Services
American Medical Association
535 North Dearborn Street
Chicago, Illinois 60610

Joint Review Committee on Education in Radiologic Technology
211 East Chicago Avenue
Chicago, Illinois 60611

American Society of Radiologic Technologists
645 North Michigan Avenue
Chicago, Illinois 60611

Professional Organizations, continued

Subcommittee on Radiation Therapy Technology
Commission on Technologists' Affairs
American College of Radiology
20 North Wacker Drive
Chicago, Illinois 60606

To Broaden Your Understanding:

-visit a hospital where a radiation therapy technician works, talk to him/her, and ask about his/her work

-write to schools and professional organizations

Nuclear Medical Technologist

Nuclear medicine involves the application of radioactive isotopes in the diagnosis and treatment of disease. Under the supervision of a doctor, isotopes are injected into the blood stream, tissue, or organs, and then are observed by a nuclear radiation detector known as a scanner. The nuclear medicine technologist attends to the needs of the patient throughout this procedure. Great care must be taken in the use and disposal of the potentially harmful radioactive materials.

Nuclear medicine technologists are employed in hospitals, private medical laboratories, physicians' offices, clinics, public health laboratories, and industrial plants.

Qualifications and Education

An interest and aptitude in the sciences are desirable qualities for students contemplating this field. In addition, the following abilities are important: following instructions precisely; giving instructions and making explanations to patients; and perform routine, repetitive procedures accurately.

In order to become a nuclear medicine technologist, a background as a medical technologist, or as a registered nurse, or three years of college with an emphasis on science courses are necessary prerequisites to the required 12-month program in nuclear medicine technology.

(Prerequisites: Either a) be a medical technologist, or b) be a radiologic technologist, or c) be a registered nurse, or d) have 3 years of college with an emphasis in the biological or physical sciences).

Required Special Training: 12-month program in nuclear medicine technology. Whether or not the bachelor's degree is awarded after completion of this 12-month training depends upon the program enrolled in and the student's prior education and training.

Nuclear Medicine Technologist

College of St. Francis (4-year bachelor's degree program)
Joliet 60435

Evanston Hospital
Evanston 60202

Northwestern Memorial Hospital
Chicago 60611

St. Mary of Nazareth Hospital Center
Chicago 60622

Veterans Administration Hospital
Hines 60141

Employment Prospects

In 1974 nuclear medicine technologists were in great demand both nationally and in Illinois. This relatively new field is expected to have many positions available in the next ten years.

Salary

In 1974 inexperienced nuclear medicine technologists in the Chicago area received salaries of approximately $800 per month. Elsewhere in the state salaries were lower. Those with teaching responsibilities had beginning salaries in the vicinity of $1,000 per month; those with administrative responsibilities earned $1,200 or more. Of course, salaries for experienced personnel were considerable higher.

Career Mobility

Nuclear medicine technologists may with accumulated experience or additional education become administrators in their field. Those with an interest in teaching may teach nuclear medicine to students entering the field.

Further Reading

None

Professional Organizations Where More Information May Be Obtained

American Society of Radiologic Technologists
645 North Michigan Avenue
Chicago, Illinois 60611

Society of Nuclear Medicine Technicians
1201 Waukegan Road
Glenview, Illinois 60025

American Registry of Radiologic Technologists
2600 Wayzata Boulevard
Minneapolis, Minnesota 55455

American Society of Clinical Pathologists
2100 West Harrison Street
Chicago, Illinois 60612

To Broaden Your Understanding

-visit a hospital where a nuclear medicine technologist works and talk with him/her and ask about his/her work

-write to schools and professional organizations

(Article on the Nuclear Medical Technologist)

Interviews conducted with nuclear medicine technologists in 203 hospitals in 1969 revealed:

"Most of the nuclear medicine technicians we talked to reported that they found their work varied and interesting, and it is probably safe to say that the average technician does not suffer from boredom. When technicians do leave their jobs, the most common reasons are marriage, pregnancy, or a better paying position elsewhere."

"Nuclear medicine technicians were appreciative of the responsibility they were entrusted with, the newness of the field, the skill required to obtain good results, and the mutual confidence and regard between doctors and technicians, especially in the area of new information and techniques. Technicians generally were pleased with their work situation. They desired better preparatory programs and more continuing instruction, especially for those nuclear medicine technicians who are working nearly full time. Technicians were piqued where they sensed a lack of interest by their hospital or department head in the nuclear medicine unit. Other concerns were lack of space, need for another technician, a concern to show others in the hospital what nuclear medicine could do, and a desire for more equipment and better procedures."

"The reasons people leave positions as nuclear medicine technicians is a useful guide to the problems of the job. Eighteen percent (18%) of the hospitals replied that their technicians left because the department could not offer sufficient opportunities for advancement. An additional eleven percent (11%) cited an inadequate salary schedule as the prime cause for leaving (although seventeen percent (17%) considered it an important cause). Less than five percent (5%) reported that technicians left because of lack of interest, supporting the frequently expressed idea that the nuclear medicine technician's job is in general varied and interesting.

SOURCE: ERIC 042 902 Development of Career Opportunities for Technicians in Nuclear Medical Field -- Survey of Job Characteristics, Manpower Needs and Training Resources; Interim Report No. 1, July 1969, Technical Education Research Center, Cambridge, Massachusetts, Sponsored by the Office of Education

The administration of oxygen for various types of illness has been a standard medical procedure for many years. As medical technology has advanced, many refinements and improvements have been made in the procedure for administering oxygen and other therapeutic gases so as to control and regulate dosage precisely and to adapt the treatment to the patient's exact medical and physical condition at the time.

The increasing precision of the process and complexity of the equipment has required that the therapy be given by a highly skilled person especially trained for this function. As a result, the health occupation of inhalation therapist has emerged in the past several years. This is now one of the most rapidly growing of all the allied health occupations.

The inhalation therapist sets up and operates various types of therapeutic gas and mist inhalation equipment, such as respirators, tents, masks, catheters, cannulas, and incubators. He administers through these devices prescribed doses of medicinal gases and aerosolized drugs to hospitalized patients.

The inhalation therapist receives from the physician a prescription specifying the type of therapy, the type of medication, and the dosage. He must then determine the most suitable method of administering the inhalant, the precautions to be observed, and the modifications that may need to be made in the method in order to comply with the physician's exact requirements.

The therapist then explains to the patient what the inhalation treatment will consist of, so as to enlist his cooperation and allay anxiety. When the equipment is brought to the bedside, the therapist instructs the patient as to breathing procedure, and then proceeds to arrange the tent or hood, or apply the face mask or insert the cannula or catheter. Then he starts the flow of gas from the "bottle" or other source, setting the controls to regulate the flow at the required level.

As the therapy is in process, the therapist observes the patient to detect adverse reactions, notifying the nurse or doctor should these develop. He also reads the equipment gages to insure that specified pressures are being maintained.

The inhalation therapist also operates the Intermittent-Positive-Pressure-Breathing Machine (IPPB) to deliver medicinal gases and drugs in aerosolized mist concentration to the patient's respiratory system.

Some inhalation treatments run from 5 to 15 minutes. Others are considerably longer, and some are continuous. While the treatment is in process, the inhalation therapist observes the patient's comfort and general condition, noting rate of respiration, pulse, and the patient's color (pallor or flushing). He may also be required to conduct pulmonary function tests of various kinds, including lung volumes, gas flows, and blood gas analysis.

In addition to these direct therapeutic functions, the inhalation therapist is also required to perform several other related duties. He must:

- Keep the equipment clean, sterile, and in good working condition, and order repairs as needed.
- Order new equipment and see that it is properly stored.
- Maintain adequate supplies of oxygen and other gases.
- Conduct classroom and on-the-job instruction in inhalation therapy.
- Keep current with the latest developments by reading the literature, and attending meetings.

In small hospitals, there may be just one inhalation therapist; working under the direction of a physician, he will be responsible for all the duties that have been described. In larger hospitals, there may be an inhalation therapy supervisor, together with a number of inhalation therapists, trainees, and clerical help.

Qualifications and Education

Aptitudes: Verbal ability is necessary to comprehend meaning of medical prescriptions and to confer with the patient. Clerical ability is necessary to recognize pertinent details in patients' charts and to keep accurate records. Motor coordination and finger dexterity are necessary to set up equipment, manipulate controls, and to make minor repairs.

Interests: A preference for sciences, machines, and techniques is essential. So is a preference for working with people to benefit their health.

Temperament: The inhalation therapist should be able to communicate calmly with people who are under stress. He should also be extremely accurate, since this is essential in regulating medication and equipment precisely to prescription orders.

Education, training, and experience range from high school education with courses in biology and chemistry, along with more than a year's on-the-job training under strict supervision, up to and including a B.S. degree, depending upon the position desired. For the beginning high school graduate who cannot go on to college and complete a bachelor's degree, enrollment in a hospital or college or university program of inhalation therapy training or a 1- or 2-year approved curriculum is recommended. The accrediting body is the Joint Review Committee for Inhalation Therapy Training, sponsored by the American Medical Association and the American Association for Inhalation Therapy.

(Prerequisite: high school diploma or its equivalent)

Required Special Training: 2-year program in respiratory therapy leading to either a diploma or an associate degree, or in some instances, when combined with 2 or more years of college study, leading to a bachelor's degree. (There are no bachelor's degree programs in Illinois.)
[Exceptions to the above are noted below.]

Respiratory Therapist

Central YMCA Community College
Chicago 60606

Cook County Hospital
Chicago 60612
(prerequisite: 2 years of college; program is 18 months in length)

Lutheran Hospital
Moline 61265
(in affiliation with Black Hawk College)

Malcolm X College
Chicago 60612

Memorial Hospital
Springfield 62705
(in affiliation with Lincoln Land College)

Northwestern University Medical Center
Chicago 60611
(prerequisite: 2 years of college; program is 9 months in length)

Parkland College
Champaign 61820

St. Anthony Hospital
Rockford 61101
(in affiliation with Rock Valley College)

Triton College
River Grove 60171

University of Chicago
Hospitals and Clinics
Chicago 60637

(prerequisite: 2 years of college; program is 18 months in length.) (a special 5-week diploma respiratory therapy program is offered for persons with either a) a bachelor's degree with an emphasis in the sciences, b) partial fulfillment of a community college respiratory therapy program, c) a nursing background, or d) background in a related health field. (6 months of respiratory therapy work experience is necessary for eligibility)

RESPIRATORY THERAPIST - Further Information

Employment Prospects

In 1974 employment prospects for respiratory therapists were excellent in Illinois. Increasing numbers of health care facilities had recognized the desirability of employing graduates of approved respiratory therapist training programs to provide respiratory therapy services. Excellent employment opportunities were expected to continue for the next decade.

Salary

In 1974 salaries for beginning registered respiratory therapists (registration is granted to those who pass an examination after completing a training program of 2 or more years in length and 1 year of experience) averaged $4.50 per hour, and after four years increased to $5.35 per hour. Supervisors and administrators earned considerably more. Respiratory therapy department heads earned $12,000 to $20,000 depending on the size of the department. Educators of respiratory therapists and technicians had annual incomes ranging from $10,000 to $15,000.

Career Mobility

Due to the recent acknowledgement by many smaller hospitals of the need for well-trained respiratory therapists, there are attractive opportunities for therapists to assume increased responsibility in smaller health care facilities. The relative infancy of the profession and the small number of practitioners has resulted in favorable conditions for advancement to supervisory and administrative positions for those who are well-qualified.

Private companies provide respiratory care services to hospitals and individuals. Therapists working for private companies as sales representatives and practicing therapists often receive higher salaries than those employed by hospitals.

Occasionally respiratory therapists become cardipulmonary technologists. The necessary training is usually gained through on-the-job experience. There are numerous opportunities in this developing field.

Proficiency examinations in respiratory therapy have recently been designed, but in 1974 their specific use had not been determined. In the near future, the tests may be used to test for competence in the professional course work and/or knowledge gained through experience, thereby resulting in shortening the required training for becoming a respiratory therapist.

Further Reading

Respiratory Care, a journal published by the American Association for Respiratory Therapy

Kinsinger, Robert E., editor, Health Technicians, J.G. Ferguson Publishing Company, Chicago, 1970, pp. 166-174

Odgers, Ruth F., and Wenberg, Burness G., editors, Introduction to Health Professions, The C.V. Mosby Company, St. Louis, 1972, pp. 95-102

Professional Organization Where More Information May Be Obtained

American Association for Respiratory Therapy
7411 Hines Place, Suite 101
Dallas, Texas 75235

To Broaden Your Understanding

-obtain volunteer or paid work experience in a respiratory therapy department of a hospital

-talk with a respiratory therapist

-talk to a respiratory therapy patient about the importance of respiratory therapy to his/her health

-write to schools and to the professional organization

RESPIRATORY THERAPY TECHNICIAN

The respiratory therapy technician works with and assists the respiratory therapist. The technician performs many of the same functions as the therapist. However, because the technician has less extensive academic background in anatomy, physiology, pharmacology, and clinical medicine, he/she oftentimes is delegated less responsibility and is given few opportunities to exercise independent judgment. (See pages 6-D-1 and 6-D-2 in this section for a fuller description of respiratory therapy.)

(Prerequisite: high school diploma or its equivalent)

Required Special Training: 1-year program in respiratory therapy in a hospital or junior college

Respiratory Therapy Technician

Belleville Area College
Belleville 62221

Moraine Valley Community College
Palos Hills 60465

Parkland College
Champaign 61820

Rock Valley College
Rockford 61101

St. Mary's Hospital
Quincy 62301

Swedish-American Hospital
Rockford 61101

University of Chicago Hospitals & Clinics
Chicago 60637
(program is 1 year in length; prerequisite is 1 year of college)

Victory Memorial Hospital
Waukegan 60085

Employment Prospects

In 1974 Illinois prospects for the employment of respiratory therapy technicians were excellent. Smaller hospitals which previously had used non-trained hospital personnel to administer respiratory therapy were recognizing the need to hire trained respiratory therapists and technicians. Excellent employment opportunities were expected to continue for the next ten-year period.

Salary

Salaries in central Illinois in 1974 for inexperienced registered technicians (registration is granted to those who pass a registration examination, after completing a 1-year training program and 1 year of work experience) began at about $3.25 per hour. Persons with four years of work experience earned an average of $3.75 per hour. Non-registered technicians earned less. Well-qualified persons with technician-level training sometimes held supervisory and administrative positions, more commonly in smaller hospitals. Salaries for such persons were $6.00 an hour or more.

Career Mobility

Because of the recent recognition of the need for well-trained respiratory therapy technicians and the small number of registered technicians, there are numerous opportunities for increased responsibility and salary. Technicians who demonstrate their competence may assume greater responsibility, eventually performing supervisory and administrative functions. In some cases a technician may be the department head of the respiratory therapy unit.

Sometimes technicians desire to work in the related areas of cardiopulmonary care. Entry into this field is usually achieved through on-the-job training. Prospects in this developing field are excellent.

Technicians who have completed 1-year respiratory therapy technician training programs and wish to become therapists may transfer some of their course work to 2-year therapist training programs. Arrangements for the transfer of course work credits must be made by the student.

Proficiency examinations in respiratory therapy have recently been designed, but in 1974 their specific use had not been determined. In the near future, the tests may be used to test for competence in the professional course work and/or knowledge gained through experience, thereby resulting in shortening the required training for becoming a respiratory therapy technician or respiratory therapist.

Further Reading

Respiratory Care, a journal published by the American Association for Respiratory Therapy

Kinsinger, Robert E., editor, Health Technicians, J.G. Ferguson Publishing Company, Chicago, 1970, pp. 166-174

Odgers, Ruth F., and Wenberg, Burness G., editors, Introduction to Health Professions, The C.V. Mosby Company, St. Louis, 1972, pp. 95-102

Professional Organization Where More Information May Be Obtained

American Association for Respiratory Therapy
7411 Hines Place, Suite 101
Dallas, Texas 75235

To Broaden Your Understanding

obtain volunteer or paid work experience in a respiratory therapy department of a hospital

-talk with a respiratory therapy technician and respiratory therapist

-talk to a respiratory therapy patient about the importance of respiratory therapy to his/her health

-write to schools and to the professional organization

The biomedical engineer[2] applies theory from the physical sciences (chemistry, physics, geology) and technology from science and industry to the solution of problems in medicine and the life sciences (physiology, biochemistry, biophysics, cytology, neurophysiology).

He has become an important partner, alongside the physician and surgeon, in every aspect of health care and preventive medicine. His contributions have revolutionized scientific and medical research and are responsible for many of the recent dramatic advances in prevention and treatment and in the repair of damage done by accident or disease.

All aspects of engineering are finding application in human biology and medicine. Many of the current efforts fall within the following areas:

- The development of new instruments for use in medical and surgical care or in research.
- The invention and perfecting of devices to repair or compensate for parts of the human body that do not function properly or that have suffered damage as a result of disease or accident.
- The adaptation of computer technology to serve a wide range of specialized requirements in the health services and in health research.
- The application of engineering theory and methods in medical and biological research—in studies, for example, of the structure of the living organism and the mechanisms through which the human body maintains itself in good running order.

Medical engineering draws on many specialties—electronics, fluid dynamics, mechanics, optics, radiation, thermodynamics, and others. Because it draws on so many resources and puts them to use for new and sometimes surprising purposes, biomedical engineers have been described as "creative borrowers." Techniques used in tracking space satellites have been put to work in monitoring systems designed to serve as electronic eyes and ears for the professional nurse in charge of a hospital patient-care unit. Plastics and methods of plastic fabrication, initially developed for the manufacture of ladies' hosiery, are now being used to splice damaged arteries and so to save human lives.

Following is a cross section of each of the major areas in biomedicine with illustrations of what is being done.

Instruments

One of the greatest needs in both medical care and research is to make measurements on organs and systems within the body "noninvasively"—without making any additional holes. X-ray technology has been developed to a high degree for this purpose, but new techniques are now being developed. One such technique uses narrow beams of sound energy in the same way oceanographers use it to locate and plot the position of underwater objects. By this means it is possible, for example, to measure an enlarged liver, to identify the presence and location of a brain tumor, or to find out whether the head of an unborn baby is too large to pass through its mother's pelvic arch. This is accomplished by means of a crystal ultrasound generating transducer connected by a flexible cable with an oscilloscope. The transducer transmits the ultrasound impulses and acts as a microphone to receive their echoes and pass them along to the oscilloscope. The echoes occur when the ultrasound impulses touch solid tissues, and tissues of different density return correspondingly different echoes. Translating the returning signals into visual images, the oscilloscope displays them on the screen where their vertical deflections enable the experienced observer to identify and take the measure of the object or organ with which he is concerned.

Another series of "noninvasive" techniques use radio energy to transmit information from a measuring device that has been swallowed, or is worn. These little transistors have been used as "radio pills" to record the fluctuations in body temperatures, pressures, *p*H and other chemical changes, the presence of internal bleeding, ovulatory activity, and digestive activity. They have also been used in research on animals, by surgical implantation to get a "closer look."

Of the many instruments devised by biomedical engineers, here is a small sampling: a tiny microphone that can be introduced via a vein into the heart to diagnose specific heart "murmurs" so that a surgeon can know more precisely what to expect; completely automatic methods for chemical and visual analysis of biological specimens for various abnormalities improving speed and accuracy of diagnosis; use of the laser as a surface and near-surface surgical tool, especially valuable for some sorts of eye surgery.

[2] Bioengineering, medical electronics, medical engineering, bioinstrumentation, biomedical instrumentation, medical instrumentation. The preferred term is becoming bioengineering.

Replacement and Repair Devices

Some of the most interesting developments in medical engineering have to do with the production of what might perhaps be called "spare parts." Until fairly recently, such devices as did exist were limited to external parts of the body—for example, eyeglasses, dentures, hearing aids, artificial arms and legs. Now biomedical engineering has been put to work to produce new devices such as: an electronic obstacle-detector to help blind people estimate distances, avoid bumping into things, or keep from falling at street curbs or into sidewalk openings; a lifelike artificial forearm and hand powered by an electronic mechanism which is activated in turn by nerves or residual muscle (as it responds to the neural commands, the user can clench or unclench the fist, lift weights, and even write).

Much more revolutionary is the idea of using manmade devices to compensate for the faulty functioning of internal organs, or to repair damaged parts, or even to replace organs damaged beyond repair. Some devices for such purposes have already been developed, and research and experiment give promise of more to come.

Already in use are a number of devices that remain outside the body as they take over the functioning of certain organs at critical periods. One example is the heart-lung machine used to pump and oxygenate the blood during open heart surgery. Another is the electric defibrillator, used to restore the normal beat of a heart stricken by ventricular fibrillation, a potentially fatal quivering of the heart muscles. This device sends an electric current through the heart, thus stopping the quivering and inducing the heart to resume its normal beat.

Still another lifesaving machine is the artificial kidney—a mechanism which takes over the blood-cleaning job ordinarily performed by normal kidneys. One or two treatments a week can maintain people with diseased kidneys who otherwise could not possibly have lived more than a very short time. A new and improved version of the kidney machine can treat as many as 15 patients at the same time; it is simpler to operate than earlier models, and other improvements reduce the possibility of bacterial infection.

Relying on miniaturized electronic mechanisms, medical engineers look toward the continuing development of corrective devices that can be implanted under the skin, leaving the individual free to move about. The heart pacemaker is a pioneer venture in this area. Among projects now underway is the development of an implantable bladder-stimulator to be activated by radio impulses.

Meantime research continues, looking toward the development of more and better materials to patch up or even take the place of organs within the human body. As mentioned earlier, some plastics have already proved useful in some kinds of internal repair; flexible new resins may prove even more helpful as repair materials. Replacement of defective organs is a still more delicate problem, and chemists are continuing their search for materials suitable for engineering fabrication for this purpose. Such a material needs to be compatible with living tissue and must meet other exacting specifications. An artificial heart valve, for example, has to be made of a material that does not suffer mechanical fatigue under the continuing pressure of blood flow, and its chemical makeup must be such that it does not cause dangerous reactions like blood clotting, chemical poisoning, or corrosion.

Computing Machines and Electronic Data Processing (EDP)

Computers and other electronic "business machines" are helping to streamline and expedite large-scale administrative operations in hospitals, health departments, and throughout the health field. Such equipment is also being adapted for the hospital's medical records and the health department's vital statistics. New tasks, never before feasible, can now be undertaken. In such areas, for example, as epidemiology and the control of widespread diseases as well as in research, automatic data processing is yielding new and significant insights.

Even in medical care, where personal attention is paramount, electronic tools can help the physician and the nurse to make better use of their special skills. Though not in the computer branch of the electronic "family," the monitoring system borrowed from the space program is helping the professional nurse give more intensive care to more patients. Another and very specific data-processing example is the adaptation of computers for use by physicians as diagnostic aids. Though the computer cannot take over the diagnostician's job, experience indicates that it can frequently help the physician to speed up the process and pinpoint his findings.

In one demonstration, several hundred cases were examined in which the problem was to determine the cause of obscure thyroid disorders. In such a diagnosis, the task is to consider many symptoms and to determine the most probable cause in the light of the combined evidence. After the computer's "memory" had been stored with all the possible variables, its answer in nearly every case matched the diagnosis of the highly skilled specialist whose opinions served as a yardstick for measuring the computer's dependability. For the busy general practitioner and his patients, prompt access to such a store of specialized knowledge is of inestimable benefit.

lem not only in diagnosis (and, for that matter, not only in the health field) but throughout all the sciences. The more knowledge is available, the harder it is for the individual to keep up with what is known or to locate what might be useful in his own work. Here, in helping to capitalize on the "information explosion," automatic data processing systems can perhaps make their greatest contribution to the health field and to science generally. Information retrieval through the use of electronic mechanisms offers the medical and scientific librarian a new tool for dealing with a new and unprecedented task.

Research

In the biophysical sciences, engineering is contributing ideas as well as instruments. Its share in research ranges through almost every aspect of health-related sciences. Medical engineers are involved, for example, in the simulation of complex biological systems leading to increased understanding of living processes; in evaluating the quantitative effects of tranquilizer drugs on muscle fibers; in studying the molecular and crystal structure of the cell and its genetic significance; perhaps most dramatically, in developing new concepts for investigating the communications network of the nervous system and for gaining a new understanding of the human brain—how it learns, how it remembers, how it thinks, how it sleeps.

Career Opportunities

Biomedical engineering is slowly becoming a more and more vital part of all life science activities, from basic research to diagnosis and treatment. Biomedical engineers work in many places—hospitals, research foundations, medical, academic, industrial, and government laboratories, as well as such exotic environments as outer space and under the sea. The challenge to the biomedical engineer will sharpen as he is called upon to control the environmental hazards to life, devise ways to monitor these hazards, and even adapt our very way of life. Wherever he works, routine or repetitive tasks will be few and far between.

Diversification of career opportunities will increase for biomedical engineers, for specialists in allied fields such as electronic data processing, and particularly for various technician specialists.

Qualifications and Education

The medical general practitioner has given way to the medical specialist, but the biomedical engineer must specialize in diversity. He must be able to biomedicine. Approaches to problems of this nature require excellence as an engineer—the watchwords are invent and apply—and thorough familiarity with the area of application. Ability to communicate well is vital, and will make all the difference between a mediocre and a good biomedical engineer. An interest in machines, electronic devices, instruments, and the human body is important. Students wishing to prepare for engineering can begin now by getting a good foundation in high school mathematics, biology, chemistry, and physics. After high school, there will be a minimum of 4 years of college leading to a bachelor's degree in engineering.

In the past, biomedical engineers were drawn from among those trained in established engineering disciplines—electrical, mechanical, chemical, civil, and the like. This will no doubt continue for some time. But the engineering student who is looking toward this field will have a headstart if he can include some courses in biology, physiology, biochemistry, or the biophysical sciences generally. Even without this additional background, there are openings for those who are prepared to supplement their college work in engineering through on-the-job training plus some outside reading and study.

Training for biomedical engineering is in process of development at both the undergraduate and graduate level. Some universities have already set up specialized courses, and more are being planned.

Broadly based training is particularly important in a field which is expanding in so many directions. Since no one person can be expected to be equally expert in all aspects of medical engineering, increasing experience necessarily involves some specialization. But flexibility and the capacity to adapt one's skills to a variety of problems are essential. The best preparation for a satisfying combination of specialization and adaptability is sound professional training in basic disciplines.

Biomedical Engineer

Required Special Training: 4-year program in biomedical engineering, after which a bachelor's degree is awarded. A master's and/or doctoral degree is necessary for advancement in the field.

Illinois Institute of Technology Chicago 60616	(bachelor's and master's degree programs)
Northwestern University Evanston 60201	(bachelor's and master's degree programs)
University of Illinois at Circle Campus Chicago 60607	(bachelor's, master's, and doctoral degree programs)

Biomedical Engineering Technician

Required Special Training: Either a) on-the-job training, b) related work experience, or c) 2-year biomedical engineering technician training program (there are no such programs in Illinois).

BIOMEDICAL ENGINEER - Further Information

Employment Prospects

In 1975 biomedical engineers with bachelor's degrees were usually employed in industry. A greater proportion of those with master's and doctoral degrees worked in health care institutions. Employment prospects were good in 1975 and were expected to remain good in the next decade.

Salary

In 1975 starting salaries for biomedical engineers with bachelor's degrees averaged $12,000 per year. Inexperienced engineers with master's degrees averaged $16,000; those with doctoral degrees averaged $18,000. Capable, experienced persons received salaries ranging considerably higher.

Career Mobility

There are many kinds of work opportunities in the biomedical field, as can be seen from pages 8-F-1-3. The potential for challenging work is great for creative persons; the potential for the application of technology to improving health care is limitless.

Further Reading

Bronzino, Joseph D., "The Biomedical Engineer -- The Roles He Can Play," Science, 174:1001-03, December 3, 1971.

Professional Organizations Where More Information May Be Obtained

Group on Engineering in Medicine and Biology
Institute of Electrical and Electronic Engineering
United Engineering Center
25 West 45th Street
New York, New York 10036 (for information on biomedical instrumentation)

Division of Foods, Pharmaceuticals, and Bioengineering
American Institute of Chemical Engineers
United Engineering Center
25 West 45th Street
New York, New York 10036 (for information on artificial organs)

To Broaden Your Understanding

-visit a hospital, industry, or other organization employing a biomedical engineer, and discuss the work he/she does

-obtain paid or volunteer work in a hospital and/or engineering firm

-write to schools and professional organizations

BIOMEDICAL ENGINEERING TECHNICIAN

The great increase in the use of automated equipment used in hospitals, industry, and research laboratories has given rise to a need for trained persons to operate and maintain this complicated equipment.

Biomedical engineering technicians who work in hospitals operate, service, and in some cases teach others how to use a variety of biomedical machines which aid the functioning of vital body organs such as the heart, lungs, and kidneys. Some of the most commonly known complex biomedical machines are those used to keep careful watch on blood pressure, the functioning of the heart, and brain waves during operations.

In industry and research, where the majority of biomedical engineering technicians are employed, job responsibilities may include assistance to biomedical engineers in the development, testing, and maintenance of new equipment.

A small, but steadily increasing number of technicians work in hospitals. Usually they work under the supervision of a biomedical engineer. In smaller hospitals the technician often must understand the workings of all the medical equipment; in larger hospitals, he/she may specialize in working with only one kind of machine.

Qualifications and Education

Those considering training as a biomedical engineering technician should have good mechanical aptitude and manual dexterity. An interest in fixing machinery will help make the work more satisfying. Educational preparation for becoming a technician varies. In some cases, on-the-job training in a hospital or biomedical equipment industry is sufficient. Some community colleges offer 2-year associate degree programs in biomedical engineering technology; however, Illinois has no such programs.

BIOMEDICAL ENGINEERING TECHNICIAN - Further Information

Employment Prospects

As of 1975 many hospitals were unaware of the existence of and usefulness of biomedical technicians. In some cases technicians were successful in finding jobs after convincing hospital administrators of the value of their services. Employment prospects were good in industries which manufactured medical equipment and provided preventive maintenance services for biomedical equipment. The outlook for employment in future years appeared favorable, given the increasing mechanization of health care services.

Salary

No information was obtained on Illinois salaries. In a nearby state, beginning salaries for biomedical technicians averaged about $10,000 a year. Those with five years of experience earned about $14,000.

Career Mobility

Biomedical technicians in many hospitals work in the maintenance department. In other cases, they form their own department--in which case there are greater chances for promotion for capable technicians to supervisory positions.

Further Reading

Kinsinger, Robert E., editor, Health Technicians, J.G. Ferguson Publishing Company, Chicago, 1974, pp. 26-35.

Medical Electronics and Data, a journal published at 2994 West Liberty Avenue, Pittsburgh, Pennsylvania

Medical Instrumentation, a journal published by the Association for Advancement of Medical Instrumentation

Professional Organizations Where More Information May Be Obtained

None

To Broaden Your Understanding

-talk to several technicians in hospitals and industry about their work

-inquire at larger hospitals to learn if they provide on-the-job training to persons wanting to become biomedical engineering technicians

ELECTROCARDIOGRAPH (EKG or ECG) TECHNICIAN

In an age when so many people suffer from heart trouble, there is a great need for the services of the electrocardiograph (EKG or ECG) technician and the machine he operates. The EKG technician operates the electrocardiograph, a machine which records the action of the patient's heart muscle. To administer the EKG exam, the technician first explains to the patient what is going to be done, then he attaches metal disks called electrodes to the patient's chest, arms, and legs. The patient feels nothing while the exam is in progress. While the machine is operating, the technician must pay special attention to the tracing on the graph paper. Should any abnormal situation occur, he must be able to recognize it and seek medical help promptly. After the exam is completed, the technician will mount the readings on cards and turn them over to the physician in charge. Usually that physician is a specialist in internal medicine or cardiology (the study of the heart).

Besides administering the examination, the technician must also be able to make minor repairs on his machine and keep it in good running order.

The EKG technician works in the hospital laboratory, clinic, emergency room, or doctor's office.

Qualifications and Education

Because he works directly with people, he should have a pleasant personality and an ability to sympathize with patients under stress. The technician should also have an aptitude for working with electrical equipment.

To become an EKG technician, one must first obtain a high school diploma or its equivalent. Most EKG training is on-the-job in an accredited hospital and may last from 3 to 6 months depending upon the type of equipment used.

ELECTROCARDIOGRAPH (EKG or ECG) TECHNICIAN - Further Information

Employment Prospects

In 1975 employment prospects for EKG technicians were good in Illinois, and were expected to remain good in the next ten years.

Salary

Starting salaries for EKG technicians were $7,000 to $8,000 yearly in Chicago. Technicians in other parts of the state usually had somewhat lower salaries. Salaries were higher for supervisory personnel and for technicians capable of administering more specialized tests for the diagnoses of heart diseases.

Career Mobility

Experienced, competent technicians may acquire the skills needed to administer specialized tests to determine the presence or absence of heart disease. Training in the use of these specialized instruments: phonocardiographs, echocardiographs, and vectocardiographs; and stress testing of the heart may be obtained in some hospitals. Technicians with longer and and even more specialized training may become cardiovascular technicians. Other possibilities for assuming more responsibility for experienced technicians are supervisory positions and teaching positions for the training of new EKG technicians.

Further Reading

None

Professional Organization Where More Information May Be Obtained

June Wilson, Recording Secretary
American Cardiology Technologist's Association
4940 La Ceiba Drive
Pensacola, Florida 32506

To Broaden Your Understanding

-obtain volunteer or paid work experience in a health care facility

-talk to an EKG technician and a physician about their work and the significance of the electrocardiograph in diagnosing heart disease

-contact hospitals to determine if they offer EKG technician training; if they do offer training, discuss the program with the instructor

-write to the professional organization

ELECTROENCEPHALOGRAPH (EEG) TECHNICIAN

Electroencephalography is a scientific field involving the recording and study of brain waves. The electroencephalographic (EEG) technician administers the EEG exam and operates the electroencephalograph, a device which records the results of the exam. Every person's brain continuously emits tiny electrical impulses; the electroencephalograph is designed to pick up these electrical impulses and detect any abnormality about them. Disturbances in one's brain waves can indicate the presence of epilepsy, stroke, or a tumor.

When an electroencephalogram has been requested by one's doctor, the patient will go to an EEG laboratory or department in a hospital. There the technician will request the patient to relax and will attach metal disks called electrodes to various parts of his head. During the exam the room is usually darkened to aid relaxation; the patient feels nothing while the machine is working. The exam may take 45 minutes or longer as it is essential that the patient be completely relaxed and a thorough test be made. Sometimes the technician will request the patient to breathe deeply or perform various mental activities. These are for the purpose of observing brain activity under a variety of situations. After the exam is completed, the technician turns the graphic results over to the physician in charge, usually a neurologist or neurosurgeon (both are involved with the study of disorders of the brain).

Qualifications and Education

An EEG technician should have a pleasant and reassuring personality. He should have an interest in people and a desire to work with and for them. Often he must deal with young children as well as confused and frightened adults who do not understand what is happening them. The technician should be mature enough to be able to comfort and reassure such patients as well as be able to explain clearly and simply what is going to happen during the exam. Manual dexterity and a good grasp of visual concepts are assets when working with the machine.

Training is usually on-the-job; however, some hospitals offer formal courses of instruction. The course is typically six months long. After completion of one year of work experience, the title of EEG "technologist" is conferred and greater responsibility may be assumed.

ELECTROENCEPHALOGRAPH (EEG) TECHNICIAN - Further Information

Employment Prospects

In 1975 employment prospects for EEG technicians were good. Graduates of hospital formal training courses in EEG technology had the best chances of finding the better jobs. In the next decade, employment prospects were expected to remain good.

Salary

Beginning salaries for EEG technicians in Illinois ranged from $6,000 to $8,000 per year. Persons with the professional designation "technologist" and with five years of work experience earned from between $8,000 to $12,000. Supervisory EEG personnel received maximum annual salaries of about $16,000. In general, salaries were somewhat higher in Chicago than in the remainder of the state.

Career Mobility

Experienced EEG technologists may assume more responsibility and receive higher pay after demonstrating their capabilities. They may also be granted supervisory and administrative duties over other EEG personnel. Finally, accomplished persons may teach in educational programs for the training of EEG technicians.

Further Reading

Kinsinger, Robert E., editor, Health Technicians, J.G. Ferguson Company, Chicago, 1974, pp. 80-87

Professional Organization Where More Information May Be Obtained

American Electroencephalographic Society
4137 Erie Street
Willoughby, Ohio 44094

To Broaden Your Understanding

-talk to and observe a certified EEG technician at work

-obtain volunteer or paid work experience in a hospital

-inquire at hospitals about EEG technician training programs

-write to the professional organization

CHIROPRACTOR

Chiropractic is a system of treatment based on the principle that a person's health is determined largely by the nervous system, and that interference with this system impairs normal functions and lowers resistance to disease. Chiropractors treat patients primarily by manual manipulation of parts of the body, especially the spinal column.

Because of the emphasis of the importance of the spine and its position, most chiropractors use X-rays extensively to aid in locating the source of the patients' difficulties. Many also use such supplementary measures as water, light, and heat therapy, and prescribe diet, exercise, and rest. Most state laws restrict the type of supplementary treatment permitted in chiropractic. Chiropractic as a system for healing does no include the use of drugs or surgery.

Employment opportunities for chiropractors are expected to be favorable through the mid-1980's. Most of the openings will be to replace those who die and retire.

Underlying the expected moderate growth in the occupation are an increase in population and the trend to include chiropractic services in health insurance coverage, including Medicare and Medicaid.

Since most states require some college training and others are likely to require it in the next few years, the outlook is best for those who have completed 2 years of college in addition to the 4 years of chiropractic college.

Opportunities for new graduates to begin their own practice are likely to be best in those parts of the country where chiropractic is generally accepted as a method of health care. Opportunities also should be good for those who wish to enter salaried positions in chiropractic clinics, chiropractic colleges, and other organizations that employ chiropractors. Earnings, as in other types of independent practice, are relatively low in the beginning, but rise after the first few years. Incomes for chiropractors vary widely: beginning chiropractors average about $10,000 a year; experienced practitioners usually earn from $14,000 to $28,000 with $24,000 annually as the average, according to limited data available.

About 16,000 persons, 6 percent of them women, practiced chiropractic in 1972. Most chiropractors are in private practice. Some are salaried assistants of established practitioners or work for chiropractic clinics and industrial firms. Others teach or conduct research at chiropractic colleges. More than two-fifths of all chiropractors are located in California, New York, Texas, Missouri, and Ohio.

Qualifications and Education

Forty-eight states and the District of Columbia regulate the practice of chiropractic and grant licenses to chiropractors who meet certain educational requirements and pass a state board examination. The type of practice permitted and the educational requirements vary considerably from one state to another. In 1972, Louisiana and Mississippi did not regulate the practice of chiropractic or issue licenses.

Most states require successful completion of a 4-year chiropractic course following high school graduation. About three-quarters of the states also require 2 years of college work in addition to chiropractic training. Nearly two-fifths of the states also require that chiropractors pass a basic science examination. Chiropractors licensed in one state may obtain a license in another state by reciprocity.

In 1972, there were 10 chiropractic colleges. Most require 2 years of college before entrance, and some require that specific courses be taken during these 2 years. Some chiropractic colleges

emphasize courses in manipulation and spinal adjustments. Others offer a broader curriculum, including subjects such as physiotherapy and nutrition. In most chiropractic colleges, the first 2 years of the curriculum are devoted chiefly to classroom and laboratory work in subjects such as anatomy, physiology, and biochemistry. During the last 2 years students obtain practical experience in college clinics. The degree of Doctor of Chiropractic (D.C.) is awarded to students completing 4 years of chiropractic training.

Chiropractic requires considerable hand dexterity but not unusual strength or endurance. Persons desiring to become chiropractors should be able to work independently and handle responsibility. The ability to work with detail is important. Sympathy and understanding are among personal qualities considered desirable in dealing effectively with patients.

Most newly licensed chiropractors either set up a new practice or purchase an established one. Some start as salaried chiropractors to acquire experience and funds needed to establish their own practice. A moderate financial investment is usually necessary to open and equip an office.

General information on chiropractic as a career and a list of schools of chiropractic are available from:

American Chiropractic Association
2200 Grand Avenue
Des Moines, Iowa 50312

International Chiropractors Association
741 Brady Street
Davenport, Iowa 52803

(Prerequisite: generally, 2 years of college work, with an emphasis in biology and chemistry)

Required Special Training: Generally, a 3 to 4 year professional program in a college of chiropractic.

Chiropractor

National College of Chiropractic
200 East Roosevelt Road
Lombard 60148

(offers a 10 trimester program [3 full years + 4 months] to students with 2 years or 60 semester hours of prior college work; also offers a 2-year bachelor of science degree with a major in human biology)

Optometrist

An optometrist, doctor of optometry (O.D.), is educated and trained to examine eyes to detect vision problems. He may prescribe eyeglasses or contact lenses, as needed, or he may recommend other optical treatment to preserve or to improve eyesight. If evidence of eye disease or injury is observed, he refers the patient to an ophthalmologist for diagnosis or treatment.

After lenses are ground to the optometrist's prescription in an optical laboratory, he fits them to frames suitable to the patient and styled to the patient's features. The optometrist then adjust the eyeglasses as required to make them both comfortable and effectual.

In addition to this principal function, an optometrist may render service in any or all of the following areas:

Contact Lenses: Recent years have seen greatly increased use of contact lenses. Much of the research and development has been done by optometrists. Some optometrists now devote their entire attention to prescribing and fitting contact lens. To others it has become an ever increasing part of their general practice.

Children's Vision: Optometry is playing a leading role in discovering and solving children's vision problems, especially in the development and use of vision training and in orthoptics. Many optometrists specialize in children's vision; others serve as consultants to schools and school systems.

Aids for the Partially Sighted: Many of the effective aids for the partially sighted have been developed by optometrists. Through their research, telescopic and microscopic lens systems have been improved to benefit many in the older age group; these aids have also helped thousands of children with seriously impaired vision.

Vision Training: Vision training has long been recognized as an effective method of correcting some types of crossed eyes. It is also useful as a way to sharpen visual perception and to improve vision for reading. Some optometrists devote a large part of their time to this specialty; others include it as one of several services.

Many optometrists go into private practice.

There are many opportunities for new graduates to associate themselves with established optometrists who need assistance or are preparing for retirement. The American Optometric Association serving as a clearinghouse for associate opportunities provides a placement service for its members. Generally there are more openings than interested graduates.

There are also opportunities for optometrists in industry, in public hospitals, in numerous government agencies, and as commissioned officers in all branches of the Armed Forces. Great need exists for men and women to teach optometry or to conduct research. These careers, however, require a graduate degree.

Qualifications and Education

Students should begin early to take courses in the fundamental sciences—mathematics, chemistry, physics; biology, neurology, physiology, anatomy, and psychology. All colleges of optometry require 2 years of preoptometric college study, but today many beginning optometry students complete a 4-year college course before entering their professional training. The 11 American colleges and one Canadian college accredited by the American Optometric Association require the completion of a 4-year course of professional training for the degree of doctor of optometry.

There are many scholarships offered by State optometry associations as well as the universities and colleges. Each year, a comprehensive list of scholarships is compiled by the American Optometric Association and information on this subject may be obtained there. Financial assistance may also be obtained by educational loans under the Health Profession's Educational Assistance Act.

For further information, write to:
American Optometric Association
7000 Chippewa Street
St. Louis, Missouri 63119

EDUCATIONAL PROGRAMS IN OPTOMETRY - ILLINOIS

Optometrist

(Prerequisite: At least 2 years of college, but many students complete a bachelor's degree [4 years])

Required Special Training: 4-year professional program in a college of optometry

Illinois College of Optometry
Chicago 60616

Idealism, hero worship, the family tradition are all good reasons for considering a medical career, but unless they are balanced by realism, they may not provide a reliable and accurate picture of the doctor's life. There is indeed much glamour and drama in the physician's career, but his accomplishments are more accurately measured by his hard, patient work; his infinite attention to what may seem prosaic detail; and his willingness to undertake the unpleasant tasks that are part of his profession.

Qualifications

Not everyone is cut out to be a physician. It is fair to say that no profession requires more exacting combination of strengths—intellectual, physical, and emotional.

Anyone who is looking toward a medical career must have a first-rate capacity for thinking and learning. Being a good student is important because medical training is long and the courses are difficult —and because being a good physician means adding to your learning constantly throughout your professional life.

The candidate for medical school needs to do well in science. He'll need plenty of intellectual curiosity, initiative, judgment, and the perseverance that will carry him through years of rigorous training.

Health is important, too. As a medical student, he will need enough physical stamina to take on 5 or more years of intensive study and clinical work after college. Whether he becomes a general practitioner, pediatrician, ophthalmologist, or other medical specialist, he will, during his early years, be on call 24 hours a day.

Finally, the would-be physician should be sure he has the emotional stability that the practice of medicine demands. A good physician not only likes people and genuinely wants to serve them, but he is also prepared to express this concern in the often difficult relations and decisions. It takes a special kind of attitude to deal with the human tragedies which are a part of every practicing physician's experience throughout his professional life. Human understanding and warmth are essential for the practice of medicine, but these must be tempered by objective judgment and reason.

Preprofessional Education

Medical training takes at least 8 years after graduation from high school—and may require from 10 to 15 years for those who want to specialize. Basic education is the same for all physicians, regardless of later specialization.

The first step toward a medical education is taken in high school, with courses that prepare the student for college entrance. The school he chooses should be an accredited college or university with high academic standards.

When he reaches college, he should talk to his faculty adviser about courses. (English, physics, biology, inorganic chemistry, and organic chemistry are required.) He should begin to look into medical schools to which he may want to apply and he should also write to several to find out about special entrance requirements.

At present, approved medical schools require a minimum of 3 years of college work for entrance. A substantial number require a minimum of 4 years or a bachelor's degree. Most authorities on medical education recommend taking the full 4 years of college and a degree. Admission to medical school is competitive, and a college graduate stands a much better chance of being accepted.

Good grades are important to the premedical student. Only 5½ percent of the 1969 medical school freshmen had grade averages as low as "C" in their premedical college work. If a premedical student finds college science difficult or can't place himself in the upper half of his class, he might be well-advised to reconsider his objectives. For the same reason, every premedical student should take the aptitude test given under the sponsorship of the Association of American Medical Colleges. This test is taken a year before planned entrance into medical school. It helps determine the student's capacity for the study of medicine. Scores made on this test are used by many medical schools in screening applicants. The test is given twice a year; information about it may be obtained from The Psychological Corporation, 304 East 45th Street, New York, New York 10017.

At least 9 months to a year before he finishes his preprofessional training, the student should complete his medical school applications. He should apply to three to five schools. Most State medical schools show a decided preference for residents of their own States. A majority of American medical schools are now participating in the Central Application Service conducted by the Association of American Medical Colleges. The student submits just one application to the A.A.M.C. This organization will

then forward copies to any medical schools the student designates.

Professional Education

The standard medical school course in the United States and Canada takes 4 years. However, some medical schools make it possible for the student to complete his studies in 3 years by staying in school during the summer vacations. Every medical school in the country meets the high standards set by the American Medical Association and the Association of American Medical Colleges, and has been officially approved by both of these professional organizations.

An alternate course is to take the first 2 years of medical school work in an approved school of basic medical sciences and the last two in a regular medical school. In 1969 there were 95 fully approved medical schools in the United States awarding the M.D. degree and six approved 2-year schools of basic medical sciences. Canada had 15 medical schools. Students considering medical study abroad should first get in touch with the licensing board in the State where they plan to practice, and ask for the names of foreign schools acceptable to that State.

Practically all medical students spend 1 or 2 years as interns in an approved hospital after they graduate from medical school.

A physician intending to specialize in a particular branch of medicine must have additional training as a resident physician. The trend in medical education seems to be away from the general internship (rotating through several specialties) and toward hospital training in the particular field of specialization.

Licensing

To practice, a physician must be licensed by a State board of medical examiners. Candidates must pass a licensing examination. In most States, the physician is permitted to apply for licensure immediately upon receipt of his medical degree; many States, however, require at least 1 year of internship. The majority of States will license without written examination a physician who holds a license from another State; some States limit this type of reciprocity. Three quarters of the States accept a certificate from the National Board of Medical Examiners as a basis for State licensing without further examination. To qualify for this certificate, the student must pass a three-part examination. The first part is given at the end of the second year in medical school; the second at the end of the fourth year; and the third after internship.

The medical student should obtain complete information about requirements for licensing, so he can take these into account in his plans for practice.

General Practice

So many advances have been made in the treatment of the many different diseases and disabilities that it is not possible for one person to practice with full expertise in all branches of medicine. That is why there is so much specialization.

It is wise for a student to decide, while still in medical school whether he wants to make his career as a general practitioner or as a specialist.

Today more than half of all physicians in private practice either limit themselves to work in one specialty or else devote a considerable part of their time to a specialty. Family practice itself has become a specialty. Today's family practitioner serves as the physician of first contact with the patient, evaluates the patient's total health needs, provides personal medical care, and accepts responsibility for the patient's total health care, including the involvement of consultants when needed.

To qualify as a specialist, the physician must spend additional years in study and training for his chosen branch of medicine. Many physicians begin their specialty training right after internship. They become residents in a hospital for several years and concentrate on a chosen aspect of medicine.

Residencies in the following branches of medicine are approved by the American Medical Association's Council on Medical Education:

1. Anesthesiology
2. Colon and Rectal Surgery
3. Dermatology
4. Family Practice
5. General Practice
6. General Surgery
7. Internal Medicine
8. Neurological Surgery
9. Neurology
10. Obstetrics and Gynecology
11. Ophthalmology
12. Orthopedic Surgery
13. Otolaryngology
14. Pathology
15. Pediatrics
16. Physical Medicine and Rehabilitation
17. Plastic Surgery
18. Preventive Medicine:
    - General Preventive Medicine
    - Aerospace Medicine
    - Occupational Medicine
    - Public Health
19. Psychiatry and Neurology:
    - Child Psychiatry

20. Radiology:
    Diagnostic Radiology
    Therapeutic Radiology
21. Thoracic Surgery
22. Urology

It can be seen from this list that some of the specialties have recognized subspecialties, and the physician may concentrate his practice as much as he chooses. For example, an internist's specialty field is internal medicine, but within this specialty he may further pinpoint his practice on allergy, arthritis, heart and circulatory disease, lung disease, or some similar area. Or he may specialize in pediatrics (child health) or geriatrics (health and medical needs of older people).

For formal recognition as a specialist, a physician seeks certification from the official accrediting body for his particular specialty. These are the American boards representing recognized fields of specialization. In general, requirements for specialty certification call for 2 to 4 years of advanced hospital training, followed by 2 or more years of practice in the specialty. After meeting requirements for certification and passing examinations set by the board, the physician becomes a recognized specialist—a diplomate—in his field.

Where Physicians Practice

Most physicians are in private practice, working either independently or with one or more professional colleagues. But there are also many other kinds of opportunities, both for general practitioners and for specialists.

Public health, for example, is itself a recognized specialty—with certification from the American Board of Preventive Medicine. (See the statements on the local health department in the section on Hospital and Health Services Administration. In addition to his medical degree and his medical training as a general practitioner or a specialist, the career public health physician usually has a graduate degree in public health. Maternal and child health, the control of both communicable disease and chronic disease, environmental health, the public health aspects of mental health are just some of the opportunities in public health. Most public health physicians are in government health departments—local, State, or Federal. But some are on the staffs of voluntary health agencies.

Physicians are also becoming increasingly involved in research. For information about this area see the section on Basic Sciences in the Health Field.

In addition to the continuing and heavy demand for physicians to staff hospitals, health departments, medical schools, and research institutions, there are innumerable opportunities in school systems, in business and industry, and in other institutional positions.

For further information, write to:

American Medical Association
535 North Dearborn Street
Chicago, Illinois 60610

National Medical Association
1717 Massachusetts Avenue, N.W.
Washington, D.C. 20036

American Medical Women's
Association, Inc.
1740 Broadway
New York, N.Y. 10019

Association of American Medical Colleges
One Dupont Circle
Washington, D.C. 20036

EDUCATIONAL PROGRAMS IN MEDICINE - ILLINOIS

(Prerequisite: A minimum of 3 years, and commonly 4 years, of college with an emphasis on the sciences)

Required Special Training: 4-years professional program in a college of medicine followed by 1 or 2 years of internship. To qualify as a specialist, additional years of study are required.

Physician

Chicago Medical School
University of Health Sciences
Chicago 60612

Pritzker School of Medicine
University of Chicago
Chicago 60637

Stritch School of Medicine
Loyola University
Maywood 60153

Medical School
Northwestern University
Chicago 60611

Rush Medical College
Chicago 60612

School of Medicine
Southern Illinois University
Springfield 62708

College of Medicine
University of Illinois
at the Medical Center
Chicago 60612

(the first year of post-graduate basic medical instruction may be taken at the Urbana-Champaign campus of the University of Illinois)

PHYSICIAN'S ASSISTANT

The Twentieth Century has seen the nation's health care facilities and health needs expand phenomenally. With this expansion has come specialization, so that in the 1970's there are a variety of kinds of health practitioners supplementing the work of the physician.

One of the most recent developments in the provision of health care is the creation of the profession of physician's assistant.

The physician's assistant has been defined by the Board on Medicine of the National Academy of the Sciences as "a skilled person qualified by academic and practical clinical training to provide services under the supervision and direction of a licensed physician." Essentially, the physician's assistant is an extension of the physician. He can increase the physician's efficiency by taking over the simpler, more routine, time-consuming tasks, freeing the doctor to devote his time and skills to the more complex matters of diagnosis and treatment. In rural and inner city areas it is anticipated that the physician's assistant will greatly extend the services of the physician by providing basic health care to people who have found it difficult to get medical attention in the past. Those with more complicated health problems would be directed to see the doctor.

The physician's assistant is not meant to replace the physician. His function is to assist his employing physician in providing health care in times of recurring shortages of physicians in many parts of the nation.

The duties of the physician's assistant are restricted to those medical areas in which he has been trained. Many work in the area of family practice, while others assist physicians whose specialties are pediatrics, surgery, physical medicine, internal medicine, dermatology, radiology, and opthalmology. All physicians' assistants are familiar with and are expected to respond to emergency situations. It is only in this area that they must act independently of the physician.

Physicians' assistants are employed by physicians in private practices, clinics, public health facilities, and hospitals. Others serve as researchers and instructors in physician's assistant training programs.

Qualifications and Education

There are approximately 85 physician's assistant programs in the nation -- and hundreds more applicants to those programs than can be admitted. These programs seek applicants with enthusiasm and a strong desire to serve in their role for many years. An aptitude for the sciences, good communicative skills, administrative ability, manual dexterity, and a pleasant personality are important to success as a physician's assistant. Some programs require 2 years of college course work prior to entrance, others will take students 18 years of age or older with a high school diploma or its equivalent. Probably of greatest importance, almost all prefer persons with previous experience in providing health care (for instance; nurses, medical corpsmen, emergency medical technicians, lab technicians, and so on).

Many educational programs for physicians' assistants are two years in length, the first year stressing academic work, the second year stressing clinical experience. A large number of programs are conducted by universities which have medical schools. (There are no physician's assistant educational programs in Illinois.)

PHYSICIAN'S ASSISTANT - Further Information

Employment Prospects

Despite the fact that a number of states have not made changes in their laws to allow physicians' assistants to work for a physician, employment prospects were excellent. Illinois has not changed its laws in this regard; nevertheless in 1974 physicians' assistants were employed by physicians. In 1974 employment prospects for the foreseeable future appeared excellent.

Salary

In 1974 salaries paid by physicians to their physicians' assistants varied appreciably, but typical beginning salaries ranged from $12,000-$15,000 annually. In at least one case a physician's assistant was paid on a monthly salary plus a commission based on the number of patients he saw.

Career Mobility

The profession of physician's assistant was deliberately developed to help the physician to provide good medical to patients. Persons who are considering this field should not view it as a stepping-stone to later becoming a physician. For the most part, physician's assistant training programs require the applicant to have had experience providing health care. Therefore, oftentimes those who gain entry into these programs are former medical corpsmen from the armed services, nurses, etc. To repeat, physicians' assistants are not likely prospects for admission to medical school for the purpose of becoming doctors. Physicians' assistants desiring to do other than patient care may find employment opportunities as instructors in physician's assistant programs.

Further Reading

American Medical Association, Health Care Functions and Responsibilities of Physician's Assistants, A Survey, no date

American Medical Association and the U.S. Department of Health, Education, and Welfare, Physicians Support Personnel, A Directory of Programs Training, 1974

Association of Physician Assistant Programs, National Physician Assistant Program Profiles 1975-76, first edition, Association of Physician Assistant Programs, 2120 L Street, N.W. Suite 210, Washington, D.C. 20037, 1974.

Professional Organizations Where More Information May Be Obtained

American Academy of Physician's Associates
Room 356
2150 Pennsylvania Avenue
Washington, D.C. 20037

American Medical Association
535 North Dearborn
Chicago, Illinois 60610

To Broaden Your Understanding

-talk to physicians about the work of the physician's assistant

-write to the professional organizations

Medical Assistant

The medical assistant is the doctor's "factotum," his "do everything." She combines in one person the role of secretary, receptionist, administrative aide, clinical aide, and countless other functions. She is the link between the physician and his patients, his professional associates, and his suppliers of equipment and medication.

Most medical assistants work in the office of physicians in private practice. Some work in group practice offices or medical clinics. The remainder are employed in larger institutions, such as hospitals and research laboratories.

Duties

It is the medical assistant's job to assist the doctor in managing his office efficiently and to perform a variety of clinical and administrative duties, freeing the doctor to concentrate on diagnosis and treatment of patients.

In a typical day a medical assistant may perform all of the following duties:

- Assist the doctor in giving some examinations.
- Receive patients.
- Answer the telephone and schedule appointments.
- Obtain medical histories from patients.
- Arrange hospital admissions.
- Greet representatives from various firms selling medical supplies.
- Assist in emergency situations.
- Reassure and comfort nervous and ailing patients.
- Order medical supplies.
- Type medical reports and fill out insurance forms.

Qualifications and Education

Important personal qualities are adaptability, kindness, physical stamina, a positive attitude, discretion, good judgment, neatness, and accuracy. Above all, the medical assistant must be sincerely devoted to helping people. She must maintain a friendly, cheerful manner that is at the same time sympathetic and courteous.

The medical assistant must be constantly alert to the fact that her attitude and manner reflect on her employer and enter into the impression that others have of him.

Students interested in a medical assisting career can begin preparing for this occupation before leaving high school. There are a number of high school courses which will prove valuable. Most important are: basic secretarial, typing, English, mathematics, and courses emphasizing health sciences.

Ideally, the high school graduate should enroll in a 2-year associate degree program offered by a community or junior college. The 2-year program has been established to give the student a broad foundation in basic medical assisting skills, including a period of practical experience in a doctor's office. The 2-year program also enables a medical assisting student to apply for certification upon graduation, provided the college she is attending has been approved by the American Medical Association in cooperation with the American Association of Medical Assistants (AAMA).

Many schools also offer 1-year courses which confer a certificate. Exploring other educational avenues may be necessary when it is not possible to enroll in a college offering a 2-year or 1-year course. Vocational and technical schools and reputable commercial institutions offer a variety of short-term courses which can be beneficial.

Some training is available through on-the-job programs sponsored by the Manpower Development and Training Act. Further information about MDTA opportunities is available from State employment service offices.

If it is necessary to go to work without receiving special training, some medical assistants will be able to find a physician who will train personnel on the job.

Continuing Education

Once the medical assistant is employed, she may enroll in the local chapter of the American Association of Medical Assistants. She will learn a great deal from fellow members and the speakers at monthly meetings. Many groups also sponsor educational seminars and chapter study courses.

After she has acquired the necessary experience, as determined by the AAMA Certifying Board, she will be eligible to apply for the certification examination. With the guidance of reference texts and a detailed study outline, she can prepare herself to take the test and become a certified medical assistant.

EDUCATIONAL PROGRAMS IN MEDICAL ASSISTING - ILLINOIS

Required Special Training: Either a) on-the-job training, or b) 1-year medical assisting program in a vocational or technical school, after which a certificate in medical assisting is awarded, or c) 2-year associate degree program in medical assisting in a community college

Medical Assistant

Belleville Area College
Belleville 62221

Bryman School
Chicago 60603

Marion Adult Education and Career Training Center, Inc.
Chicago 60612

Midstate College
Peoria 61602

Robert Morris School
Carthage 62321

Triton College
River Grove 60171

William Rainey Harper College
Palatine 60067

Employment Prospects

In 1974 there were no reliable estimates of the number of medical assistants, nationally or in Illinois. Most medical assistants work for doctors who have a private medical practice, and overall, it has been estimated that there is one medical assistant for each one to three doctors. In civilian life nearly all medical assistants are women; in the military services, most medical assistants are men. In 1974 there were more job openings in the Chicago area than elsewhere in Illinois. Opportunities were better for those who understood medical terminology and could perform simple clinical procedures than for those with only basic clerical skills. Employment prospects for well-qualified medical assistants appeared to be good for the coming decade.

Salary

In 1974, beginning salaries ranged from $5,000 to $8,000 in Illinois. New graduates of a two-year medical assistant program were reported to be earning $500 to $700 per month in Chicago; the lower salaries were received by those working for physicians in private medical practice, the high salaries by those working in hospitals. Top salaries earned were $12,000-$15,000 by experienced practitioners.

Career Mobility

There appears to be a trend toward enlarging the responsibilities of the medical assistant. In the future, medical assistants may be performing more clinical tasks than now. Graduates of medical assistant training programs which stress training in clinical as well as clerical areas offer more competencies to a prospective employer, and have greater chances of assuming larger responsibilities. For this reason graduates of nursing programs, who have a clinical background, frequently seek employment as medical assistants. There are opportunities for some medical assistants to teach their field in a vocational-technical school or community college. Many such teachers do not have education beyond their medical assisting educational program; in some cases completion of the bachelor's degree is needed for teaching. Finally, the field is attracting a number of college graduates with bachelor's degrees, who have no specific training in medical assisting.

Further Reading

The Professional Medical Assistant, a journal published by the American Association of Medical Assistants

Kinsinger, Robert E., editor, Health Technicians, J.G. Ferguson Publishing Company, Chicago, 1970, pp.214-221

Professional Organization Where More Information May Be Obtained:

American Association of Medical Assistants, Inc.
One East Wacker Drive, Suite 1510
Chicago 60601

To Broaden Your Understanding:

-talk to a medical assistant in a doctor's office
-talk to a doctor about the work of the medical assistant(s) working for him/her
-write to schools and the professional organization

OPTHALMIC MEDICAL ASSISTANT

Persons working under the supervision of an opthalmologist or 'eye doctor' are called opthalmic medical assistants. They perform a variety of technical procedures for the doctor. Some of these include scheduling patients and other general secretarial duties, taking case histories, administering dressings after surgery, giving eye drops and other medications, testing for color vision, giving instructions in contact lens wear and care, and sterilizing instruments for the doctor's use. Opthalmic medical assistants may be employed in opthalmogists' offices, clinics, hospitals, and eye research and teaching centers.

Qualifications and Education

The group which oversees the standards for training of opthalmic medical assistants, the Joint Commission on Allied Health Personnel in Opthalmology, has designated three different kinds of opthalmic assistants: 'opthalmic assistant,' 'opthalmic technician,' and opthalmic technologist.' To be eligible fo training for any of these kinds of positions, one must have a high school diploma or its equivalent. An interest in people and a desire to help them, an ability to do neat and precise work, cooperativeness, and good judgement are valuable assets to have when you work as an opthalmic medical assistant.

'Assistant' training is usually 1 year in length and is taken at a community college, vocational-technical school, by means of a home study course, or on the job. 'Technician' training requires 2 years of training in a community college or hospital program plus on-the-job training. 'Technologist' education which is only in the planning stage will consist of a 4-year college program in opthalmic technology and on-the-job training. The responsibilities and salaries of graduates of these three kinds of training programs vary depending on the amount of training they have received.

There are no formal educational programs for opthalmic medical assistants in Illinois. (Graduates of medical assistant educational programs (see section 7-E) frequently find employment as opthalmic medical assistants.

OPTHALMIC MEDICAL ASSISTANT - Further Information

Employment Prospects

In 1975 employment prospects for opthalmic medical assistants were very good, and were expected to remain so in future years.

Salary

In 1975 opthalmic medical assistants with the 'assistant' designation earned on the average of $7,000 to $8,000 per year in the Midwest. 'Assistants' with greater competencies were designated as 'Opthalmic Assistants A' and had higher salaries than those designated as 'Opthalmic Assistants B' (lesser competencies). In 1975 beginning opthalmic "technicians" had incomes of $8,000 to $10,000 per year. Salaries for those with ten years of experience ranged up to $15,000. Salaries for all levels of opthalmic medical assistants were higher on the east and west coasts than in the Midwest.

Career Mobility

The Joint Commission on Allied Health Personnel in Opthalmology has outlined a 'career ladder' by which the 'Assistant B' may advance to the 'Assistant A' level. Following three years of experience of the 'A' level, one may advance to the "technician" by passing an equivalency examination.

Further Reading

Joint Commission on Allied Health Personnel in Ophalmology, Careers in Medicine: Opthalmic Medical Assistants, St. Paul, Minnesota, no date

Professional Organization Where More Information May Be Obtained

Joint Commission on Allied Health Personnel in Opthalmology
1575 University Avenue
St. Paul, Minnesota 55104

To Broaden Your Understanding

-talk with opthalmic medical assistants, medical assistants, opthalmologists and other doctors about their work as it relates to your interest in opthalmic assisting

-write to the professional organization

Osteopathic Physician

There are seven colleges of osteopathic medicine accredited by the American Osteopathic Association. Their graduates receive the degree of doctor of osteopathy (D.O.).

Minimum entrance requirements for all seven colleges are 3 years of preprofessional college work in an accredited college or university. Over 90 percent of all osteopathic medical students in recent years have completed the regular 4-year college course and received a bachelor's degree before starting their professional training in osteopathic medicine.

Some liberal arts colleges make it possible for their students who have completed 3 years of preprofessional college work to receive the bachelor's degree upon successful completion of their first year's work in a college of osteopathic medicine.

Though specific entrance requirements vary among the colleges of osteopathic medicine, in general they require that the undergraduate college (preprofessional) training should include chemistry, biology, physics, and English. The colleges urge prospective students to begin these subjects while they are still in high school.

Qualifications and Education

Some of the personal qualifications the American Osteopathic Association lists as necessary for success in the field of osteopathic medicine are the desire to serve as an osteopathic physician, friendliness and patience, and the ability to meet and inspire confidence in people. Other characteristics which the association considers desirable include self-confidence, emotional stability, enthusiasm, and perseverance.

All seven colleges of osteopathic medicine are accredited by the American Osteopathic Association. During the first half, basic science subjects are taken, such as anatomy, physiology, pathology, bacteriology, immunology, biochemistry, histology, embryology, pharmacology, and public health. In addition, there is training in osteopathic principles, diagnosis, and practice, including manipulative therapy and other techniques. During the last half, the curriculum includes clinical subjects and practical training in the osteopathic hospitals and outpatient clinics with which the college is affiliated.

After receiving the degree of doctor of osteopathy, most of the graduates serve a rotating internship of 12 months before entering private practice. For this training, they go to one of the 80 teaching osteopathic hospitals which has been approved by the American Osteopathic Association for intern training.

The basic course in osteopathic medicine is designed to train its graduates to be general practitioners. There are opportunities, however, for specialization.

Twelve specialty certifying boards are affiliated with the American Osteopathic Association. These are the American Osteopathic Boards of: Anesthesiology; Internal Medicine; Dermatology; Neurology and Psychiatry; Obstetrics and Gynecology; Ophthalmology and Otorhinolaryngology; Pathology; Pediatrics; Proctology; Radiology; Rehabilitation Medicine; and Surgery.

Licensure

A State license is necessary to practice osteopathic medicine. All States grant such licenses to graduates who fulfill the educational qualifications and pass the required examinations. Licensing agencies in 49 States and the District of Columbia issue unlimited licenses to eligible doctors of osteopathic medicine. Some limitations remain upon their right to use drugs and operative surgery in one State.

State requirements for licensing differ considerably. Specific information can be secured from the licensing board of the State where the student is planning to practice.

Opportunities

Most members of the osteopathic medical profession are in private practice. This involves many of the same considerations as private practice in other fields. The potential advantages of working independently and of increasing one's income with years and experience should be weighed against disadvantages such as long and unpredictable hours.

Although licenses are available to doctors of osteopathy in all States, a 1969 survey indicates that approximately half of the 14,000 osteopathic physicians practicing in the United States were located in Florida, Michigan, Missouri, Ohio, Pennsylvania, Texas, and New Jersey.

According to the American Osteopathic Association, 310 osteopathic hospitals are located in the United States. The majority of practicing doctors of osteopathy utilize these hospitals. In addition, D.O.'s are eligible for admittance to the medical and surgical staff of many tax-supported hospitals throughout the country.

For further information, write to:
American Osteopathic Association
212 East Ohio Street
Chicago, Illinois 60611

EDUCATIONAL PROGRAMS IN OSTEOPATHIC MEDICINE - ILLINOIS

(Prerequisite: A bachelor's degree (in some cases only 3 years of college) with a strong background in chemistry, biology, and physics)

Required Special Training: 4 years in a college of osteopathic medicine followed by a 12-month internship in an osteopathic hospital

Osteopathic Physician

Chicago College of Osteopathic Medicine
Chicago 60615

Podiatrist

The podiatrist is a professionally trained foot-care practitioner whose services supplement the medical care provided by the physician. Within his own field, the podiatrist is an active member of the health team. Since 3 out of 4 people have foot troubles, a very important need in health services is being filled by podiatry.

The podiatrist diagnoses and treats diseases and deformities of the feet or tries to prevent their occurrence. The problems he deals with range from a simple corn to foot difficulties requiring special shoes or foot appliances. He consults with other medical specialists concerning further medical treatment.

Podiatrists must be alert to a patient's general health, too. Sometimes a disease like diabetes or hardening of the arteries will produce symptoms in the feet or legs. If the patient is not already under the care of a physician, the podiatrist will urge him to get medical treatment promptly. In turn, people with diseases that affect the feet may be sent by their physicians to a podiatrist for auxiliary care.

The podiatry field is far from overcrowded. Twenty-two million patients were served by podiatrists in 1970. The expanding population with its greater number of older people has resulted in an increasing demand for podiatrists. The podiatrist's practice ranges from office treatment and surgery to consultation with specialists in every area of health. Most podiatrists are self-employed, working in their own offices or in professional buildings with other specialists. Many others serve on the staff of hospitals and treatment centers, in government health programs, and the Armed Forces. Some teach in colleges of podiatry and some do research work.

Although most podiatrists give general foot care to a general clientele, some become particularly interested in specialized work. This might be with children, older people, or industrial workers, or with the treatment of foot deformities. Some podiatrists may prefer to teach, either full or part time, or do research on foot ailments. Men and women with top qualifications sometimes act as consultants for various private and government health agencies, and for hospitals.

Qualifications and Education

The podiatrist must have deft hands, steady nerves, and good vision. A knack for mechanical work is helpful, since the podiatrist uses quite a bit of electrical equipment and must be able to make or adjust such devices as casts, braces, and splints.

To become a podiatrist, a student must complete a 4-year course at a college of podiatry. Anyone planning to enter a college of podiatry must be a high school graduate and must have completed at least 2 years of college work.

One-year and 2-year residencies are available to students who want further experience or who must have extra practical training to meet licensing requirements in certain States.

For further information, write to:
American Podiatry Association
20 Chevy Chase Circle
Washington, D.C. 20034

(Prerequisite: At least 2 years of college with an emphasis on the sciences)

Required Special Training: 4-year professional program in a college of podiatry

Podiatrist

Illinois College of Podiatric Medicine
Chicago 60610

Veterinarian

Looking after the health of farm animals and pets is an occupation almost as old as civilization itself. People living in close association with animals soon realized that they were--like human beings--subject to many ills, which could make them unfit for use as food or unable to work or provide companionship. And, by practical experience, people also learned that animals could transmit many diseases to their owners. In fact, in older civilizations, the same "medicine man" treated both animals and human beings. It was not until many centuries later that veterinary medicine became a separate specialty of the medical sciences.

Nowadays, the veterinarian has the basic responsibility for keeping animals healthy and taking care of them when they're sick or injured. He has also become a key figure in disease prevention among human beings. This is one of the newest developments in the health field, and helps explain why veterinary medicine today is a career with wide opportunities for service.

Work done by the veterinarian usually falls into one of three main categories. He tries to keep animals free from disease by vaccinating them and teaching their owners how to feed and care for them properly. He gives medical or surgical care to sick or injured animals. Finally, he works to protect and promote human health. His observations, research, and treatments have been applied in bettering man's health--in fields of surgery, internal medicine, cancer, tuberculosis, and chronic diseases. He plays an important part, also, in protecting human beings from the various diseases that can spread from animals to man.

It is not hard to see why the veterinarian's work is so important to farmers and pet owners, and to the managers of zoos, circuses, riding stables, and other establishments where animals are grouped together. Sickness among cows for example, will ruin a dairy farmer financially unless it can be stamped out before the whole herd is affected. But veterinary medicine is just as important--in a less obvious way--to people who live in cities and don't own animals. When they buy milk, meat, poultry, and eggs, they are benefiting from the veterinarian's services--from his efforts to keep food-producing animals in good health, and from his inspections of animal-origin foods.

People in all kinds of communities also benefit from the veterinarian's efforts to stamp out or control those animal diseases which spread to human beings. Twenty of these diseases are a possible threat in this country, with rabies, brucellosis, and a form of food poisoning called salmonellosis heading the list. Keeping these in check is a responsibility shouldered by the veterinarian in cooperation with the specially trained physician or other health official.

A majority of veterinarians--an estimated 60 percent--go into private practice. Most of them handle all kinds of domestic animals. Rural veterinarians may practice largely with cows, horses, swine, or poultry. Veterinarians living in cities or large towns usually treat only household pets, but may care for farm animals as well. A small number of veterinarians specialize in zoo and circus animals, or in animals that are raised commercially for their fur.

Rural veterinarians who develop large practices sometimes build clinics or hospitals, where animals can be brought for treatment and surgery, but many practice from offices and travel to their patients. They make use of many modern methods of communication and transportation. It is not at all unusual for the rural veterinarian to keep in touch with his office by radio-telephone, or to fly his own plane.

In addition to the work he does with his animal patients, the rural veterinarian also has the responsibility of teaching farmers and their families about diseases which farm animals can transmit to people, and of showing them how to protect themselves.

The veterinarian who is interested in a public health career needs special training in addition to this education in veterinary medicine. It is recommended that he get a year or two of practical experience, and then enroll for a program of postgraduate study in an accredited school of public health. Specialized courses will help him to understand how comprehensive health programs are developed, and to see how veterinary medicine can contribute to such programs. This postgraduate work leads to a master's degree--usually master of public health.

The veterinarian fits with special ease into the public health field, because he has been trained to consider diseases as they affect animals in groups. Prevention rather than treatment is stressed--and prevention is the keystone of public health.

More than 11 percent of all veterinarians work directly in the public health field--for the Federal Government, State, or local agencies, and international groups.

Qualifications and Education

To be successful, the veterinarian needs a combination of natural gifts and technical training. He/she must be fond of animals and feel no fear when working with them. He/she needs to be an alert observer--one's patients cannot answer questions or describe symptoms. Steadiness and calmness are also important, since both animals and their owners react unfavorably to impatience, or rough or abrupt motions.

Anyone planning to become a veterinarian should count on a minimum of 6 years of schooling after graduation from high school. One must have at least 2 years of preprofessional study at a liberal arts or agricultural college. One then enters an approved college of veterinary medicine, which gives a 4-year course leading to the degree of doctor of veterinary medicine (D.V.M.).

Although only 2 years of college are required, it is best to have a full 4 years of college work, with a bachelor's degree. The extra years give the student a broader cultural background--and mean that he has more to offer his profession and the community which he will serve. Also, competition is keen for entry to schools of veterinary medicine; other things being equal, the college graduate has a better chance of acceptance.

EDUCATIONAL PROGRAMS IN VETERINARY SCIENCE - ILLINOIS

Veterinarian

Required Special Training: At least 2 years of college (many students have 4 years) in a preprofessional curriculum offering appropriate courses. Following this is a 4-year professional program in veterinary science.

University of Illinois
Urbana 61801

Veterinary Technician

(Prerequisite: high school diploma or its equivalent)

Required Special Training: 2-year community college program in veterinary technology

Parkland College
Champaign 61820

VETERINARY TECHNICIAN

The veterinary technician (also called the veterinary assistant, animal technician, or laboratory animal technician/technologist) works under the supervision of a veterinarian to assist him in the treatment and care of the animals with which he is working. In assisting and caring for experimental animals, the veterinary technician may work under an animal scientist, in which case he/she would be more likely to use the title "animal technician" or "laboratory animal technician." The animals involved may be pets, farm stock, zoo specimens, or laboratory animals. Some of the duties of the technician include obtaining and recording information about the cases, collecting specimens and performing certain laboratory procedures, preparing equipment and animals for surgery, assisting in surgery, applying dressings to wounds, and caring for and feeding the animals staying at the clinic or laboratory where the technician is employed. As the need for veterinarians and animal scientists and their research continues to grow, there will likewise be an increasing need to delegate such technical tasks as those mentioned above to non-professional personnel like the veterinary technician.

Because the veterinary technician must work directly under the supervision of a veterinarian or animal scientist, he/she is employed in the same settings as these professionals. Private veterinary practices, biological laboratories, zoos, meat packing companies, and government agencies such as the U.S. Department of Agriculture are the most common sources of employment.

Qualifications and Education

A person considering a career as a veterinary or animal technician should have a liking for animals and a concern for their welfare. He/she should have the ability to handle them carefully and be able to work with and around them without fear. In addition, an interest in the biological sciences is helpful.

Training is usually 2 years in length following high school graduation and is designed to provide the student with a general background in biology, chemistry, mathematics, and communications, with some economics and business management. Some colleges and universities offer a 4-year baccalaureate degree in animal technology or animal science.

VETERINARY TECHNICIAN - Further Information

Employment Prospects

In 1975 employment prospects for veterinary technicians were good in Chicago and generally fair in the remainder of the state. Similar employment prospects were expected to continue in the next ten years.

Salary

Inexperienced veterinary technicians earned from $5500 to $6500 annually in 1975. Those with some experience received $7000 to $8000 per year. Teachers of veterinary technicians were paid $8500 to $10,000.

Career Mobility

Opportunities for advancement for veterinary technicians are quite limited. Experienced, capable technicians may teach in or administer educational programs for the training of veterinary technicians. Technicians desiring to become veterinarians must complete an educational program of the kind mentioned under "Veterinarian" at the top of the page 7-I-3. Competition for acceptance into veterinarian educational programs is very intense.

Further Reading

Catcott, E.J. and Smithcors, J.F. editors, Animal Hospital Technology, American Veterinary Publications, Inc., Wheaton, Illinois, 1971.

Professional Organization Where More Information May Be Obtained

American Veterinary Medical Association
600 South Michigan Avenue
Chicago, Illinois 60605

(In 1975 an Illinois organization for veterinary technicians was in the process of formation; for further information contact Director, Curriculum in Veterinary Technology, Parkland College, Champaign, Illinois, 61820)

To Broaden Your Understanding

-ask a veterinarian to let you assist him, preferably on at least ten different occasions so that you can get a balanced view of the kind of work involved

-talk with veterinarians and, if possible, a veterinary technician

-write to the school

Professional Nurse

In hospital nursing, positions for professional nurses range from general duty nurse (the usual beginning job) to director of the nursing service, with the in-between positions of head nurse and supervisor, each with its assistants and associates. A nurse's education, experience, and ability will determine the extent to which she advances.

Public health nursing is concerned not only with the care of the sick but also with the prevention of illness. The public health staff nurse (the beginning position in this field) goes into homes, schools, clinics, and industries. Positions in public health nursing range from this beginning position through supervisor to director of the service, each with its assistants and associates. Each of these has its special educational and experience requirements.

Occupational health (industrial) nurses work with employees of business firms, industries, and other establishments, and are responsible for the health of the workers on the job—and often off the job too. These nurses are concerned with the first-aid treatment for injuries and minor illnesses, and with helping to promote safe and healthful working conditions. Occupational health nursing, like school nursing, is often considered a part of public health nursing.

Nurses also hold teaching positions at schools of professional nursing, schools of practical nursing, and college and university programs offering advanced preparation in nursing and related fields.

In private duty nursing, the nurse contracts independently to give bedside care to patients in the home or hospital. She is engaged at the request of the physician or the family.

There are additional opportunities for nurses in U.S. Government service at home and abroad. These will be found in the military nurse corps of the Army, Navy, and Air Force; Veterans' Administration hospitals; Agency for International Development; and Peace Corps. Home and foreign mission services, national and international organizations (American Red Cross and World Health Organization, for example) provide many interesting positions for nurses. Physicians' and dentists' offices, camps, magazines and publishing houses, and professional organizations are other places where nurses work.

Nursing also has its clinical specialties. For example:

- Pediatric nurses specialize in caring for children.
- Obstetric nurses care for mothers and new babies.
- Psychiatric and mental health nurses care for mentally ill.
- Rehabilitation nurses care for patients with chronic and disabling conditions.
- Medical-surgical nurses care for patients before, during, and after surgery, and in most types of illness.

Other nursing specialties include the care of patients with particular diseases, such as cardiovascular illnesses, cancer, and pulmonary ailments.

Positions in advanced fields of nursing are open to nurses that have experience and have taken additional courses of study beyond the basic preparation, usually at the master's or doctoral level.

The new graduate of a basic nursing program most likely will begin his or her nursing career in a hospital as a general duty nurse—or in a public health agency as a staff nurse, provided she or he has completed a baccalaureate program approved for public health nursing. With more experience and further education, the nurse will then work up to the higher positions, as in any other profession.

Most professional nurses work a 40-hour week, although they cannot always expect a conventional 9-to-5 day. Nursing services go on 24 hours a day; nurses expect to take their turn at evening and night duty.

Professional nurses can choose their preferred area of specialization. Many nurses enjoy the routine of hospital work with its opportunity for direct patient care, participation in research, and in teaching. Others prefer the freedom of activity in public health nursing—working with patients and their families through the health department, the school system, the visiting nurse association, or other community agencies. The occupational health nurse works in a factory or office which may employ large numbers of workers. Working in a physician's office or in private day nursing appeals to those who like a more independent setting.

Qualifications and Education

Intelligence, common sense, integrity, a sense of responsibility, a considerable degree of self-discipline, tact, and humor—all of these are important. A healthy outlook on life, both in its dark moments and on the lighter side, and good physical health are essentials. (The applicant will be required to pass a physical examination before being accepted by a school of nursing.)

A nurse must like people well enough to put up with them when they are irritable and when caring for them may be difficult. She must like people well enough to take care of all kinds of people, of all ages, and in all stages of illness or injury. Finally, the nurse must like people well enough to work smoothly with other members of the health team—physicians, nurses, and other professional personnel, and auxiliary workers.

Students who cannot foresee giving themselves to nursing with sincerity and purpose, but who hope only for a glamorous well-paying job, should consider some other profession. Preparation for nursing is hard work, but most nurses agree that the ideals and satisfactions of the profession are worth it.

An applicant to a nursing program must be 17 or 18 years of age. The maximum age limit depends on the individual applicant and the school. Most schools admit men students as well as women. Opportunities for men in nursing are excellent.

All schools of professional nursing require at least high school graduation for admission, and a few require college work. In addition, most require the completion of certain high school subjects.

Professional nursing schools fall into three general categories: junior or community college schools offering a 2-year associate degree program; hospital schools of nursing offering a 2½- to 3-year diploma program; and colleges offering a 4-year baccalaureate program. All three types require graduation from high school, various pre-entrance examinations, plus a physical examination. Their programs cover the nursing arts and sciences which form an essential background for nursing practice.

The associate degree program (2 years) will include general education courses, especially science, at the junior college level, in addition to nursing theory and practice. The diploma course (2½- to 3-years) may also involve general education subjects, including biological, physical and social sciences, and nursing theory and practice.

Graduates of either of these courses are fully prepared for bedside nursing in a hospital, nursing home, or private duty, but they are not prepared for supervisory or administrative positions in nursing. Some students who complete a 2-year or 3-year program may wish to go on to the 4-year college program. This they can do, but should not count on getting transfer credit for the full 2 or 3 years of education they have had. Colleges may grant credit for some of the courses, or they may provide credit on the basis of examinations provided by the college.

The 4-year baccalaureate program ("baccalaureate" and "bachelor's" are interchangeable terms) includes work in the arts, humanities, and sciences. The major is in nursing, including theory and practice. Graduates are prepared for general duty staff nursing, for beginning positions in public health agencies, for advancement to supervisory and administrative work in nursing, and for graduate study leading to a master's or doctor's degree.

A graduate degree, which would involve 1 to 5 years of study beyond the baccalaureate, is ordinarily required for advanced clinical practice, teaching, research, and other advanced positions.

All nursing schools preparing professional nurses today are State approved. This means their graduates are eligible to take State licensing examinations. Those passing the State licensing examination are permitted to practice in the State and to identify themselves as registered nurses, using the initials R.N. after their names.

EDUCATIONAL PROGRAMS IN PROFESSIONAL NURSING - ILLINOIS
(Undergraduate)

(Prerequisite: high school diploma or its equivalent)

Required Special Training: the professional nurse is defined here as a graduate (having passed the examination which confers the designation, R.N.) of one of these three kinds of programs:

2-year associate degree program offered in community colleges;

3-year diploma program offered in hospitals;

4-year (sometimes somewhat longer) bachelor's degree program offered in colleges and universities.

A) Associate Degree Programs in Nursing

Belleville Area College
Belleville 62221

Black Hawk College
Moline 61265

College of DuPage
Glen Ellyn 60137

Elgin Community College
Elgin 60120

William Rainey Harper College
Palatine 60067

Illinois Central College
East Peoria 61611

Illinois Valley College
Oglesby 61348

Joliet Junior College
Joliet 60436

Kankakee Community College
Kankakee 60901

Kaskaskia College
Centralia 62801

Kennedy-King College
Chicago 60621

Lake County College
Grayslake 60030

Lewis & Clark Community College
Godfrey 62035

Lincoln Land Community College
Springfield 62703

John A. Logan
Carterville 62918

Malcolm X College
Chicago 60612

Mayfair College
Chicago 60630

Associate Degree Programs in Nursing, Continued

McHenry Community College*
Crystal Lake 60014

Moraine Valley Community College
Palos Hills 60465

Morton College
Cicero 60650

Olive-Harvey
Chicago 60628

Olney Central College
Olney 62450

Parkland College
Champaign 61820

Prairie State College
Chicago Heights 60411

Rend Lake College
Ina 62846

Rock Valley College
Rockford 61101

Carl Sandberg College
Galesburg 61401

Sauk Valley College
Dixon 61021

Shawnee Junior College
Ullin 62992

Southeastern Illinois College
Harrisburg 62946

Southern Illinois Collegiate Common Common Market
Carbondale 62901**

Southwest Community College
Chicago 60652

State Community College
East St. Louis 62201

Thornton Community College
South Holland 60473

Triton College
River Grove 60171

Waubonsee Community College
Sugar Grove 60554

Wilbur Wright College
Chicago 60634

* The McHenry College Associate Degree Nursing Program is conducted in cooperation with the Elgin Community College Nursing Program.

** The Colleges in the Southern Illinois Collegiate Common Market include Rend Lake, John A. Logan, Shawnee, Southeastern Community, and Southern Illinois University.

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B) Diploma Programs in Nursing

Augustana Hospital
Chicago 60614

Blessing Hospital
Quincy 62301

Cook County Hospital
Chicago 60612

Copley Memorial Hospital
Aurora 60507

Decatur Memorial Hospital
Decatur 62526

Evangelical School of Nursing
Oak Lawn 60453

Evanston Hospital Nursing School
Evanston 60201

Freeport Memorial Hospital
Freeport 61032

Graham Hospital
Canton 61520

Illinois Masonic Hospital
Chicago 60657

Lake View Memorial Hospital
Danville 61832

Lutheran General & Deaconess Hospitals
Park Ridge 60068

Lutheran Hospital
Moline 61265

Memorial Hospital
Springfield 62701

Mennonite Hospital
Bloomington 61701

Methodist Hospital
Peoria 61603

Michael Reese Hospital
Chicago 60616

Moline Public Hospital
Moline 61265

Mount Sinai Hospital
Chicago 60608

Passavant Memorial Hospital
Jacksonville 62650

Ravenswood Hospital
Chicago 60640

Rockford Memorial Hospital
Rockford 61103

Rock Island Franciscan Hospital
Rock Island 61201

St. Anne's Hospital
Chicago 60651

St. Anthony Hospital
Rockford 61101

St. Bernard's Hospital
Chicago 60621

St. Francis Hospital
Evanston 60202

St. Francis Hospital
Peoria 61603

St. John's Hospital
Springfield 62701

B) Diploma Programs in Nursing, Continued

St. Joseph Hospital
Joliet 60435

St. Mary of Nazareth
Chicago 60622

South Chicago Community Hospital
Chicago 60617

Swedish American Hospital
Rockford 61101

Northwestern Memorial Hospital - Wesley - Passavant School of Nursing
Chicago 60612

West Suburban Hospital
Oak Park 60302

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C) Bachelor's Degree Programs in Nursing

(Unless indicated otherwise, the following bachelor's degree nursing programs admit both 1) students who have had no professional nursing education and 2) students who have completed an associate degree program in nursing in a community college or a hospital diploma nursing program) NOTE: In order to be eligible for many graduate level (master's and doctoral degrees) nursing programs, the student must have completed an undergraduate program (bachelor's degree) which is approved by the National League for Nursing.

Bradley University
Peoria 61606

Chicago State University
Chicago 60628

DePaul University
Chicago 60616

Elmhurst College
Elmhurst 60126

Governor's State University
Park Forest South 60466
(three programs stressing these areas: practice, teaching, and administration. Prerequisite: registration as a nurse [R.N.] in Illinois, and completion of either an associate degree program in professional nursing or a hospital diploma program in professional nursing)

Illinois Wesleyan University
Bloomington 61701
(program is only for students with no prior nursing education)

C) Bachelor's Degree Programs in Nursing, continued

Lewis College
Lockport 60441

Loyola University
Chicago 60626

North Park College
Chicago 60625

Northern Illinois University
DeKalb 60115

Olivet-Nazarene College
Kankakee 60901

Rush College of Nursing and Allied Health Sciences
Chicago 60612

St. Xavier College
Chicago 60655

Sangamon State University
Springfield 62703
(program is only for students who are registered nurses [R.N.] in Illinois, and who have completed either an associate degree professional nursing program or a hospital diploma program in professional nursing)

Southern Illinois University
Edwardsville 62025

College of Nursing
University of Illinois at the Medical Center
Chicago 60612
(prerequisite: 1 year of college study, stressing biology and chemistry)

College of Nursing
Area Health Education System - Region 3-B
University of Illinois
Champaign 61820
(program is only for students who are registered nurses [R.N.] in Illinois, and who have completed either an associate degree professional nursing program or a hospital diploma program in professional nursing)

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D) Master's Degree Programs in Nursing Specializations

(Prerequisite: Be a registered nurse (R.N.) and have completed a bachelor's degree in nursing. [Check with individual programs for professional nursing courses necessary for eligibility for admission to master's degree programs.]. In order to be eligible for many graduate level nursing programs, the student must have completed an undergraduate program which is approved by the National League for Nursing -- check with undergraduate programs to see if they are so approved.)

Required Special Training: approximately two years in a graduate-level professional nursing program, after which a master's degree is awarded.

Governor's State University Park Forest 60466	Offers three specializations: a) nursing practice b) nursing teaching c) nursing administration
Loyola University Chicago 60626	Offers three specializations: a) medical-surgical nursing b) psychiatric nursing c) maternal and child health nursing
Northern Illinois University DeKalb 60115	Offers four specializations: a) medical-surgical nursing b) maternal and child health nursing c) community health nursing d) nursing administration
St. Xavier College Chicago 60655	Offers one specialization: a) advanced nursing practice and teaching in psychiatric and/or mental health
College of Nursing University of Illinois at the Medical Center Chicago 60612	Offers five specializations: a) medical-surgical nursing b) psychiatric nursing c) maternity-midwifery nursing d) public health nursing e) nursing service administration
College of Nursing University of Illinois (Peoria Campus) Peoria 61606	Offers two specializations: a) medical-surgical nursing b) public health nursing (community and family nurse practitioner options)

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E) Doctoral Degree Program in Nursing Specializations

(Prerequisite: a master's degree in nursing)

Required Special Training: approximately three years in a doctoral level professional nursing program, after which a Ph.D. is awarded.

College of Nursing
University of Illinois at the Medical Center
Chicago 60612

Offers four specializations:
a) nursing practice
b) nursing education
c) administration of nursing practice
d) science applied to nursing

Employment Prospects

In 1974 employment opportunities for registered professional nurses (RN's) were plentiful in Illinois, and were expected to remain plentiful for the foreseeable future. Now and in the future, RN's with additional education will be able to select from career opportunities in education, administration, and nursing practice in these clinical fields: medical-surgical, maternal-child, public health, and psychiatric. New opportunities for nurses to work in preventative medicine and health maintenance services will probably become available if some form of national health insurance is adopted by Congress. Opportunities for employment in hospitals and extended care facilities will stay stable in terms of numbers, but will continue to demand new skills in specialty practice areas as further scientific advances are made in medicine. Some registered nurses with specialized advanced education will also find employment or practice opportunities as "nurse practitioners."

Salary

Financial rewards depend on education, job descriptions and responsibility, and geographic location. In 1974 nurses in larger cities earned more than those in rural areas, but usually this was offset by higher living costs in cities. Nurses with advanced education often found employment in responsible "leadership" positions in nursing and thus were paid substantially more. A recent study of salaries of registered nurses employed by non-federal hospitals in Chicago reported that a director of nursing earned, on the average, $329 weekly while the general duty staff nurse earned an average of $184 each week. Public health nurses earned just under $200 per week. Provision of fringe benefits by employers varied but usually included paid vacation and birthdays, participation in some type of retirement plan, insurance, and sometimes financial assistance to further education.

Career Mobility

Registered nurses must be licensed by the State Board of Nurse Examiners in the state where they are employed, or practice nursing. Graduation from an approved school, successful completion of an examination administered by the state board and certain other requirements must be met in order to become licensed. Once licensed

Career Mobility, continued

by a state, it is usually reasonably simple to get licensed in another state.

Registered nurses in "advanced nursing practice" positions may also need specialized certification. Probably because most registered nurses are women, there is a fairly high dropout-rate from the labor market. Some do return to nursing full or part-time after family obligations have lessened. For the individual with a strong career commitment, there are numerous opportunities for a challenging career. As with any career, however, advancement may mean moving to a new area to take advantage of an excellent job opportunity; it definitely means participating in continuing education programs (which in some states will soon be required in order to maintain a license) and would probably require a master's or doctoral degree in nursing or a related area.

LPN's wishing to become registered professional nurses (RN's) should know that most community colleges offer proficiency tests for academic credit in their associate degree nursing programs.

LPN's wishing to become RN's and RN graduates of hospital diploma nursing program wishing to enter bachelor's degree nursing programs may also receive academic credit for some of their previous learning by successfully taking the New York College Proficiency Examinations in Nursing. Since not all professional nursing education programs will accept the results of these examinations, interested persons should contact those programs they are considering to see if this avenue of mobility is a real possibility.

A number of Illinois institutions have initiated upward mobility opportunities for LPN's and for those with no nursing education:

1) University of Chicago Hospitals and Clinics, Chicago: sponsors a diploma nursing program whereby LPN's can become RN's.
2) South Chicago Community Hospital, Chicago: sponsors a diploma program whereby LPN's can become RN's.
3) The Southern Illinois Collegiate Common Market, Carbondale: accepts LPN's from 4 LPN community college programs (John A. Logan [Carterville], Rend Lake [Ina], Shawnee [Ullin], and Southeastern [Harrisburg]) into its associate degree nursing programs.

Career Mobility, continued

4) Illinois Valley Community College [Oglesby] and William Rainey Harper College [Palatine]: have "ladder" nursing programs which give students the choice of either completing the first year of the nursing program and taking the LPN examination for licensure or continuing with the second year and taking the associate degree examination.
5) Evanston Hospital Nursing School, Evanston: admits students with differing learning abilities who may progress in the nursing program according to their own pace.
6) Michael Reese Hospital, Chicago: operates an enrichment program for nursing students who, because of prior inadequate educational preparation, do not qualify for admission to schools of nursing.

Further Reading

American Nurses' Association, Facts About Nursing '72-73

Robinson and Reres, Your Future in Nursing Careers, Richards Rosen Press, Inc., New York, 1972

Lysaught, Jerome P., An Abstract for Action, McGraw-Hill Book Company, New York, 1970

Professional Organizations Where More Information May Be Obtained

American Nurses' Association
2420 Pershing Road
Kansas City, Missouri 64108

National League for Nursing
10 Columbus Circle
New York, New York 10019

To Broaden Your Understanding

-Volunteer for work in a hospital or nursing home to learn if you might want to be a nurse

-Visit schools, hospitals, and nursing homes during "open house" days

-Where a club exists, join a high school future nurses organization

-Write to schools and professional organizations

PRACTICAL NURSE

For the student who wants direct and frequent patient contact but who does not choose a career in professional nursing, practical nursing could be a rewarding alternative. The licensed practical nurse (LPN) works with professional nurses, most often in the capacities of assistant and bedside nurse. The LPN functions as an assistant in complex and critical medical situations. In situations where the patient is not critically ill and the procedures are fairly simple, the LPN has more responsibility and, while not entirely independent, nevertheless functions without on-the-spot supervision.

The LPN attends to nearly all the patient's bedside needs: changing the linens, bathing the patient, feeding (when necessary), and assisting in personal hygiene, grooming, and physical movement. LPN's also perform such tasks as checking and recording temperature and blood pressure, and administering drugs and medications. In the event of an emergency, the LPN knows where to seek help and, when help is found, will assist in the emergency work. The LPN sterilizes equipment, prepares supplies and facilities to be used, prepares the patient for whatever special treatment is to be undergone, and applies first aid when necessary. At all times the LPN should be observant for any signs or symptoms in his/her patient(s) which should be reported to a doctor or professional nurse.

Because of the expanding professional responsibilities of registered nurses, the LPN is providing a large share of bedside nursing care. LPN's are employed in hospitals, public health agencies and rehabilitation agencies, private homes, physicians' offices, clinics, nursing homes, and such special institutions as psychiatric hospitals or children's hospitals. Many LPN's prefer to work in an area of nursing such as medical-surgical, intensive care, pediatrics, or psychiatric. There is an increasing demand for men as licensed practical nurses, especially in the area of psychiatric and rehabilitation nursing.

Qualifications and Education

Anyone considering a career in practical nursing should have a strong desire to help all kinds of people. The situations that confront LPN's daily may be depressing, ugly, even traumatic. And although hospitals are very clean places in which to work, working directly with sick and disabled persons sometimes brings the LPN into contact with unpleasant sights and odors which must be dealt with. The work frequently involves a lot of stooping, bending, and lifting. Good physical health as well as emotional stability, patience, tact, and understanding are key personal qualities wanted in a potential licensed practical nurse.

Educational programs are conducted in vocational schools, technical schools, some public high schools, adult education programs, hospitals, and community colleges. Entrance requirements vary: some hospital programs require the student to have a high school diploma or its equivalent while others do not (check with the program you are interested in); community colleges require a high school diploma or its equivalent for admission to the school. Training usually consists of one year of combined academic work and clinical experience; high school programs may last two years.

EDUCATIONAL PROGRAMS IN PRACTICAL NURSING - ILLINOIS

(Prerequisite: high school diploma or its equivalent)

Required Special Training: 1-year practical nursing program in a community college, hospital, area vocational center, or school of nursing; and passage of the examination which confers the designation L.P.N. (licensed practical nurse)

ALTON

Alton Vocational School of Practical Nursing
Alton 62002

BLOOMINGTON

Bloomington School of Practical Nursing
Bloomington 61701

CANTON

Spoon River College
Canton 61520

CARBONDALE

Southern Illinois Collegiate Common Market*
Carbondale 62901

CARTERVILLE

John A. Logan College
Carterville 62918

CHAMPAIGN

Parkland College
Champaign 61820

CHICAGO

Chicago Public Schools--Practical Nursing Center
1820 W. Crenshaw Street
Chicago 60612

CHICAGO, cont.

City College of Chicago
721 North LaSalle
Chicago 60610

St. Francis X. Cabrini School of Practical Nursing
811 South Lytle
Chicago 60607

DANVILLE

Danville Junior College
Danville 61832

DECATUR

Decatur School of Practical Nursing
Decatur 62523

DIXON

Sauk Valley College
Dixon 61021

EAST PEORIA

Illinois Central College
East Peoria 61611

EAST ST. LOUIS

East St. Louis School of Practical Nursing
East St. Louis 62201

FREEPORT

Highland Community College
Freeport 61032

GALESBURG

Carl Sandburg College
Galesburg 61501

GODFREY

Lewis and Clark Community College
Godfrey 62035

GRAYSLAKE

College of Lake County
Grayslake 60030

HARRISBURG

Southeastern Illinois College
Harrisburg 62946

HINSDALE

Hinsdale Sanitarium & Hospital
Hinsdale 60521

JACKSONVILLE

Jacksonville School of Practical Nursing
Jacksonville 62650

JOLIET

Joliet Township High School
Joliet 60432

KANKAKEE

Kankakee Community College
Kankakee 60901

KEWANEE

Black Hawk College East
Kewanee 61443

LASALLE

St. Mary's Hospital
LaSalle 61301

MALTA

Kishwaukee College
Malta 60150

MATTOON

Lake Land College
Mattoon 61938

MOLINE

Black Hawk College
Moline 61265

MORTON GROVE

Oakton Community College
Morton Grove 60053

MOUNT CARMEL

Wabash Valley College
Mount Carmel 62863

MOUNT VERNON

Rend Lake College
Mount Vernon 62846

OGLESBY

Illinois Valley Community College
Oglesby 61348

PALATINE

William Rainey Harper College
Palatine 60067

QUINCY

Quincy School of Practical
Nursing
Quincy 62301

RIVER GROVE

Triton Junior College
River Grove 60171

ROBINSON

Lincoln Trail College
Robinson 62454

ROCKFORD

Rockford School of Practical
Nursing
Rockford 61109

SOUTH HOLLAND

Thornton Community College
South Holland 60473

SPRINGFIELD

Springfield School of Practical
Nursing
Springfield 62703

STREATOR

Streator Township High School
Streator 61364

ULLIN

Shawnee Community College
Ullin 62992

* The colleges in the Southern Illinois Collegiate Common Market include Rend Lake, John A. Logan, Shawnee, Southeastern Community, and Southern Illinois University.

PRACTICAL NURSE - Further Information

Employment Prospects

Most licensed practical nurses (LPN's) are employed in hospitals; others work in extended care facilities, home health agencies, industry, doctors' offices, and in private duty with individual patients. Allowing for population differences, Illinois has fewer LPN's than is average for other states. Illinois has a somewhat higher ratio of registered professional nurses than is average for all states, so that may affect the utilization of and need for LPN's. In 1974 employment prospects for practical nurses were very good in Illinois, and were expected to remain very good for the foreseeable future.

Salary

A salary study conducted by the American Hospital Association in mid-1973 indicated that the average beginning salary for LPN's in Illinois hospitals was slightly over $500 per month. The average salary for all LPN's working in hospitals was $565 per month. Generally, salaries for practical nurses usually were about 75% of those paid to professional nurses.

Career Mobility

Licensed practical nurses obtain a license to practice through the state board of nurse examiners. Licensure by one state usually provides ready access to licensure by other states. In most states, it is necessary to graduate from an approved school and successfully complete a written examination administered by the state. Since these requirements are set by each state, there are variations including the possibility in some states for licensure without completing an approved program for licensed practical nurses. This is the exception, not the rule and does not currently exist as an option in Illinois. The usual route for advancement of the nursing career is through additional education in order to qualify for licensure as a registered nurse.

LPN's wishing to become registered professional nurses (RN's) should know that most community colleges offer proficiency tests for academic credit in their associate degree nursing programs.

LPN's wishing to become RN's may also receive academic credit for some of their previous learning by successfully taking the New York College Proficiency Examinations in Nursing. Since not all professional

Career Mobility, continued

nursing educational programs will accept the results of these examinations, interested persons should contact those programs they are considering to see if this avenue of mobility is a real possibility.

A number of institutions in Illinois have initiated upward mobility opportunities for LPN's and for those with no nursing education:

1) University of Chicago Hospitals and Clinics, Chicago: sponsors a diploma nursing program whereby LPN's can become RN's.
2) South Chicago Community Hospital, Chicago: sponsors a diploma program whereby LPN's can become RN's.
3) The Southern Illinois Collegiate Common Market, Carbondale: accepts LPN's from 4 LPN community college programs (Common Market schools include John A. Logan College [Carterville], Rend Lake College [Ina], Shawnee Junior College [Ullin], and Southeastern Illinois College [Harrisburg]) into its associate degree nursing program.
4) Illinois Valley Community Co[illegible]glesby; and William Rainey Harper College, Palatine; [illegible]adder" nursing programs which give students the choi[illegible] either completing the first year of the nursing program and taking the LPN examination for licensure or continuing with the second year and taking the associate degree examination.
5) Evanston Hospital Nursing School, Evanston: admits students with differing learning abilities who may progress in the nursing program according to their own pace.
6) Michael Reese Hospital, Chicago: operates an enrichment program for nursing students who, because of prior inadequate educational preparation, do not qualify for admission to schools of nursing.

Further Reading

American Nurses' Association, Facts About Nursing '72-73

National Federation of Licensed Practical Nurses, Bedside Nurse

National Association for Practical Nurse Education & Service, The Journal of Practical Nursing

Professional Organizations Where More Information May Be Obtained

National Federation of Licensed Practical Nurses
250 West 57th Street
New York, New York 10019

National Association for Practical Nurse Education and Service
122 East 42nd Street, Suite 800
New York, New York 10017

National League for Nursing
10 Columbus Circle
New York, New York 10019

To Broaden Your Understanding

-Volunteer for work in a hospital or nursing home to learn if you might want to be a nurse

-Visit schools, hospitals, and nursing homes during "open house" days

-Where a club exists, join a high school future nurses organization

-Write to schools and professional organizations

NURSING ASSISTANT

Nursing assistants in hospitals and nursing homes help nurses in providing many services related to the comfort and welfare of patients. Nursing aides, the term usually applied to female assistants, help practical and professional nurses by performing less skilled tasks in the care of patients.

Orderlies and attendants, occupational titles usually applied to male nursing assistants, assist practical and professional nurses by performing a variety of duties for male patients and certain tasks in the care of the physically ill, mentally ill, and mentally retarded.

Nursing aides, orderlies, and attendants do the following work activities:

- -bathe, dress, and undress patients
- -assist in personal hygiene of patients
- -serve and collect food trays and help feed patients who need assistance
- -transport patients using wheelchairs or aid them in walking
- -take and record temperatures, pulses, respiration rates, and food intake and output, as directed
- -apply ice bags and hot water bottles
- -give alcohol rubs
- -clothe patients in preparation for examinations and treatments and remain with them
- -collect charts, records, and reports, and deliver them to authorized persons
- -collect dirty linen and store clean linen
- -answer signal lights and bells to determine patients' needs
- -report all unusual conditions or reactions of patients to the nurse in charge

It has been estimated that there were a total of 875,000 nursing assistants employed in the U.S. in 1972, of which nearly 600,000 worked in hospitals.

Qualifications and Education

Those considering working as a nursing assistant ought to have a liking for people, and considerable understanding for the needs of sick people. The work situations that the nursing assistant frequently faces may be depressing, ugly, even frightening. And although hospitals are very clean places in which to work, working directly with sick and disabled persons sometimes brings the nursing assistants into contact with unpleasant sights and odors which must be dealt with. The work frequently involves a lot of stooping, bending, and lifting. Good physical health and strength as well as emotional stability, patience, tact, and understanding are desirable qualities.

Although there are no standard educational requirements for becoming a nursing assistant, vocational centers, clinics, and hospitals provide instructional programs. The on-the-job training programs given by clinics and hospitals often include classroom instruction, demonstrations and practice, taught by a professional nurse.

EDUCATIONAL PROGRAMS IN NURSE ASSISTING - ILLINOIS

Required Special Training: Either a) on-the-job training available in most hospitals, and in some clinics, or b) a short training program in a community college. (Many Illinois high schools participate in Area Secondary Vocational Centers, some of which offer nurse assisting programs.)

Nurse Assistant

Carl Sandburg College
Galesburg 61401

Joliet Junior College
Joliet 60436

McHenry County College
Crystal Lake 60014

Parkland College
Champaign 61820

Spoon River College
Canton 61520

State Community College of East St. Louis
East St. Louis 62201

NURSING ASSISTANT - Further Information

Employment Prospects

In 1974 there were numerous jobs available for nursing assistants (nurses' aides, orderlies, and attendents). There will continue to be job openings in the coming years.

Salary

In 1974 salaries were low, and they will probably continue to be low in the coming years. In mid-1973 a salary study conducted in Illinois hospitals indicated that beginning nursing aides earned starting salaries ranging from a low of $260 per month to a high of $574 per month. Average starting salaries in Illinois were $400 monthly for beginning workers, and $440 for all nursing assistants.

Career Mobility

In most hospitals there is no upward career mobility. In other words, there are no opportunities for nursing assistants to receive significantly greater responsibility and substantially higher pay.

Further Reading

Isler, Charlotte, The Nurse's Aide in the Hospital, Springer Publishing Company, Inc., New York, 1968.

Professional Organizations Where More Information May Be Obtained

(Nursing assistants have no professional organization. Local hospitals and nursing employees are a source of information about the work of the nursing assistant)

To Broaden Your Understanding

- visit a hospital or nursing home and talk to nursing assistants, practical nurses, and professional nurses about their work
- contact the personnel office of a local hospital and find out about salaries, fringe benefits, and if there are any real opportunities for eventually receiving increased responsibility and higher pay.

NURSE ANESTHETIST

Any surgical procedure involves a concerted group effort on the part of doctors, nurses, and technicians. Each performs a specific role which benefits the health of the patient. A primary person on the surgical team is the nurse anesthetist. He/she is responsible for administering the pain-killing drugs and/or gases collectively known as anesthetics. Anesthetics maintain the patient in a painless state during the course of an operation or the delivery or a baby.

The nurse anesthetist is responsible for setting up the necessary equipment for operations and testing equipment to insure proper function. When a patient arrives for surgery, the nurse anesthetist positions him, records his blood pressure, respiration, pulse, and blood type, and when the doctors are ready, applies the anesthetic. In addition, the nurse anesthetist prepares pre-operation medications for intravenous injection as prescribed by the supervising physician.

During an operation the nurse anesthetist maintains the patient in an anesthetized state, either by regulating the gas and oxygen flow or by administering intravenous injections. He continues to keep a constant record of the patient's vital life signs and informs the doctor of any change in these signs.

Following an operation, the nurse anesthetist assists in moving the patient to the recovery room, periodically checks the patient for undesirable symptoms due to the anesthesia, and submits a post-operative report to the physician in charge. Additional duties include dissembling and sterilizing equipment, removing supplies, requesting additional supplies, and repairing any defective equipment used in anesthesia.

Most nurse anesthetists work in hospitals. A few are employed by dentists to administer anesthetics to dental patients.

Qualifications and Education

Persons interested in this field ought to enjoy being helpful to people undergoing surgery and childbirth. They should be able to learn to work under stressful conditions, and to reacte quickly and efficiently on occasions when patients develop dangerous symptoms.

In order to become a nurse anesthetist, a professional nursing program and at least one year of nursing experience must be completed. Following that, a professional training program in anesthesia is required. Most of these programs are 24 months in length.

(Prerequisites: completion of a professional nursing program and registration as a nurse (R.N.), plus at least 1 year of work experience as a nurse in an acute care unit. Oftentimes, a college chemistry course is also required [graduates of hospital nursing programs would be viewed as lacking in chemistry])

Required Special Training: A professional training program in anesthesia, 24 months in length, except shorter in length where noted.

Nurse Anesthetist

Decatur Memorial Hospital
Decatur 62526

McHenry Hospital
McHenry 60050

Presbyterian-St. Luke's Hospital
Chicago 60612

Ravenswood Hospital
Chicago 60640

St. Francis Hospital (18-month program)
Peoria 61603

St. John's Hospital (18-month program)
Springfield 62701

NURSE ANESTHETIST - Further Information

Employment Prospects

In 1975 employment prospects in Illinois and in the nation were very good. Smaller hospitals were experiencing more difficulty than larger ones in attracting nurse anesthetists to work for them due to more exhausting working conditions and somewhat lower salaries. Overall, employment prospects were expected to remain very good during the next decade.

Salary

Starting salaries in Illinois for nurse anesthetists ranged from $14,000 to $20,000 in 1975. Salaries increased with added work experience and responsibilities.

Career Mobility

With the accumulation of successful work experience, nurse anesthetists may assume supervisory and administrative responsibilities over other nurse anesthetists. Those with an interest in teaching may become instructors in hospital educational programs for the preparation of nurse anesthetists.

Further Reading

Journal of the American Association of Nurse Anesthetists

Nursing Outlook journal

Professional Organization Where More Information May Be Obtained

American Association of Nurse Anesthetists
111 East Wacker Drive
Chicago, Illinois 60601

To Broaden Your Understanding

-do volunteer or paid work related to nursing in a hospital or nursing home

-talk to nurse anesthetists and other kinds of nurses about their work

-write to schools and the professional organization

HOMEMAKER - HOME HEALTH AIDE

Nursing agencies and social service agencies concerned with assistance to the homebound have come to rely with increasing frequency on a relatively new category of worker -- the home health aide. The home health aide, sometimes called home aide or visiting health aide, is involved with the physical and simple health needs of the homebound, or disabled person.

Typical assignments might include bathing or exercising a convalescent person or semi-invalid; seeing to it that the patient takes his medicine; keeping in touch with the nurse or doctors, as to the patient's condition. The health aide would also assist in the preparation of meals and help feed the patient.

The agencies most likely to employ and assign these workers are local health departments, welfare dependents, private social work agencies, hospitals, or community voluntary agencies.

Qualifications and Education

Persons considering becoming home health aides should enjoy helping people who cannot adequately help themselves in doing routine daily activities. Aides should be able to accept the inability of patients to fully take care of themselves.

Home health aides are recruited primarily from among mature women who have had experience in bringing up their own families, and also from among young people seeking job training. Training courses range from 40 to 120 hours, and combine instruction in homemaking and home health care.

Training is provided by public health agencies, welfare agencies, visiting nurse agencies, voluntary family and children's service agencies, state and community mental health agencies, hospitals which provide home care services, and community colleges. The courses include training in household management, nutrition, infant and child care, and personal care. On completion of class work, trainees receive on-the-spot training, working under the supervision of a public health nurse, social worker, occupational therapist, nutritionist, or other health professional.

EDUCATIONAL PROGRAMS FOR THE HOMEMAKER-HOME HEALTH AIDE - ILLINOIS

Required Special Training: Training of at least 40 hours, and usually 120 hours, in most cases provided by the agencies which will hire those completing the training. Such agencies include: public health, welfare, visiting nurse, voluntary, family and children's service, state and community mental health agencies. In addition, some hospitals and community (junior) colleges offer training programs. (For more information, contact agencies listed above or the following community colleges.)

Homemaker - Home Health Aide

Danville Junior College
Danville 61832

Parkland College
Champaign 61820

State Community College of East St. Louis
East St. Louis 62201

HOMEMAKER - HOME HEALTH AIDE - Further Information

Employment Prospects

In 1974, the National Council for Homemaker-Home Health Aide Services stated that, ideally, there ought to be 300,000 homemaker-home health aides employed in the nation, whereas there were actually only 45,000 employed part-time and full-time. These were virtually all women and they tended to range in age from 40 to 65. It was not possible to determine 1974 Illinois employment prospects. In the coming years, employment prospects for the nation as a whole appeared good due to the trend toward recognition that it is frequently desirable to care for children, the elderly, and the sick in their homes. It was expected that the eventual acceptance of this idea by the federal government would result in greatly increased aid to agencies training and employing homemaker-home health aides.

Salary

Salaries were generally low -- oftentimes at the minimum hourly wage level. Efforts to increase salaries significantly were being made. In larger cities, some experienced homemaker-home health aides earned as much as $7,000 - $8,000 yearly.

Career Mobility

Within this field there are opportunities for assisting in training, mid-level supervision, and the assignment and record keeping of the activities of homemaker-home health aides. Some homemaker-home health aides work in a specialized setting, such as assisting a therapist in the care of physically or mentally handicapped persons.

Further Reading

None

Professional Organization Where More Information May Be Obtained

National Council for Homemaker - Home Health Aide Services, Inc.
67 Irving Place - 6th Floor
New York, New York 10003

To Broaden Your Understanding

-visit an agency employing homemaker-home health aides and talk to an aide and to a supervisor of aides

-write to schools and contact agencies which provide training

-write to the professional organization

OPERATING ROOM TECHNICIAN

The operating room technician [ORT] is a vital member of the surgical team. His/her duties are numerous and essential to the smooth functioning of the doctors and nurses involved in an operation and/or delivery of a baby. The technician functions under the direction of the operating room supervisor who is a registered nurse. Under the nurse's supervision, the technician prepares the operating room for surgery; arranging and sterilizing the equipment and instruments to be used. Supplies of such fluids as plasma, blood, and glucose are also checked and maintained by the technician, in case they should be needed. When the patient arrives, the technician assists in the proper positioning of the patient. If specimens are to be taken or dressings applied, the technician assists in these tasks. At all times the technician is there to comfort and reassure the patient.

As the operation begins, the ORT may be called upon to assist the anesthesiologist. During the operation, he/she assists the surgeon, handling all the sterilized instruments and equipment. Following an operation, the ORT helps to clean up the operating room and prepare for the nest operation.

Operating room technicians are employed in hospitals and large clinics having a surgery department. Because most training programs are either at hospitals or, in the case of community college programs, taken partially in affiliated hospitals, most technicians find employment at the hospital where they were trained.

Qualifications and Education

A student desiring to become an operating room technician should be emotionally stable and reliable. These are two qualities that are at a premium in the operating room. Often the atmosphere is quite tense, the doctors are under a lot of strain, and a patient's life may be at stake. The ORT must be able to function well under these circumstances. He/she must possess good judgement, understand and respond to directions quickly, and be able to anticipate to some extent the needs of the other members of the team. In addition, the prospective technician should have good physical stamina -- operations very often mean long hours on one's feet.

Operating room technology programs are usually one year in length and are offered throughout the country in hospitals and community colleges. The prerequisite for a program is usually a high school diploma or its equivalent.

EDUCATIONAL PROGRAMS FOR THE OPERATING ROOM TECHNICIAN - ILLINOIS

Required Special Training: Either a) classroom study and on-the-job clinical experience in a hospital or b) 1-year program for training as an operating room technician in a community college.

Operating Room Technician

Belleville Area College
Belleville 62221

Blessing Hospital
Quincy 62301

Copley Memorial Hospital
Aurora 60507

Decatur Memorial Hospital
Decatur 62526

Illinois Central College
East Peoria 61611

Kaskaskia College
Centralia 62801

Malcolm X College
Chicago 60612

Moline Public Hospital
Moline 61265

Moraine Valley Community College
Palos Hills 60465

Parkland College
Champaign 61820

Rend Lake College
Ina 62846

St. Elizabeth Hospital
Granite City 62040

St. John's Hospital
Springfield 62701

Triton College
River Grove 60171

William Rainey Harper College
Palatine 60067

OPERATING ROOM TECHNICIAN -- Further Information

Employment Prospects

In 1975, employment prospects in Illinois were excellent, and were expected to continue to be good for the next decade.

Salary

Beginning salaries for operating room technicians in the Chicago area ranged from $3.00 to $3.50 per hour in 1975. Elsewhere in Illinois salaries were somewhat lower, averaging $2.65 to $2.85 per hour. Operating room technicians with five years of work experience received about $3.75 per hour in Illinois outside of Chicago, and somewhat more in Chicago.

Career Mobility

Operating room technicians work under the direction of a registered nurse; thus there are no opportunities for capable operating room technicians to advance to supervisory positions over other operating room technicians. In some cases, an outstanding operating room technician may be assigned to a surgical team which performs very complex surgery--such as open heart surgery. Sometimes she/he will then receive higher pay. After a few years of work experience in surgery, or less often, in the delivery, emergency, or recovery rooms of a hospital, many operating room technicians return to school to become nurses. After becoming registered nurses, many of them return to work in the operating room setting, but this time with expanded responsibilities and higher pay. In a few cases, operating room technicians are not employed in a hospital, but are hired to work exclusively for one or more surgeons.

Further Reading

Or Tech, a journal published by the Association of Operating Room Technicians, Inc.

Kinsinger, Robert E., editor, Health Technicians, J.G. Ferguson Publishing Company, Chicago, 1970, pp.158-165

Professional Organization Where More Information May be Obtained

Association of Operating Room Technicians, Inc.
1100 West Littleton Boulevard, Suite 101
Littleton, Colorado 80120

To Broaden Your Understanding

-talk with operating room technicians, nurses, and surgeons (the operating room technician functions as a member of a surgical team; the interested student should try to get a good idea of the stress involved in the work of the operating room technician, and and try to understand what qualities she/he must develop in order to function as an effective worker)

-try to get volunteer or paid work experience in a hospital or nursing home

-write to schools and the professional organization

PUBLIC HEALTH PROFESSIONAL / ENVIRONMENTAL HEALTH PROFESSIONAL

The good health of our people depends as much on the prevention of illness in people and in making healthful the environment in which we live as it does on the treatment of the sick, injured, and disabled. The prevention of the conditions that result in a contaminated environment is the mutual concern of the environmental and public health professionals. These health workers have a diversity of educational experience and backgrounds.

The nation's growth and productivity have contributed to many complex environmental problems that seriously challenge man's health and well-being. Included are problems related to the pollution of air, water, soil, and contamination of food; occupational and community stresses, noise, temperature, and vibration; inadequate housing and work environments; highway and home hazards; and radiation and other hazards.

Environmental health represents a diverse area of work; thus, it draws heavily on the well-established disciplines. These include: chemistry, physics, and biology of many specialties; hydrology; meteorology; oceanography; engineering; sanitation; ecology; medicine of several specialties; law; mathematics; statistics; political science; economics; and social science.

Persons in these disciplines are engaged in the following activities related to environmental health: 1) carrying out technical and administrative-legal functions concerned with prevention and control programs, 2) planning, implementing, and directing general and specific programs; 3) conducting relevant research and development; 4) conducting investigations, surveys, and surveillance programs; and 5) teaching at all levels of education and training.

This section is concerned basically with those fields primarily related to prevention and control of disease and the delivery of direct health services to people.

The environmental engineer applies engineering and scientific principles and practices to the prevention, control, and management of environmental factors that may influence man's physical, mental, and social health and well-being.

Most engineers now enter the environmental health field at the bachelor's degree level, having completed curriculums in civil, chemical, or mechanical engineering.

The sanitarian, sometimes known as an environmentalist, applies his knowledge of the principles of the physical, biological, and social sciences in the improvement, control, and management of man's environment.

Sanitarians perform a broad range of duties. They safeguard the cleanliness and safety of the food people eat, the liquids they drink, and the air they breathe. They inspect food manufacturing and processing plants, dairies, water supplies, and other places for health hazards. They seek compliance with local regulations and with state and federal laws relating to public health. They also plan, conduct, and administer environmental health programs, and promote the enactment of health legislation.

The minimum educational requirement usually is a bachelor's degree, with emphasis on the biological, physical, and sanitary sciences.

Industrial hygiene personnel include industrial hygienists, engineers, chemists, nurses, toxicologists, physiologists, dermatologists, environmental hygienists, technicians, or other similar occupational designations. Basic

industrial hygiene activities include the recognition, evaluation, and control of those environmental factors that have an adverse effect on health and efficiency of workers in places of employment or among citizens of the community. These specialists are essentially concerned with four categories of stresses: a) toxic chemical agents such as dusts, gases, plastics, and pesticides, b) physical agents or energy stresses such as excessive noise, temperature extremes, and radiations, c) biological hazards such as infectious agents and enzymes, and d) other work-related stresses such as monotony, rigors of work process, and equipment design.

Industrial hygiene personnel examine the work environment for identification and determination of unhealthy conditions such as excessive noise and inadequate ventilation; for collection of samples for chemical analysis; and for recommendations for the control of hazardous conditions.

In federal agencies and in large industrial companies, they may also conduct research studies on toxicity of materials, analytical methods, and field instrumentation. In such organizations, occupational health programs may also be staffed with physicians, nurses, toxicologists, radiation specialists, and laboratory personnel in offering a comprehensive preventive health program for workers. Industrial hygiene personnel in state and local official agencies provide various consultation and technical services to workplaces within their jurisdiction.

Environmental industrial hygiene personnel are employed by manufacturing and other industrial and commercial enterprises, insurance companies, universities, federal agencies, and state and local official agencies.

Radiation protection personnel at the professional level include health physicists, engineers, chemists, biologists, and other scientific and technical occupations with special training in the health aspects of radiation. The radiation exposure problems with which they are concerned are associated with the use of electronic products, such as X-ray machines, particle accelerators, microwave ovens and color television sets, radioactive materials, and nuclear reactors, as well as environmental radioactive contamination. Their work is conducted principally in industrial, medical, research, or educational institutions that use radiation sources, and in health agencies that have responsibility for protection of the public health.

State and local public health departments are the official government agencies responsible for providing leadership in making the community a healthier and safer place in which to live. The health department may administer programs concerned with general health services, specific medical care services, and/or environmental control related to health. With few exceptions, the health officer or commissioner is a physician who usually has had public health training and experience. The health officer, as chief executive of the health department, administers the direct services for which responsibility is assigned to his department by law. He also assumes leadership in stimulating community-wide cooperation and action to strengthen gaps in health practices and services in the area.

In larger public health departments, the work of the health officer is bolstered by a public health administrator. This executive has responsibility for organizing, planning, and directing such functions as budget, personnel, procurement, legal and related administrative services, and perhaps statistics, research, and other professional programs. He has professional competence in administrative practices and procedures,

particularly as they relate to public health programs. His training may have been in a school of public health.

A specialist frequently included on the staff of larger health departments is the health program analyst. This person is a planning specialist --a professional expert in his own right, with basic training in some field such as statistics, economics, or sociology. He may also be known as a public health analyst or specialist.

The director of each program in the health department probably has on his staff a health program representative. This position requires someone with a bachelor's degree, although he may not be trained in a specific health profession. This public health representative or public health advisor takes part in promoting public public participation in new health services, program planning, and fact gathering.

Another important specialist in the public health department is the public health nurse. Working in settings such as community clinics, hospitals, schools, industry, and visiting nurse associations, it is the responsibility of the public health nurse to provide family- and community-centered services such as the provision of health education and prenatal care information for expectant mothers, caring for bedridden patients, making referrals to community social service agencies and to physicians.

Qualifications and Education

The several fields described in this section require a variety of personal and educational qualifications.

The following pages, 9-A-4 to 9-A-6, "Educational Programs in Public and Environmental Health," are only a partial listing of educational programs which are appropriate for persons considering public and environmental health professions. Therefore, students interested, for instance, in public health nursing or environmental engineering, should also learn about educational programs more directly to the field (that is, nursing or engineering, in the cases above).

EDUCATIONAL PROGRAMS IN PUBLIC AND ENVIRONMENTAL HEALTH - ILLINOIS

(Persons with a college degree in environmental or public health may pursue a variety of kinds of employment, depending on their educational background, their interests, and the job market)

Public Health

Governor's State University Park Forest South 60466	(prerequisite: 2 years of college; offers bachelor's degree in "Human Ecology" with an orientation in environmental planning)
Northwestern University Chicago 60611	(prerequisite: a bachelor's degree, preferably with a background in the sciences; program is 1 year, after which a master's in public health (M.P.H.) is awarded
School of Public Health University of Illinois at the Medical Center Campus	(offers two programs-prerequisite for both: a bachelor's degree preferably with a background in the sciences.1) 1-year program, after which a master's in public health (M.P.H.) is awarded, 2) 2-year program after which a master of science in public health (M.S.P.H.) is awarded

Environmental Health

Governor's State University Park Forest South 60466	(prerequisite: 2 years of college; offers bachelor's degree programs in environmental analysis and environmental conservation; offers master's degree programs in environmental analysis and environmental management)
Illinois Institute of Technology Chicago 60616	(offers an environmental engineering major through the doctoral level)
Illinois State University Normal 61716	(offers a bachelor's degree program only in environmental health through the Center for Allied Health Professions)
Northwestern University Evanston 60201	(the Engineering Department of the Technological Institute offers an interdisciplinary bachelor's degree program in environmental engineering)

Environmental Health, continued

Southern Illinois University Carbondale 62901	(offers an option - "Thermal & Environmental Engineering" - in the engineering major. Program is through the master's degree level)
University of Illinois Urbana 61801	(curriculum in general engineering offers a concentration in environmental quality; department of civil engineering offers master's and doctoral degree programs in "Environmental Engineering in Civil Engineering"; also, the Environmental Studies Program provides coordination and support for the development of inter- and multidisciplinary programs of research, teaching, and public services in the general area of environmental studies)

Environmental Health Technician

(Some of the programs listed below give preparation only in water technology; others include instruction in the areas of air and food as they relate to environmental health)

Carl Sandburg College Galesburg 61401	(1-year certificate program in public service - water division option)
Loop College Chicago 60601	(certificate program [22 semester hours in length] in wastewater technology)

Environmental Health Technician, continued

Olive-Harvey College Chicago 60628	(2-year associate degree program plus 2 certificate programs (11 and 15 semester hours in length) in environmental control technology)
Prairie State College Chicago Heights 60411	(2-year associate degree program in air, water, and wastewater control technology)
Rock Valley College Rockford 61101	(2-year associate degree program in occupational health and safety technology — a program concerned with the detection and remedying of health hazards in work settings)
Shawnee College Ullin 62992	(three 1-year certificate programs 1) wastewater treatment technology 2) water treatment technology, 3) water/wastewater technology)
Triton College River Grove 60171	(2-year associate degree program in occupational safety and health --a program concerned with the detection and remedying of safety and health hazards in work settings)

PUBLIC HEALTH PROFESSIONAL / ENVIRONMENTAL HEALTH PROFESSIONAL -

Further Information

Employment Prospects

There is a need for capable public and environmental health professionals in Illinois as well as elsewhere in the nation. Our society's increasing awareness of the importance of maintaining the health of all our people means there is a growing need for public and environmental health workers.

Salary

There are a great many kinds of work included under the heading of public and environmental health professionals. The education and experience necessary to enter these fields differs greatly. Therefore, it is not possible in a paragraph or two to meaningfully discuss salaries. Salaries are comparable to those earned by health workers with similar background and experience.

Career Mobility

A number of kinds of public and environmental health work requires skills possessed by persons with bachelor's degrees. On the other hand, many jobs which require the conducting of research, the supervision of others, or the administration of a department or organization, require advanced college degrees and successful related work experience. Persons with the appropriate combination of educational background and work skills can find opportunities for advancement within a single organization or in other organizations.

Further Reading

Weiss, Laura Burstein and Spence, Ann Bennett, A Guide to the Health Professions, Cambridge, Massachusetts: Harvard University Printing Office, September 1973, pp. 11-26, 45-58

Journal of Environmental Health, a journal published by the National Environmental Health Association

American Journal of Public Health, a journal published by the American Public Health Association

Daniel M. Wilner, Rosabelle Price Walkley, and Lenor S. Goerke, Introduction to Public Health, 6th edition, 1973, New York: Macmillan and Company

PUBLIC HEALTH PROFESSIONAL / ENVIRONMENTAL HEALTH PROFESSIONAL -

Further Information, Continued

Professional Organizations Where More Information May Be Obtained

Illinois Environmental Protection Agency
2200 Churchill Road
Springfield, Illinois 62706

National Environmental Health Association
1600 Pennsylvania Street
Denver, Colorado 80203

American Public Health Association
1015 18th Street, N.W.
Washington, D.C. 20036

Association of Schools of Public Health
1825 K Street, N.W., Suite 707
Washington, D.C. 20036

To Broaden Your Understanding

-visit your local (or nearest) public health department to get an idea of the kinds of health services it provides

-obtain volunteer or paid work experience in a health care facility

-write to schools and professional organizations

ENVIRONMENTAL HEALTH TECHNICIAN

The great amount of attention recently accorded our environment and man's pollution of it has given rise to a new technical health worker: the environmental health technician. A graduate of a 2-year community college program in environmental health technology may work with scientists, engineers, sanitarians, urban planners, or other specialists concerned with environmental protection, gathering data for use in determining ways to improve the quality of our environment and bring a halt to its growing decay. The duties of the environmental health technician are varied. They may involve working in the field, gathering data and samples; they may involve extensive laboratory testing and record keeping. The inspection of food processing plants, restaurants, cafeterias, public restrooms, and public swimming areas or the operation, maintenance, and supervision of waste water and filtration plants are other activities that involve the environmental health technician.

Environmental health technicians can be found working in public health departments, housing departments, hospitals, university environmental health departments, nuclear power companies, industry, and agriculture.

Qualifications and Education

A strong interest in and concern for the environment are primary qualifications if one is to gain satisfaction from this field. In many cases an enjoyment of the outdoors is helpful as much of the technician's work may be done outside. For those employed in a laboratory setting, an aptitude for performing technical laboratory procedures would be useful. In many work situations, it is important for the health technician to record information, analyze and summarize it in writing, and then present it orally in a persuasive manner.

Education for becoming an environmental technician involves 2 years of study at a community college in the field of environmental health technology. High school courses in science (biology, chemistry and/or physics) and mathematics (algebra and geometry) would be good preparation for later coursework taken at the community college level. A college program in environmental health technology would probably include additional chemistry and math as well as zoology, microbiology, English and public speaking, and courses directly related to the field such as air pollution control, water pollution control, food and milk sanitation, and environmental health administration.

ENVIRONMENTAL HEALTH TECHNICIAN - Further Information

Employment Prospects

In 1975 employment prospects for environmental health technicians were quite good. It was believed that they would improve somewhat in future years.

Salary

In 1975 beginning salaries for graduates of 2-year programs in environmental health were between $7,000 and $9,000 per year. Typically, technician salaries increased slightly with each year of work experience.

Career Mobility

In many cases, the scope of the responsibilities of environmental health technicians does not increase with accumulated experience. Technicians perform a great variety of duties, oftentimes out-of-doors. Promotion to supervisory positions is not likely without the completion of a bachelor's degree in environmental health or a related field.

Further Reading

Journal of Environmental Health, a journal published by the National Environmental Health Association

Professional Organization Where More Information May Be Obtained

National Environmental Health Association
1600 Pennsylvania Street
Denver, Colorado 80203

To Broaden Your Understanding

-visit your local public health department and talk to the technicians working there about their work

-obtain paid or volunteer employment with your local health department

-write to schools and the professional organization

It is the function of the health educator to give people the facts about health and disease so they will act for their own well-being and that of their families.

The health educator tells people about the dangers of smoking so they will be persuaded to quit, the importance of regular health checkups so they will get them, the hazards of overweight so they will eat sensibly, and the importance of polio "shots" so they will get them.

This states the function of the health educator in simple terms but the process is much more complicated.

The health educator seldom talks directly to the people he hopes to influence. He works, instead, through a wide variety of intermediaries in the community—teachers, club leaders, health officers, public health nurses, trade-union program directors, Scout leaders, community group leaders, and others. Through these intermediaries he reaches a much larger audience than he would by himself. There is, however, another reason for working through them. These are "opinion molders"; they have a personal relationship with those being educated and are therefore likely to have a greater influence with them.

The health educator will meet with groups of these intermediaries and work out health education programs with them to be incorporated in their regular daily activities. He also prepares or directs the preparation of guides for conducting these educational activities and the materials (leaflets, films, exhibits, slides, posters, etc.) that are going to be used.

The health educator also works with another type of intermediary—the mass media (newspapers, magazines, radio and television, trade newspapers, organizational newsletters, etc.). He either prepares or directs the preparation of the appropriate articles, features, photographs, which can be used by the media, or he works with the writers, editors, or program directors so they can prepare it. As a result, the influence of the health educator is extended to vast audiences who could not otherwise be reached.

Admittedly, contact with the public through the media is less desirable than personal contact. Nevertheless, it is the maxim of health education, as of other educational efforts, that many methods are used to complement and reinforce each other and to have a cumulative effect.

The ultimate goal of health education is action—getting the person being educated to take the necessary steps for preservation of health or safety. But this goal is not always achieved. Most smokers, for example, keep on smoking no matter how many times they have had the danger pointed out to them. Few people use their auto safety belts, despite the repeated messages on television on the importance of using them. The dangers of alcohol and drug abuse are being repeatedly dinned into the minds of young and old, yet alcoholism and drug addiction continue to increase. Considerable health education goes on with the populations of "inner cities" and "ghettos." Yet, much of it is ignored.

The educator has recognized that it is not enough just to point out the hazards of a particular practice or the advantages of another. There are all sorts of obstacles to perception and appropriate action. These might be emotional resistances, language barriers, social and economic barriers, psychological blocks, and so on.

Whatever they are, it is the job of the health educator to identify and then devise methods to overcome them or sidestep them. Otherwise, education will have no effect, or, to put it more properly, education will not take place, since education is more than information—it is successful motivation for effective action.

To get at the bottom of these resistances, the health educator may use various techniques of investigation: interviews, surveys, community studies, together with the insights gained from psychology and sociology.

A basic tenet of the health educator is that final decisions about health practices should be made by the individuals involved. Nevertheless, he accepts a responsibility to provide access to all sources of information and experiences needed by the individual so he can relate desirable health practices to his personal goals, aspirations, and values—the things he cares about.

The health educator thus serves as a psychological stage-setter—stimulating people in the community to recognize health problems of which they may be unaware and to work for their solution. Such problems might have to do with pollution of the environment, chronic disease, overpopulation, drug abuse, or any of hundreds of ills which plague our society today. The health educator knows that constructive group action can often accomplish wonders in behalf of health. Even more important, when people themselves work together to solve a problem of common concern, they will arrive at the solution which will work for them.

Moving along with an interested group when it is ready to act, the health educator will help its members set up effective working relationships with other interested groups in the community—schools, churches, health agencies, welfare organizations, labor unions, and the like. Perhaps the health educator will assist them in organizing a conference, planning a neighborhood cleanup campaign, or developing a television series dramatizing poor health conditions in farm labor camps. He may contact resources, coordinate interagency efforts, or administer other aspects of the program. Whatever his duties may be in any particular case, his aim is to encourage more effective individual and group action designed to maintain and improve the health of people throughout the community.

The health educator is prepared to use any number of very different methods of communication—whatever the situation calls for. He is expert in a variety of individual, group, and community educational approaches, as well as in how a wealth of educational media and materials can be used most effectively. He experiments with new educational techniques, such as closed circuit television and teaching machines, to find how they can be utilized optimally in the health field. Sometimes he helps a group create its own educational materials—an experience which often leads to greater learning than could ever result from exposure to the most polished professional teaching aids.

Sometimes the problems in taking health action lie not with the community, however, but with the people providing health services. Clinic hours may be arranged more for the convenience of the professionals than of the public. Clinic workers may be curt and impersonal in their treatment of the people they serve. Advice may be given in technical terms rather than in language that people can easily understand. In those cases, the health educator can play an important role by helping other health personnel plan and deliver health care in ways which the community can and will use. Similarly, the health educator often has a job to do in educating legislators and other policymakers that consumer interests must be considered in planning and funding health programs.

With major changes taking place in the delivery of health care at local, regional, and national levels, participation of health educators in planning groups is increasingly in demand. By seeking the involvement of all persons who have an interest in the problem, the health educator helps assure that it is understood from each of the many dimensions which bear on its solution. He utilizes group skills and understandings to aid each member of the planning team express his own ideas and listen to other points of view. He helps define common goals and stimulates and guides discussion as necessary to help the group reach its own decisions and determine how they will be carried out. Thus, whether helping a ghetto neighborhood to plan its own health center or helping representatives from State agencies to agree on needed regional medical facilities, the health educator helps people to help themselves by bringing needs and resources together to create new partnerships for health.

Frequently, improving health care involves training—for health workers who need to keep abreast of new knowledge in their own professional disciplines through continuing education; for young people entering new health careers; for neighborhood health aides who will help to improve health communications among the poor; for citizen volunteers who are ready to assume new community leadership. Here again, the health educator can contribute to better health by consulting on the development of training programs, by suggesting creative methods, and even by training the trainers themselves to be better teachers.

Health educators, then, are modern pioneers—seeking new understanding into human behavior, new ways to apply this knowledge in health education, and new approaches to building stronger and healthier communities.

Qualifications and Education

Health education is a relatively new profession; consequently, individuals with many kinds of backgrounds have been and are now working as health educators. Some have strengths in administration or social welfare, or public information, or community organization. Some were at one time in nursing, teaching, environmental health, and similar occupations. Many of these people, who saw this new field of education developing and liked its looks, reinforced their college background where necessary, especially in the physical and social sciences and education. Some went on to professional study in the field of health education.

Today the requirements for becoming a qualified health educator are more exacting, and all the signs point in the direction of strengthened professional standards. Leadership position in the field require a master's degree. This includes training in fundamental public health areas, such as disease control and environmental health. It also includes in-depth preparation in educational program planning and theory and methods analysis of health education problems. Most master's degrees in health education are offered by schools of public health, although a few universities without such schools have

recently been accredited to provide such training. Many of these institutions have available financial assistance of one sort or another to enable deserving applicants to complete their professional training.

An increasing number of colleges and universities are now offering a bachelor's degree in community health education. These programs (with instruction in the biological and social sciences and basic health education skills) prepare the student for many community jobs as well as for graduate study if he so desires. A bachelor's degree with a blend of broad, solid courses in physiology, bacteriology, chemistry, biology, educational and social psychology, sociology, and cultural anthropology also provides the basic underpinnings needed for admittance to master's degree programs.

More and more openings also are becoming available for health education aides and assistants. Background requirements for such positions vary, and training usually takes place on the job. Nevertheless there is a considerable interest in developing a 2-year college program for health education assistants, leading to an associates of arts degree. As with the bachelor's degree program, the A.A. degree which is contemplated would prepare the student for a job immediately upon completion of training, as well as provide him with the basic schooling necessary for admittance to the next step of the career ladder.

Doctoral degrees—traditionally the highest academic degree available—are also offered in public health education. Many doctors in this specialty are needed now, and more are expected to be needed in the future, to meet rapidly growing demand for research and evaluation skills in health education and for teaching in institutions of higher learning around the world.

Students planning a career in this field should obtain information about the educational requirements of the schools in which they are interested. Some schools offering the master's degree also require a certain amount of practical work experience prior to professional education. Some agencies have special paid positions for career development in health education, and others offer exciting jobs for volunteers. Getting involved in a community health project, a neighborhood health center, or a hospital clinic is also good experience for the would-be health educator. Opportunities to develop skills in communication and public speaking, leadership techniques and group work, community organization, and educational methods should all be welcomed.

Like workers in many other health occupations, the health educator needs to enjoy people and work well with them. But something more is needed in terms of personal relationships. He must be able to play a variety of roles successfully according to the demands of the situation. At times he will work in a behind-the-scenes capacity, helping others start and carry out projects for which they properly get the credit. At times he must be able to help people caught in conflict understand each other's point of view while he maintains the trust and good-will of all parties concerned. And at times he must be the people's advocate until they come forward to speak for themselves.

Since the health educator works with people, his greatest satisfactions come from people—from seeing them take action which will lead to better individual and community health, from watching them develop their ability to solve their own problems, from sharing their sense of achievement in doing something they didn't know they could do.

EDUCATIONAL PROGRAMS IN HEALTH EDUCATION - ILLINOIS

Required Special Training: Depends on the kind of employment desired; generally, a bachelor's degree in health education is the minimum requirement for employment. Teaching health occupations education or hygiene in the public secondary schools requires teacher certification.

Health Educator

Eastern Illinois University Charleston 61920	(bachelor's degree program)
George Williams College Downers Grove 60515	(bachelor's and master's degree programs)
Illinois State University Normal 61761	(bachelor's degree program)
Southern Illinois University Carbondale 62901	(bachelor's and master's degree programs)
Southern Illinois University Edwardsville 62025	(bachelor's degree program)
Department of Health and Safety Education University of Illinois Urbana 61801	(bachelor's degree programs in school health education, community health education, school safety education, and public safety education; master's degree programs in community health education and public health education; doctoral program in health education)
Western Illinois University	(bachelor's degree program; master's degree program in community health education and school health education)

HEALTH EDUCATOR -- Further Information

Employment Prospects

There is a growing need for community (public) health educators in Illinois and elsewhere. New programs and services such as Comprehensive Health Planning, Health Systems Agencies, Health Maintenance Organizations, Regional Medical Programs, Neighborhood Health Centers, Model Cities Health Projects, Maternal and Infant Care Programs, Community Mental Health Centers, Migrant Health Projects, and Patient Education all have included health education positions in their staffing plans. In addition to these new program developments, a variety of special projects on smoking and health, drug abuse, alcholism, nutrition, family planning, safety, environmental pollution control, and consumer protection have required the services of community health educators. In 1975 the employment outlook in Illinois and nationally was good and is expected to remain so during the next decade.

Salary

Starting salaries for those with a bachelor's degree in community or public health education was approximately $9,000 per year. Persons with a master's degree in community health education received beginning salaries of $10,000 to $14,000. Experienced individuals earned from $15,000 to $27,000 annually.

Career Mobility

Persons interested in community health education should eventually plan to obtain a master's degree in public health (MPH) or a master of science degree in public health (MSPH), preferably from one of the academic institutions accredited by the American Public Health Association. The attainment of such a degree would enhance the individual's chance of obtaining a position of significant responsibility.

Further Reading

American Journal of Public Health, a journal published by the American Public Health Association, Inc.

Health Education Monographs, a journal for public and community health educators

Matthews, M. "Some Trends in Schools of Public Health," American Journal of Public Health, March 1975, pp. 291-292

Professional Organizations Where More Information May Be Obtained

American Public Health Association, Inc.
1015 Eighteenth Street, N.W.
Washington, D.C. 20036

Society for Public Health Education, Inc.
655 Sutter Street
San Francisco, California 94102

To Broaden Your Understanding

-visit and talk with a public health educator in your local, county, regional or state health department

-write to professional organizations and schools

HEALTH OCCUPATIONS TEACHER

The health occupations teacher is a trained allied health worker who instructs others in his/her profession. The duties of the health occupations teacher vary with the level of the educational program in which he is involved. In a high school health occupations program, the teaching done may be aimed at introducing students to a variety of health occupations and/or teaching the basic skills of some health professions. At the community college and college or university level, the health occupations teacher usually teaches knowledge and skills of his specific allied health profession. For example, a respiratory therapist would teach the theory of blood gases, as well as how to use machines to measure blood gases.

Depending on previous experience, education, and interests, a teacher of an allied health profession may choose to be a teacher or administrator in a high school, community college, college, or hospital setting.

Qualifications and Education

Allied health workers thinking of becoming health occupations teachers should be good practitioners and be enthusiastic about their health professions. In addition, they should have a strong desire to educate persons to becoming capable, empathic health team members. They should be responsible, cooperative, and able to establish good rapport with their students.

Educational requirements vary; a minimum of a bachelor's degree is necessary for teaching in high schools.

(Prerequisite: educational preparation as a health practitioner; experience desirable)

Required Special Training: a minimum of a bachelor's degree in health occupations education

Health Occupations Teacher

Governor's State University
Park Forest South 60466

(offers bachelor's degree program in "allied health sciences education" -- prerequisite: 2 years of college; offers master's degree program in "allied health sciences education")

Department of Vocational and Technical Education
University of Illinois
Urbana 61801

(bachelor's degree program prepares allied health practitioners for teaching in secondary school health occupations programs or for teaching others to be practitioners in an allied health profession; master's degree program is for teaching others to be practitioners in allied health professions, or administering such an educational program, usually conducted in community colleges, universities, and hospitals)

HEALTH OCCUPATIONS TEACHER - Further Information

Employment Prospects

With the expansion of certification and accreditation requirements in the health professions and the need for qualified educators of these health professionals, the outlook for employment in 1974 was excellent.

Salary

In 1974 salaries varied greatly, depending on previous work experience, academic qualifications, and the nature of the employing institution.

Career Mobility

Competent, experienced health occupations teachers may rise to teaching positions in institutions which confer more prestige and higher salaries. Teachers may assume administrative responsibilities.

Further Reading

None

Professional Organizations Where More Information May Be Obtained

(there is no professional organization; interested students should write to the educational programs listed on the previous page)

To Broaden Your Understanding

-visit a health occupations teacher at a high school and a college

-get experience in some form of teaching activity to see if you have the interest and potential to become an effective teacher

-write to schools

Medical Illustrator

At one time, the work of the medical illustrator was limited to drawings and charts for medical journals, textbooks, monographs, and similar publications.

Today the medical illustrator's activities have a much broader scope. He interprets medical information by many kinds of visual presentations. He may use drawings, models, photography, exhibits, and television. He works with physicians, research scientists, educators, authors, and others to record facts and progress in many health fields.

Illustrators may work with specialists in subjects such as anatomy (structure of the body), pathology (study of diseases), and embryology (development of the body). Medical education relies heavily on the medical illustrator's work. The health professions depend on the illustrator to produce visual presentations for their own use and for the public. Scientific illustrations are now widely used in general magazines, professional journals, textbooks, exhibits, and pamphlets.

The medical illustrator's art combines minute accuracy with technical versatility. He works in many art media—water color, crayon, pen and ink, air brush, pencil, wax, plaster, plastics.

Medical artists either work in a medical environment (hospital, clinic, medical school, research institute) or they free lance. Some combine the two.

Qualifications and Education

Students intending to become medical illustrators should be science minded—with a creative interest in science and with the scientist's capacity for observation and study. They must have the ability to observe with accuracy, visualize with imagination, and persevere in application. Medical illustrating is not a career for everyone interested in art. It requires these special combinations of talent.

Only five universities in the nation offer programs in medical illustration--either at the bachelor's or master's degree level. They are between five and seven years in total length. The first years of these programs stress the biological sciences and art; the final years include human anatomy, physiology, pathology, and instruction in the media and techniques used in medical illustration.

(Prerequisite: High school diploma or its equivalent)

Required Special Training: Either a) 5-year college program, of which the final 2 years or more are devoted to medical illustration, or b) a bachelor's degree in some field plus a master's degree in medical illustration of approximately 2 years in length

Medical Illustrator

School of Associated Medical Sciences
University of Illinois College of Medicine
Chicago 60612

(a 5-year program)

Employment Prospects

In 1974, employment prospects for medical illustrators were good. Employment opportunities in medical art tended to be in the major urban areas.

Salary

In 1974 beginning salaries varied greatly, but yearly incomes of $10,000-$14,000 were common. The salaries of experienced persons varied greatly as well. The highest salaries were earned by freelance illustrators; top incomes were $50,000-$100,000.

Career Mobility

Experienced medical illustrators may teach or administer in a university medical art program or perform a variety of illustration assignments in a hospital setting or veterinary clinic. Highly skilled persons may limit their work to freelance assignments; pharmaceutical companies pay the highest salaries for the services of freelance artists. For medical illustrators who wish to work in a non-medical field, their background is such that they can seek employment in technical and graphic illustration.

Further Reading

Journal of Biocommunication, a journal published by the Association of Medical Illustrators and the Health Sciences Communications Association

Nakamura, Julia V. and Massy M., Your Future in Medical Illustration: Art and Photography, Richards Rosen Press, New York, 1971

Odgers, Ruth F. and Wenberg, Burness G., editors, Introduction to Health Professions, The C.V. Mosby Company, St. Louis, 1972, pp. 167-172

Professional Organization Where More Information May Be Obtained

Association of Medical Illustrators
6650 Northwest Highway
Chicago 60631

To Broaden Your Understanding

-talk to a medical illustrator about his/her work (contact a large hospital, medical center, or university to find the name of a nearby illustrator)

-write to the professional organization and the school

Medical Librarian

Year after year a vast store of knowledge accumulates in the many branches of medicine, in medical research, and in scientific research related to medicine. This knowledge is recorded in journals and other periodicals, text books, monographs, and other publications.

These publications, coming from every part of the world, are collected in the medical library where they are made available for professional people needing them for various purposes. What is discussed in Bombay must be made available as quickly as possible to the health professionals and students in London and New York.

Doctors, nurses, dentists, pharmacists, therapists of various kinds, technicians, and health profession students may come to the library for texts or monographs on a subject of special interest. Or they may search the journals for background material or for research reports on the latest developments in their field.

The medical and scientific journals would also be used by research scientists or research students, since these are the main source of information on what has already been done, and what is currently being done in the field in which they are working.

Ordering, classifying, indexing, and keeping files and loan records of the materials in the library is basic, but it is only the beginning of the job.

Readers and researchers frequently call upon the specialized skills of the librarian to track down information on a particular subject. The material may be in obscure documents or scattered in many places, requiring a bit of detective work to find it. If the document is in another language, the librarian may be called upon to obtain a translation. Frequently, the librarian is called upon to compile bibliographies or provide a comprehensive review or abstract on a particular subject.

Aside from serving in person, the librarian also responds to mail or phone inquiries. Wherever the question comes from, success in finding the answer depends largely on the librarian's skill. Librarians may have only very general knowledge of medicine, but must know how and where to locate every type of information or material on short notice.

Medical librarians work in such places as schools of medicine, nursing, dentistry, and pharmacy; hospitals; research institutes; pharmaceutical houses and similar industries; health departments; professional societies; and voluntary health agencies.

In a hospital, the service offered by the medical library will depend on many factors: whether the hospital conducts research and training, the categories of illness treated, and others. In some hospitals, there are separate libraries: the medical library, the nursing school library (if there is a nursing school there), and the patients' library. More and more, however, these are being grouped together under the direction of one chief librarian, with assistants in charge of the separate services.

In the school of nursing, the librarian is considered a member of the faculty. She is concerned with developing the school's curriculum, meeting the reference requests of graduate and student nurses, and providing both groups with recreational reading.

The librarian also plays an important role in the hospital rehabilitation service.

The librarian serving patients will provide book cart services, develop programs of interest for patients who are up and about, and visit new patients to learn about their reading interests.

Qualifications and Education

To be happy and successful as a medical librarian, the prospective student needs to have a genuine respect for the printed word—for the publications that record the forward march of science. But the librarian deals with people as much as with books. Friendliness and the capacity to understand and share other people's interests are important. A sense of humor, a well-developed curiosity, and good imagination are great assets.

The bachelor of arts or bachelor of science degree is required for entrance to any of the 53 schools of librarianship in the United States accredited by the American Library Association.

A program taking 1 calendar year beyond the bachelor degree leads to a master of science or a master of arts degree in librarianship. Since admission requirements of the individual schools vary slightly, the candidate is advised to write to the school for specific information in this area. Many schools offer postgraduate programs which may lead to a doctor of philosophy or doctor of library science degree.

Good reading knowledge of at least one foreign language is necessary and a fair degree of fluency in several is helpful.

(Prerequisite: bachelor's degree, preferably with an emphasis in the sciences).

Required Special Training: A 1-year program in medical librarianship after which a master's degree is awarded.

Medical Librarian

Rosary College
Chicago 60305

University of Chicago
Chicago 60637

University of Illinois
Urbana 61801

MEDICAL LIBRARIAN - Further Information

Employment Prospects

In 1974 the number of job openings in medical librarianship was smaller than in previous years. However, graduates of Illinois educational programs in medical library science were able to find positions. In the coming years with increased federal support for health care, it is expected that there will be more employment opportunities for medical librarians.

Salary

In 1974 beginning annual salaries for medical librarians working in medical school libraries and in hospitals were $9,000 to $10,000; in governmental agencies, $11,000; and in pharmaceutical companies, $12,000. Experienced librarians with increased responsibilities earned salaries of $15,000-$30,000.

Career Mobility

Many medical libraries employ a number of medical librarians at several levels of responsibility. Medical librarians wishing to do related work can move into other areas of librarianship or into the fields of medical communication or medical publishing. Persons outside the medical library profession and who desire to enter the field will find a bachelor's degree background in the sciences most helpful.

Further Reading

Science Research Associates, Inc. Medical Librarians, Occupational Brief No. 218, Chicago, 1973

Professional Organization Where More Information May Be Obtained

American Library Association
50 East Huron Street
Chicago, Illinois 60611

Medical Library Association, Inc.
919 North Michigan Avenue
Chicago, Illinois 60611

To Broaden Your Understanding

-talk to a librarian about his/her work
-visit the medical library of a college of medicine, pharmaceutical company, or hospital
-write to schools and professional organizations

Medical Record Administrator

It is the responsibility of the medical record administrator to see to it that for each patient in the hospital a complete, continuous, and accurate record is kept from the time of his admission to the time of discharge.

A great deal of material must be gathered and checked: patient's medical history, results of the physical examination, diagnosis, laboratory findings, medication, temperature readings, progress, notes, and others.

From this record all hospital professionals involved in the care of the patient can tell at a glance what treatment has been carried out and what treatment is being planned.

When a patient is discharged from a hospital, his medical record is sent to the hospital's medical record department. There it is checked for accuracy and put in files for future use in the event the patient should return.

To maintain the accuracy of the medical record, the medical record administrator makes sure that uniform medical terminology is used by the various members of the staff who make entries in it.

The medical record administrator is responsible not only for the content of each record but also for maintenance of all of the records in an efficient medical records library. She follows a recognized classification system in coding diseases, operations, and other factors. She indexes information from the records, sets up catalogs, and controls the traffic in case records.

The medical record administrator also prepares medical and statistical reports upon request. Most hospital administrators request daily, weekly, and monthly reports from the medical record department. These reports are used in directing operations and formulating policy.

At present only 4,000 registered medical record administrators are employed in this field. About 10,000 facilities need their services. Job opportunities exist in hospitals, clinics, neighborhood health centers, medical research organizations, health departments, nursing homes, and government agencies. There are also teaching positions in accredited schools for medical record technicians.

Qualifications and Education

Important qualities in a medical record administrator are orderliness, accuracy, and precision. Since the duties involve working with very busy physicians and occasionally with worried patients and their families, poise and patience are essential traits. The obligation to keep medical records confidential requires a strong sense of responsibility and discretion.

A minimum of 4 years of study following high school is required to become a professional registered medical administrator. There are alternate programs of study. One is a 4-year program in a college or university giving a bachelor degree in medical record administration or medical record science. The other is a 12-month course in a hospital certificate school following 4 years of college study with specific background in the biological sciences. On completion of either of these programs the graduate is eligible to take the national registration examination for registered record administrator, signifying professional status in the medical record field.

EDUCATIONAL PROGRAMS IN MEDICAL RECORDS - ILLINOIS

Medical Record Administrator

Required Special Training: Either a) bachelor's degree in medical record administration or b) 1-year certificate program in medical record administration for those already having a bachelor's degree in another field. (There are no certificate programs in Illinois)

School of Associated Medical Sciences
University of Illinois
at the Medical Center
Chicago 60612

(Prerequisite: 3 years of college)
Program is 12 months in length after which bachelor's degree is awarded

Illinois State University
Normal 61761

(Prerequisite: 2 years of college)
Program is 2 years in length after which bachelor's degree is awarded

Medical Record Technician

Required Special Training: Either a) 2-year degree program in medical record technology or b) 1-year correspondence course from the American Medical Record Association or c) 1-year hospital diploma program in medical record technology (there are no 1-year hospital programs in Illinois).

Belleville Area College
Belleville 62221

Central YMCA Community College
Chicago 60606

Illinois Central College
East Peoria 61611

College of Lake County
Grayslake 60030

Moraine Valley Community College
Palos Hills 60465

Oakton Community College
Morton Grove 60053

Thornton Community College
South Holland 60473

MEDICAL RECORD ADMINISTRATOR - Further Information

Employment Prospects

In 1974 there were approximately 300 medical record administrators in Illinois. The demand for administrators was quite strong and employment prospects over the next ten years appeared good.

Salary

In 1974, starting salaries for inexperienced medical record administrators were about $9,000 to $10,000 in large Illinois cities and somewhat less in smaller communities. Experienced administrators earned considerably more than beginning ones.

Career Mobility

Medical record administrators who wish to consider other health-related work may enter post-graduate college programs in education, public health, health education, or business administration and after that find employment as a medical record educator or as a medical record administrator in government or other organizations. They may find positions as instructors in medical record technician programs in community colleges or medical record administration programs in universities. Frequently, they serve as part-time consultants to the record departments of smaller hospitals and nursing homes.

Further Reading

Medical Record News, a journal published by the American Medical Record Association

Odgers, Ruth F., and Wenberg, Burness G., editors, Introduction to the Health Professions, 1972, p. 103-108

Professional Organization Where More Information May be Obtained

American Medical Record Association
875 North Michigan Avenue, Suite 1850
Chicago, Illinois 60611

To Broaden Your Understanding

-visit a medical record department in a hospital and talk to the people working there about their work
-write to schools and the professional organization

Medical Record Technician

The medical record technician works in the medical record department of a hospital, nursing home, or clinic. Like the medical record administrator who supervises her/him, the medical record technician must maintain accurate records of patients. This information is needed by patients, physicians, insurance companies, health care facilities, and in cases of federal health programs like Medicare, the federal government.

Medical record technicians in smaller health care facilities will probably perform a wide range of tasks and those in larger hospitals may specialize in only two or three aspects of medical record work. Among the duties the medical record technician may perform are: filing medical records, reviewing medical records for completeness and accuracy, typing medical reports, compiling statistics, and supplying health information to other persons or agencies.

Qualifications and Education

Since the medical record technician's work consists largely of keeping accurate records, she/he must be able to handle large amounts of information without often making mistakes. Such office and clerical tasks require patience. In order to be reasonably satisfied with medical records work, one should enjoy and have ability in performing clerical tasks involving considerable detail and requiring a high degree of accuracy.

There are three educational routes to becoming a M.R.T. The most common method is completion of a two-year program in a community college. Less common, and probably limiting chances for advancement in the field, is the one-year course offered by a few hospitals and community colleges (there are no such programs in Illinois). Finally, the American Medical Record Association offers a correspondence course enabling the high school graduate to become a medical record technician.

MEDICAL RECORD TECHNICIAN - Further Information

Employment Prospects

In 1974 there were about 400 medical record technicians in Illinois. Technicians were employed as heads of medical record departments in smaller hospitals and clinics or worked under the direction of medical record administrators in larger medical record departments. In 1974, the demand for technicians was quite strong and job prospects for the next ten years appeared good.

Salary

In 1974, beginning salaries for inexperienced medical record technicians in Illinois were about $7,000 to $9,000. Experienced technicians earned considerably more than beginners working in the same medical record department. Generally, salaries were lower than this in small towns and rural areas.

Career Mobility

Medical record technicians may assume greater responsibility and receive salary increases without further education. Those desiring to be medical record administrators may return to college to finish a bachelor's degree in medical records or a bachelor's degree in another field and then enroll in a one-year hospital-based certificate program in medical record administration. Some hospitals provide financial assistance to their medical record technicians who wish to further their education.

In 1974, there were no proficiency or equivalency examinations which could assist the medical records worker in her/his career advancement. Such examinations may be a reality in the future to help the careers of those who wish to receive the greatest possible credit for their ability and related experience.

Further Reading

Medical Record News, a journal published by the American Medical Record Association

Kinsinger, Robert E., editor, Health Technicians, J.G. Ferguson Publishing Company, Chicago, 1970, pp. 204-213

Professional Organization Where More Information May be Obtained

American Medical Record Association
875 North Michigan Avenue, Suite 1850
Chicago, Illinois 60611

To Broaden Your Understanding

-visit a medical record department in a hospital and talk to the people working there about their work
-write to schools and the professional organization

MEDICAL TRANSCRIPTIONIST

The medical transcriptionist types written and recorded medical records. The transcriptionist works with the medical record administrator and medical record technician in the preparation and maintenance of accurate patient records.

Medical transcriptionists work in hospitals, clinics, and nursing homes. The records they transcribe are used for emergency and follow-up treatment by physicians and other health care personnel, by insurance companies, and by other agencies. The transcriptionist must type medical dictation, understand medical terms, and know how to interpret medical reports.

Qualifications and Education

Accuracy and speed in typing technical and often complex medical information are necessary for effective medical transcription.

Many transcriptionists begin work as medical transcriptionists with no formal training in the typing of medical records. They receive on-the-job experience in learning the necessary terminology. Alternate ways of training to become a transcriptionist are the 2-month correspondence course offered by the American Medical Record Association or a 1-year community college program in medical transcription.

Required Special Training: Either a) related work experience or b) on-the-job training or c) 2-month long correspondence course from the American Medical Record Association or d) 1-year community college program in medical transcription.

Medical Transcriptionist

William Rainey Harper College
Palatine 60067

Oakton Community College
Morton Grove 60053

MEDICAL TRANSCRIPTIONIST - Further Information

Employment Prospects

In 1974 there was a great need for transcriptionists, especially in the Chicago area. Employment prospects in the next ten years appeared good.

Salary

In 1974 salaries of inexperienced transcriptionists working in Illinois ranged from $5,000 to $7,000. As a rule, salaries were considerably higher in Chicago and other cities than in smaller towns and rural areas.

Career Mobility

For the most part, medical transcriptionists do not seek to enter other health fields. Occasionally, transcriptionists desire to become medical record technicians. The three possible routes to becoming a medical record technician are described in the section on educational programs in medical records.

Further Reading

Medical Records News, a journal published by the American Medical Record Association

Odgers, Ruth F., and Wenberg, Burness G., editors, Introduction to the Health Professions, 1972, pp. 103-108

Professional Organization Where More Information May be Obtained

American Medical Record Association
875 North Michigan Avenue, Suite 1850
Chicago, Illinois 60611

To Broaden Your Understanding

-visit a medical record department in a hospital and talk to the people working there about their work
-write to schools and professional organizations

Physical Therapist

The physical therapist is a professionally trained member of the health team, including physicians, nurses, and other specialists. His job is to help patients overcome their disability through therapeutic exercise, massage, and the use of heat and cold. To carry out his tasks, he must have detailed knowledge of human anatomy and physiology and know what steps may be taken to correct disease and injury.

For example, in the case of a child with a birth defect, the physician calls upon the physical therapist to perform a muscle evaluation in order to determine the extent of the damage. On the basis of the muscle test, plans are made for the kind of physical therapy the child needs. The physical therapist then carries out the plan of treatment.

In working with this child, the physical therapist gives the exercises that bring weakened muscles back toward normalcy. Treatment may include water exercises in warm baths or pools, hot packs, electricity (special currents that stimulate paralyzed muscles), ultraviolet rays, and massage. If the child must be fitted with braces or crutches, the therapist's task is to teach him to walk with the aid of these appliances.

Treatment can be more effective, and progress faster, if the patient and his family understand the purpose and plan and know just how they can play their part. Physical therapy services include instructing patients and their families in how to carry on prescribed treatment at home. They may need specific instruction in the techniques of muscle reeducation, or in the care and use of braces or prosthetic appliances.

In meeting a patient for the first time, the physical therapist, like the physician, keeps in mind the importance of preparing him emotionally for what is to come. He is sensitive to the problems of the patient, made vulnerable by his disability or disease.

Because the treatment may be prolonged and tedious, the full cooperation of the patient will be required. As a first step, therefore, the physical therapist familiarizes himself with the patient's personal background as well as his medical history, and makes an effort to gain his confidence and cooperation. The therapist-patient relationship often determines success or failure in involving the patient in his own treatment. This is especially true of children, and here, of course, the therapist must do his best to help the parents as well as the child to understand the treatment.

A wide choice of employment opportunities exists. A great many therapists hold positions in general hospitals and in specialized institutions such as those for children, veterans, and people with orthopedic conditions or chronic diseases. Many opportunities also can be found in rehabilitation centers throughout the country, where patients come for the care and training that will enable them to gain confidence and independence.

An increasing number of large industrial firms have physical therapy departments in the medical clinics serving their plants and offices. Also, the need is growing for physical therapists in schools for crippled children. Or a physical therapist may join the Armed Forces with an officer's commission and serve in an Army, Navy, or Air Force hospital. Physical therapists also are employed in the hospitals of the U.S. Public Health Service. (The availability of part-time employment should be an attraction for women with domestic responsibilities.) Physical therapists are also needed in teaching and in research.

Qualifications and Education

Adaptability, emotional stability, tact, an outgoing personality and a pleasant appearance are "musts" in this profession. Physical therapy also takes a great deal of patience and the ability to work toward a long-range goal, even though the progress may sometimes seem slow. Manual dexterity is important. At least average weight and height are desirable, but strength as such is subordinate to good health.

There are three basic plans of education for physical therapy: four-year bachelor's degree courses; 12 months' certificate courses for students who hold bachelor's degrees (offered in 15 schools); graduate training leading to a master's degree for students with a bachelor's degree and the requisite background.

In 1974, 66 universities offered fully accredited physical therapy programs. Essentially, the course is divided into several areas: A liberal arts program emphasizes the humanities and social studies. Study of the biological sciences includes anatomy, physiology, and pathology. Major emphasis in physical sciences is on chemistry and physics, including the fundamental principles of mechanics, thermodynamics, light, sound, and electricity. Specialization courses provide the fundamental knowledge and skills required to treat patients. Finally, supervised clinical practice completes the course.

Required Special Training: A number of Illinois colleges and universities offer two or three years of preliminary (pre-professional) course work in physical therapy. Following this course work, and depending on the particular program, approximately 1 to 2 years in a professional curriculum in physcial therapy are required, after which a bachelor's degree in physical therapy is awarded. (Usually there is intense competition for acceptance into the professional curriculum.) In some programs transfer students in the professional curriculum are awarded a certificate in physical therapy upon completion of that program and are also granted a bachelor's degree from the college from which they transferred.

Physical Therapist

345 E. Superior Street, Room 1323
Northwestern University
Chicago 60611

Northwestern offers three kinds of programs:

a) Certificate Program: this program is designated for two classifications of students:
   1. for those with a bachelor's degree in a field other than physical therapy: 15-month program in physical therapy after which a Certificate in physical therapy is awarded
   2. for those with 3 years of college whose previously-attended college will grant a bachelor's degree upon the student's completion of a 15-month program in physical therapy at Northwestern. Upon completion of the program, Northwestern awards a Certificate in physical therapy.

b) Bachelor's degree program: for students with 3 years of college: 15-month program in physical therapy after which a bachelor's degree in physical therapy is awarded by Northwestern.

c) Master's degree program: for students with a bachelor's degree in physical therapy and 2 years of experience as a physical therapist:
1 1/2 to 2 years or more graduate level program in physical therapy, after which a master's degree in physical therapy is awarded.

Physical Therapist

School of Associated Medical Sciences
University of Illinois at the Medical Center
Chicago 60612

(Prerequisite: 2 years of college)
(Program is 2 years in length after which a bachelor's degree is awarded)

Chicago Medical School
University of Health Sciences
Chicago 60612

(Prerequisite: 2 years of college)
(Program is 2 years in length after which a bachelor's degree is awarded)

Note: The U.S. Army has a physical therapy program which is conducted out-of-state. For more information, consult "Military Training Programs in Health Fields" in section 1-B.

Employment Prospects

In 1974 employment prospects for physical therapists were generally good in Illinois. There were opportunities in Chicago but many metropolitan centers around the country had only limited job openings. Nationally increased recognition of the importance of rehabilitation and the growth of nursing homes should result in a substantial rise in demand for physical therapists during the next ten years.

Salary

In 1974, physical therapists with no prior experience generally received from $8,500-$10,000 per year in Illinois. Beginning salaries in Illinois' hospitals averaged $825 per month in mid-1973 and for all physical therapists, $930 per month. In 1974 salaries for physical therapy supervisors, teachers, and consultants ranged from $14,000-$20,000 yearly. Top specialists and administrators received annual salaries of from $15,000-$25,000.

Career Mobility

With experience physical therapists may assume supervisory and administrative responsibilities. Graduate education is ofter desirable for therapists interested in consulting to nursing homes and other institutions, the education of physical therapists and physical therapy assistants, and administrative posts. In recent years, some physical therapists have established their own private practices. Except in cases where individual colleges will arrange for special examinations, there are no proficiency or equivalency examinations available to physical therapy assistants wishing to become physical therapists. (Such examinations, which are available in a few health fields, test for competence in the professional course work and/or knowledge gained through related work, and can result in shortening the required training period.)

Further Reading

Physical Therapy, a journal published by the American Physical Therapy Association

Odgers, Ruth F., and Wenberg, Burness G., editors, Introductions to Health Professions, the C.V. Mosby Company, St. Louis, 1972, pp. 71-78

Professional Organization Where More Information May Be Obtained

American Physical Therapy Association
1156 15th Street, N.W.
Washington, D.C. 20005

To Broaden Your Understanding

-do volunteer or paid work in the physical therapy department of a hospital or rehabilitation center

-gain some kind of work experience in a health care institution

-talk with a physical therapist about his/her work

-write to schools and the professional organization

PHYSICAL THERAPY ASSISTANT

The physical therapy assistant is a skilled technical health worker who assists the physical therapist in patient treatment programs and in other activities necessary to the operation of a physical therapy department. Specifically, she/he helps administer treatment to patients with muscle, nerve, joint, or bone diseases or injuries. The physical therapy assistant uses physical exercises, machines, massage, applications of heat, cold, water, light, and electricity as she/he works to restore as completely as possible the normal physical and mental functions of the patient after disease or injury. Physical therapy assistants may also help patients adjust to the use of splints, braces, crutches, wheelchairs, and artificial limbs. They care for patients and help move those who cannot walk from one place to another. The physical therapy assistant may also work with the physical therapist in performing tests and evaluations to determine the progress that has been made in therapy. In addition, the physical therapy assistant schedules patients, orders supplies, and performs other office duties.

Physical therapy assistants work in a variety of settings. The largest number work in hospitals. Others are employed in rehabilitation centers, industry, and schools for crippled children.

Qualifications and Education

Because of the large number of people with whom she/he comes in contact with, the physical therapy assistant must like and possess the ability to get along well with other people. An outgoing personality is desirable and the ability to instill in others enthusiasm and confidence also is needed. The physical therapy assistant must be very understanding and be able to offer support to patients while they are being treated. The assistant should show appreciation for even the smallest amount of progress made by patients and should be able to build upon it. She/he should also enjoy physical activity.

Community college physical therapy assistant programs require a high school diploma or its equivalent to be eligible to enroll. The program itself is two years, after which the associate degree is awarded.

EDUCATIONAL PROGRAMS IN PHYSICAL THERAPY ASSISTING - ILLINOIS

(Prerequisite: High school diploma or its equivalent)

Required Special Training: 2-year associate degree program in physical therapy assisting.

Physical Therapy Assistant

Belleville Area College
Belleville 62221

Central YMCA Community College
Chicago 60606

Illinois Central College
East Peoria 61611

Morton College
Cicero 60650

Oakton Community College
Morton Grove 60053

Southern Illinois University
Carbondale 62903

PHYSICAL THERAPY ASSISTANT - Further Information

Employment Prospects

In 1974 Illinois employment prospects for physical therapy assistants were reasonably good for those who were willing to search for work beyond their community of residence. As with some other health fields, there were cities where the hospitals were not hiring physical therapy assistants; on the other hand, some had been unable to attract assistants. In the coming decade, employment prospects were expected to remain relatively good.

Salary

Detailed salary information for Illinois was not available. A check with several hospitals employing physical therapy assistants revealed beginning salaries for inexperienced persons to be in the neighborhood of $6,500 per year. Salaries rose slightly for experienced assistants.

Career Mobility

Physical therapy assistants can assume greater responsibility after having shown their capabilities. The amount of responsibility they might be granted would also depend on the willingness of his/her superiors to delegate authority. Occasionally a physical therapy assistant wishes to become a physical therapist, which requires a bachelor's degree. In most cases, there is strong competition for admission to bachelor's degree programs. If admitted, the physical therapy assistant often may apply a considerable amount of his prior college course work toward meeting the requirements of the bachelor's degree. Except in cases where individual colleges will arrange for special examinations, there are no proficiency or equivalency examinations available to physical therapy assistants wishing to become physical therapists. (Such examinations, which are available in a few health fields, test for competence in the professional course work and/or knowledge gained through related work, and can result in shortening the required training period.)

Further Reading

Physical Therapy, a journal published by the American Physical Therapy Association

Kinsinger, Robert E., editor, Health Technicians, J.G. Ferguson Publishing Company, Chicago, 1970, pp. 93-100

Professional Organization Where More Information May Be Obtained

American Physical Therapy Association
1156 15th Street, N.W.
Washington, D.C. 20005

To Broaden Your Understanding

-do volunteer or paid work in the physical therapy department of a hospital or rehabilitation center

-gain some kind of work experience in a health care institution

-talk with a physical therapist and a physical therapy assistant about their work

-write to schools and the professional organization

When the patient is referred by the physician, the therapist makes an evaluation to determine the current level of functioning and to learn more about the patient as a person—his likes and dislikes, hopes and fears, experiences and expectations. After making the evaluation, the therapist can decide which activity would appeal to the patient and have most value for him. The extent and speed of progress is very much dependent on the therapist's professional judgment.

Incapacitated people often resist help because of resentment about their disability and for other psychological reasons. This calls for insight, understanding, and empathy, because the first concern of the therapist is to engage the patient's interest.

Types of Therapy

Many factors enter into the decision as to the type of therapy used: the nature of the patient's disability, the patient's physical and emotional condition, temperament, short-term and long-term goals of the therapy, and so forth.

The kinds of challenges presented are illustrated by the following examples:

Would learning to type help develop hand coordination for the injured airplane mechanic? Once the therapist has gained his interest, he responds eagerly, and the use of a practical skill helps him improve and return to work earlier.

Would weaving be the most beneficial activity for the woman with arthritic fingers? If this would help her to achieve a sense of progress in the doing, and at the same time benefit her therapeutically, the answer would be "yes."

How can a housewife in a wheelchair who has lost the use of one hand manage at home? She is learning how to work with a paring board that fits over the edge of the table upon which a potato has been impaled on a nail. This adapted device makes it easier for her to prepare vegetables without assistance.

How will a little girl develop enough coordination in her movements to eat alone? She needs first to learn to let eyes and hands work together, by tossing a beanbag while sitting at a cutout table. By performing this activity she will eventually develop the ability to feed herself.

Beside the ability to teach and to communicate with handicapped people, and a general background of knowledge in the basic science and medicine, the occupational therapist needs specific knowledge in the various working skills used in therapy. Among these working skills are leatherwork, jewelry making, ceramics, woodwork, metalwork, textile crafts, and printing. He also needs to know the skills of daily living and simple homemaking.

The therapist may also organize educational activities, such as the study of language or creative writing, or he may organize dramatic groups. For activities such as these, he will generally call upon the assistance of a professional in the particular field. Though he cannot himself be an expert in all these activities, the occupational therapist must know enough about them to understand their therapeutic value, and to set them into motion.

Trained men and women volunteers often play an important part in occupational therapy services. These unpaid but skilled workers aid the therapist and, in turn, the patients, by lending their abilities and special talents. The volunteers work under the direction of the occupational therapist.

Often the physical or mental disability is so severe as to make it no longer possible for the patient to perform in his former occupation or profession. In such cases, the therapist may discover some other skill or talent which the patient can develop and use, and this becomes the goal of the therapy. This can be, for the therapist, a very rewarding experience.

One of the occupational therapist's regular duties is to prepare reports for the information of his professional teammates. A report may cover, for example, an account of the progress of a physically disabled patient who has been assigned tasks of increasing difficulty. Or it may cover the progress being made by crippled children in developing muscle coordination through play with therapeutic toys.

Qualifications and Education

Occupational therapy requires 4 years of college training leading to the degree of bachelor of science. There are some minor differences in these courses and it is a good thing to look into them in advance. However, most colleges and universities offering courses in occupational therapy are approved by the Council on Medical Education and Hospitals of the American Medical Association, in collaboration with the American Occupational Therapy Association.

In addition to the 4 years of academic preparation, a clinical training period is required in order to qualify for professional registration. In most schools, this clinical experience takes 6 to 9 months.

For those who already have a degree before enrolling in a program of occupational therapy, there is an advanced-standing course of 18 to 22 months, divided between academic and clinical work. There is also a master's degree program offered in several universities.

Although supervised clinical experience is part of all the approved programs, compensation during this period varies widely. Some institutions offer no compensation at all, others provide maintenance, and still others give a cash stipend in lieu of maintenance.

The college preparation for occupational therapy emphasizes physical and behavioral sciences, such as anatomy, physiology, neurology, psychology, and sociology. Other subjects would include manual and creative skills, educational subjects, and recreational activities.

The occupational therapist works with people of all kinds and all ages. Their temperaments and personalities are likely to be as varied as their illnesses and handicaps. To gain their confidence, he should have a warm, friendly personality that inspires both trust and respect. Together with these qualities, he should also have ingenuity and imagination in adapting activities to individual needs. The success of his work often depends in large part on his skill in bringing people and activities together in the right combination.

He also needs to be skilled, patient, and resourceful in teaching, since the people he works with present unusual and difficult learning problems. This occupation presents an excellent opportunity to combine an interest in teaching with an interest in helping people in distress and extreme need.

Required Special Training: Either a) a bachelor's degree in occupational therapy plus a clinical internship of at least six months, or b) for those with a bachelor's degree in a field other than occupational therapy, a post-baccalaureate program leading to a master's degree in occupational therapy or a certificate of proficiency in occupational therapy (there are no master's degree or certificate programs in Illinois).

Occupational Therapist

School of Associated Medical Sciences
University of Illinois College of Medicine
Chicago 60612

(Program consists of 3 years at the University of Illinois Urbana campus and 16 months at the College of Medicine campus in Chicago -- after which a bachelor's degree is awarded)

Curriculum in Occupational Therapy
School of Associated Medical Sciences
Region 3-B
University of Illinois College of Medicine
Chicago 60612

(Program is offered on the University of Illinois Urbana-Champaign campus, but is administered through the College of Medicine, Chicago)

OCCUPATIONAL THERAPIST - Further Information

Employment Prospects

Occupational therapists are employed in general hospitals, mental health facilities, rehabilitation centers, nursing homes, and schools. More recently occupational therapists have begun to work in industry. Some serve as consultants; some have established private practices. In 1975 employment prospects were good. The U.S. Department of Labor has predicted there will be an average of 1100 annual job openings over the next ten years.

Salary

In 1975 beginning salaries in Illinois ranged from $9,800 to $11,000 yearly. Therapists with supervisory responsibilities earned from $10,500 to $14,000; those who headed occupational therapy departments received from $15,000 - $22,000.

Career Mobility

With experience occupational therapists may assume supervisory and administrative respinsibilities. Health care facilities and other agencies require occupational therapists to serve as consultants as they develop new occupational therapy services. Persons with college degrees in areas other than occupational therapy may become occupational therapists after completion of certificate or master's degree programs (mentioned on page 11-C-3). Occupational therapy assistants may become registered occupational therapists by passing the equivalency examination offered by the American Occupational Therapy Association. However, there are no proficiency examinations available to those wishing to demonstrate their mastery of specific professional course work. For those interested in teaching, administration, and research in this field, master's and doctoral degrees in education, administration and related areas are desirable academic qualifications.

Further Reading

American Journal of Occupational Therapy, a journal published by the American Occupational Therapy Association

Odgers, Ruth F., and Wenberg, Burness G., editors, Introductions to Health Professions, the C.V. Mosby Company, St. Louis, 1972, pp. 119-26

Professional Organization Where More Information May Be Obtained

American Occupational Therapy Association
6000 Executive Boulevard
Suite 200
Rockville, Maryland 20852

To Broaden Your Understanding

-do volunteer or paid work in the occupational therapy department of a hospital or health care facility

-gain some kind of work experience in a health care institution

-talk with an occupational therapist about his/her work.

-write to schools and the professional organization

OCCUPATIONAL THERAPY ASSISTANT

There are two levels of trained personnel in occupational therapy -- the occupational therapist and the certified occupational therapy assistant (COTA). As with the other therapies, often it is the assistant who carries out programs and activities on a one-to-one basis with patients. The activities that the COTA teaches and directs may include creative arts such as clay modeling, leatherwork, macrame, painting, woodworking, and weaving, or such skills as typing, keypunching, and the operation of power tools.

Although the COTA works under the general direction of the registered occupational therapist, he/she can exercise a high degree of initiative, responsibility, and independent action. Besides planning occupational programs (usually in cooperation with the registered occupational therapist), teaching, and supervising patients, one of the assistant's main responsibilities is observing patients and reporting those observations back to the occupational therapist in charge. In this manner, the COTA and the occupational therapist cooperate in evaluating a patient's therapeutic progress. Often an assistant may even be given supervisory and/or administrative responsibilities, particularly if the occupational therapy department is small and employs a registered therapist on a part-time or consultive basis only.

Certified occupational therapy assistants are found working in all settings where registered occupational therapists are employed, including hospitals, clinics, rehabilitation centers, veterans' hospitals, nursing homes, extended care facilities, schools for handicapped children, psychiatric facilities, and community mental health centers.

Qualifications and Education

Although education and training will prepare students to work effectively with patients having physical and mental disabilities, it is helpful if the student has a strong concern for these people and a desire to help them help themselves. Emotional maturity, a pleasant personality, and an ability to communicate with others and establish effective interpersonal relationships can contribute to success and fulfillment as an occupational therapy assistant. Likewise the ability to remain optimistic and supportive even in the face of discouraging situations will contribute to the assistant's job satisfaction and the patient's welfare.

Programs for the preparation of occupational therapy assistant vary in length: community college associate degree programs are 2 years in length. A few community college programs are only 1 year, and hospital-based programs may be only 20 weeks long. Areas of instruction include physical and mental illnesses, psychology, arts, crafts, and the purpose and philosophy of occupational therapy.

(Prerequisite: high school diploma or its equivalent)

Required Special Training: Either a) a hospital-based occupational therapy assistant program of at least 20 weeks (there are no hospital-based programs in Illinois), or b) a 1-year community college occupational therapy assistant program, or c) a 2-year associate degree community college occupational therapy assistant program.

Occupational Therapy Assistant

Illinois Central College East Peoria 61611	(2-year program only)
Thornton Community College South Holland 60473	(both 1 and 2-year programs)

OCCUPATIONAL THERAPY ASSISTANT - Further Information

Employment Prospects

In 1975 employment prospects for occupational therapy assistants were generally good in Illinois and were expected to continue to remain so in coming years.

Salary

Detailed salary information was not available. In 1975, Illinois salaries ranged from $8,000 to $11,000 per year.

Career Mobility

Occupational therapy assistants can assume greater responsibility after demonstrating their competence. The amount of responsibility they might be given may also depend on the willingness of their superiors to delegate authority to them. Occasionally an occupational therapy assistant wishes to become an occupational therapist, which usually requires a bachelor's degree. There is usually competition for entry into bachelor's degree programs. If admitted the occupational therapy assistant may be able to apply some of his prior college course work toward meeting the requirements of the bachelor's degree. There are no proficiency examinations available to those wishing to test out of specific professional level courses. However, the American Occupational Therapy Association offers an equivalency examination to occupational therapy assistants; passing of this examination will result in their becoming occupational therapists.

Further Reading

American Journal of Occupational Therapy, a journal published by the American Occupational Therapy Association

Kinsinger, Robert E., editor, Health Technicians, J.G.Ferguson Publishing Company, Chicago, 1974, pp. 150-57

Professional Organization Where More Information May Be Obtained

American Occupational Therapy Association
6000 Executive Boulevard
Suite 200
Rockville, Maryland 20852

To Broaden Your Understanding

-do volunteer or paid work in the occupational therapy department of a hospital or health care facility

-gain some kind of work experience in a health care institution

-talk with an occupational therapist about his/her work

-write to schools and the professional organizations

Medical Social Worker

The medical social worker is skilled in helping a patient and his family handle personal problems that result from severe or long illness or disability. The problem is usually social, emotional, or financial—or all three. But, whatever its nature, it can be severe enough to retard recovery and prolong convalescence. The patient who makes the best response to medical treatment is usually the one who is easiest in his mind. Thus the services of the medical social worker are an integral part of the patient's total treatment.

"I'll lose my job now that this bad heart means I can't carry heavy loads anymore," says one patient. The medical social worker can help him select a job which is satisfactory to him and which the physician agrees will not be overtaxing.

"I can't sleep for worrying about where the children can live," says a hospitalized mother. Again, this is a problem for the medical social worker who knows the family circumstances.

And what of the individual who lives in a boarding house and must suddenly begin following a restricted diet?

Or the child crippled by polio whose family must learn to treat him as a "regular" member of the family as far as possible?

Illness makes the average man's problems seem bigger. But they often are bigger—and may be of crisis proportions. The medical social worker and the patient, and often his family, together think through all angles of the problem to be tackled, which may include not only immediate needs but also plans for convalescence.

These are all human problems—all requiring tact and talent in human relations, professional skill, and judgment. And there is no magic formula.

Social workers are trained to understand people and their personal and social needs. Medical social workers give particular attention to these needs and the related problems that are associated with illness and disability. They know that everyone reacts to trouble in his own way. Some people withdraw, some become defiant, some bluster, and some become irritable. Even if the patient keeps his head and his temper, he may need help.

A great push has developed in recent years to get patients out of hospitals and into familiar surroundings. The social worker has become an important link for the patient between hospitalization and the return to normal life in the community. Along with an understanding of human nature, social work requires a thorough professional knowledge of all the community resources that can be tapped in order to assist the individual, and a thorough familiarity with the community as a whole and its social issues.

The social worker has become an advocate for changes in existing and established community services that must be remodeled to meet the changing needs, thus fostering the health and well-being of the patients. As an advocate, he assists in organizing groups to bring pressure for changes by dramatizing the problems. The social worker tries to mobilize efforts of all agencies to focus attention on the complex aspects of these problems. Frequently, the social worker needs to call on one or another of these resources for special services. The community's homemaker service, for example, may provide a homemaker to look after the family while the mother is in the hospital, or a home health aide to help out when someone who lives alone is convalescing. In other cases, the social worker may need to get the advice and assistance of an employment counseling service, or a child placement agency, or a lawyer, or a schoolteacher, or whoever can help get to the heart of the patient's particular problems.

The medical social worker is one of the essential members of the patient's immediate medical team, which is directed by the physician. The practice of medical social work appeals particularly to men and women who think of health not in the abstract sense of the scientific laboratory but in terms of human living—of people. In short, the job is people, the service an integral part of caring for patients—of all kinds, every creed and color, every field of interest, every type of personality, and with every conceivable human problem.

Medical social workers are employed in hospitals, clinics, public and private health centers; local, State, and Federal public health departments; military and veterans' hospitals; and voluntary health agencies concerned with special groups—for example, crippled children, the blind, the deaf, patients with tuberculosis, heart disease, or cancer, or handicapped people in need of rehabilitation. Experienced medical social workers also teach in universities—in schools of medicine, public health, and social work.

The successful medical social worker needs a special combination of personal qualities. Objective good judgment, the capacity to stand off and look at all sides of human problems, is as important as warm sympathy. The profession demands a genuine liking and respect for people, and faith in them. Of special importance to the medical social worker is the ability to work as a member of a team.

The skilled practice of medical social work requires the highest quality of professional preparation. A medical social worker must have a bachelor's degree from an accredited college or university.

There are 200 accredited colleges and universities in the United States, and two in Canada, offering undergraduate programs in social welfare that prepare students for direct entrance into social welfare employment or for graduate education. Graduate social workers can attain master's degrees upon completion of a 2-year program at any of 73 accredited colleges and universities in the United States and 4 in Canada. About one third to a half of the semester hours are in field instruction that relate academic work to practical experience. Programs for the doctoral level are available in 23 accredited colleges and universities in the United States and 2 in Canada. A doctoral degree is required for university teaching, advanced practice, policy formulation, and administration. Many scholarships and fellowships are available to qualified students. An estimated 80 to 85 percent of all graduate students receive some sort of financial assistance.

Courses vary from school to school, but all accredited programs cover five major areas of knowledge: human behavior and the social environment; social welfare policy and services; the methods of social work (the process of intervening in the flow of events to help solve a problem or develop a resource); research; and direct engagement in service (field practice). The Council on Social Work Education is the accrediting agency in the United States and Canada for social work education.

Required Special Training: a 4-year bachelor's degree program in social work. A master's degree (1 to 2 years in length) is desirable for those intending to remain in this field. Some programs offer a number of courses dealing with medical aspects of social work; other programs do not offer such courses, making it necessary for the student to learn the medical aspects while on the job or through some other means.

Social Worker

George Williams College
Downers Grove 60515 (bachelor's and master's degree programs)

Jane Addams Graduate School of Social Work at Chicago Circle
Box 4348
Chicago 60680 (bachelor's, master's and doctoral programs)

Loyola University
Chicago 60611 (master's degree program)

Roosevelt University
Chicago 60605 (bachelor's degree program)

School of Social Service Administration
University of Chicago
Chicago 60637 (bachelor's, master's, and doctoral degree programs)

University of Illinois
Jane Addams School of Social Work
Urbana 61801 (bachelor's, master's, and doctoral degree programs)

MEDICAL SOCIAL WORKER - Further Information

Employment Prospects

While employment prospects in some fields of social work were not good in 1974, they were reasonably good in medical social work. Opportunities were quite good for persons with bachelor's degrees in social work and better for those with master's degrees in social work. Those with bachelor's degrees in areas other than social work continued to be employed in social service positions requiring social work skills, but their long-range career prospects were not as good as for those with degrees in social work.

Salaries

While a typical annual starting salary in Illinois for those with a bachelor's degree in social work was approximately $7,600 in 1974, social workers in medical settings made about $8,000 to $9,000. Persons with a master's degree in social work received beginning salaries of $10,000 to $13,000. Many experienced social workers earned $15,000 to $25,000 a year.

Career Mobility

Persons interested in medical social work will find it easier to find employment after they have earned their social work degree if they take their required field work experience in some sort of medical setting. Medical social work is carried on in a large number of settings. In hospitals social workers work in psychiatric units, physical rehabilitation units, and in some larger hospitals they may work in specialized areas, such as pediatrics. In the hospital as well as in other settings, the experienced, competent practitioner eventually will assume greater responsibility and receive a higher income. The master's degree in social work is nearly essential for those aspiring to positions of major responsibility.

The range of work performed by the social worker is increasing rapidly. In general there has been a trend in recent years for the hospital-employed social worker to devote more of his/her efforts to people while they are outside of the hospital: counseling about matters from the payment of medical bills to teen pregnancies to death and dying, visiting homes to aid the adjustment of recovering patients, and visiting homes to confirm reports of child abuse, malnutrition, and so on.

Further Reading

Social Work, a journal published by the National Association of Social Workers

Social Case Work, a journal for social workers

Abstracts for Social Workers, a journal for social workers

Hallowitz, E. "Innovations in Hospital Social Work," Social Work, July, 1972, pp. 89-97.

Teague, Doran. "Social Services Enterprises: A New Health Care Model," Social Work, July, 1971, pp. 66-74

Professional Organizations Where More Information May Be Obtained

Council on Social Work Education
345 East 46th Street
New York, New York 10017

National Association of Social Workers
600 Southern Building
15th and H Streets, N.W.
Washington, D.C. 20005

To Broaden Your Understanding

-obtain volunteer or paid work experience as a camp counselor, an aide in a hospital or nursing home, a recreation leader, or as any other kind of worker in an employment setting that will give you a chance to improve your understanding of human relations.

-visit and talk with the workers in some of these agencies: mental health centers, child welfare and public assistance agencies, day care centers, public health departments, Red Cross, etc.

-write to professional organizations and schools

Speech Pathologist and Audiologist

It is estimated that 1 out of every 20 people in this country has a speech problem which needs treatment.

The goal of speech pathologists and audiologists is to help children and adults with speech problems to communicate as nearly normally as possible.

Following are some of the types of programs with which the speech pathologist and audiologist work: lisping, cleft palate, impaired hearing, talking difficulties resulting from cerebral palsy, talking difficulties resulting from emotional or physical disturbance or retardation.

In speech disabilities which have a physical cause, the clinician may need to work with physicians and dentists. When the disorder is emotional in origin, he may need to cooperate with a psychiatrist or a psychologist. A vocational counselor may be brought in if the speech problem is a handicap to employment. Other professional people with whom the speech pathologist and audiologist work are the public health nurse, the social worker, and the school teacher.

Both men and women are needed in this field. At the present time, about 3 out of 4 clinicians are women, but an increasing number of men are taking up this work. The person trained in speech pathology and audiology has a wide choice of areas where he can be of service. Many public schools need clinicians to work with children with speech troubles. In addition, there are a number of both public and private schools which have been set up exclusively for children handicapped by deafness, cerebral palsy, or other conditions which affect their ability to talk. Speech pathologists and audiologists are important members of the staff of such schools. There are also mobile speech clinics which travel to outlying communities to serve both children and adults.

Other organizations employing speech pathologists and audiologists are social agencies, clinics at colleges, and medical centers. Various Federal, State, and local government agencies employ workers to provide services for crippled children with speech problems and there is a special speech and hearing clinic for members of the Armed Forces.

Many highly trained speech pathologists and audiologists specialize in research work. Others serve as teachers in colleges, medical schools, and training institutions.

The people who can give specialized help are known as speech pathologists and audiologists. Their profession is comparatively new. Before it came into existence, people with speech disabilities had hardly any place to turn for help. Few physicians—even child specialists—had been taught techniques for speech rehabilitation; clinical and consulting psychologists were similarly untrained. Recognition of this need brought a new group of specialists into existence—men and women who had studied the physical and emotional factors involved in speech difficulties and who had learned how to deal with them.

Like many other young health services, this field is in great need of additional personnel. Interesting jobs go begging simply because there aren't enough trained people to fill them.

Special qualities are called for in people who work directly with handicapped children and adults.

First is a real concern for people with physical and psychological impairment and a sincere desire to help them. Second, but equally important, is the ability to work with such problems objectively. The clinician should have a warm, friendly personality that inspires confidence in the person being helped. Patience and perseverance are also needed, since speech rehabilitation is a slow process. Relating well with children is a definite asset, since most of the work in speech rehabilitation is done with youngsters.

To qualify as a speech pathologist, a person must have a master's degree from a college or community with an acceptable department of speech pathology and audiology. In the attainment of the master's degree, he must complete sufficient course credits in speech and hearing to be certified by the American Speech and Hearing Association.

No special college preparation is required, but the student should be well-advised to take a broad liberal arts education with courses in biology, anatomy, physiology, physics, general psychology, adult and adolescent psychology, sociology, and anthropology. Courses in special fields of study related to speech and language are also helpful. These would include linguistics, semantics, phonetics, and introductory courses in speech pathology and audiology.

Professional training, including work at the graduate level, must be taken at a college or university with a program of speech pathology and/or audiology.

The college student will probably decide in his junior year which particular aspect of this profession appeals to him most and then will select his graduate courses with the help of a faculty adviser. Although the curricula leading to a master's degree in speech pathology and audiology vary from college to college, the following basic areas are covered within all professional courses of study: fundamental studies of the processes of normal speech and hearing including anatomy and physiology; acoustics and the psychological aspects of human communications; the nature of disorders of speech and hearing; the measurement and evaluation of speech production, language abilities and auditory processes; clinical treatment and training of children and adults with speech, language, and hearing disorders; and research methodology in the study of speech and hearing. Graduate studies should include preparation in the particular aspects of speech pathology and audiology and related fields which are pertinent to the work the student plans to do. He may concern himself primarily with speech disorders, language impairment, or hearing disorders. However, speech, hearing, and language are so interrelated that professional competence requires familiarity with these three areas.

EDUCATIONAL PROGRAMS IN SPEECH PATHOLOGY AND AUDIOLOGY - ILLINOIS

Required Special Training: a bachelor's degree in any field, followed by a master's and internship experience (a bachelor's degree takes approximately 4 years of study, a master's degree in speech pathology and audiology requires at least 1 full year of study for those students who have an undergraduate background in the field, and about 2 years of study for those whose undergraduate background in another field).

Speech Pathologist and Audiologist

Augustana College*
Rock Island 61201

Bradley University**
Peoria 61606

Eastern Illinois University**
Charleston 61920

Elmhurst College*
Elmhurst 60126

Illinois State University**
Normal 61761

Mundelein College*
Chicago 60626

Northern Illinois University**
DeKalb 60115

Northwestern University***
Evanston 60201

College of Saint Francis*
Joliet 60435

Saint Francis Xavier College*
Chicago 60655

Southern Illinois University**
Edwardsville 62025

Southern Illinois University***
Carbondale 62901

University of Illinois***
Champaign 61820

Western Illinois University**
Macomb 61455

* Offers bachelor's degree only.

** Offers work through the master's degree.

*** Offers work through the doctoral degree.

SPEECH PATHOLOGIST - Further Information

Employment Prospects

In 1975 employment prospects at the state and national level were good. Certified speech pathologists were still being requested for employment in hospital and community speech centers as well as rest homes, public schools, health departments, and research centers. With increasing concern for the health and education problems of the preschool, minority, and aged populations, it appeared that the need for certified speech pathologists would continue--if local, state, and federal support continues in these areas.

Salary

In 1975 a typical starting salary, in clinics in Illinois, for individuals with a master's degree was $10,000. The results of a recent national survey indicated that average salary for members of the American Speech and Hearing Association holding a master's degree was $11,000 to $12,500 (depending on work environment and experience). Eleven per cent of the members reported earnings over $20,000.

Career Mobility

Experienced speech pathologists can return to college to obtain a doctoral degree or they can become clinical supervisors or clinical administrators. Also, if qualified, they can move into state or federal government positions dealing with direction of the profession. With the possible increase in Medicare and Medicaid, there are funding opportunities for individuals with a master's degree to serve as research assistants in dental and medical schools, in such locales as Centers for Craniofacial Anomalies, Cleft Palate Clinics, Otolaryngology Clinics, Ear-Nose-and-Throat Clinics, and Biocommunication Centers.

Further Reading

Asha, a general informational journal published by the American Speech and Hearing Association

Journal of Speech and Hearing Disorders

Journal of Speech and Hearing Research

Journal of Communication Disorders

Speech and Hearing News

Illinois Speech and Hearing Journal

Professional Organization Where More Information May Be Obtained

American Speech and Hearing Association
9030 Old Georgetown Road
Washington, D.C. 20014

To Broaden Your Understanding

-observe the clinical activities of a speech pathologist--in a local hospital, rest home, Easter Seal Center, or school

-talk with a speech pathologist who works in a hospital, school, etc.

-see if you can obtain and view a filmstrip-sound recording entitled "A Compelling Life: A Career in Speech Pathology and Audiology" available from the Career Information Center, University of Utah, Salt Lake City, Utah, or "Communication Disorder Specialist" available from the American Speech and Hearing Association, 9030 Old Georgetown Road, Washington, D.C. 20014

-write to schools and the professional organization

The prosthetist and orthotist work closely with the physician, surgeon, and therapist to provide total rehabilitation services for the disabled. The prosthetist makes and fits artificial limbs, while the orthotist makes and fits orthopedic braces to support weakened body parts or to correct physical defects, such as spinal malformations. Both work from the physician's prescription, to make devices giving the patient maximum comfort and function. Their work begins after consultation with the patient and with careful and accurate measurements. With this information, they design a device that will meet the individual needs of the patient, constructing it from various materials such as plastic, leather, wood, steel, and aluminum.

Before the work is complete, the patient receives at least one preliminary fitting, enabling the prosthetist or orthotist to make needed changes before finishing the prosthesis (artificial limb) or orthosis (brace). The final step is an evaluation of the appliance, as worn by the patient, by the prosthetist or orthotist, and other rehabilitation specialists. The physical therapist and occupational therapist help the patient learn to use his new equipment.

Qualifications and Education

Anyone who plans a career as a prosthetist or orthotist will need skill with his hands and in the use of tools, as well as considerable mechanical skill and inventiveness. Patience, accuracy, and a keen sense of responsibility are essential. In addition, he should be able to communicate effectively with both patients and other members of the rehabilitation team. Lastly, and of prime importance, he should have a sense of real concern for the welfare of the disabled.

Great advances have been made in prosthetic and orthotic education in the past 10 years. Special courses in prosthetics and orthotics are now offered by several leading universities. These courses are 2 to 5 weeks in duration and are available to persons with some practical experience. The courses include the study of anatomy, biomechanics (study of how the body functions as a mechanical system), engineering as related to prosthetic and orthotic devices, and actual shop experience in orthotic and prosthetic construction.

Until 1971, the basic requirement for practitioner certification was a 4-year apprenticeship program conducted in a facility accredited by the American Board for Certification in Orthotics and Prosthetics, and a passing grade on the certification examination. At present and through 1975, however, a candidate for the examination must have taken, in addition to his apprenticeship, at least three specified short-term courses at one of the colleges or universities accredited by the board. From 1976 through 1979, a candidate will have to have an associate of arts degree in orthotics and/or prosthetics and have had 2 years of clinical experience subsequent to graduation. Beginning in 1980, he will have to possess a bachelor of science degree in orthotics and prosthetics.

In addition to these educational requirements, a candidate will have to present recommendations from three orthopedic surgeons and pass the certification examination.

High school courses recommended for the prospective orthotist or prosthetist include physics, chemistry, mathematics, and biology, as well as shopwork in metal, wood, and plastics. Accounting and business administration courses will be useful to the individual considering the eventual operation of his own facility. A working knowledge of psychology and human relationships is also important in dealing with patients and professional associates.

Orthotist and/or Prosthetist

Required Special Training: Either a) 2-year associate degree program in orthotics and prosthetics plus 3 years clinical experience or b) 2 years of college work to include, but not exceed, 8 semester hours in any one subject--English and speech, biological sciences, physics and engineering, chemistry, mathematics, psychology, and shop training -- followed by three short-term courses in orthotics and prosthetics and 3 years clinical experience (there are no such programs in Illinois) or c) 4-year bachelor's degree program in orthotics and prosthetics and 1 year of clinical experience (there are no 4-year programs in Illinois) or d) 4-year bachelor's degree in an area other than orthotics and prosthetics followed by three short-term courses in orthotics and prosthetics and 2 years of clinical experience.

Olive-Harvey College
Chicago 60628
(2-year associate degree program--in conjunction with the School of Associated Medical Sciences and the Orthopedics Department of the Abraham Lincoln School of Medicine of the University of Illinois Medical Center)

Northwestern University
Chicago 60611
(Beginning in January 1976, a 6-month program will be offered to those with a minimum of two years of college, preferably with an emphasis in science course work; in addition, short-term courses in orthotics and prosthetics for health practitioners are offered)

Orthotic-Prosthetic Assistant

Required Special Training: High School diploma or its equivalent and 3 years of apprenticeship, of which 2 years must involve patient contact (inquire about apprenticeships at Veterans Administration hospitals and other larger hospitals)

Orthotic-Prosthetic Technician

Required Special Training: Tenth-grade education and 2 years of apprenticeship (inquire about apprenticeships at Veterans Administration hospitals and other larger hospitals)

Employment Prospects

In 1974 there were 70 certified orthotists and prosthetists in Illinois and possibly an equal number were uncertified. (Certification is granted after passing an examination designed to determine professional competency.) It is becoming increasingly important to be certified. Due to increasingly high standards of health care, many employers seek certified practitioners. Not only does certification result in more job opportunities, but also in greater salary. Nationally, there were close to 3,000 orthotists and prosthetists. They worked in hospitals, clinics, and in private facilities which fabricate and fit artificial limbs and braces. In 1974 the employment outlook was excellent and was expected to continue to remain so for the foreseeable future.

Salary

In 1974 the average beginning salary for certified orthotists and prosthetists in the Midwest ranged from $11,000 to $15,000 yearly. Those who were not certified made an estimated $1,000 to $2,000 less per year in comparable positions.

Career Mobility

Those in the field tend to remain. A few practitioners enter the related fields of physical therapy and occupational therapy. However, it is more common for physical therapists and occupational therapists to seek additional training and experience so that they become orthotists and prosthetists. There are no proficiency or equivalency examinations available to persons desiring to move into orthotics and prosthetics. (Such examinations, which are available in a few other health fields, test for competence in the professional course work and/or knowledge gained through related work, and can result in shortening the required training period.)

Further Reading

Science Research Associates, Inc. Orthotists and Prosthetists, Occupational Brief No. 288, Chicago, 1973

Professional Organization Where More Information May Be Obtained

American Orthotic and Prosthetic Association
1440 N Street, N.W.
Washington, D.C. 20005

To Broaden Your Understanding

-visit a hospital, clinic, or private facility where orthotic and prosthetic appliances are fitted, designed, and made and talk to the persons who work there

-write to schools and professional organizations

Orthotic-Prosthetic Assistant and Technician

The orthotist and/or prosthetist is aided in his work by assistants and technicians who are also certified by the board.

The orthotic-prosthetic assistant works under the direct supervision of the orthotist-prosthetist and is responsible for fabricating and fitting devices. He is closely involved in patient care. To become certified, the assistant must possess a high school education or the equivalent, he must have 3 years of accredited apprenticeship training, and he must pass the assistant certification examination.

The orthotic-prosthetic technician is involved mainly in the fabrication of components and devices; he does not take part in direct patient-care activities. To become certified, the technician must have completed the tenth grade, he must have 2 years of nonformal apprenticeship training, and he must pass the technician certification examination.

The prosthetist or orthotist may work in a privately owned facility or in a hospital laboratory, or he may be affiliated with a government agency such as the Veterans' Administration. In small organizations, the same person may fabricate and fit both limbs and braces. In larger facilities, a skilled orthotist or prosthetist may employ one or more assistants and technicians to do the actual construction work under his supervision, while he himself specializes in adjustment and fitting.

Employment in this field is steady, and the skilled orthotist or prosthetist who keeps up with new developments is needed today as never before.

The skilled prosthetist or orthotist can expect a number of tangible—and intangible—rewards. Like other people who provide health services, he will find in his work a deep satisfaction that cannot be measured in dollars and cents. He sees in a dramatic way how his skills help handicapped people to lead happier lives. As he adjusts an artificial limb or brace to make it fit and work better, he may be restoring a man to a paying job or enabling a woman to care for her home and children. It is responsible and challenging work which can bring a feeling of intense personal satisfaction and pride.

Employment Prospects

In 1974 there were an undetermined number of assistants and technicians. Nationally, there were only about 200 technicians and 200 assistants who had been certified. (Certification is granted to the assistant or technician after passing an examination designed to determine his professional competence.) It is becoming increasingly important to be certified. Due to increasingly high standards of health care, many employers seek certified practitioners. Not only does certification result in more job opportunities, but also in greater salary. Many more were not certified. In 1974 the employment outlook was excellent and was expected to continue to remain so for the foreseeable future.

Salary

In 1974 the average beginning salary for certified assistants in the Midwest ranged from $7,000 to $10,000 annually. Technicians averaged $5,000 to $7,000 in their first year of work. Non-certified workers' salaries were generally lower by $1,000 or more per year.

Career Mobility

Many young assistants and technicians tend to remain in this field. Salaries are good considering the amount of education and training required to enter the field. Assistants are eligible to apply for apprenticeship experience at the technician level or move directly to the educational program required to become an orthotist or prosthetist. Technicians may apply for the educational program necessary to practice as an orthotist or prosthetist. There are no proficiency or equivalency examinations of professional knowledge available to assistants or technicians desiring to move upward in this field, or for those in related fields such as occupational therapy and physical therapy to move into orthotics and prosthetics. (Such examinations, which are available in a few other health fields, test for competence in the professional course work and/or knowledge gained through related work, and can result in shortening the required training period.)

Further Reading

Science Research Associates, Inc. Orthotists and Prosthetists, Occupational Brief No. 288, Chicago, 1973

Professional Organization Where More Information May Be Obtained:

American Orthotic and Prosthetic Association
1440 N Street, N.W.
Washington, D.C. 20005

To Broaden Your Understanding:

-visit a hospital, clinic, or private facility where orthotic and prosthetic appliances are fitted, designed, and made and talk to the persons who work there

-write to schools and professional organizations

RECREATIONAL THERAPIST

(Therapeutic Recreation Specialist)

For people confined to mental institutions and hospitals; and those handicapped by a physcial or emotional disability, how they spend their often long leisure hours can have a decided effect on how quickly and how well they recover. Recreational therapists realize this and, accordingly, their work is centered around a particular theory of recreation, namely that "play" is good medicine and that an institutionalized or home-bound patient can make a much quicker recovery and/or adjustment if his leisure time can be spent to his benefit.

Recreational therapists may work with groups of patients or individuals. Depending upon where they are employed, they may deal with all sorts of illnesses and disabilities -- old age, mental illness, paraplegia, mental retardation -- or they may specialize in one type of illness or disability and work only with those patients -- the mentally retarded, crippled children, old people, stroke victims, etc.

The recreational therapist's program would probably include such activities as athletics, arts and crafts, dancing, music, movies, camping, parties, and a patient newspaper. The primary goal behind all these different activities is for the patient to experience beneficial exercise, social participation, and group interaction which might help his recovery and/or adjustment. Such activities are also intended to aid a patient's readjustment to the outside world, before he is discharged.

Qualifications and Education

Students interested in becoming recreational therapists should enjoy working with people; they should be adept at communicating ideas and instructions to people of varying levels of intelligence; they should possess patience and tolerance. Physical coordination is necessary in order to demonstrate and teach others various athletic and dance skills. Manual dexterity is helpful for teaching ceramics and other crafts. Good color discrimination is necessary for those teaching art to patients. In addition, creativity, organization, and an ability to teach others are extremely important assets.

A bachelor's degree in recreational therapy or therapeutic recreation (a program usually given through the physical education department) is the minimum requirement for work as a recreational therapist. A master's degree, with a major in recreational therapy, is necessary for positions in administration, research, and teaching.

EDUCATIONAL PROGRAMS IN RECREATIONAL THERAPY — ILLINOIS

Recreational Therapist

Required Special Training: 4-year bachelor's degree program in recreational therapy in a college or university

George Williams College
Downers Grove 60515
(bachelor's and master's degree programs)

Southern Illinois University
Carbondale 62901
(bachelor's and master's degree programs)

University of Illinois
Urbana 61801
(bachelor's, master's and doctoral programs)

University of Illinois at Chicago Circle
Chicago 60607
(bachelor's degree program--this program is the Kinesiotherapy program offered by the School of Physical Education)

Recreational Therapy Assistant

(Prerequisite: high school diploma or its equivalent)

Required Special Training: 2-year recreational therapy assisting program in a community college

Central YMCA College
Chicago 60606

Moraine Valley Community College
Palos Hills 60465

Parkland College
Champaign 61820

Triton College
River Grove 60171

RECREATIONAL THERAPIST - Further Information

Employment Prospects

In 1974 employment prospects for recreational therapists were very good. Increased recognition of the importance of the leisure needs of handicapped and special populations has provided an impetus for federal, state and local agencies to seek qualified, trained personnel to provide these services.

Salary

Recreational therapists with no prior experience generally received from $8,000 - $10,000 yearly. In 1974 salaries for recreational therapists with a master's degree and/or several years of work experience ranged from $10,000 to $15,000. Top level jobs paid up to $25,000 and more. For the most part salary depended on the type of employing agency.

Career Mobility

Those who show that they are capable workers may assume increased responsibility after a period of work experience. A master's degree in therapeutic recreation is desirable for advancement to administrative positions and for serving as a consultant to agencies with therapeutic recreation programs.

Further Reading

Frye, Virginia and Peter, Martha, Therapeutic Recreation: Its Theory, Philosophy and Practice, The Stackpole Company, Harrisburg, Pennsylvania, 1972.

Therapeutic Recreation Journal, published by the National Therapeutic Recreation Society

Professional Organization Where More Information May Be Obtained

National Therapeutic Recreation Society
1601 N. Kent Street
Arlington, Virginia 22209

To Broaden Your Understanding

-obtain volunteer or paid work experience related to therapeutic recreation in a mental health facility, nursing home, rehabilitation center, or other organization providing therapeutic recreation services.

-talk with a recreational therapist about his/her work

-write to schools and the professional organization

RECREATIONAL THERAPY ASSISTANT

(Therapeutic Recreation Technician)

The delivery of therapeutic recreation services cannot be done by recreational therapists alone. While they may plan activities and evaluate the therapeutic value of those activities, often it is the recreational therapy assistant (therapeutic recreation technician), under the direction of the recreational therapist, who implements the programs on a person-to-person basis. Often it is the assistant who actually teaches a group of retarded children how to square dance, who organized and oversees the bridge tournament for the men and women of a retirement home, or who coaches paraplegics in wheelchair basketball. The daily work load of a recreational therapist necessarily deprives him/her of frequent patient contact -- in larger hospitals, clinics, and rehabilitation centers there are meetings to attend and evaluations to be made; there is consulting to be done with physicians and counseling to be done with patients' families; there is reading, research, and planning to be done and all that takes time. Meanwhile, it is the assistant who is seeing to the patients' immediate recreational needs, supervising the recreational activities, helping those patients having difficulties, and all the while observing the patients' progress so that it may be reported to the recreational therapist and the therapeutic value of the recreation be reassessed. In some cases, the recreational therapy assistant may take on supervisory and administrative tasks. This often happens when an assistant is employed in a small facility and the recreational therapist works only part-time or in a consulting capacity.

Recreational therapy assistants can find employment in hospitals, clinics, rehabilitation centers, public and private schools, correctional facilities, community mental health facilities, nursing homes, and summer camps serving those with certain disabilities.

Qualifications and Education

Students considering a career in therapeutic recreation should have a strong desire to serve others and work closely with them. They ought to enjoy teaching and participating in recreational activities.

Training to become a recreational therapy assistant (therapeutic recreation technician) involves 2 years in a community college therapeutic recreation program. Courses include instruction in areas such as disabling conditions, recreation activity skills and activity analysis, human growth and development, program planning, and group dynamics.

RECREATIONAL THERAPY ASSISTANT - Further Information

Employment Prospects

The position of recreational therapy assistant (Therapeutic recreation technician) was a new one. Studies indicated that there is a need for such persons. Future studies will be completed beginning in late 1975 to assess employment prospects.

Salary

Because of the newness of this position, there were no salary figures. It was expected that assistants with no prior work experience would receive between $7,000 and $8,500 per year.

Career Mobility

Experienced, capable recreational therapy assistants may advance to positions of greater authority in the agencies in which they work, or in other agencies employing therapeutic recreation personnel. Supervisory and administrative jobs usually require completion of a bachelor's degree. While the two-year training programs offered by community colleges are not specially designed for transfer to four-year institutions it may be possible to arrange for transfer of certain credits to individual colleges.

Further Reading

Kraus, Richard, Therapeutic Recreation Service, W.B. Saunders Company, Philadelphia, Pennsylvania, 1973

Stein, Thomas and Sessoms, H. Douglas, Recreation and Special Populations, Halbrook Press, Inc., Boston, Massachusetts, 1973

Therapeutic Recreation Journal, published by the National Therapeutic Recreation Society

Professional Organization Where More Information May Be Obtained

National Therapeutic Recreation Society
1601 N. Kent Street
Arlington, Virginia 22209

To Broaden Your Understanding

-obtain volunteer or paid work experience related to therapeutic recreation in a mental health facility, nursing home, rehabilitation center, or other organization providing therapeutic services.

-talk with a recreational therapist about his/her work

-write to schools and the professional organization

Music Therapist

Throughout the ages, man has turned to music to express his feeling of joy, despair, love, and hate. For each it serves a different purpose, and for some many purposes. Now, for those who are disabled, music may become an actual part of medical treatment.

Music therapy, the professional application of music to accomplish therapeutic aims, is used to aid patients afflicted with long-term disabilities such as tuberculosis, and with progressive diseases such as muscular dystrophy. For them it offers a new interest to make life more worthwhile. Even more effective is its use with the mentally ill, for music therapy may achieve changes in the patient's behavior that will give him a new understanding of himself and of the world around him. This should serve as a base for improved mental health and more effective adjustment to normal living.

A high percentage of the trained music therapists are now employed in psychiatric hospitals. Treatment is given to patients of all age groups, ranging from disturbed small children and adolescents to adults, who suffer from mental illness of many types and varying degrees of seriousness. As a member of the mental health team, the music therapist devises programs to achieve aims prescribed by the attending psychiatrist. Periodically, the therapeutic results are evaluated.

Recently, there has been a noticeable trend toward treatment of the mentally ill at outpatient clinics, locally administered and staffed, but supported by Federal Government grants. Discharged patients of mental institutions may be under continued observation and receive required treatment there, while others, who have not been institutionalized, may find the attention they need. Customarily the mental health team of the clinic includes a psychiatrist, a psychologist, a nurse, a social worker, and often a music therapist.

Many children with other handicaps profit from music therapy. The mentally retarded, the cerebral palsied, the crippled, and the blind make up a group that is second only to the mentally ill in numbers receiving music therapy. Rewarding personal satisfaction may be expected of the music therapist who works with children.

Music therapists may devise programs of many kinds in an effort to gain and to hold the patient's interest. Much depends upon his susceptibility to training, for what would be within the realm of one would be inappropriate for another. Group singing is commonly used. Musical appreciation and musical education is appealing to others. To the most trainable, instrumental instruction is offered, and, eventually, some of this group may qualify for orchestral work. Every effort is made to improve skills acquired in past years and to develop an intensified musical interest which will, in itself, give a new dimension to normal living.

The demand for registered music therapists exceeds the supply. Approximately 600 were actively employed throughout the United States in 1971. The greatest number served in psychiatric hospitals, but others work in general hospitals, isolation hospitals, and schools for exceptional children.

Qualifications and Education

A baccalaureate degree in music therapy is essential for a career in this field. For those who have a degree in music, the required therapy courses may be taken at graduate school as a part of the work toward a master's degree. Also required, to qualify as a registered music therapist, is a 6-month internship at an approved psychiatric hospital, affiliated for clinical purposes with an accredited music therapy school. In 1974, 28 American colleges and universities were approved by the National Association of Schools of Music to offer the degree of bachelor of music therapy.

(Prerequisite: High school diploma or its equivalent)

Required Special Training: 4-year program in music therapy, after which a bachelor's degree is awarded

Music Therapist

DePaul University
Chicago 60604

Illinois State University
Normal 61761

Western Illinois University
Macomb 61455

MUSIC THERAPIST - Further Information

Employment Prospects

In 1975 there were more positions available for music therapists than there were music therapists. Increasingly, therapists were finding employment in community mental health centers, working with day (non-hospitalized) patients. It was not possible to speculate on employment prospects in the next decade.

Salary

The salaries of music therapists in 1975 were quite similar to those paid to public school teachers. In Chicago, inexperienced therapists received nearly $10,000 per year. Those employed in smaller institutions and in smaller communities usually received lower pay. Experienced therapists received incremental pay increases, much the same as teachers.

Career Mobility

Capable, experienced music therapists may assume supervisory responsibilities. With two years of work experience plus a master's degree in music therapy or related field, it is possible to teach in an educational program for the preparation of music therapists. Persons with a bachelor's degree in music therapy have the academic background to move into educational programs or work in psychology and the social service areas. Persons entering music therapy from other fields most frequently come from public school music teaching, private music teaching, and professional music; fewer come from psychology, nursing, and other social service areas.

Further Reading

Journal of Music Therapy, a journal published by the National Association for Music Therapy, Inc.

Gaston, E. Thayer, Music in Therapy, Macmillan Publishing Company, New York, 1968.

Professional Organization Where More Information May Be Obtained

National Association for Music Therapy
P.O. Box 610
Lawrence, Kansas 66044

MUSIC THERAPIST - Further Information, Continued

To Broaden Your Understanding

-request the name of a music therapist located in your area from the National Association for Music Therapy, Inc.

-read about music therapy and then locate a hospital or rehabilitation center providing music therapy services, and ask to observe and to do volunteer work

-write to schools and the professional organization

Pharmacist

The pharmacist may be found in a variety of work settings, but no matter where he practices his basic functions remain the same. His primary responsibility is to compound and dispense medicine on the order of a physician or other qualified practitioner. To perform his function at the highest standards, he must be fully acquainted with the physical and chemical properties of drugs and the way they behave in the system. He must know how a particular drug will affect a human being, alter the cause of a disease, and react with other drugs being taken. He must also know how a drug may react in laboratory tests of blood and other human tissues.

The pharmacist serving in the community must be proficient in business matters, since he must purchase and sell hundreds of health-related items. In the hospital, the pharmacist may be responsible for the selection and purchase of all medicines used by the facility. In settings where hiring and supervision of personnel is required, the pharmacist will need management ability.

The pharmacist often serves as educator—both to the public and to the health practitioner in the proper use of drugs.

Qualifications and Education

Like the physician or nurse, the pharmacist assumes responsibility for human life. He must be dedicated from the start to conscientious and dependable services. Meticulous regard for accuracy, orderliness, and cleanliness is essential.

The pharmacist's ethics must be unquestionable. He is entrusted with the storage and distribution of dangerous and habit-forming drugs, and must be scrupulous in handling or dispensing them.

A person intending to become a pharmacist should be good in scientific subjects, enjoy working with people, and have better-than-average intelligence.

The number of women entering the profession of pharmacy is increasing steadily. Between 1959 and 1969 the percentage of female pharmacy students doubled. Today 1 student in 5 is a girl.

Women work in all areas of the profession. Many work part time when their family responsibilities become heavy.

To obtain a degree in pharmacy, the student must complete either a 5-year or 6-year program of education after graduation from high school. The 5-year program leads to the degree of bachelor of science in pharmacy. The 6-year program leads to the degree of doctor of pharmacy.

Some colleges of pharmacy accept the student immediately after graduation from high school, and offer the full 5-year or 6-year program themselves. Others permit or require the student to take the first year or 2 years of the 5-year or 6-year curriculum at a college or junior college.

There is no exception to the rule, however, that a minimum 3 years of professsional education must be acquired at an accredited college of pharmacy. In California, only those students who have studied in pharmacy college for at least 4 years are eligible for a license to practice.

There are 72 accredited schools of pharmacy in the United States and in Puerto Rico. The student should write the pharmacy school he hopes to enter to learn about entrance requirements and curriculum and to find out whether or not the school requires or permits him to take the first year or two of the program before admission. The student may choose, for financial reasons, to take his preprofessional courses at a college or junior college near his home.

In high school the student should take courses designed to prepare him for entrance to college. His grades should be good. Colleges of pharmacy do not judge an applicant solely by his high school marks, but these certainly are an important factor. Many pharmacy colleges require applicants to take aptitude tests, the results of which are considered along with the high school marks.

The curriculum in high school should be planned carefully. The general idea is to get as good a background as possible in English, mathematics, history, and government or social studies. Courses in chemistry, biology, and physics are especially helpful in preparing students for the many science courses required in the pharmacy curriculum.

Licensing and Registration

Because pharmacists have such heavy responsibilities and are so closely concerned with the health of the people they serve, all States have strict laws about licensing and registration. These may vary from State to State and the prospective pharmacist is instructed, while still in college, about the regulations applying in areas where he may wish to practice.

All of the States but one require graduation from an accredited school of pharmacy. Almost all of them, in addition, require practical experience, known also as internship. In most States, this re-

quirement can be met by combining clinical assignments done in connection with classwork and experience gained during summer vacations. The student should check internship carefully, since this may weigh heavily in obtaining a license to practice.

Before he can receive a license, the graduate in pharmacy must pass an examination given by the board of pharmacy in the State where he plans to practice. If he passes, he is then registered by the board. Most States honor licenses issued by other States. There are a few exceptions, and the pharmacist will be informed of these while he is still in school.

Community Pharmacies

Of the more than 100,000 registered pharmacists in the country, about 8 out of 10 work in community pharmacies.

There are several kind of community pharmacies, and the range of the pharmacist's professional work depends to some extent upon where he is employed. For example, the strictly prescription pharmacy or apothecary shop handles nothing but drugs and other items related to medical care. In the general community pharmacy, more than half the gross volume of business comes from this source, and the remainder comes from sales of merchandise found traditionally in drugstores—cosmetics, stationery, cameras, and the like. In some pharmacies, sales of general merchandise and fountain sales make up more than 50 percent of the business. In large general merchandising pharmacies, the trend is toward hiring managers trained in business techniques so the pharmacist is utilized more in his professional capacity.

The young pharmacist just out of school usually starts his career as an assistant to the owner or manager of a pharmacy. As he gains experience, he advances to managerial duties. Eventually, he may transfer to a larger pharmacy with expanded responsibilities, or become the owner or part-owner of a community pharmacy or an apothecary shop.

Pharmacists in Health Facilities

One of the rapidly expanding and important areas of practice open to pharmacists is pharmacy service in a hospital, nursing home, extended care center, or clinic. The routine duties of the pharmacist in health facilities are quite similar in many respects to those of the pharmacist dispensing prescription orders in a community pharmacy, but also include highly specialized tasks for which special training and experience are required. The size and character of the facility help to determine the functions of the pharmacist. In some of the larger facilities, there is considerable manufacturing of sterile solutions and drug preparations.

The health facility pharmacist works very closely with the medical staff as well as with the administrator's office. He is the custodian of the facility's pharmaceutical supplies and is responsible for purchasing these and a variety of other related supplies. He acts as a consultant on drug problems, and as the instructor in this field to other members of the facility staff. Frequently he is the monitor for the drug component of treatment. These facilities now employ approximately 10,000 registered pharmacists for full-time work, and in addition perhaps a third that many on a part-time basis. The need for pharmacists to practice in hospitals, nursing homes, and clinics continues to grow, and this practice environment is becoming increasingly attractive to pharmacists.

Smaller facilities frequently depend on nearby community pharmacies for their services or employ a part-time pharmacist. The tendency, however, is to engage a full-time pharmacist who can also take on related tasks, such as handling certain laboratory routines, sterilization of supplies, and administrative duties. Hospitals of 50 beds or more are taking on full-time pharmacists, and those with 100 beds or more find it practically impossible to get along without two or more pharmacists.

Any pharmacist licensed to practice may do so in this environment; however, a pharmacist wishing additional training and experience may become a resident in a hospital pharmacy recognized for high quality of service and facilities. It is also possible to augment or combine this practical experience with a year or more of study at an accredited graduate school associated with a school of pharmacy leading to the degree of master of science in hospital pharmacy. This experience may also be used in the program leading to the doctor of pharmacy degree.

The broad preparation and experience of the hospital pharmacist and his intimate contact with hospital administration may lead to more and more administrative work. If he has a flair for this, he can supplement his education by attending an accredited school of hospital administration, and become fully qualified to step into an administrative post. (For a description of this career, see the section on Hospital and Health Services Administration.)

Opportunities

Pharmacists are employed by the U.S. Public Health Service and all three branches of the Armed Forces. Serving as commissioned officers, they can rise to the rank of colonel in the Army and to equivalent ranks in the Public Health Service, the Navy, and the Air Force. Pharmacists are also employed by the Veterans' Administration, where they have civil service status.

Many of the drugs and medicines which pharmacists formerly compounded in their own pharmacies are now produced on a large scale by drug manufacturers. In addition, modern antibiotics, "sulfa" drugs, vaccines, and the like are made only in special plants which rely heavily on research, product development, and product control. This means that the pharmacist's services are needed in a variety of establishments.

The pharmacist who is particularly interested in the scientific aspects of his profession can find employment in the laboratories of pharmaceutical manufacturers. He may go straight to such employment from pharmacy college, but, if research is his goal, he should go on to graduate study in pharmacy, pharmacology, pharmaceutical chemistry, or other pharmaceutical sciences. These are growing fields with excellent prospects for both men and women.

Prospects

The well-qualified pharmacist can be sure that the demand for his services will increase in the future. He can also count on recognition for his contribution to the community.

Pharmacy has a direct relationship to pharmacology and other biophysical sciences. Through the research activities of drug manufacturers as well as of nonprofit laboratories, the development of new drugs and other dosage forms has become one of the major areas of investigation and progress in the health-related sciences. On this front, pharmacy and the research work associated with it have a direct relationship with the occupations covered in Basic Sciences in the Health Field.

For further information, write to:

American Pharmaceutical Association
2215 Constitution Avenue, N.W.
Washington, D.C. 20037

National Association of Boards of Pharmacy
77 West Washington Street
Chicago, Illinois 60602

American Society for Pharmacology and Experimental Therapeutics
9650 Rockville Pike
Bethesda, Maryland 20014

American Association of Colleges of Pharmacy
850 Sligo Avenue
Silver Spring, Maryland 20910

Pharmacist

(Prerequisite: At least 1 year of college)

Required Special Training: Usually 5 years of study in a professional school of pharmacy.

College of Pharmacy
University of Illinois at the
Medical Center
Chicago 60680

(prerequisite: 1 year of college; the professional program is another 5 years in length)

Pharmacy Technician

Required Special Training: Either a) on-the-job training under the supervision of a pharmacist, b) brief training program offered by a number of hospitals (there is no list of Illinois hospitals offering such training; check with the hospital of your choice), or c) a 2-year program for preparation as a pharmacy technician in a community college (there are no community college programs in Illinois).

PHARMACY - TECHNICIAN

With the many duties to be performed daily by today's pharmacist, it is difficult for him to function without an assistant. The pharmacy technician performs all those duties not requiring the specific knowledge and judgement of a registered pharmacist. Whereas the pharmacist must interpret the order, certify it, and choose the proper drug amounts, it is usually the pharmacy technician who prepares the label, fills and packages the prescription, and maintains all records concerning the purchase. For drugs which must be prepared in the pharmacy, either the pharmacist prepares them himself or he supervises the technician in the preparation. In any event, it is the technician who prepares the labels, selects the drugs to be used in the prescriptions (according to the pharmacist's directions), selects the equipment to be used in the mixing, and weighs and measures the proper amounts (as directed by the pharmacist). In addition, the technician packages and records the prescriptions.

Other duties of the pharmacy technician include checking supplies, maintaining inventory records, purchasing (under the direction of the pharmacist), receiving supplies, and billing customers.

Pharmacy technicians are employed in all places that employ pharmacists: privately owned pharmacies, hospital pharmacies, laboratories in private drug industries, pharmaceutical companies, the government, and some universities.

Qualifications and Education

The nature of the work performed by the pharmacy technician requires that he/she possess the qualities of accuracy and reliability.

The training given to persons wanting to be pharmacy technicians is usually received on the job from a pharmacist or through a brief training course offered by a number of hospitals. In 1974 there were no 2-year community college training programs in Illinois, but there are a very few in other states.

PHARMACY TECHNICIAN - Further Information

Employment Prospects

In 1975 employment prospects for pharmacy technicians who have received thorough training were generally good, and were expected to remain good. Those with only limited training, and who therefore would be of less help to the pharmacist, found it less easy to find employment.

Salary

No reliable salary information was obtained. [illegible]rienced graduates of a 2-year community college pharmacy techni[illegible]rogram outside of Illinois received about $450 per month.

Career Mobility

Capable, experienced pharmacy technicians working in large pharmacies may advance to assuming supervisory duties. Other than that, there is no mobility. Pharmacy technician training is not a stepping stone to becoming a pharmacist. (See page 12-A-4 for the education required in order to become a pharmacist.)

Further Reading

None

Professional Organizations Where More Information May Be Obtained

American Pharmaceutical Association
2215 Constitution Avenue, N.W.
Washington, D.C. 20037

Illinois Pharmaceutical Association
222 West Adams Street
Chicago, Illinois 60606

To Broaden Your Understanding

-obtain work experience in a pharmacy

-talk to a pharmacist and a pharmacy technician about their work

-write to the professional organizations

EMERGENCY MEDICAL TECHNICIAN (Ambulance Attendant)

Emergency medical technicians (EMT's), or ambulance attendants as they have been called in the past, play an important role in the health care system. But their past work has not been as influential as their future potential should prove. Attempts are now being made to up-grade emergency medical care and in Illinois a "trauma-care system" has been instituted in an effort to combat the rising number of deaths due to accidents and/or sudden illness.

Accidents are the fourth leading cause of death for persons of all ages in this country. Trauma, often the result of an accident or sudden illness, is the leading cause of death for persons between the ages of one and thirty-seven. Efficient emergency medical care administered by well-trained and well-equipped emergency medical technicians can do much to avert needless death and suffering. As an administrator of emergency first aid, the emergency medical technician can apply immediate care to the victim in place of the doctor. Such efforts may make the difference between life and death for a seriously ill or injured person. Sometimes for them the drive to the hospital and the wait to see a doctor is just too long.

When the EMT arrives at the scene of the accident/illness, he often must enlist the help of bystanders in order to create a safe environment in which to proceed. This is particularly important in the case of an automobile accident. He then must determine the nature and extent of the injury/illness and decide which types of emergency care should be administered and in what order. His decisions might involve opening and maintaining an air passage, resuscitating a heart attack victim, controlling bleeding, treating for shock, assisting in childbirth, or simply removing the victim as quickly and safely as possible from the scene and treating him enroute. On the way to the trauma center, the EMT may confer with the hospital doctor and emergency room staff over two-way radio.

Once the patient has reached the emergency room, the EMT may continue to aid personnel there until a physician can be obtained. Even after the patient is no longer under the EMT's care, the technician has additional duties. He is responsible for reporting to the attending physician and staff his own observations on what has occurred as well as filling out particular forms for diagnostic and record purposes. If the victim has died, the EMT must comply with particular regulations in regard to the deceased and he must notify the coronor. And after each trip he must replace linen, have equipment sterilized and/or replaced, have the inside decontaminated, and check to be sure the ambulance itself is clean and in good working order.

Emergency medical technicians are employed in hospitals, clinics, private ambulance services, police and/or fire departments, and funeral homes.

Qualifications and Education

An emergency medical technician should be physically fit, be able to lift and carry up to 100 lbs., possess manual dexterity and general physical coordination since much of his work is physical in nature. Likewise he should be sound in mind: the traumatic situations he is called upon to deal with demand a person of emotional stability, psychological adaptability, and sound judgment under stress. He should also have a pleasant personality and be able

to work smoothly with other people, giving and receiving instructions.

To qualify for training as an EMT, one must possess a high school diploma or its equivalent, and be at least 18 years of age.

Training programs are conducted in hospitals, often in affiliation with community colleges. A minimum of 86 hours of special training is required; some programs offer an additional 116 hours or more advanced training. Essential instruction acquaints the prospective EMT with the care and use of typical emergency equipment -- fracture kits, intravenous kits, rescue tools, stretchers, oxygen delivery systems, etc. -- as well as typical emergency medical procedures.

EDUCATIONAL PROGRAMS FOR THE EMERGENCY MEDICAL TECHNICIAN - ILLINOIS

(Prerequisite: Must be at least 18 years of age and be physically fit)

Required Special Training: A minimum of 81 hours of special training, conducted in hospitals, often in affiliation with community colleges. (An advanced 12-hour course in emergency medical technique is available at some of the institutions listed below.)

Emergency Medical Technician - (There are also emergency medical technician training programs at hospitals listed below given at many other hospitals in Illinois which have been designated as trauma centers.)

Carl Sandburg College
Galesburg 61401

College of DuPage
Glen Ellyn 60137

Danville Junior College
Danville 61832

Illinois Central College
East Peoria 61611

Kennedy-King College
Chicago 60621

Lake Land College
Mattoon 61938

Mayfair College
Chicago 60630

Moraine Valley Community College
Palos Hills 60465

Parkland College
Champaign 61820

St. James Hospital
Pontiac 61764

St. Joseph Hospital
Bloomington 61701

Western Illinois University
Macomb 61455

EMERGENCY MEDICAL TECHNICIAN - Further Information

Employment Prospects

In Illinois in 1975, emergency medical technician employment prospects for police and fire personnel were good. Employment prospects for emergency medical technicians working for private ambulance companies were poor, due to the decreasing number of these companies. These conditions were expected to continue throughout the next decade.

Salary

Starting salaries for inexperienced emergency medical technicians averaged $7,000 per year in 1975. Emergency medical technicians with five years of work experience could expect salaries of up to $9,000.

Career Mobility

Emergency medical technicians wishing for both greater responsibility and income may take an advanced EMT II (Paramedic) course. Completion of this course prepares the emergency medical technician to administer intravenous fluids, give tracheal intubations, and provide limited coronary care.

Further Reading

Emergency journal

Emergency Medical Services journal

Professional Organizations Where More Information May Be Obtained

National Registry of Emergency Medical Technicians
1395 E. Dublin-Granville Road
P.O. Box 29233
Columbus, Ohio 43229

To Broaden Your Understanding

-talk with an emergency medical technician about his/her work

-obtain employment assisting in emergency care with a hospital or private ambulance agency

-write to schools and the professional organization

MEDICAL PHYSICIST

The medical (or hospital health) physicist is a fairly new arrival to the health field. His rise to prominence corresponds directly with the advent of the atomic age and the application of the atom to peaceful uses. Medical physcises are most often associated with radiation therapy because they have played such a large part in the development of this treatment method. Today, though, they are generally found working with all aspects of diagnosis and treatment involving physics. These areas include X-ray, nuclear medicine, radiation therapy, ultrasonics, lasers, and thermography. In addition, medical physicists are also concerned with patient monitoring, medical instrumentation, and medical computations.

Research, consulting, and education are the three areas of activity in which the medical physicist works today. Some specialize in just one area but most are involved in all three areas during the course of their careers. Research is currently being conducted in such important areas as cancer detection and treatment. In consultation they combine their efforts with physicians to determine the best treatment for a particular patient. They work to maintain and improve standards for control of radiation hazards in hospitals. Those medical physicists who are educators help to train future doctors, technicians, and medical physicists.

Most medical physicists are employed by universities and hospitals. Often they work in a hospital and are also faculty members at an affiliated university.

Qualifications and Education

Due to the complexity of this field, the qualities of intellectual curiosity, scientific aptitude, and patience are indispensable. Those interested in medical physics ought to have excellent ability in mathematics and the sciences. A master's degree or doctorate is essential. College course work related to this field would include physics, biophysics, medical physics, chemistry, mathematics, and radiation biology.

EDUCATIONAL PROGRAMS IN MEDICAL PHYSICS – ILLINOIS

For Preparation as a
Medical Physicist or Health Physicist

(Prerequisite: 4-year university program in the physical sciences)

Required Special Training: master's or doctoral degree in medical physics

Medical Physicist

Health Physicist

University of Chicago
Chicago 60637

(Offers a 2-year master's degree in medical physics and a 4-year doctoral degree in medical physics)

MEDICAL PHYSICIST - Further Information

Employment Prospects

In 1975 employment prospects for medical physicists were good. They were better than ever before, and were expected to continue to improve in the coming years with the increasing realization by many hospitals of the important contribution of medical physics to health care.

Salary

In Illinois beginning salaries for inexperienced medical physicists with a master's degree were $10,000 to $12,000 per year in 1975. Beginning salaries for those with doctorates were $15,000 to $16,000. Salaries for persons with doctorates and with five years of work experience averaged $25,000-$30,000. Generally, the incomes of medical physicists employed by hospitals and in industry were roughly similar.

Career Mobility

A master's degree in medical physics is necessary to enter this field. Capable experienced persons have good chances of gaining increasing responsibility in this small but rapidly expanding field. Administration and the instruction of physicians are typical of the more advanced kinds of work done by medical physicists.

Further Reading:

Medical Physics, a journal published by the American Association of Physicists in Medicine

Professional Organization Where More Information May Be Obtained

Administrative Secretary
American Association of Physicists in Medicine
335 East 45th Street
New York, New York 10017

To Broaden Your Understanding:

-talk to a medical physicist at a larger hospital about his/her work (there are no medical physicists at many smaller hospitals)

-obtain paid or volunteer work in a health care facility

-write to the school and the professional organization

HEALTH PHYSICIST

The health physicist is often confused with the medical physicist; in general, the difference between the two amounts to the degree of specialization. Whereas medical physicists are found most often in the hospital-university-clinical setting, health physicists are more often involved outside of the hospital, in government and industry, in public and environmental health. Many health physicists are employed by the U.S. Atomic Energy Commission, the U.S. Department of Public Health, in large scientific laboratories such as Argonne National Labs near Chicago, and in private industry such as Commonwealth Edison. Their role is to protect man and his environment from the hazards of ionizing radiation. Their work involves research, consulting, and education as well as enforcement and development of state and federal regulations pertaining to radiation safety.

Qualifications and Education

Health physicists begin their career with a strong curricula in the physical sciences on the college level. Due to the complexity of this field, the qualities of intellectual curiosity, scientific aptitude, and patience are indispensable. Those interested in health physics ought to have excellent ability in mathematics and the sciences. A master's degree or doctorate is essential. College course work related to this field would include physics, biophysics, medical physics, chemistry, mathematics, and radiation biology.

HEALTH PHYSICIST - Further Information

Employment Prospects

In 1975 employment prospects for health physicists were good, nationally. Due to the increased use of radioactive substances in industry and in health care, and the need to protect the environment from radiation hazards, employment prospects in the next decade should continue to improve.

Salary

In 1975 inexperienced health physicists with master's degrees earned an average of $12,000 per year. Those with five years of experience received in the neighborhood of $17,000.

Career Mobility

No information was obtained regarding career mobility.

Further Reading

Health Physics Society, A New Profession in the Nuclear Age, no date (a booklet available free from the Health Physics Society)

Professional Organization Where More Information May Be Obtained

Health Physics Society
4211 39th Street, N.W.
Washington, D.C. 20016

To Broaden Your Understanding

-visit a university, hospital, laboratory, or other facility employing health physicists and discuss their work

-write to the school and the professional organization

FUNERAL DIRECTOR AND EMBALMER

The funeral director helps families and friends of deceased persons, many of whom are under considerable emotional stress and bewildered by the many details of the occasion, to make the personal and business arrangements necessary for the funeral service and burial.

The embalmer prepares the body for viewing and for burial. In many instances the funeral director and the embalmer are the same person.

The director's job begins when a call is received from a family requesting services. After arranging for the body to be removed to the funeral home, the director obtains the information needed for the death certificate, such as date and place of birth and cause of death. The director makes an appointment with the family to discuss the details of the funeral. These include: time and place of services; clergyman and organist; selection of casket and clothing; and provisions for burial or cremation. Directors also make arrangements with the cemetery, place obituary notices in the newspapers, and take care of many other details. Directors must be familiar with the funeral and burial customs of various religious faiths and fraternal organizations.

Embalming is a sanitary and preservative measure, and under certain circumstances, such as delayed burials, is required by law. Embalmers, perhaps with the help of apprentices, first wash the body with germicidal soap and shave it if necessary. The embalming process itself replaces the blood with a preservative fluid. Embalmers apply cosmetics to give the body a natural appearance and, if necessary, restore disfigured features. Finally, they dress the body and place in the casket selected by the family.

On the day of the funeral, directors attend to floral displays, provide cars for the family and pallbearers, receive and usher guests to their seats and organize the funeral procession. After the service they may help the family file claims for social security, veteran's and union benefits, and insurance. Directors may serve a family several months following the funeral until all these matters are satisfactorily completed.

Funeral homes, which numbered 23,000 in 1972, employed nearly all of the directors and embalmers. Most funeral homes had 1 to 3 of these workers, including the owner. Many large homes, however, had 20 or more. Several hundred embalmers worked for morgues and hospitals.

Qualifications and Education

Important personal qualities for funeral directors are courtesy, tact, and the ability to communicate effectively with the public. They should have the desire and ability to comfort grieving people. Embalmers should have the manual dexterity and sense of good taste necessary for performing the varied aspects of the embalming process.

High school students can start preparing for a career in this field by taking courses in biology, chemistry, speech, and psychology. Students may find part-time or summer jobs in a funeral home. Although these jobs consist mostly of maintenance and clean-up tasks, such as washing and polishing hearses, they can be helpful in gaining familiarity with the operation of funeral homes.

In order to become a funeral director or embalmer in Illinois, a high school diploma or its equivalent is required, followed by at least one year of college, one year in a school of mortuary science, and a one-year apprenticeship. Following completion of these requirements there is a state licensing examination to be passed in order to be an embalmer, and a second examination necessary to become a funeral director.

(Prerequisite: high school diploma or equivalent)

Required Special Training: One year of college, one year of mortuary science education, and one year of apprenticeship.

Southern Illinois University
Carbondale 62901 (2-year associate degree program)

Worsham College of Mortuary Science, Inc.
Chicago 60610 (In order to be admitted to this one-year mortuary science program, one year of college work must have been completed elsewhere)

FUNERAL DIRECTOR AND EMBALMER - Further Information

Employment Prospects

In 1975 employment prospects for funeral directors and embalmers were very good and were expected to remain so in the coming years.

Salary

In 1975 Illinois salaries for new graduates of mortuary science programs who were serving their one-year apprenticeships averaged $125 - $145 per week. Fully licensed embalmers and funeral directors who did not own their own funeral homes earned between $175 and $250 weekly. Those who owned their own funeral homes, and did a large volume of business, earned considerably more.

Career Mobility

Most inexperienced embalmers and funeral directors begin their working life in the employment of a funeral home. The ambition of most of them is to purchase and operate their own funeral home.

Further Reading

Grollmann, Earl, Concerning Death, A Practical Guide for the Living, Beacon Press, Boston, 1974

Jackson, Edgar N., For the Living, Channel Press, Des Moines, Iowa, 1963

National Funeral Directors Association, Funeral Service: Meeting Needs, Serving People, Milwaukee, Wisconsin, 1974

Professional Organization Where More Information May Be Obtained

National Funeral Directors Association
135 West Wells Street
Milwaukee, Wisconsin 53203

To Broaden Your Understanding

-obtain volunteer or paid work experience with an embalmer or funeral director

-talk with an embalmer and a funeral director about their work

-write to schools and the professional organizations

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