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FINAL REPORT

DEVELOPMENT OF PROVINCIAL LABORATORY
SERVICES IN LEBANON

September 1966 - September 1967

by

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I INTRODUCTION

The project was implemented at the request of the Minister of Public Health, Lebanon. It was suggested that the project should cover all the provincial hospitals in which a department of clinical pathology had been established. At the commencement of the project seven hospital laboratories were functioning in the country and later in 1967 two more were established, one in Sour and the other in Tibnine.

The laboratories already in existence were:

- Polyclinic laboratory attached to the 'Dispensary' at the Ministry of Public Health
- Beirut Hospital
- Hospital for Mount Lebanon at Baabda
- Hospital for South Lebanon at Saida
- Hospital for North Lebanon at Tripoli
- Hospital for the Bekaa at Zahle
- Hospital and clinical laboratory attached to the Rural Health project at Halba.

The World Health Organization provided the assistance of a technical officer - laboratory operations and the funds were provided from the Regular fund. In addition a sum of 300 dollars was allotted for teaching aides, in the form of bench text books, for each laboratory. The government of Lebanon seconded a senior laboratory technician to act as a national counterpart and provided equipment, apparatus and reagents necessary for the efficiency of the hospital laboratories. The approximate cost to the government over a period of two years was 20 000 dollars and this sum was obtained from the normal annual budget allocated to the Central Public Health Laboratory. The generosity of the government in providing the necessary equipment contributed largely to the success of the project.

II THE PROJECT AREA

The laboratories situated in the provincial hospitals shown in Section I not only catered for the in-patients of the hospital but also for a large out-patient population. The patients were not only civilians recommended by their medical practitioners but also government personnel of various ministries and their relations, personnel of the "Sûreté Générale", armed forces and municipalities were also attended to. This was most noticeable with the patients attending the Saida, Tripoli and Zahle hospital laboratories.

At the commencement of the project an analysis of the ratio of workload to staff complement was made of the laboratories involved; a comparison of the year 1965 and 1966 (estimated on the basis of the first eight months of 1966) is shown below together with staff complement, as Table 1.

TABLE 1

	HOSPITAL LABORATORY					
	Baabda	Beirut	Polyclinic	Saida	Tripoli	Zahle
Tests 1965	14 602	24 789	43 101	17 466	25 874	21 076
Tests 8 months 1966	16 022	21 193	29 888	13 602	23 325	19 063
Estimated total 1966	24 000	32 000	45 000	21 000	34 500	28 500
% increase	+66%	+30%	+4%	+20%	+34%	+35%
Technical staff	2	2	4	2	3	2
Others	2	3	6	1	1	2
Tests per technician	12 000	16 000	11 200	10 500	11 500	28 500

These figures show an abnormally high average output per technician per annum, a reasonable figure to expect is 10 000 specimens per technician per year in a clinical laboratory.

III SUMMARY OF OBJECTIVES

The general aim of the project was to assist the government to raise the standard of the work carried out in the provincial hospital laboratories already established and to assist in setting up any further hospital or provincial laboratories needed.

Particular attention was to be paid to advising on the techniques and methodology, aiming to standardize the procedures in all the government laboratories. Reporting and data recording, so that reliable results and information would be available from one laboratory to another throughout the country, was

another contributing objective. The standardization of apparatus, equipment and reagents was a subject upon which attention was to be paid. The major and most important objective, of course, was to assist in training and supervising the work of the technical staff in techniques in which they were not familiar. It was also hoped to improve the relationship between the Central Public Health Laboratory and the provincial hospital laboratories so that all administrative procedures would be co-ordinated under one body.

IV METHODS

It was agreed that eventually the provincial hospital laboratories should carry out all the investigations demanded of them by the medical practitioners and health authorities in the area, and that the Central Public Health Laboratory would then become only a reference laboratory for specialized investigations. The laboratories should also become self-supporting in the preparation of reagents and solutions, to this effect each laboratory was supplied with an analytical balance and a small pH meter, together with the necessary chemicals.

It was agreed that the laboratories should perform the following disciplines:

1. Microbiology - to cover clinical bacteriology, parasitology mycology and serology.
2. Biochemistry - to include routine analysis and electrolyte balance studies, limited enzyme techniques such as phosphatases and transaminase groups. More specialized investigations, such as electrophoretic patterns should be carried out by the biochemical section at the Central Public Health Laboratories.
3. Haematology - routine investigations and myelograms should be studied. and Immuno- Blood grouping and across matching of blood should also haematology be carried out.
4. Clinical - to cover urine analysis, examination of cerebro-spinal pathology fluid and other biological fluids.

It was anticipated that at a later date a section for public health bacteriology and histopathology should be established in every provincial laboratory covering each district or Mahafazat.

V ACCOMPLISHMENTS

The programme officially started on 1 September 1966, although the writer devoted the first three weeks of June - before going on home leave - to assisting with the ground work of the project. During the preparatory phase the WHO technical officer accompanied Dr Elias Hayek, the Director of the Central Public Health Laboratories, on visits to each of the provincial hospital laboratories to study and discuss the requirements. During the following two months the Director prepared lists of equipment and where necessary ordered supplies to cover those needed. The lists of equipment were separated under six headings, a) the major non-expendable equipment; b) expendable material with an average 'life' of less than two years; c) expendable material of over two years 'life'; d) expendable material which could be replaced after four months; e) expendable glassware which could be replaced after four months; and f) expendable chemicals and reagents replaceable after four months. These lists were eventually compiled into booklet form. Each laboratory was furnished with a copy of the booklet and as from 1 January 1968 they will be able to order from the Central Public Health Laboratories store articles necessary to make up the stocks to the level as shown in the lists. The maximum stock to be held by the laboratory was based on the volume of work carried out by the unit and will be subject to alteration in the light of experience.

In consultation with Dr E. Hayek, it was agreed that the project should be divided into three phases. The first, the preparatory phase, which was to be spent in the Central Public Health Laboratories to study the allocation of equipment, the standardization of methods to be adopted in each discipline with the chief of each section concerned at the Central Public Health Laboratory, and programme finalization. The second phase was to visit the various laboratories in turn, to assist in the administration and organization of the laboratory and help with instruction in haematology and clinical pathology. The third phase was to devote time to instructing the staff in biochemistry and bacteriology methods. The time-table of the programme for the project was prepared and is shown in Table 2. It will be noted that the technical instruction periods were divided into two sections of four weeks' duration for each section. The first four weeks were to be devoted to haematology and clinical pathology and later in the programme during the remaining four weeks instruction was to be given in biochemistry. This order was chosen so that the necessary apparatus and reagents needed in biochemistry would be made available later in the programme as there was an anticipated delay in ordering them.

The month of August was to be spent in visiting each laboratory to assess the work accomplished and give any additional help needed.

TABLE 2

Hospital laboratory	Suggested dates	Actual dates attended
Beirut C.P.H.L.	29.8.66 - 17.9.66	29.8.66 - 17.9.66
Beirut Hospital	9.1.67 - 3.3.67 24.4.67 - 6.5.67	16.1.67 - 3.3.67
Baabda Hospital	26.9.66 - 14.10.66 6.2.67 - 25.2.67	26.9.66 - 14.10.66 12.4.67 - 21.4.67
Saida Hospital	17.10.66 - 12.11.66 8.5.67 - 3.6.67	17.10.66 - 12.11.66 6.3.67 - 31.3.67
Tripoli Hospital	14.11.66 - 10.12.66 5.6.67 - 1.7.67	14.11.66 - 10.12.66 24.4.67 - 27.4.67 including 1 week at Halba
Zahle Hospital	27.2.67 - 25.3.67 3.7.67 - 29.7.67	13.6.67 - 11.8.67
Polyclinic	12.12.66 - 7.1.67 3.4.67 - 10.4.67	12.12.66 - 13.1.67 3.4.67 - 10.4.67

Perhaps it would be advisable to mention first the achievements obtained peculiar to all the laboratories, before assessing the accomplishments of each individual laboratory.

1. Administration

1.1 Very few out-patients attended the laboratories at the Beirut and Baabda hospitals, but this situation was, however, a major problem in the laboratories of the Polyclinic, Saida, Tripoli and Zahle hospitals for large numbers of out-patients attended daily at the laboratories. It was suggested that an appointment system should be adopted and strictly adhered to, the number of appointments to be made daily varied from laboratory to laboratory. It was also suggested that the Medical Director of each hospital should countersign the request form for laboratory examination submitted by the patients

from private medical practitioners of their towns and villages. On returning later to the various laboratories this plan seemed to be working successfully and was helping the work of the laboratory to run more smoothly.

1.2 In some laboratories it appeared the practice for the technicians to leave the laboratory and take blood samples from the patients on the wards of the hospital. With such limited numbers of staff this was most unsatisfactory for it left the laboratory without technical personnel, making subsequent accumulation of out-patients, delay in carrying out the technical work and no one to deal with any emergency investigations needed. It was suggested that a nurse or some other suitably qualified personnel should collect the venepunctures and despatch them to the laboratory. This method has been readily adopted in all the hospitals except Baabda and Tripoli.

1.3 A great deal of time was being spent on sorting out specimens, request forms and scraps of paper with patients' names on them. The institution of daily work sheets for the haematology, biochemistry, urine analysis and stool examinations was made and proved successful.

1.4 Methods of the correct way to order and register the receipt of equipment were also demonstrated.

1.5 In every laboratory the standard of cleanliness of glassware was poor, this was due, primarily, in most cases to inadequate supplies of the necessary material and equipment. With the use of 'Microsolv' as a detergent and a plentiful supply of distilled water, instruction was given in the correct procedure for washing laboratory glassware, and this important section has now reached a good standard.

It was impossible to find a solution to one aspect of the administration of the laboratory, in which a considerable amount of time was being spent by the technical staff and that was the volume of secretarial work involved. It was estimated that each technician spent at least one and a half hours each day carrying out duties of this nature - such as booking appointments, checking and registering specimens sent to the Central Public Health Laboratory, checking and registering reports received on specimens from the Central Laboratory, registering specimens and reports into the day book, recording daily and monthly statistics of work performed, preparing orders and checking receipt of goods together with numerous interruptions by telephone calls requesting examination results and patients calling personally for reports on their specimens.

A new type of request and report forms had been prepared and submitted for printing, modelled to a standard size and pattern, but these had not been received by the time the project terminated, although they were in the hands of the printers.

2. Technical

2.1 Most laboratories appeared to have inadequate bench space to carry out any additional work. New laboratories were constructed at the Beirut and Lahle hospitals. With re-organization of the laboratory rooms and a few additional tables the problem has been slightly alleviated in the remaining laboratories, but the situation is still far from satisfactory. The lack of drawer space was a most noticeable feature of every laboratory and the Director had 'nests' of twenty drawers made with formica tops, three 'nests' were given to each laboratory. Extra power points had also to be installed for the additional electrical apparatus.

2.2 Laboratory procedures. It was agreed that the technical methods to be used in the provincial laboratories should be those suggested in the WHO Health Laboratory Service Manuals 1, 2 and 3 with a few exceptions in the manual of biochemistry. The alternative methods used would be those described and distributed by Dr F. Stephan, Chief, Chemistry Section, Central Public Health Laboratory. Certain clinical pathology investigations had not been incorporated in these manuals and the writer wrote an additional manual to cover these few tests. The institution of bulk dilution methods for all haematological procedures was recommended, using the same volume pipette - 0.05 ml - for diluting blood for erythrocyte, leucocyte, platelet and eosinophil counts as well as haemoglobin estimation. This minimizes the variety of pipettes to be carried in stock and they are also less expensive. The method of Wintrobe sedimentation rate was recommended as the packed cell volume of the red cells can be determined on the same tube. Standardization and checking each month the colorimeter for haemoglobin estimation was demonstrated. Additional investigations taught were the determination of the reticulocyte count, osmotic fragility and examination of bone marrow. In the short period spent in each laboratory it was impossible to teach adequately the technicians so that they became proficient in reading a myelogram. Prothrombin time determinations were also made a routine investigation in all provincial laboratories. The major feature of the Haematological training was the necessity to prepare satisfactorily and stain peripheral blood films so that reliable results could be placed upon the examination, thus leading to a correct diagnosis.

The two recommendations made and instituted in the biochemical procedures, was the modification of the methods used by adopting a semi-micro technique, these methods speeded up the procedure and entailed using less blood and equipment. The methods were adopted in all hospital laboratories except those at Beirut and the Polyclinic. The necessity for preparing frequently accurate standard solutions for all investigations carried out, and these to be run in parallel every time a determination is made, was stressed. Too frequently it was found that a laboratory was using a 'factor' which had been given to it by the biochemistry department of the Central Laboratory, irrespective of the standard being checked on the colorimeter used.

WHO supplied the project with three sets of standard sera containing known biochemical constituents, the proprietary name of the sera, Versatol, Versatol-A and Versatol-A Alternate were supplied by Messrs William Warner. These sera proved invaluable in checking the reagents, instruments, methods and the technical ability of the technician, and it is hoped that in future each laboratory will continue to check their results periodically by using these standard sera. The results varied a great deal and only one laboratory came out creditably; however, the exercise served the purpose to show the mistakes that can occur, and that carrying out procedures mechanically does not always give reliable results and that each step of every method has a purpose and must be checked periodically, as well as controlling the reagents and the instruments - especially the flame photometer. If these points have been absorbed by the technicians then accurate biochemical results should automatically follow and more reliability placed on the results. The Directors and medical staff of each of the hospitals strongly and repeatedly requested that clinical bacteriology should be carried out in each of their hospital laboratories, but in spite of repeated efforts to obtain assistance from the Chief, Section of Bacteriology, Central Public Health Laboratory, no co-operation was made available.

3. Accomplishments at Individual Hospital Laboratories

3.1 Baabda Hospital Laboratory, 26 September - 14 October 1966 and 12-21 April 1967

The laboratory attached to this hospital carries out investigations only on the patients in the hospital. A limited number of out-patients are received, but the majority are sent to the Polyclinic laboratory in Beirut. The premises of the laboratory are small, but compact; suggestions to elongate a bench in the washing-up room, and rearrange the work of the haematology and clinical pathology so that it is carried out in one room and the biochemistry in another was

adopted. The laboratory staff consisted of three technicians and one laboratory aide. The Pharmacist has been made responsible for the laboratory and is expected to carry out the biochemistry investigations, in actual practice this does not occur. One of the technicians of the laboratory had attended, as a WHO fellow, the training course for medical laboratory technician tutors - project EMRO 0061 - and on appointment to the Baabda hospital laboratory he adopted many of the techniques which he had been taught during the course. The clinicians were satisfied with the standard of the work performed by the laboratory staff. It can be assessed as a smooth running unit which performs efficiently all the necessary investigations required of it, except bacteriology. Unfortunately one technician was transferred from the staff in June 1967 and it is doubtful that the standard and efficiency of the laboratory will be maintained with such a reduced staff (33%), and there will definitely be no opportunity to expand the work with the present premises and complement of staff. A new hospital is being built and suitable laboratories are being incorporated into the building. On returning to the laboratory towards the end of the project in August 1967, the standard and volume of work was being maintained in spite of the difficulties under which the staff are working.

3.2 Beirut Hospital Laboratory, 15 January - 24 February 1967

The laboratory carries out the work of this 200-bed hospital only, the hospital includes an infectious diseases wing and the specimens from out-patients are referred to the Polyclinic Laboratory at the Ministry of Public Health. As this hospital laboratory was the practical training centre for clinical pathology subjects of the course in project EMRO 0061, most of the methods and techniques suggested for the government laboratories were already being applied. Unfortunately the technician who previously assisted with the training programme had left the government service and was replaced by an inexperienced, but interested, technician, who was not conversant with the methods. New laboratory premises were opened on 16 January 1967, and although these were a marked improvement upon the old premises even more advantage could have been obtained had a greater detail to planning been exerted. For example, no cupboards, shelves nor drawers were available to store stock equipment or that in current use.

The staff of the laboratory consisted of an experienced technician, who also had attended the Technician Tutors Course of EMRO 0061, and a technician with limited experience, two aides are also employed full time. It was obvious from the outset that an increase in technical staff would have to be made if an expansion of the work was to be implemented.

Assistance was given in organizing the laboratory into its new premises, and then concentration was made upon developing the haematological and clinical pathology sections of the laboratory. Many efforts were made to introduce clinical bacteriology into the routine work of the laboratory especially from the infectious diseases aspect of meningitis and intestinal disorders, but to no avail. Similarly no expansion of the biochemical investigations could be made owing to the lack of proper facilities. Blood sugar and blood urea estimations were the only biochemical tests carried out, but the semi-micro method was not adopted, the excuse given was that the 'aide' who carried out these tests was not capable of handling graduated pipettes accurately.

On returning to the laboratory at the end of the project no progress in the work had been made, although the section of haematology was reputed to be working satisfactorily according to the reports given by the clinicians. The present number of staff is more than adequate for the volume and type of work carried out in this laboratory.

3.3 Saida Hospital Laboratory, 17 October - 11 November 1966 and 6-31 March 1967

The laboratory not only carries out the work of this busy hospital serving the south of Lebanon but also has a large out-patients clientele. Almost fifty per cent of the investigations made were from specimens submitted by patients from outlying villages, government personnel and their relatives, military and municipal employees in the locality. The medical staff are intern from the American University Hospital, Beirut, who demand not only a large variety of investigations but also a high standard of work.

It seemed impossible for such a large volume of work to be carried out in such a small laboratory of very limited bench space; reorganization of the laboratory rooms and two additional tables did slightly alleviate the congestion, however. Before the project started the staff consisted of only one technician and one laboratory aide, and the number of investigations carried out in 1965 was 18 000. However, before the writer visited the laboratory another technician was appointed and the pharmacist of the hospital put in charge of the unit, also to work half of her time in the laboratory - this she did conscientiously and well. The work continues to expand in volume and if a greater variety of laboratory procedures are to be carried out it is essential that the number of technicians should be increased.

The main problem affecting the laboratory was lack of organization and administration, consequently concentration upon this aspect of the work was made. Technical instruction in haematological procedures and clinical pathology was given, advice on cleansing and preparation of glassware for laboratory use was donated. The semi-micro methods for the estimation of blood sugar and urea were instituted serum cholesterol, protein and uric acid determinations were carried out as routine but it was not possible to demonstrate the electrolyte balance investigations as no flame photometer nor Van Slyke apparatus was available. The technical staff were most interested in the instruction given and co-operated in every way. On returning to the laboratory at the end of the project the standard and enthusiasm for the work was being maintained, it was also encouraging to learn that plans for a new laboratory were being studied. Here, again, agitation to establish a section for clinical bacteriology examinations was made, the technical staff were willing to carry out the additional work but this move was discouraged by the central laboratory.

3.4 Tripoli Hospital Laboratory, 14 November - 9 December 1966 and
24 April - 25 May 1967

This hospital laboratory served not only the hospital itself but had a large out-patient service, comprising not only patients from outlying villages in north Lebanon but government and municipal employees and their relatives. A very large volume of routine work was carried out, but unfortunately the hospital medical personnel did not interest themselves in the work of the department of pathology, nor place any confidence in the results of the tests received.

The premises are rather small but it is possible to manage with the present volume of work, but bench and storage space will prevent any expansion of the work. The staff consists of a part-time pharmacist in charge of the laboratory, she has had a good basic training in laboratory procedures, in France, and can assist in most disciplines when necessary; three technicians and a cleaner make up the complements of staff. It will be seen that the number of technical staff in the laboratory is adequate for the volume of work carried out and is sufficient at the moment for an increase in the complexity of the work envisaged for this hospital.

The daily organization and administration of the laboratory appeared quite satisfactory, but it would be preferable if the technical staff remained at their benches rather than spend too much time collecting blood samples from patients on the wards.

The technical work demonstrated was similar to that enumerated in "Methods Section IV". The demands for biochemical examinations of specimens, other than blood sugar, urea, cholesterol and uric acid, were virtually non-existent. It does not seem likely that this will ever be an active reliable provincial laboratory unless radical changes are made in staff and the supervision of the work.

3.5 Halba Laboratory, 15-19 May 1967

During the week spent in this laboratory attached to the Rural Health project the writer was able to give a little advice on simple haematological procedures, including the standardization of the photo-electric colorimeter for haemoglobin estimation. There is ample accommodation for a marked extension of the work and a competent technician serves the laboratory. Unfortunately the medical staff of the project do not take full advantage of the laboratory facilities offered to them.

3.6 Zähle Hospital Laboratory, 13 June - 11 August 1967

This laboratory carries out the pathological examinations for the hospital patients and a large out-patient clientele derived from the same type of populations as the Saida and Tripoli hospital out-patient departments. The laboratory premises have been reconstructed and additional rooms added to the previous department, but similar to the reconstructed laboratory at Beirut Hospital no cupboards, shelves or drawers were built into the rooms, so that apparatus could be conveniently stored.

The staff consisted of only one technician, one aide and a part-time cleaner previous to the writer's visit. When, however, the reconstructed laboratory was opened a further two technicians were appointed to the establishment, making a full cadre. This number of staff is adequate for the volume of work carried out and will also allow for a slight expansion of the work.

The technical work of the laboratory covered a wide field in all disciplines, and included blood grouping, crossmatching techniques, certain enzyme biochemistry, electrolyte balances etc. The technician was keenly interested in his work and the status of the laboratory was appreciated by the local clinicians for it had been developed along good lines. During the nine weeks in which the writer spent working there he was able to help develop further the haematology and clinical pathology procedures, and institute the semi-micro biochemical techniques, also help to solve various technical problems as they arose. Although frequently demanded by the clinicians, it was not possible to set up a section of clinical bacteriology and serology.

The complement of staff is sufficient for the volume of work carried out at present, the premises are adequate and sufficient equipment is available. The time spent in this laboratory was most rewarding and one does not hesitate to say that this is the most efficient of all the government laboratories, and the writer is confident that the present standard will be maintained as long as the present staff are allowed to remain working there.

3.7 Polyclinic, Ministry of Public Health, 12 December 1966 - 13 January 1967 and 3-10 April 1967

This laboratory is a "screening centre" for patients attending the various clinics attached to the Ministry of Public Health, also a large number of out-patients, recommended for laboratory investigations by their medical practitioners, attend the clinic. The laboratory is situated in an apartment and not designed as laboratory premises; basically it consists of six rooms containing formica topped tables, and has only limited service arrangements.

The present number of staff is quite adequate to deal with the volume of work received and should be able to cope with any expansion of the work envisaged. Previously the distribution of the work among the staff appeared uneven, for each member confined himself or herself to his own discipline, so that if there was an increased volume of work received by one section, no additional assistance would be given to the technician by the personnel of a less busy section. It was suggested that all technicians should be trained as polyvalent personnel, so that the work could be more evenly distributed. The Director of the laboratory is a well experienced full-time pharmacist, he is assisted by four technicians, a secretary, and five aides.

The types of investigations carried out on the patients are limited to urinalysis, stools for helminths, blood urea and sugar estimations, routine haematology and occasionally blood cholesterol and blood uric acid determinations are requested. Over 90% of the work reveals normal results. Holding discussions with the Director of the laboratory it was thought that a more satisfactory and economical solution would be to remove this laboratory to the new department of pathology at the Beirut Hospital, for the following reasons; a) better designed and adequate laboratory premises are already in existence; b) there would be no duplication of expensive apparatus and equipment; c) the present technical staff of both laboratories would be sufficient to cover the immediate and future

expansion of the work; d) a competently qualified pharmacist would be in charge of both laboratories. The Director of the Central Public Health Laboratory was also in favour of this plan and consequently suggested that any further time to be spent by the writer at the Polyclinic should be curtailed.

On returning to this laboratory at the end of the project no progress had been made in respect of transferring the laboratory; however, the technicians were rotating between the various departments and the work appeared to run smoothly.

A national counterpart was appointed to the project on 16 January 1967, but unfortunately was only allowed to work for three days a week until a replacement in the histopathology department could be found for him. Mr Maroun Wakim - the national counterpart - proved a valuable asset in the many aspects of the project. During the first two weeks of June he was transferred to give assistance to the laboratory of the Lebanese Red Cross Transfusion Service, and then later he was given the task of opening and setting up hospital laboratories in Sour and Tibnine, consequently his services to the project were terminated. One technician was taken from the histopathology department of the central laboratory to work in Tibnine hospital laboratory and Mr Maroun Wakim had to return to the bench of his original department. The situation still remained like this on the termination of the project.

VI COMPARATIVE SUMMARY AND ASSESSMENTS OF RESULTS

Viewing the project as a whole the writer can truthfully say that there has been a marked general improvement in the work of the provincial hospital laboratory services as from before September 1966. Of course, much depends on how critical and idealistic one is.

It would be helpful to make a comparative summary and assess the results of the project under the following headings: 1) Administration; 2) Premises; 3) Equipment; 4) Technical Staff; 5) Technical Work.

1. Administration

Previous to the implementation of the project there seemed to have been little liaison between the Central Public Health Laboratory Services in Beirut and the provincial hospital laboratories. Strict supervision of the provincial laboratories was not carried out, and seldom did an officer visit them. The laboratories found difficulty in obtaining

supplies from the central stores. However it is hoped that when the national counterpart is appointed to a position of Superintendent Technician, he will be able to pay regular visits and make strict supervision of the hospital laboratories. The lists of equipment and stores available as shown in the booklet should facilitate the laboratories in obtaining continuous supplies of equipment.

2. Premises

It is most encouraging to report that a new laboratory was built and equipped at the Beirut Hospital and the old laboratory at Zahle completely reconstructed. Plans to incorporate a complete department of pathology in the new hospital now being built in Baabda, and the proposal to construct new laboratories in the grounds of both the Saida and Tripoli hospitals show that the Ministry of Public Health is fully alert to the needs of these essential departments. It is hoped that a little more detailed planning will go into the construction of these new departments, such as adequate drawer space, and sufficient cupboards to store the equipment needed to run the department.

3. Equipment

The government was most generous in supplying apparatus and equipment to make the project a success. Additional colorimeters centrifuges, water baths were given to each laboratory as well as an analytical balance and pocket pH meter. Flame photometers have been ordered for each laboratory as well. The expendable equipment has been supplied in quantities commensurate with the work carried out in each laboratory. It is hoped that the central store of the central laboratory will be constantly aware of the need to keep adequate levels of stocks of expendable items always available for the provincial laboratories. This should be one of the major duties of the superintendent technician, to supervise the store and distribution of equipment.

4. Technical Staff

The appointment of a national counterpart, who was so willing to help and learn, assisted the project immensely, and the ideal situation appeared to have occurred. It was most disappointing to see the position degenerate during the last three months but it is sincerely hoped that his activities will soon be revived.

The shortage of technical staff was the major problem facing the project, right from the start. Young, inexperienced and incapable female pharmacists had been appointed in charge of the laboratories at the Saida, Baabda and

Tripoli hospitals. These appointments were resented by the more experienced and senior male technical personnel in these laboratories. The pharmacists were given a short period of training in the biochemical department of the central laboratory and only the pharmacist from the Saida hospital appears to have gained any advantage from this. Their technical ability and reliability to produce accurate results was always under doubt and constantly the technicians had to make themselves practically responsible for both the technical and administrative aspects of the work. Their presence did not alleviate the problem of shortage of staff but in some cases proved more of a hindrance. The increase in technical staff at the Saida and Zahle hospitals laboratories proved a great help, but it must be pointed out that if an increase in the volume and complexity of examinations is to be carried out in the laboratory services additional "pairs of hands" are needed to meet the situation. There is no shortage of semi-trained technicians in Lebanon who have attended the one-year basic training course for medical laboratory technicians at the American University, and who are only too anxious to find employment. The cadre of technicians in all of the laboratories remains exactly the same as it was nine years ago in spite of the increase in volume of routine work and the variety of examinations carried out. It is felt that an urgent review of the position should be made by the Civil Service. In spite of the continuous representation of the position this point failed to make any impact.

5. Technical Work

The standard of the technical work has been raised in all laboratories, except the Tripoli hospital laboratory, during the past year. The technicians were anxious to learn new methods and to increase their knowledge of the work of their chosen profession. The general greatest advancement was made in haematology, although some laboratories showed marked improvement in their biochemical technical ability. The demand for immuno-haematology was very limited and will not be a necessity until local blood banks have been established in the area. An improvement in certain aspects of clinical pathology was noted.

The most disappointing feature of the project was the inability to establish sections of clinical bacteriology in the provincial hospital laboratories, for these sections would eventually become responsible for the sanitary and serological bacteriology. Repeated requests from the Directors of the hospitals and their medical staff were made to establish this branch of the science and the technicians were equally anxious to co-operate in this aspect of the work. However, the Chief, Bacteriological Section, Central Public Health Laboratory, put forward many objections to establishing such departments.

VII RECOMMENDATIONS AND PREDICTIONS FOR THE FUTURE

If the standard of work and the activities of the provincial hospital laboratories are to be maintained as set by the present project, it is imperative that a Superintendent Technician should be appointed. This appointment cannot be overemphasized, especially in view of the present situation where there is no permanent director of the Central Public Health Laboratory. The duties of a superintendent technician should be to control the management of the laboratory stores and the distribution of chemicals and equipment to the various laboratories. He should have supervision of the technical staff and technical methods to be carried out and also to assist in establishing new hospital laboratories and departments in existing laboratories. He should visit each provincial laboratory at least once a month without previous appointment and should be responsible to the Director of laboratory services for the smooth and efficient running of this part of the Ministry of Public Health. The national counterpart who assisted the writer in the project is an admirable candidate for such a post, his personality, character and seniority in technical experience makes him the ideal choice. As one of the problems appeared to be discipline, control and authority of staff, it is recommended that the young inexperienced female pharmacists should be replaced by experienced senior technicians. The duties and the power of authority should be specified and he should come directly under the control of the Director of Laboratory Services and the Superintendent Technician and not the matron of the various hospitals.

The writer advocates that a grading system for all the technicians should be adopted and an experienced polyvalent senior technician should be appointed to each provincial hospital laboratory. Another urgent task is to reassess the cadre of the medical laboratory technicians needed by each laboratory. As previously stated the cadre was made ten years ago, before some of the laboratories had even been established. The growth of the work has already outstripped that anticipated, but even so there is need for further expansion, including the formation of clinical bacteriology sections and the expansion of clinical chemistry sections. The minimum staff requirements for each provincial hospital laboratory should be three trained technicians, three laboratory 'aides', a glassware cleaner, a general cleaner, and a clerk-typist. As mentioned previously, a quarter of the technicians' time is spent each day in doing clerical work, this is to be deplored and assistance should be given wherever possible - one suggestion would be to share a clerk-typist equally with the X-Ray departments, which in every case are adjacent to the laboratory.

Another small task of which the technicians should be relieved is the withdrawing of blood from patients in the hospital wards, this is already carried out by a nursing orderly in some hospitals, but the point to be stressed is that "the technicians place" is at the laboratory bench.