

ANNUAL

REPORT

1985-86



PAKISTAN SCIENCE FOUNDATION



**Pakistan Science Foundation**

**ANNUAL REPORT**  
**1985 - 86**

**PAKISTAN SCIENCE FOUNDATION**  
Almarkaz F7/2  
Islamabad

**LETTER OF TRANSMITTAL**

Islamabad

Dear Mr. Secretary

I have the honour to enclose herewith Annual Report of the Pakistan Science Foundation for the fiscal Year 1985-86 alongwith its audited accounts, as adopted by the Board of Trustees for submission to the National Assembly as required by the Pakistan Science Foundation Act III of 1973.

With regards,

Yours sincerely,

Sd/-

(Dr. M. D. Shami)  
Chairman

**PAKISTAN SCIENCE FOUNDATION**

Secretary,  
Ministry of Science and Technology,  
Government of Pakistan,  
ISLAMABAD.

**PAKISTAN SCIENCE FOUNDATION**

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## LIST OF ABBREVIATIONS

B	Baluchistan
C	Centre
F	Frontier
P	Punjab
S	Sind

### **Sponsoring Institutions:**

AC	Agricultural College
AU	Agricultural University
EU	Engineering University
QU	Quaid-i-Azam University
KU	Karachi University
HG	Government College, Haripur
PU	Peshawar University/Punjab University
SU	Sind University
KMC	Khyber Medical College
NHL	National Health Laboratories
CSIR	Council of Scientific and Industrial Research
JPMC	Jinnah Post-graduate Medical Centre
NIAB	Nuclear Institute for Agriculture & Biology

### **Disciplines**

AGR	Agricultural Science
BIO	Biological Sciences

Sciences

ENG	Engineering Sciences
MED	Medical Sciences
PHY	Physical Sciences
CHEM	Chemical Sciences
MATH	Mathematics & Computer Sciences
EARTH	Earth Sciences
OCEAN	Oceanography
ENVR	Environmental Sciences



## INTRODUCTION

The Pakistan Science Foundation was established on June 30, 1973 under the Pakistan Science Foundation Act No. III of 1973 (Annexure-I) "to promote and finance scientific activity having a bearing on the socio-economic needs of the country." Under the Act, the Foundation has been entrusted with the following functions:-

- a)
  - i) establishment of comprehensive scientific and technological information and dissemination centres;
  - ii) promotion of basic and fundamental research in the universities and other institutions, on scientific problems of national significance relevant to the socio-economic development of the country;
  - iii) utilization of the results of scientific and technological research, including pilot plant studies to prove the technical and economic feasibility of processes found to be promising on a laboratory scale;
  - iv) establishment of science centres, clubs, museums, herbaria and planetaria;
  - v) development of learned bodies scientific societies, associations and academies engaged in spreading the cause of scientific knowledge in general or in the pursuit of a specific scientific discipline or technology in particular;
  - vi) organization of periodical science conferences, symposia and seminars;
  - vii) exchange of visits of scientists and technologists with other countries;
  - viii) grant of awards, prizes and fellowships to individuals engaged in developing processes, products and inventions of consequence to the economy of the country; and
  - ix) special scientific surveys not undertaken by any other organization and collection of scientific statistics related to the scientific effort of the country.
- b) The Foundation shall also;
  - i) review the progress of scientific research sponsored

by the Foundation and evaluate, the results of such research;

- ii) scientist pool
- iii) cultivate liaison with similar bodies in other countries.

The activities performed under the above mentioned statutory functions are given in the chapters that follow.

## CHAPTER - I

### ACTIVITIES AND PROGRAMMES

The progress of work done by the Pakistan Science Foundation during the year 1985-86 under the various functions entrusted to it is summarised below:-

Item: I. ESTABLISHMENT OF PAKISTAN SCIENTIFIC AND TECHNOLOGICAL INFORMATION CENTRE (PASTIC)

i) Document Supply:

During the period of this report three thousand nine hundred and three (3903) documents were supplied to individual researchers and S&T organizations. The materials comprised of hard copies and microforms of articles of periodicals, patents, reviews and reports.

ii) Publications:

The following publications were produced.

**a. Pakistan Science Abstracts:**

This publication contains abstracts of Scientific research work published in Pakistan. Following volumes were published.

<u>Vol.</u>	<u>Year</u>	<u>Issues</u>
22	1982	1-4
23	1983	1-4
24	1984	1-4
25	1985	1-
26	1986	1-

**B. Other Publications:**

- Directory of Scientific Periodicals of Pakistan.
- Directory of Agricultural Libraries
- List of Scientific Periodicals in the Libraries of Bahauddin Zakariya University.
- List of Scientific Periodicals in the Library of Quaid-i-Azam University, Islamabad.

iii) National Science Reference Library:

Five hundred and ten titles (six hundred and five issues) of periodicals were received by the library. Six hundred and sixty books (accession numbers, 3727-4389) were classified and catalogued. Efforts were made to reorganise the library. Classification and cataloguing of all books of the library was completed and 3200 titles were computerised. Computerization of primary and secondary journals holding was also started and 400 titles were computerised.

iv) Programming and Data Processing:

The activities of this unit were as follows:-

a) Database of Pakistan Science Abstracts:

With the object of preparing a data base of scientific-research literature published in Pakistan a beginning was made from computerization of Pakistan Science Abstracts. For this purpose classification code, title and author of articles, and bibliographies description of the source journal of 6700 articles were entered on the computer and class code was prepared.

b) Patent Information:

Patent information available with PASTIC on microfilm was entered on the computers. Seven thousand and two hundred (7200) patents were computerized.

c) Word Processing:

Starting from volume 25 of the Pakistan Science Abstracts all PASTIC Publications were composed on the computer. Thus, for the period of this report, Pakistan Science Abstracts Vol. 25, I, Vol. 26, I and lists of scientific periodicals in the libraries of the Quaid-i-Azam University and the Bahauddin Zakariya University, Directory of Scientific Periodicals of Pakistan were prepared by the computer section.

iv) Translation:

Nine (9) research articles were translated from French, German and Russian. The total number of pages translated were ninety.

vi) Bibliographies:

Fifteen subject bibliographies containing 700 references were prepared.

vii) Union Catalogue:

The 1970 edition of the Union Catalogue, comprising of 5000 titles of journals of 90 libraries were computerised. This was done with the object of up dating the information. New information about the serial holdings of Quaid-i-Azam University and of the Bahauddin Zakariya University was entered on the computer and these lists were printed for distribution.

viii) Reprography Unit:

Jobs of the following organizations were executed during the report period.

-	Ministry of S&T	8 jobs,	5 pages;	64780 impressions
-	Pakistan Acad. of Science.	3 jobs;	14 pages	15000 impressions
-	Pakistan Museum of Natural History.	4 jobs;	12 pages;	45000 impressions
-	Ministry of Edu.	1 job;	50 pages;	2750 impressions
-	Quaid-i-Azam University	10 jobs;	1109 page;	521350 impressions
-	PASTIC	17 jobs;	1779 pages;	521350 impression
-	Pakistan Science Foundation	20 jobs;	291 pages;	341850 impressions
	Total:-	<u>89</u>	<u>3281</u>	<u>1,518,680</u>

II. RESEARCH SUPPORT

THE PROMOTION OF BASIC AND FUNDAMENTAL RESEARCH IN UNIVERSITIES AND OTHER INSTITUTIONS ON SCIENTIFIC PROBLEMS RELEVANT TO THE SOCIO-ECONOMIC DEVELOPMENT OF COUNTRY.

The Foundation carries out its statutory responsibility for the support of scientific research through a number of programmes, which include:-

- a) Grants of research projects submitted by individuals or groups of scientists in the universities and research institutions across the nation.

TABLE - I

**SCIENTIFIC RESEARCH PROJECTS SANCTIONED DISCIPLINE  
WISE DURING JULY 1973 TO JUNE 1986**

DISCIPLINE	1973-82		1982-83		1983-84		1984-85		1985-86		1973-86	
	No.of scheme	Amount sanction- ed	No.of scheme	Amount sanction- ed	No.of scheme	Amount sanction- ed	No.of scheme	Amount sanction- ed	No.of scheme	Amount sanction- ed	No.of scheme	Amount sanction- ed
Agricultural Sciences	24	4.373	2	0.368	2	0.645	3	0.655	-	-	31	6.385
Biological Sciences	54	7.082	5	0.869	3	0.580	4	1.254	4	0.869	70	10.654
Chemical Sciences	70	8.418	8	1.173	3	0.618	3	0.314	5	1.363	89	11.886
Earth Sciences	12	1.212	1	0.186	-	-	3	0.670	-	-	16	2.068
Engineering Sciences	5	0.460	2	0.620	-	-	1	0.167	-	-	8	1.247
Environmental Sciences	14	1.554	-	-	2	0.383	-	-	1	0.547	17	2.484
Mathematical Sciences	5	0.250	-	-	-	-	-	-	-	-	5	0.250
Medical Sciences	39	4.077	-	-	3	0.824	7	1.857	4	1.444	43	8.202
Oceanography	3	0.456	-	-	1	0.820	-	-	-	-	4	1.280
Physical Sciences	18	3.151	2	0.503	-	-	3	0.970	2	0.986	25	5.610
Total:-	244	31.032	20	3.719	14	3.871	24	5.887	16	5.209	319	50.066

- b) Institutional support provision of equipment, literature staff training facilities, etc. to build institutional capability for conducting research.
- c) Support for participation in regional and international research programmes.

A. Grants of Research Projects Submitted by Individual Research Workers or Groups of Scientific Workers.

Research Support is the Foundation's principal programme for the promotion of basic and fundamental research, having relevance to the socio-economic needs of the country.

During the period under report, 42 projects costing Rs.18.43 million were received by the Foundation, whereas 49 projects proposals which had been at the various stages of their processing, were carried over from the previous year. Thus, in all, 91 proposals remained under active consideration of the Foundation during the period 1985-86. These proposals were examined by experts in the relevant fields in the light of their scientific merit and relevance to national needs according to the criteria laid down by the Foundation. The criteria for research are (a) competence of the scientific personnel available to carry out the research (b) Institutional capability i.e., availability of requisite equipment, library facilities and support from scientific colleagues (c) scientific merit of the proposed research (d) likelihood of completion of the project within the stipulated time. Each proposal, after the initial review report, is placed before the Technical and other Committees of the Foundation. During the report period only 16 projects could be sanctioned at an estimated cost of Rs.5.200 million.

Discipline-wise list of grants sanctioned by the Foundation is given in table -1.

## RESEARCH PROJECTS

Summaries of the research proposals sanctioned, during the year 1985-86, are given below:-

### I. BIOLOGICAL SCIENCES

P-PU/BIO (141)

Title: Studies on the Siwalik artiodactyla (Suoidea, Anthracotherioidea and Cervidea).

The fossils of Artiodactyl animals are abundantly found in the siwaliks. The survey of these fossil has two fold importance Zoologic as well as geologic. Zoologically, it is important because

the past history of such animals is easy to interpret. Geologically, these fossils help in understanding the stratigraphy of the area. The project aims at surveying the region for collecting and studying fossil fauna. These specimens thus collected will be identified, catalogued and will form the part of collection of the Pakistan Museum of Natural History.

C-QU/BIO (144)

Title: Effect of Phytohormones applications in the Amelioration Water & Salt stress in Legumes.

Legumes are not only important for their economic value but also for their capability of fixing the atmospheric nitrogen through their root nodules. The process of nodulation in leguminous plants is adversely affected under stress conditions such as salinity, waterlogging, drought and higher temperature. Varied structural and physiological changes occur in the root nodules under stress conditions, but their exact nature and functions have not so far been properly identified.

This project is aimed at investigating the mechanism of osmoregulation of the intact leguminous plants under salt and water stress and its implications in (i) nodule initiation, (ii) nodule differentiation and (iii) nodule effectivity. The identification of stress induced and phytohormone affected changes in the host plant and the root nodules will also be made.

The information thus obtained will help the investigators in proposing suitable ameliorating measures for growing legumes.

P-TICR/BIO (145)

Title: Collection and record of Reptilian Fauna of Tableland Potwar, Punjab, Pakistan

Previous studies on the Zoogeographical distribution of Reptiles in Pakistan has shown that much of the territory of Pakistan is yet to be explored. One of such areas from where no record exists, is Potwar region of Pakistan, which has unique geographical position, as it lies between the foothills of Himalayas on one hand and vast plains of Punjab on the other, and it is assumed that its herpectofauna might represent a transitional mixture of Himalayan, Indo-Oriental and Paleoarctic forms.

This project is aimed at surveying the Potwar region for the collection of natural fauna pertaining to class Reptilia. The specimens procured under the project will form as part of the collections of Pakistan Museum of Natural History.



Title: Hormonal Influences on Skeletal Muscle Grafts.

Many recent studies have shown that skeletal muscles in human beings and many groups of animals are capable of undergoing successful transplantation. During this process, almost all of the original muscle fibres within the graft undergo complete degeneration and are replaced by a whole new population of regenerating muscle fibres. However, the degree of structural and functional recovery obtained within the grafts has not been more than 50% of the original. Attention is now directed towards understanding the effects of various systematic factors on this process. There are some hormones which are known to have anabolic effect on normal skeletal muscle. It is hypothesized that these hormones should be able to play an important role in producing structurally and functionally superior muscle grafts.

This project investigations will be made on the muscle regeneration in the absence of three of the most important hormones with known anabolic properties; i.e. testosterone, Insulin and Thyroid hormones. The effects of gradual replacement of these hormones on muscle grafts will be analysed and on the other end of the spectrum, the effects of higher than normal concentrations of these hormones on muscle regeneration will also be assessed.

This study will not only be important from the point of view of obtaining better muscle grafts but would also be helpful in determining the feasibility of muscle grafting surgery in patients who may have one or more of such hormonal abnormalities.

## 2. CHEMICAL SCIENCES

S-KU/Chem/(164)

Title: Mechanism of Iron release from Biological Iron Transport Compounds.

Iron is insoluble in physiological pH and aerobic environment. Thus acquisition and transport of iron is a problem for living organisms which survive in such an environment. The problem is overcome with the help of strong chelating agents for  $\text{Fe}^{3+}$  (Low MW siderophores in case of Microorganisms and proteins in case of higher organisms). The strong binding constants of these chelating agents for  $\text{Fe}^{3+}$ , in turn has difficulty of releasing iron from these chelates for eventual cellular utilization. Reduction of  $\text{Fe}^{3+}$  to  $\text{Fe}^{2+}$  however facilitates iron release.

The project envisages a study of (i) Kinetics and mechanism of reduction of  $Fe^{3+}$  bound to biological transport chelates, (ii) Serum protein: transferrin, milk protein: lactoferrin and egg protein: conalbumin and (iii) binding of iron to goat milk lactoferrin with a view to assess its reputation as "Beneficial" for TB patients."

A comparison between the reactivity characteristics and iron binding properties of siderophores of pathogenic microorganism and protein will provide useful information for clinical management of infectious diseases.

S-KU/Chem (165)

Title: Isolation and Structural Studies on the Chemical constituents of *Ervatamia coronaria*.

Ervatamia coronaria (Apocynaceae) is a green tree grown in the gardens of Pakistan. Various parts of the plant are used in the indigenous system of medicine like ophthalmia treatment for wounds and inflamed parts of the body. A number of indol alkaloids have been obtained from the leaves, stem, bark and roots of the plant. Crude extract of the plant is reported to have anticancer activity. A number of anti-tumour alkaloids have been isolated from Catharanthus roseus a closely related plant, which have found wide use in medicine for the treatment of acute leukaemia in children and a number of solid tumours.

the project envisages following investigations:

- a) Isolation of hitherto un-known natural products from the leaves of Ervatamia coronaria.
- b) Determination of their structure by chemical spectroscopic means, and
- c) Evaluation of pharmacological activity, locally and abroad.

It is expected that a number of new compounds, with significant properties, shall be isolated and their structures elucidated.

P-IU/Chem (166)

Title: Studies of Heterocyclic Compounds.

Heterocyclic compounds containing imidazole nucleus have recently attracted much attention, e.g. antimicrobial agents metronidazole and misinidazole, the amino acid histidine and its decarboxylated derivative the histamine responsible for various pathological states. Imidazole-4, 5-dicarboxamide and its 1-methyl

derivative are valuable starting materials for the synthesis of purines. The condensed derivative of imidazole i.e. benzimidazole is a part of vitamin B<sub>12</sub> in the form of its 5,6-dimethyl derivative.

The project involves the synthesis of biologically active heterocycles, mainly benzimidazole and its derivatives, either by using the already existing methods or by developing new synthetic routes for their preparation.

S-KU/Chem (170)

Title: Studies on the Chemical constituents of Capparidaceous plants of Pakistan.

Plants belonging to family Capparidaceae are reputed for their medicinal properties and are used in the indigenous system of medicines against a number of human ailments.

The present study envisages isolation and structural determination of the chemical constituents of these plants. The compounds isolated as a result of this work will be subjected to screening in order to discover any antibacterial and antifungal activity thereof. The study is expected to yield encouraging biological results.

### 3. ENVIRONMENTAL SCIENCES

F-PCSIR/ENVR (28)

Title: CR-39 and Mica Nuclear Track Filter system: Development and their Applications in Biology and Environmental Research.

Experience in biological and environmental research shows that the process of purifying (a) human blood from the cancer and other types of unhealthy cells, (b) the nuclear industry air from radioactive aerosole and (c) chemical and different types of liquids from bacteria and other damaging-unwanted micro organism, can play a useful role in biological processes and public health. The need of a simple system for carrying out the above mentioned functions is even more desirable by developing countries like Pakistan, which cannot afford to purchase the costly and complicated electronic systems due to economical and other reasons.

The present scheme envisages to devise a useful system for the filtration and collection of air borne and water borne particles for further studies and apply them in (a) biological system and Environmental dosimetry.

The findings of such studies will be used in the purification and analysis of (a) blood-samples and different types of chemicals and liquids, (b) industrial and laboratory exhaust gases and (c) environmental air samples. The work is expected not only to improve the previously existing system but may also suggest entirely new applications.

MEDICAL SCIENCES

S-JPMC/Med (85)

**Title:** Biochemical Studies on Trauma

Biochemical studies on blood, urine and CSF on traumatic patients have been conducted earlier. Disturbances in electrolyte balance especially sodium and potassium as well as changes in hormones were observed. Endocrine variations result in metabolic disturbances of carbohydrate and protein. In no instance severity of trauma was associated with specific biochemical parameter except in the case of cerebral trauma in which high CSF lactate concentration was some times associated with severity of cerebral injury. To assess the severity of injury further investigation of biochemical parameters, is required, so as to find a suitable index for relating the degree of severity of trauma.

The present scheme aims at studying the effect of Biochemical parameters including - sodium, Cyclic guanosine monophosphate, Cyclic adenosine mono phosphate, lactate, protein and urea with special emphasis on energetics so as to find out some specific relationship of these to the type and severity of trauma in patients who have undergone surgery or neuro surgical cases who remain unconscious due to trauma.

The results achieved will indicate biochemical variation and severity of trauma in patients who are recovered, remained unchanged or expired.

P-NMC/MED (100)

**Title:** Incidence of Hyperuricemia in general population of different status in Multan Division and its relationship to risk factors of coronary heart disease.

Hyperuricemia can cause gout and is a risk factor for kidney stone formation, Hypertension and Coronary artery disease. It is important to elucidate the origins of the disease and identify apparently healthy subjects who have a predisposition to the disease.

This investigation is aimed at (i) defining the normal serum levels for uric acid in different socio economic strata

of Pakistani population, (ii) screening out people with high serum levels of uric acid and its possible link with symptoms and signs of the above mentioned diseases and (iii) correlating with raised levels of Serum Glutamic Oxaloacetic Acid transaminase (SGOT) and serum Glutamic pyruvic Acid transaminase (SGPT).

S-KU/Med (108)

Title: Studies on protein changes in Senile Cataract.

Cataracts (i.e.) opacities of lens are the most commonly prevailing diseases in ageing humans which deprives them of visual activity. In Pakistan cataract is more common with an on-set of about twenty years earlier than in Europe. Though the ageing process has a lot to do with cataractogenesis, yet other causes are multi factorial and perhaps synergetic.

The present study is aimed at exploring the chemical, biochemical and structural causes of lens degeneration in order to detect the possible variations in proteins from human normal and cataract lens and to isolate purify and characterize that specific variable which will contribute an understanding of cataract formation.

C-NIH/MED (110)

Title: Mother Infant Transmission of Hepatitis B Virus in Pakistan

Frequency and severity of hepatitis in pregnancy show wide geographical variations. It has been assumed that this virus crosses to placenta to cause congenital liver diseases. The association of hepatitis B-Virus infection with primary hepatocellular Carcinoma is being increasingly well documented and one presumes that the interruption of hepatitis B Virus transmission will substantially decrease the occurrence of this highly fatal disease.

This study is designed to determine the epidemiologic description of Mother infant transmission of hepatitis B-Virus in Pakistan and the prevalence of hepatitis B-Virus carriage in mothers and the rate of transmission from the mothers to their new born infants.

Such study will be helpful in morbidity and mortality control of hepatitis B by trying HBIG and hepatitis B-Virus vaccines to the mothers and neonates.

## 5. PHYSICAL SCIENCES

C-QU/Phy (50)

**Title:** Computer Simulation of laser fusion some aspects of plasma physics.

There is world-wide growing appreciation of the application of plasma physics, particularly towards achieving nuclear fusion. More and more countries are investigating their man-power and material in this field.

The present project aims at establishing a working group and studying some specific aspects of plasma physics and controlled fusion as under :-

- i) Set up a Z-pinch experiment and study various characteristic plasma parameters.
- ii) Perform computer simulation of laser fusion, processes and calculate fusion yield in spherical targets.
- iii) To investigate theoretically/computationally some plasma physics instabilities with a view to explain certain fusion/space plasma phenomena.

The study is expected to pave way to the understanding of some unexplained aspects of plasma physics.

C-QU/Phy (49)

**Title:** Coherence Properties of Radiation in nonlinear optics and lasers.

In problems related to quantum optics and laser theory, it is interesting to study the quantum statistical properties of the radiation field. The possibility of generating field distribution which cannot be described by the classical statistical method has aroused interest in the study of the photon statistics in situations where the radiation field interacts with non-linear systems. Some other non-classical features are exhibited during the interaction of field with two level atomic systems. Study of coherence properties of radiation where a spatially coherent beam is scattered by a random phase screen is another interesting area of research.

The present project aims at studying further the problems related to quantum optics and laser theory. It also aims at studying the 2nd and higher order coherence properties of the partially coherent beams which are generated by certain generalised partially coherent sources.

ii) Institutional Support:

The Pakistan Science Foundation assists the Universities in the provision of equipment, literature etc. to research workers who for one reason or another are unable to obtain these from their own institutions. It is an established fact that such support which may be small quantum wise, but if timely, ensures successful fruition of research endeavour.

During the current financial year a number of institutional support requests were received by the Foundation from various universities and research organisations. Out of these only four institutions were given grants totalling to Rs.0.831 million to enhance their research capabilities. The details of these grants are given at Annexure-III.

iii) Utilization of Research Results:

Utilization of the results of scientific and technological, research, including pilot plant studies, to provide the technical and economic feasibility of processes found to be promising on Laboratory scale:

- However during the report year no project for utilization of research result was received. Hence no grant was sanctioned/released under this head.
- The Foundation has compiled Summaries of results achieved in the PSF supported projects for circulation among the Scientists working in various universities and research organisations.

Item IV. ESTABLISHMENT OF SCIENCE CENTRES, CLUBS, MUSEUMS, HERBARIA AND PLANETARIA.

In order to promote science and to create awareness about scientific and technological development in society, the Foundation is establishing necessary infrastructure. The progress made under this function is summarised below:-

I. ESTABLISHMENT OF THE PAKISTAN MUSEUM OF NATURAL HISTORY

The Pakistan Museum of Natural History is located in two rented buildings in the Sector F-7, Islamabad. The PC-I of the Phase-II of the Museum has been approved by the ECNEC in 1986. This scheme has funds for the construction of a permanent building of the Musuem.

The Museum has formally been inaugurated and opened for general public on April, 1986. The opening ceremony was

performed by Mr. Hamid Nasir Chattha, the then Minister for Science and Technology. The ceremony was attended by the senior officers of various Ministries and other R&D institution as well as by members of the British Council, U.S. Aid and U.S. Educational Foundation. The opening of the Museum and the growing number of visitors to the Museum has given impetus to our Scientists and Artists/Designers in their quest for excellence in research and display. The last quarter of the 1985-86 period has intenssed exponential increase in the number of visitors and in students/teachers groups.

The summary of the progress made by the Museum during the 1985-86 period is itemised below:-

A. BOTANICAL SCIENCES DIVISION:

Reference Collection:

Collection of Flora: Detailed survey of flora and collection of representative plant specimens were done in various parts of the Federal Capital, Northern Area, Punjab, Baluchistan and N.W.F.P. Some of the areas investigated in detail are as follow:-

- Federal Capital Area: Islamabad, Margalla Range.
- Northern Areas; Gilgit, Hunza, Khunjrab Pass etc.
- Punjab Province; Rawalpindi and Chakwal Districts.
- Baluchistan Province; Dara Bugti, Sibi, Quetta and Mekran Districts.
- = N.W.F.P.; Kohat District.

About 6740 specimens belonging to higher plants and 1000 specimens of lower plants were collected from the above mentioned places.

Research:

About 8000 plants were dried, disinfected and mounted on Herbarium sheets. Pertinent data on habitat and altitude were also recorded in the Herbarium sheets, on every plant specimen.

About 4762 higher plants were identified and arranged systematically in the Herbarium of PMNH.

About 450 Fungi specimens were identified, and indexed for Mycological Herbarium. In addition, another 50 algal species were also identified.



Allelopathic studies on Silybum marianum was also done.

Some of the research projects completed during this year are as follows:-

- Eco-taxonomical studies on valuable plants of Baluchistan.
- Exo-taxonomical studies of Hanna- Urak Valley, Baluchistan.
- Taxonomical studies of weeds of wheat field of Kohat District.
- Phytosociological studies of Margalla Range.
- Systematic studies of Coprophilus Fungi of Chakwal District.
- Soil-plant relationship in Islamabad and Rawalpindi areas.
- Salt Tolerance studies on different varieties of peper, turnip, reddish; cabbage and cucumber.

The following projects are in progress:-

- Ethnobotanical studies of Northern Areas.
- Pollen allergies (Aerobiology)
- Soil plant-relationship in Chakwal District.
- Labiatie of Pakistan.
- Algal flora of Wah Garden.
- Cultivation and accalamatization of important medicinal plants.

#### Display of Specimens:

Plant specimens for the exhibits on "Vegetation Zones of Pakistan" and Cultivation of Pakistan" were provided to the Design Section.

#### Service Rendered to other Organizations:

About 2000 plants identified for the students of various colleges of Islamabad and for the National Agriculture Research Laboratories and National Institute of Health, Islamabad

### Training:

- i) One Associate Curator has proceeded to the Aberdeen University, England for Ph.D studies under the Government training programme.
- ii) The Director, Botanical Sciences, participated in six weeks training programme on "Modern Management Methods for R&D for Senior Scientists and Engineers" sponsored by the Ministry of Science & Technology.

### B. EARTH SCIENCES DIVISION:

#### Reference Collection:

Collection of Rocks, Minerals and Fossils: Geological field work was conducted in the eastern Salt Range, Southern Potwar Plateau, Mirpur (Azad Kashmir) and in parts of Dir, Swat, Malakand and Mardan Districts. These field works provided samples of 160 sedimentary and 80 igneous rocks, 50 mineral specimens, 64 invertebrate and 300 vertebrate fossils.

In addition, donation of 75 vertebrate fossils have been received from the University of Arizona (U.S.A.). Similarly, the American Museum of Natural History donated eighteen replicas of some of the type Siwalik Vertebrate fossils. About 120 rodents and insectivores fossils replicas have been obtained from the Harvard Peabody Museum of the University of Arizona.

#### Research:

- The existing vertebrate fossil collections have been re-organized with updating the identifications and adding more contextual information on locality and ages.
- 250 vertebrate fossils collected from the Chakwal (Southern Potwar plateau) have been identified to generic and species level. All of them are curated, labelled and preserved.
- Systematic studies on the Rodents and Insectivores (Mammalia) from the Chakwal District are in progress. So far ten families with 12 genera have been identified.
- Microfossil analyses of the Tertiary rocks of the Kala Chitta Range is in progress. The taxonomic

studies of both larger and smaller foraminifera are being done.

- - In collaboration with the National Institute of Oceanography, clay mineral analyses of the Indus Delta sediments, off the Karachi Coast, is almost completed. 36 sedimentary samples have been investigated in this study.
- Petrographic and heavy mineral analysis of 42 samples from the Siwalik rocks of the Chakwal District are in progress. Clay analyses of the Patala Formation and petrographic studies of the Cambrian sandstones, and dolomites from the Salt Range are completed.
- Systematic studies of the Tragulidae from the Chinji Formation is in progress.

#### Public Awareness Programmes:

Introductory texts accompanying the exhibits on the "Prehistoric wildlife of Pakistan" and the "Marine fossils of Pakistan" are revised. Also explanatory notes on each vertebrate fossils at display have been added.

The Earth Sciences Division delivered four popular lectures on the Human evolution; earthquake, volcanism, and Geology of Pakistan in various colleges of Islamabad area.

#### Services Rendered to other Organizations:

- i) 38 rocks and fossil specimens with description are prepared for Intermediate College, Gilgit.
- ii) 27 specimens of rocks, minerals and fossils are donated to the Board of Secondary Education, Hyderabad for their "Science Corner" display.
- iii) Various officers rendered consultancy services to mine owners/students and to the Geological Survey of Pakistan.

#### Training:

- i) One Research Associate participated in UNESCO sponsored training on Tectonics held in Chandigarh (India).

- ii) The Director obtained training on "Modern Management for R&D Senior Scientists and Engineers arranged by the Ministry of Science & Technology.

C. ZOOLOGICAL SCIENCES DIVISION:

Reference Collection:

Collection of Fauna: Field trips were conducted in parts of the district Chakwal, Dir, Gilgit, Hunza and Galiat areas. Extensive representative samples of vertebrate and invertebrate animals have been collected from these areas. These include 400 insects, 1756 fishes, 50 reptiles, 70 birds and 8 mammal specimens.

Research:

- About 3500 fishes, 2000 insects, 246 birds, 102 reptiles and 60 mammals, were identified and catalogued.
- Taxidermy of 9 mammals, 31 birds, 15 reptiles and 33 skins were completed.

Some of the research studies completed are as follows:-

- Morphology of petrothoracic sclerites of *Lygaeoidcoreoid* complex and their phylogenetic significance.
- Taxometric study of the sub-genus (*Rana*) with special reference to Phylogeny.
- Life tables of two closely related taxa of genus *Spilostethus* in three food regimes with comments on their taxonomic status.
- Some reproductive parameters in the mongoose and *Herpestes odwardsi* of Chakwal and Islamabad areas.
- Analysis of morphometric data on common house sparrows.

The studies in progress are:

- Systematics of Fishes of Malakand District and the Haro River.
- Taxonomy of reptile fauna of the Potwar Plateau.
- Morphology and Taxonomy of the Agamid Lizards of the Northern Areas.

- Comparative studies of petrothoracic sclerites in Pentatomoidea.

Services Rendered to other Organization:

Ten animal specimens were prepared for the "Science Corner" of the Board of Intermediate and Secondary Education, Hyderabad.

Training:

One Associate Curator, proceeded for Ph.D studies to the Oxford University, England under the Government's Fellowship Scheme.

D. DESIGN SECTION

Public Awareness Programmes:

**Exhibits/Dioramas:** New exhibits/dioramas are prepared on "Vegetation Zones of Pakistan" and "Animals of Northern Areas." In the Marine diorama the geology of the Sea Floor is also added.

Improvements by way of the scientists providing explanatory texts of keys to several exhibits/dioramas, have been made. These exhibits are Prehistoric Wildlife of Pakistan, Migration of Birds, Cultivations in Pakistan and the Human Story.

**Museum Tours:** Arranged five popular lectures and visits of 47 educational institutions.

Assistance Rendered to other Divisions of PMNH

General responsibility for designing, fabricating, modelling, manufacturing and repairing of small laboratory fixtures and equipments, storage cabinets, library shelves and office partitioning and decoration, visual and artwork for the PMNH newsletter, reprint request cards, visiting cards and other stationary items, Museum folders, brochures, murals of exhibits and information leaflets prepared in the context of Inauguration of the PMNH.

Service Rendered to other Organization:

- Design for Foundation's Science Caravan was prepared and its fabrication was supervised at Karachi.
- Design for exhibits of the Science Caravan were performed.

- Artwork on Certificates and Pamphlets was done for the "Seminar on the Mechanical Behaviour of Materials" arranged by the Foundation.
- Visual and artwork of the letter head for the seminar "Science and Technology in Muslim Ummah" was prepared for the Academy of Sciences.

## 2. SCIENCE PROMOTION:

The programmes undertaken regarding promotion of Science in Society are detailed below:-

### i) Science Exhibitions/Fairs:

Foundation provided grants of technical assistance for the following events.

- Annual Science Exhibition organised by the Bureau of Curriculum, Baluchistan, Quetta.
- 4th Annual Science Fair organised by the Board of Intermediate and Secondary Education, Sargodha. A grant of Rs.40,000/- was provided.
- Electronic Exhibition organised by the University of Engineering and Technology, Lahore. A grant of Rs.40,000/- was provided for the purpose.

### ii) Popular Science Lectures:

The Foundation arranged lectures of a number of Scientists and other experts during the report period.

### iii) Science Essay Competitions:

Two Science Essay competitions in Urdu and Sindhi language were arranged by the Board of Intermediate and Secondary Education, Hyderabad. Prize money of Rs. 9,000/- was provided by the Foundation.

### iv) Science Quiz Competitions:

Science quiz competitions were organised by the F.G. College for Women, Islamabad and Viqar-un-Nisa Girls High School Rawalpindi. Cash prizes amounting Rs.1,000/- was provided by Foundation to each college.

### v) Popular Science Films:

The Pakistan Science Foundation has established a

Library of highly interesting and informative science films including Britannica films and films prepared by National Film Board of Canada, Allama Iqbal Open University and USIS. A programme is being chalked out for arranging science film shows within school premises. The projector and operator will be provided by the Foundation alongwith the films.

vi) Science Clubs:

- PSF has developed an elaborate programme to support initially a limited number of Science Clubs in Schools and Colleges of the country.
- Two computers were donated to the Science Club Boys College, Mardan.
- The Foundation has also supported a private Science Club, namely YUTECH, in arranging a Computer Programming Contest for College Students.

vii) Summer School in Science for Talented Higher Secondary Students at Khanspur.

A Summer School was organised by the Board of Intermediate and Secondary Education, Lahore to provide a rich learning environment and guidance of eminent scientists and educationists. A grant of Rs.40,000/- was provided by the Foundation for the Summer School.

viii) Science Awareness in Rural Areas:  
(Mobile Science Exhibition: Science Caravan).

- An Innovative project of mobile Science Exhibition, named SCIENCE CARAVAN, was initiated by the Foundation in early 1986. This is intended specially for promoting science awareness in rural and far-flung areas in the Country. The Exhibition vehicle was designed and fabricated locally, and exhibits, models, posters, specimens, etc., were prepared and collected by the Foundation through its own sources. Work is in progress on this project.
- A PC-I for four additional Science Caravan Units was completed for submission to the Ministry of Science and Technology for a total value of Rs.4.80 million.

Item V: SCIENTIFIC SOCIETIES/LEARNED BODIES:-

The promotion of learned bodies, scientific societies/

associations and academies engaged in spreading the cause of scientific knowledge in general or in the pursuit of a specific scientific discipline or technology in particular:

The Foundation is making annual grants to the established learned bodies and scientific societies and endeavouring to provide all possible assistance to the new ones. Annual grants amounting to Rs.0.455 million were released during the current year to various Non-Government Organisations/Scientific Societies for the achievement of approved objectives (Annexure-IV).

Special grants totalling Rs.0.495 million were sanctioned to various scientific societies/institutions for their publication programmes (Annexure-V).

Item VI: SCIENCE CONFERENCES:

The organisation of periodical science conferences, symposia, seminars etc.

Science Conferences/Symposia and Seminars are important means for exchange of ideas and information amongst scientific workers. The Foundation provided grants amounting to Rs.0.495 million to various scientific societies/learned bodies and Institutions in the country during report period for holding seminars, symposia and Science Conferences. Details of funds released is given in Annexure-VI. Salient features of some of the seminars/symposia and science conferences supported by the Foundation are as under:-

- 1st National Seminar on Technology Transfer was held in July, 1985 at Islamabad. The purpose of the seminar was to review the state of existing technologies in the SAARC member countries and to assess the potential prospects, and problems in adoption, assimilation of emerging technologies in developing countries.
- SAARC Workshop on Renewable Energy Resources was organised by the National Institute of Silicon Technology in April, 1986 to review the Status of various renewable energy resources in the SAARC countries. A set of recommendations was formulated for providing energy in Rural areas through non-conventional means.

Item VII: EXCHANGE OF VISITS:

The exchange of visits of Scientists and Technologists with other countries:



In order to enable the scientists to present the finding of research carried out by them and to exchange information regarding recent advances in their respective fields of specializations, it is imperative that they should visit the higher seats of learning in the advanced countries. The Foundation financially assists the Scientists, Doctors and Engineers to facilitate their visits abroad for the purpose.

Grants totalling Rs.0.490 million were sanctioned to 20 Scientists (Annexure-VII) for attending International Conferences, Symposia and to meet their counterparts in institutions of higher learning in advanced countries.

Item VIII: AWARDS AND FELLOWSHIPS:

The grant of fellowships to individuals engaged in developing processes, products and inventions of consequence to the economy of the country:

The Foundation paid Rs.24,000/- to two students of Post-graduate Medical Institute, Lahore on account of their fellowship for M.S. Studies in the following subject:-

<u>Field</u>	<u>Title of Thesis</u>
Orthopaedic	A study in open Reduction and Internal Fixation of Supra Condylar Fracture of Humerus.
Urology	Functional changes following Acute Bilateral Ureteric Obstruction in Dogs.

Item IX: SURVEY AND STATISTICS:

A project entitled Science and Technology in the Muslim Ummah and its Methodical Development has been sanctioned to the Pakistan Academy of Sciences for a period of 3 years at a total cost of Rs.3,87,373/-.An amount of Rs.64,359/- was released on account of its 1st instalment.

The objectives of the project are as under:-

- a) Assessment of the extent to which the scientific values have been adopted in the culture of Muslim Societies during successive period of history.
- b) Identification of the potential and capability of science and technology effort in the Muslim World.
- c) Assessment of the human and material resources of

the muslim countries, and determination of science and technology needs and requirements of the Muslim World, so as to formulate long term plan.

The Results expected are:-

- A. Formulation of principles for the cultivation and promotion of science and technology, and their application for development.
- B. Preparation of guidelines for framing policies, plans and strategies for scientific and technological education, research and development keeping in view the moral spiritual values of Islam.
- C. Preparation of Relevant Monographs and Brochures.

Item X: RESEARCH EVALUATION:

The Foundation evaluated the following technical/fiscal reports received during the report year as per procedure laid down in its fifth annual report for reviewing the progress of scientific research supported by the Foundation and evaluating the results of such research.

i) Semi-Annual Reports:

28 Six Monthly Reports, invited after the initiation of each project and after the submission of the annual reports, were scrutinised by the Science Wing of P.S.F. to assess the interim progress of these projects.

ii) First and Second Annual Reports:

As many as 11 First Annual and 11 Second Annual Reports submitted by the Principal Investigators, after initial scrutiny of the Science Wing, were sent for detailed evaluation to active scientific workers in the relevant fields of study. These progress reports were then submitted to the respective Technical Committees for consideration alongwith the evaluation reports of the experts concerned which were ultimately accepted by the Technical Committees.

iii) Final Reports:

5 Final Reports in respect of the completed projects received during the year under report, were also submitted to the subject experts for review and evaluation and on receipt back from them, submitted to the relevant Technical Committees for adoption.

These reports, duly accepted by the Technical Committees, were placed before the Board of Trustees of the Foundation. The Board appreciated the research work done in these project.

Item XI: SCIENTISTS' POOL

- i) The Foundation appointed Dr. Shamim Arif as Scientist Pool Officer and attached her to the Department of Mathematics, Punjab University, Lahore. She was being paid a monthly stipend of Rs.2500/-. Later on she was permanently absorbed in the same department as Assistant Professor.
- ii) Biodata of Scientists, who were interested in finding jobs in local institutions were circulated to various Universities and R&D Organizations.

Item XII: INTERNATIONAL LIAISON:

The Foundation, during the report period, remained in contact with international, regional and national agencies like United Nations Educational, Scientific and Cultural Organization (UNESCO). Man and Biosphere (MAB) United Nations Environment Programme (UNEP), Economic and Social Commission for Asia and the Pacific (ESCAP), National Information Centre (NTIS) and US-National Science Foundation. Their representatives visited Pakistan Science Foundation to discuss collaboration in Research, Conferences and Seminars.

The activities performed by the Foundation under this head are detailed below:-

- a) Memorandum of Understanding between the Royal Society of London, U.K. and the Pakistan Science Foundation.

The Foundation continued the implementation of Memorandum of understanding between the Royal Society of London, U.K. and the Pakistan Science Foundation. During the report period, nominations of two scientists were sent to Royal Society, London for visit to U.K. under the M.O.U. Outlines of these visits are as under:-

- Dr. M. Ata-ur-Rehman, Professor of Biochemistry Jinnah Postgraduate Medical Centre Karachi visited United Kingdom from 1st - 20th July, 1985. Dr. Rehman visited various research institutes in U.K. The Foundation sanctioned return air-fare from Pakistan to U.K.
- Three week visit of Dr.S. Riaz-ud-din, Director Centre for Advanced Molecular Biology, Lahore to the United

Kingdom from 6th April - 5th May, 1986. He visited Research Institutions relevant to the field of Bio-technology. Pakistan Science Foundation provided return air-fare.

b) Seminar on Progress of Science & Technology:

A 3-days Seminar (i.e. 20th - 22nd Dec., 1985) on progress of Science and Technology was organized by Pakistan Science Foundation in collaboration with the Association of Pakistani Scientists and Engineers of North America, in the Islamabad Hotel. The Seminar was participated by 17 foreign delegates (expatriate Pakistani) and 100 local delegates. The Seminar was inaugurated by Dr. M.A. Kazi, Adviser to the Prime Minister for Science and Technology. The seminar was a mutual effort exchange on the progress of science and technology and to identify major fields of problems of mutual concern and fix research direction which are likely to provide necessary solution and to recommend guideline for future research in the field of computer technology, Genetic Engineering and Medical Sciences.

b) Collaboration with Faculty of Engineering Sheffield University U.K.

Prof. Keith J. Miller, Head Mechanical Engineer Department, who also led the Karakorum expedition in 1980, during his visit to Pakistan in July, 1985 had proposed the holding of a seminar on the "Mechanical Behaviour of Materials". The Ministry assigned the task of organizing this seminar to the Pakistan Science Foundation. Accordingly the Seminar was organized from 22nd to 26th June, 1986 wherein 9 internationally known scientists delivered a series of 32 lectures. The objectives of the seminar were as under:-

- To give an interdisciplinary review of materials behaviour covering both theoretical and experimental aspects.
- To integrate current knowledge from recent research finds and construction of models, and on design and manufacturing consideration.
- To show how recent industrial developments effect the teaching of materials in undergraduate and post-graduate courses in the analyses of catastrophic failures in the engineering world.

The seminar, was attended, by 85 registered participants from 30 organizations. An important feature of the

seminar being that the participation was mainly from the users organizations like Industrial and Manufacturing Agencies, and Defence organizations. However relevant representing Engineering Universities also participated.

The seminar was inaugurated by Dr. M.A. Kazi, Adviser to the Prime Minister on Science & Technology. In the closing session, participants were given certificates by Chairman, Pakistan Science Foundation.

The reference material provided by the lectures was compiled and sent to the libraries of participating agencies for use by the researchers.

- d) Memorandum of understanding between US-National Science Foundation & Ministry of Science and Technology

The Foundation in acting as a focal point for universities in respect of their collaborative research projects and seminars/conferences: The work accomplished under this programme is summarized below:-

- i) Collaborative Research:

- The Grants totalling to Rs.3.549 million received from NSF through Ministry of Science and Technology were released in respect of following ongoing projects.

<u>Project Title</u>	<u>Name of Sponsoring Institute</u>	<u>Amount Released</u>
Study of Bisbewzyl Isoquinoline Alkaloids from Medicinal Plants of Pakistan. PSF/Res/NSF (26).	University of Karachi Karachi.	0.569m
Study of Tissue Culture of Plants of Alkaloid and Aromatics from Pakistan. PSF/Res/NSF (27)	University of Peshawar Peshawar.	0.475m
Study of Age and Tectonic History of Kara Korum-Hindu Kush of Range Land- Intermountaine Basins of Northern Pakistan PSF/C-Res/NSF (28)	Centre for Excellence in Geology, University of Peshawar, Peshawar	2.000m

Study of Restriction Enzymes PSF/Res/NSF (32)	Centre for Advanced Studies in Molecular Biology, University of Punjab, Lahore	0.505
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3.459

- The following project has been approved by the US-NSF for funding under their special foreign currency programme.

<u>Project Title</u>	<u>Name of Sponsoring Institute</u>	<u>Amount Released</u>
Chromosome number of vascular plants of Pakistan. PSF-C/Res/NSF (30)	University of Karachi Karachi	Rs.0.450 million

- The following new proposal at a total cost of Rs.1.084 million was sent to the Ministry of Science and Technology for funding through US-NSF.

Studies on Vascular Arbuscular Mycorrhizae (VAM) Plant parasitic Nematode Interaction. PSF/Res/NSF (38)	University of Karachi Karachi
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ii) Collaborative Seminars:

- The US-Pakistan Binational Workshop on Biosaline research was held from 2nd - 20th Sept., 1985 at the University of Karachi. The objectives of the workshop were to provide a forum for an upto date assessment and information; exchange of the state of basic and applied Biosaline research; to identify major unsolved problems of mutual concern; fix research direction and to recommend guidelines for future collaborative research. A grant of Rs.1,75,000/- received from US-NSF was released to Karachi University for this workshop.
- 2nd International Symposium on Natural Product Chemistry and US-Binational Workshop was held at H.E.J. Research Institute of Chemistry, University of Karachi from 18th to 25th Jan., 1986. US-NSF financially supported this Seminar to the extent of Rs.2,51,000/-.

## CHAPTER - 2

### PROGRESS OF PSF SUPPORTED PROJECTS

An account of the progress report of PSF supported projects received during the year 1985-86, is given below:-

#### (A) Final Reports

During the year under review, five final reports were received. Particulars of these schemes and brief summaries of the achievements made in these projects are as under:-

Project No.	S-SU/Bio (115)
Project Title	Taxonomy of the Grasshoppers (Acrididae) of Sind.

#### Project Particulars:

- Duration	1 1/2 years
- Date of commencement	19.10.1983
- Date of completion	18.4.1985
- Location of Scheme	Department of Zoology, University of Sind, Jamshoro.
- Principal Investigator	Dr. Muhammad Saeed Wagan
- Total sanctioned cost	Rs.1,03,192/-
Main Objectives	To study the taxonomy, Ecology and Economic Importance of grasshoppers of Sind province.

#### SUMMARY OF THE WORK DONE:

The grasshoppers belonging to family Acrididae are of considerable economic importance to crop and range land. It is therefore necessary to have a detail knowledge of their value as a pest so that diagnosis of an economic problem can be properly made.

Survey of grasshoppers from all the districts of Sind was carried out. The places surveyed included agricultural mountainous and semi-desert areas. A total of about 1904 adult specimens of grasshoppers were collected in about 2400 sweeps. The collected material was identified as belonging to 42 species of grasshoppers; out of which 6 belong to Acridinae, 15 to Locustinae, 5 to Eyprepocnemidinae, 4 to Oxyinae, 3 to Gomphocrinae, 2 to Cyrtacanthacridinae, 2 to Traxalinae, 1 to Catantopinae, 1 to Calopteninae,

1 to Euthyminae, 1 to Tropidopolinae and 1 to Dericorythinae.

Six species were recorded for the first time from this area. These are Dericorystibialis, Gelastorhinus filatus, Oedipoda germanica, Mioscirtus wagenhoferi, Hyalorrhilus clausi and Sphingonotus theodori theodori. Besides, a new species Oxypterna akbarii reported by Moeed (1976) has been confirmed and its distribution is extended. The distribution of many of the previously recorded species has been extended as well. In addition to these, a simplified taxonomic key based on the external morphological characters for the separation of sub-families genera and species of Acrididae has been prepared.

Project No.	P-CSIR/Chem (103/1)
Project Title:	Microbial Production of Xanthan Gum for Industrial use.
Project Particulars:	
- Duration	2 years
- Date of commencement	10.5.1983
- Date of completion	9.5.1985
- Location of scheme:	PCSIR Laboratories, Lahore.
- Principal Investigator	Dr. M.A. Qadeer
- Total sanctioned cost	Rs.1,01,292/-
Main Objectives:	To develop Industrial fermentation process of Xanthan Gum by using molasses for substrate.

#### SUMMARY OF THE WORK DONE:

The xanthan gum is produced commercially by fermentation process using glucose or molasses as substrate. Since molasses is available in a large excess in the country, therefore, production of gum using the molasses could be of significant economic value.

Accordingly, fermentation of molasses by using a locally isolated culture of Xanthomonas cucurbitae PCSIR-52 was studied. The extracellular polysaccharide produced by the bacterium was identical to xanthan gum produced by Xanthomonas compestris as shown by the infrared spectra of both gums. The isolated culture was found very efficient as compared with industrially used Xanthomonas compestris NRRL B-1459. Evaluation of carbohydrates, nitrogen sources both in organic, inorganic and carboxylic



acids for gum fermentation, were carried out. Among all the carbohydrates sources was found to be an ideal substrate for the production of xanthan gum and its optimum level was 3.0 percent. The production of xanthan biopolymer was also studied in cane juice and cheese whey, beet molasses, hydrol using as carbon sources. The Ph was maintained with calcium carbonate (0.1%).

The biopolymer production was almost same in the presence of di-ammonium hydrogen phosphate, disodium hydrogen phosphate and ammonium phosphate. The addition of organic nitrogen sources, however, greatly improved the conversion of sugar into extracellular-polysaccharide. The organic nitrogen sources tested were urea, thiourea, corsteep liquor, cabbage extract and penicillin waste mycelium for cotton seed meal. The production of xanthan gum was greatly stimulated in the presence of corn-steep liquor, cabbage extract or proflo in the culture medium. Maximum xanthan gum formation was found by adding "Proflo extract" to the basal medium containing di-ammonium hydrogen phosphate. The production of biopolymer was maximum in the presence of sodium pyruvate or potassium citrate.

Effect of improving oxygen supply by (i) partial replacement of air with oxygen, or (ii) by the addition of hydrogen peroxide solution as oxygen concentrate on the production of biopolymer was studied in 10 liter stirred fermenter. The rate of gum formation was enhanced as compared with simple aeration system. Studies of biopolymer fermentation by both batch and repeated batch processes showed that the efficiency of the bacterium was little affected during its continuous growth for 150 hrs in three cycles. Production of xanthan gum was greater in sucrose-salt medium than that obtained in simple cane juice. The design of the stirred culture vessel plays significant role in the conversion of substrate to metabolites and cell mass. The multiple impeller system (disc turbine) resulted in high yield of xanthan gum due to better agitation and aeration.

Project No.	S-SU/Chem (116)
Project Title	Applications of Volatile Metal Complexes of New Schiff Bases.
Project Particulars:	
- Duration	3 years
- Date of commencement	12.10.1981
- Date of completion	11.10.1984
- Location of scheme	Institute of Chemistry, University of Sind, Jamshoro.

- Total sanctioned cost                      Rs.2,62,131/-
- Principal Investigator                      Mr. Iftikhar-ud-Din

Main Objectives:                                      To prepare (a) a few organic reagents with the expected better complexing properties; (b) metal complexes of Ni (II), Cu (II), Pd (II), Pt (II), and to determine them quantitatively; (c) and characterise the uranyl and Oxovanadium complexes.

#### SUMMARY OF THE WORK DONE:

Twenty terdentate and tetradentate new schiffs bases and forty two of their Cu II, Ni II, Pd II, and dioxouranium VI complexes have been prepared. The reagents and metal complexes were characterized using elemental micro analysis, I.R., NMR, and mass spectroscopic techniques. The reagents form coloured metal complexes which have been characterized spectrophotometrically and their potential as analytical reagents have been evaluated.

TGA, DTA and DSC of the metal complexes have also been investigated. The Ni (II) complexes are found more volatile and thermally stable than corresponding copper complexes.

The complete separation of Cu, Ni and Pd complexes of IVA<sub>2</sub> en Cu and Ni complexes of dl-PA<sub>2</sub>S as complexing reagents have been achieved on GLC. However only partial separation could be achieved using dl-AA<sub>2</sub>S as complexing reagents for Cu and Ni. The remaining complexes failed to separate by gas chromatography under the present conditions.

IVA<sub>2</sub> and dl PA<sub>2</sub>S have been developed as reagents for the simultaneous determination of Cu and Ni metal by gas chromatography using solvent extraction procedure. It has been found that Zn(II), Pb(II), Ag(I), Hg(II), U(VI), Cd(II) Ca(II), Mg(VI), citrate, tartarate, phosphate, flouride, chlorate, borate and chromate do not interfere, but Co(II), Cr(III), Al(III), Fe(III), Mn(II), interfere in the determination of Cu and Ni. However, interference effects could be eliminated using appropriate masking agents. The dioxouranium (VI) complexes of thirteen ligands have been prepared and characterized using UV visible and reflectance spectroscopic techniques.

The potentials of bis(O-hydroxyacetophenone) dl-stilbenediamine (dl-HAPS<sub>2</sub>) and bis (O-hydroxyacetophenone) meso-stilbenediamine (meso-HAP<sub>2</sub>S) ligands were also examined for the separation and quantitative determinations of copper, nickel, palladium and platinum complexes with the aid of HPLC.

- Project No. P-AEMC/Med (58)
- Project Title: Neonatal Screening for Hypothyroidism and its relationship to mental Retardation

Project Particulars:

- Duration 1 year
- Date of commencement 1.7.1982
- Date of completion 30.6.1983
- Location of scheme Atomic Energy Medical Centre, Lahore.
- Principal Investigator Dr. Farhat Zaheer
- Total sanctioned cost Rs.39,900/-

- Main Objectives:
- To prevent or minimize irreversible damage and avoid extensive delay in diagnosis.
  - To reduce exposure to harmful drug and educate parents on risk recurrence.

SUMMARY OF THE WORK DONE:

The main objective of this study was to undertake a systematic pilot study to provide data about the state of congenital hypothyroidism which causes permanent brain damage if not diagnosed and treated properly at an early stage thus causing mental retardation. This was the 1st systematic investigation for a sample of population selected for study.

A total of 1863 determinations were made on 862 subjects. including neonates, established cretins. children, infants and mothers. Hormone assays were made using both liquid RIA Technique with serum samples and a new technique in which 1/8 discs of dry blood spots were used for assay. The later technique is extremely useful for neonates where ethical problems are associated with sample collection. The conversion factor, giving interrelationship between the two methods of assay, was calculated.

The results provide data for normal children profiles and patterns of  $T_4$  & TSH levels from 0-9 days for neonates. The data for neonate indicates a stable  $T_4$  pattern of 5-9 jg/dl, while a surge for TSH was observed within 24 hours after birth which

is maintained atleast upto the 6th day. There is no influence of maternal hormones in this TSH surge and maternal TSH levels remain within normal range. This change in TSH level of neonates may be regarded as due to environmental change after birth. Whether raised TSH among neonates is essential for maintaining a normal  $T_4$  level during the first week after birth or not is a point which requires further investigation.

$T_4$  levels in relationship to  $FT_4$  levels may provide a more useful index for early diagnosis of neonatal hypothyroidism rather than  $T_4$ /TSH index. Data has been provided for  $FT_4$  determination, which is a first ever report made for such a category of subjects. Data is also provided for established cretins in comparison to those who are not clinically hypothyroids.

Project No.	P-SGR/Med (87)
Project Title:	Comparative study of Aspiration Cytology and tru-cut : needle biopsy in the Evaluation of Breast Masses.

**Project Particulars:**

- Duration 2 years
- Date of commencement 1.1.1983
- Date of completion 1.2.1985
- Location of scheme Fatima Jinnah Medical College, Lahore.
- Principal Investigator Dr. Khalida Usmani
- Total sanctioned cost Rs.1,57,072/-

- Main objectives:
- To define the role of Aspiration Cytology and Tru-Cut needle Biopsy in the management of Breast lesion.
  - To reduce the number of unnecessary operations of Excisional biopsy and study the incidence of Carcinoma in patients with breast lumps.

**SUMMARY OF THE WORK DONE:**

Carcinoma of the breast is a disease which causes the highest number of deaths from breast cancer in females. The aim of

this project was to evaluate the efficiency of needle biopsy in breast lumps as a simple diagnostic procedure and to find out the diagnostic yield of tru-cut and fine needle aspiration biopsy cytology.

One hundred patients with palpable lump breast, visiting Sir Ganga Ram Hospital, Lahore, were included in this study. Fine needle aspiration biopsies were carried out on some where as tru-cut needle biopsies were carried out on the others before an excision biopsy or mastectomy. The histological diagnosis, available in all the cases, was compared with cytological diagnosis in case of fine needle aspiration biopsy, while in case of tru-cut biopsy the histological diagnosis was compared with excision biopsy.

The results were compiled keeping in view factors like age group, marital status, age of marriage, number of children by sex, lactation period, abortions history, age at first pregnancy, blood group, family history regarding carcinoma of breast etc. and are expected to stimulate needle biopsy as a simple diagnostic criteria for breast cancer.

#### **(B) Second Annual Reports**

The second annual reports of the following projects were received and processed by the Foundation during the period under report:-

<u>Sr.No.</u>	<u>Project No.</u>	<u>Title of the Project</u>
1	P-CSIR/Agr (67)	Utilization of Indigenous Resources for Introduction of Game Birds Breeding in Pakistan.
2.	S-PCCC/Agr (77)	Development of Cotton Hybrid.
3.	B-BU/Bio (111)	Soil Vegetation and Termites their Interrelationship in Baluchistan.
4.	S-KU/Bio (116)	Chemotaxonomic Studies in Angiosperms from Pakistan with reference to Phenolics.
5.	S-AU/Bio (122)	Studies on Incidence Taxonomy and Seasonal Variation of Ecto and Endo parasites of Wild Birds in Sind.
6.	S-KU/Chem (96/1)	Synthetic Isolation Studies Towards Vinblastine and Vincristine and their novel Derivatives.

7. S-CSIR/Chem (143) Chemical Spectroscopic and Microbial Studies of Transition Metal Complexes Containing Mixed Ligands.
8. P-PU/Eng (3/1) Studies of Atmospheric, underground and Industrial Corrosion Processes.
9. B-BU/Med (89) Biochemistry of Gallbladder Glycoproteins Mucin.
10. B-BU/Med (93) Biochemistry of Normal Asthmatic and Bronchitic Lung Mucus.
11. P-PU/Phys (40) Fabrication & Characterization of MIS and Thin Film Solar Cells.

**(c) 1st Annual Reports:**

The 1st annual reports of the following projects were received and processed by the Foundation during the period under report:-

<u>Sr.No.</u>	<u>Project No.</u>	<u>Title of the Project</u>
1.	C-QU/Phys (44)	Deep Level Transient Spectroscopy on semi-conductor Materials.
2.	P-PU/Agr (86)	Studies on Phenology Germination ecology and control of some important weeds of wheat
3.	S-KU/Envr (26)	Resources Recovery from Poultry Waste and its Utilization.
4.	S-KU/Envr (24)	Hazardous effects of Industrial Pollution and Environment.
5.	P-PMI/Med (91)	An Etological Study of Urolithiasis in D.G. Khan, M.Garh & Bahawalpur
6.	S-SU/Chem (133)	Preparation and Development of new Sensitive Chromogenic Reagents for the Analysis of Metal ions.
7.	C-QU/Phys (36)	Some Aspects of Thermonuclear Fusion.
8.	S-NIO/Ocean (9)	Feasibility Studies for the Extraction of Energy from current and Heliohydrogravity along Pakistan Coast.

9. S-AU/Agr (89) Quality Improvement in Vegetable.
10. P-CSIR/Chem (140) Studies for Industrial Exploitation of Nagar Parkar China Clay.
11. S-DMC/Med (66) Identification of Biochemical Errors Causing Brain Damages and Neurological Disorders.

## CHAPTER - 3

### ORGANIZATION AND ADMINISTRATION

The organizational structure of the Pakistan Science Foundation Pakistan Scientific & Technological Information Centre (PASTIC) and Pakistan Museum of Natural History are given on page

The staff position in the Foundation, PASTIC and PMNH during the report period is as under :-

#### PAKISTAN SCIENCE FOUNDATION

S.No.	DESIGNATION	NUMBER
1.	Chairman	1
2.	Member Science	1
3.	Director/Member Finance	1
4.	Secretary	1
5.	Principal Scientific Officer	3
6.	Senior Scientific Officer	1
7.	Deputy Secretary	1
8.	Deputy Director (F&A)	1
9.	Accounts Officer	1
10.	Scientific Officer	4
11.	PS to Chairman	1
12.	Science Promotion Officer	1
13.	Librarian	1
14.	Assistant Scientific Officer	1
15.	Audit Officer	1
16.	Accountant	1
17.	Administrative Officer	1
18.	Supporting Staff	<u>63</u>
		<u>85</u>

In addition to the whole-time Staff Members of the Foundation there are about 200 scientists and technologists in various universities & research organizations who are acting in an honorary capacity as reviewers of the research proposals and members of the Technical Committees or Principal Investigators of PSF supported projects.



**PAKISTAN SCIENTIFIC & TECHNOLOGICAL INFORMATION  
CENTRE (PASTIC)**

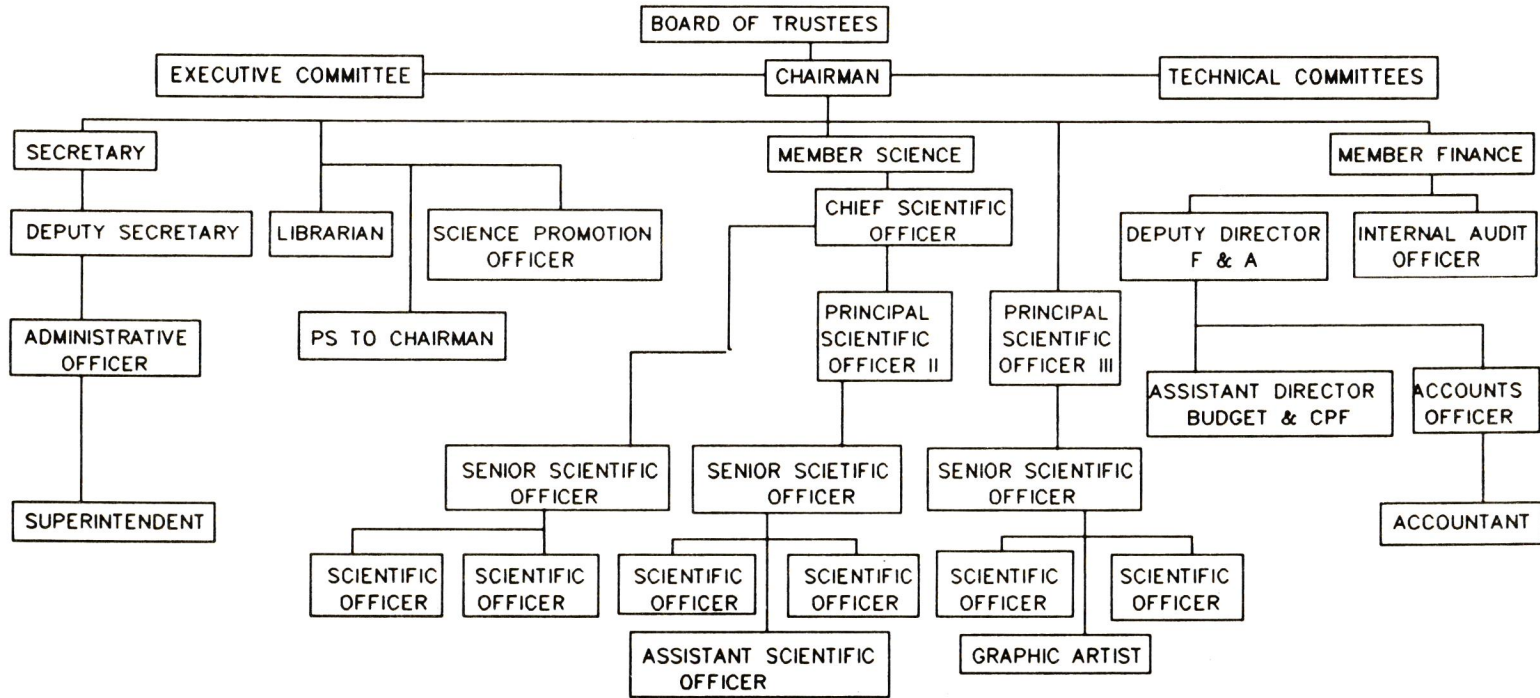
S.No.	Designation	Number
1.	Director	1
2.	Principal Documentation Officer	1
3.	Senior Librarian	1
4.	Sr. Administrative Officer	1
5.	Sr. Information Officer	1
6.	Chief Editor	1
7.	Sr. Documentation Officer	1
8.	Manager Reprographic Unit	1
9.	Officers-in-Charge	2
10.	Documentation Officer	1
11.	Accounts Officer	1
12.	Indexing/Abstracting Officer	1
13/	Patent Officer	1
14.	Printing Specialist	1
15.	Photographic Officer	1
16.	Graphic Artist	1
17.	Translating Officer	1
18.	Officer-in-Charge	1
19.	Cataloguer/Classifier	1
20.	Indexer	1
21.	Assistant Programmer	1
22.	Sr. Plate Maker	1
23.	Supporting Staff	71

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PAKISTAN MUSEUM OF NATURAL HISTORY  
P M N H

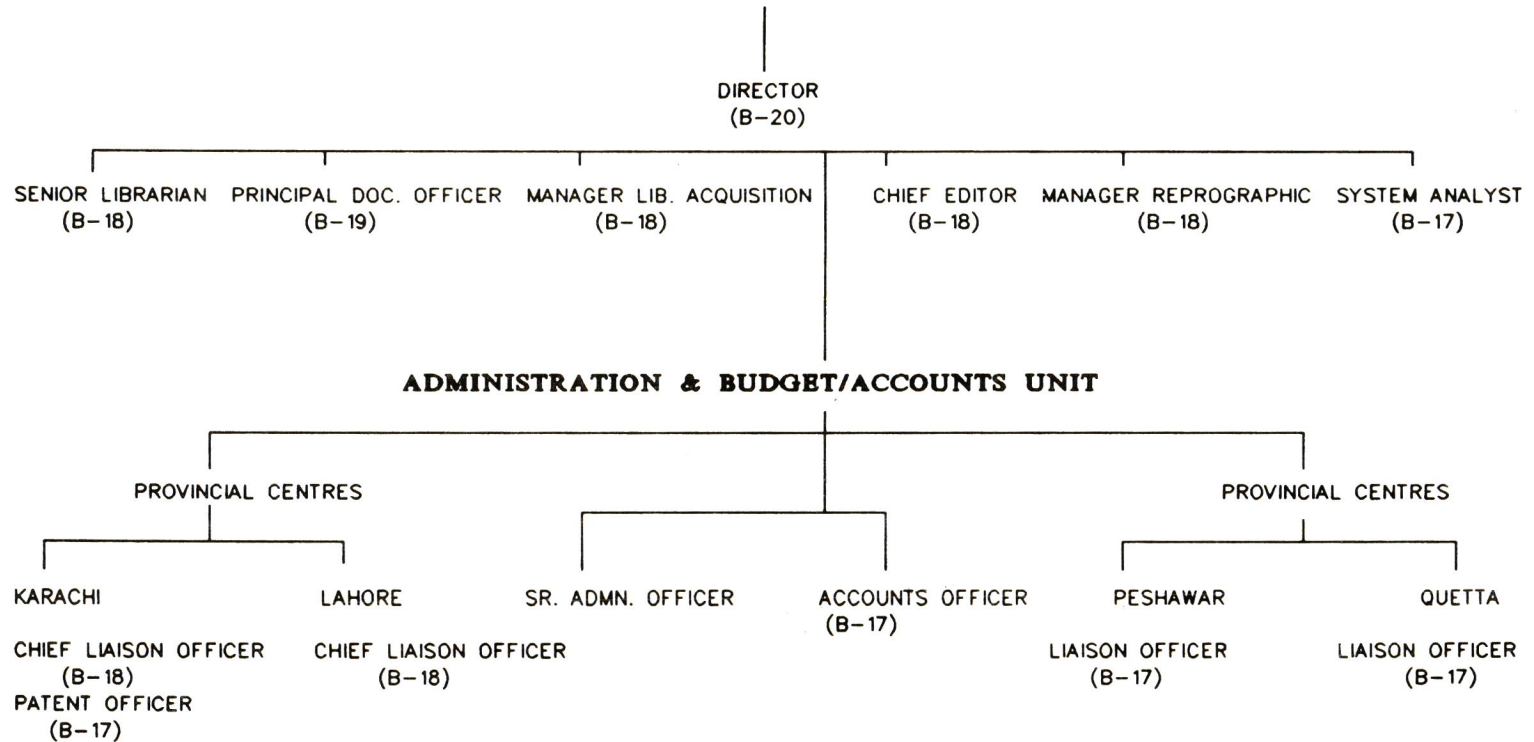
S.No.	Designation	Number
1.	Director General	1
2.	Director	2
3.	Curator	2
4.	Associate Curator	7
5.	Research Associate	18
6.	Taxidermist	2
7.	Product Designer	1
8.	Artist	1
9.	Modeller	1
10.	Children Education Programmer	1
11.	Administrative Officer	1
12.	Accounts Officer	1
13.	Accountant	1
14.	Librarian	1
15.	Supporting Staff	70
		110

**PAKISTAN SCIENCE FOUNDATION  
ORGANIZATIONAL CHART**



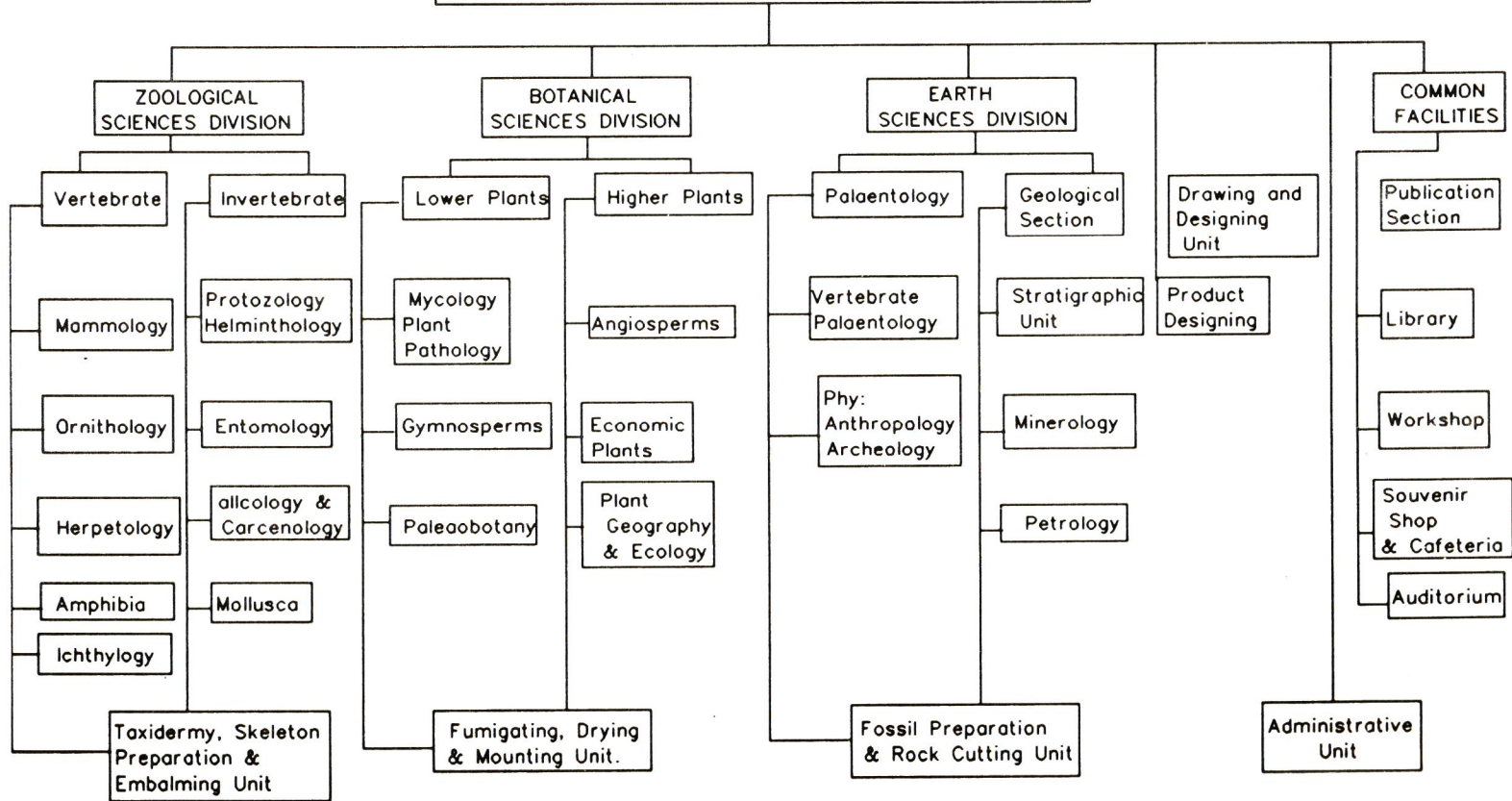
**ORGANIZATION CHART**

**PAKISTAN SCIENCE FOUNDATION  
PAKISTAN SCIENTIFIC & TECHNOLOGICAL INFORMATION CENTRE  
(PASTIC)  
ISLAMABAD**



# ORGANIZATIONAL STRUCTURE

## PAKISTAN MUSEUM OF NATURAL HISTORY



**CHAPTER - 4**  
**AUDITORS REPORT**

The reports of the Auditors appointed by the Foundation in consultations with the Auditor General of Pakistan are reproduced with respect to Pakistan Science Foundation, and its attached departments, Pakistan Scientific & Technological Information Centre and Pakistan Museum of Natural History.

The names and addresses of the Auditors are :-

Pakistan Science Foundation	Nazir Chaudhri & Co., Chartered Accountants, 2-Gardee Trust Building Napier Road, <u>Lahore-7.</u>
Pakistan Scientific & Technological Information Centre	Akbar & Company, Chartered Accountants, Amin Building Shahrah-e-Quaid-e-Azam <u>Lahore</u>
Pakistan Museum of Natural History	Ilyas Saleem & Co, Chartered Accountants, 18-D, 6th Road, Satellite Town, <u>Rawalpindi</u>

65793  
Phones: 68304  
56560

**NAZIR CHAUDHRI & CO**  
Chartered Accountants  
2-Gardee Trust Building, Napier Road,  
Lahore-7

### AUDITOR'S REPORT

We have examined the annexed Balance Sheet of Pakistan Science Foundation as at 30th June, 1986 and the annexed income and expenditure Account for the year ended 30th June 1986, and report that:-

- a) We have obtained all the information and explanation we required;
- b) Such Balance Sheet exhibits a true and correct view of the state of the Foundation's affairs according to the best of our information and explanations given to us and as shown by the Books of the Foundation;
- c) The receipts of the Foundation during the year ended 30th June, 1986, comprise of grants received from the Federal Government. We are satisfied that the grants so received have been utilised on the objects for which it was made within the specified time limit and that there was no unspent balance except for expenses incurred but not paid upto June 30, 1986. However refunds amounting to Rs.1,59,899/- received during the year as also the accumulated balance there of (Note '6' of the account), were not surrendered to the Federal Government upto the Balance Sheet date. We have also satisfied ourselves about the propriety of the disbursements made from the grant.

Sd/-

NAZIR CHAUDHRI & CO.,  
Chartered Accountants

Lahore:  
Dated: 26 March 1986

PAKISTAN SCIENCE FOUNDATION ISLAMABD

BALANCE SHEET AS AT 30TH JUNE, 1986

FUNDS & LIABILITIES	NOTE	1986	1985	PROPERTY & ASSETS	NOTE	1986	1985
<u>GENERAL FUND</u>	2	6,119,235	5,574,540	<u>FIXED ASSETS</u> (As per schedule Annexed)		4,715,918	4,204,835
<u>RESEARCH SUPPORT GRANTS</u>	3	46,799,823	41,692,726	<u>RESEARCH PROJECT IN PROGRESS</u>	7	46,799,823	41,692,726
<u>CURRENT LIABILITIES</u>	5			<u>CURRENT ASSETS</u>			
For expenses		120,746	107,050	Accounts Receivable	8	162,000	162,000
Grant Refundable to Govt.	6	<u>159,899</u> <u>280,645</u>	<u>92,957</u> <u>200,007</u>	Advances, Deposits & Prepayments.	9	1,298,220	1,183,952
				Cash and Bank Balances	10	<u>223,742</u>	<u>223,760</u>
						1,683,962	1,569,712
Rupees		53,199,703	47,467,273			Rupees	53,199,703
		=====	=====				=====

The above Balance Sheet should be read in conjunction  
with the annexed notes on accounts.

CHAIRMAN

TRUSTEE

TRUSTEE

LAHORE  
Date: 26th March 1988

Sd/-  
NAZIR CHAUDHRI & CO.  
CHARTERED ACCOUNTANTS



PAKISTAN SCIENCE FOUNDATION ISLAMABAD

INCOME AND EXPENDITURE FOR THE YEAR ENDED 30TH JUNE, 1986

<u>EXPENDITURE</u>	<u>NOTE</u>	<u>1986</u>	<u>1985</u>
Grants	11	6,611,408	7,304,762
Development grants	12	3,549,000	1,675,000
Travel grant for Scientific Survey	13	528,427	584,472
Science Conferences & Seminars			
Scientific Pool	14	12,167	5,786
Other Functions	15	738,413	149,363
Administrative expenses	16	<u>4,002,578</u>	<u>3,443,298</u>
		15,441,993	12,962,681
		=====	=====
<u>INCOME</u>			
Miscellaneous	17	4,630	6,532
Net expenditure for the year transferred to General Fund		15,437,363	12,956,149
		=====	=====

NOTE: The above Income and Expenditure account should be read in conjunction with the annexed notes on accounts.

CHAIRMAN

TRUSTEE

TRUSTEE

PAKISTAN SCIENCE FOUNDATION ISLAMABAD

SCHEDULE OF FIXED CAPITAL EXPENDITURE AS AT 30TH JUNE, 1986

PARTICULARS	As on 1.7.85	C O S T			Rate	D E P R E C I A T I O N				
		Addition	Adjust- ment	As on 30.6.86		As on 1.7.85	Adjust- ment	For the year	As on 30.6.86	W.DV.as at 30.6.86
Land lease hold	30,13,919.00	-	-	30,13,919.00	-	-	-	-	-	30,13,919.00
Furniture & Fixture	4,80,657.79	38,049.00	-	5,18,706.79	6	1,31,805.19	-	23,214.10	1,55,019.29	3,63,687.50
Office Equipment	5,89,392.00	1,52,020.00	-	7,41,412.00	15	2,54,446.95	-	73,044.76	3,27,491.71	4,13,920.29
Air conditioners	1,18,364.00	-	-	1,18,364.00	15	80,489.70	-	5,681.15	86,170.85	32,193.15
Motor Vehicles	5,56,045.00	6,10,685.88	-	11,66,730.88	20	3,32,824.20	-	1,66,781.34	4,99,605.54	6,67,125.34
Bicycle	680.00	-	-	680.00	20	501.60	-	35.68	537.28	142.72
Library Books & Films	95,946.85	7,910.91	-	1,03,857.76	5	11,474.89	-	4,619.14	16,094.03	87,763.73
Science Equipment	1,89,850.13	-	-	1,89,850.13	15	28,477.52	-	24,205.89	52,683.41	1,37,166.72
Rupees	50,44,854.77	8,08,665.79	-	58,53,520.56	-	8,40,020.05	-	2,97,582.06	11,37,602.11	47,15,918.45
1985	46,59,939.00	4,37,698.77(52783)		50,44,854.77	-	7,10,303.00(471.15)		1,76,832.05	8,40,020.05	42,04,834.72

65793  
68304  
Phones: 56560

**NAZIR CHAUDHRI & CO.**  
CHARTERED ACCOUNTANTS  
2-GARDEE TRUST BUILDING, NAPIER ROAD  
L A H O R E -7

PAKISTAN SCIENCE FOUNDATION, ISLAMABAD

NOTES ON ACCOUNTS 30TH JUNE, 1986

ACCOUNTING POLICIES

1. The principal accounting policies which have been adopted in the preparation of the Foundation's accounts are as follows:-

GRANT RECEIVED

- 1.1 Grant from the Govt. of Pakistan have been accounted for on receipt basis.

RESEARCH SUPPORT GRANT

- 1.2 Research support grant have been accounted for on payment basis.

FIXED ASSETS

- 1.3 Fixed assets have been valued at cost less accumulated depreciation except lease hold land which, is valued at cost.
- 1.4 Depreciation on Fixed assets have been charged on reducing balance method.

GENERAL FUND

	<u>1986</u>	<u>1985</u>
2. This is made up of Balance as on 1st July, 1985.	55,74,540	48,86,625
Add grant received during the year as under :-		
Non-Development Grant received from Govt. of Pakistan	1,25,00,000	1,20,00,000

Development Grant received from Govt. of Pakistan	35,49,000	16,75,000
	<u>2,16,23,540</u>	<u>1,85,61,625</u>
Less expenditure during the year.	1,54,37,363	1,29,56,149
	<u>61,86,177</u>	<u>56,05,476</u>
Less refund of unutilized grant disbursed during the year shown under grant refundable to the Govt. (Note-6)	66,942	30,936
	<u>61,19,235</u>	<u>55,74,540</u>

3. RESEARCH SUPPORT GRANT

In accordance with the principle outlined in the Charter grants aggregating Rs.51,07,097 have been paid by the Foundation during the year for the conducting of various approved scientific research projects as detailed here.

Physical Sciences	3,40,031
Chemical Sciences	10,92,167
Biological Sciences	7,99,842
Earth Sciences	26,000
Environmental Sciences	3,88,571
Agricultural Sciences	3,01,680
Engineering Sciences	1,06,780
Medical Sciences	8,95,375
Institutional Support	11,46,000
Honorarium	10,651
	<u>51,07,097</u>

This balance is arrived at as follows:-

Balance as on 1st July, 1985	4,16,92,726
Disbursed during the year	<u>51,07,097</u>
Balance as at 30.6.1986	<u>4,67,99,823</u>

4. In accordance with the provision of the agreement the guarantee has under taken to incur the grant for the performance and execution of the research projects for which the grant has been sanctioned. Accordingly these grants are being carried forward in the accounts of the Foundation and have not been adjusted for completed projects.

5. CURRENT LIABILITIES 1986 1985

These are made up of Liabilities for expenses.

Audit fee & expenses.	75,500	80,500
Salary & other Benefits	-	6,033
Other Administrative expenses	45,246	20,517
	<u>1,20,746</u>	<u>1,07,050</u>
	=====	=====
6. <u>GRANT REFUNDABLE TO GOVERNMENT</u>		
Balance brought forward	92,957	11,78,082
Amount refunded during the year relating to grants disbursed.		
During the year	66,942	30,936
Prior year.	<u>5,31,320</u>	<u>3,94,205</u>
	<u>6,91,219</u>	<u>16,03,223</u>
Less grant refunded to Government	<u>5,31,320</u>	<u>15,10,266</u>
	<u>1,59,899</u>	<u>92,957</u>
	=====	=====
7. <u>RESEARCH PROJECTS IN PROGRESS</u>		
This represents' the expenditure incurred on various research projects which appears per contra on the liabilities side under the head "Research Support Grant."		
8. <u>ACCOUNTS RECEIVABLES</u>		
	<u>1986</u>	<u>1985</u>
This consist of PASTIC	<u>1,62,000</u>	<u>1,62,000</u>
	<u>1,62,000</u>	<u>1,62,000</u>
	=====	=====
9. <u>ADVANCES DEPOSITS &amp; PREPAYMENTS</u>		
These are made up of advances to staff.	1,05,022	1,49,373
Deposits	5,500	5,500
Prepayments	9,87,468	8,28,849
L/c Margin	<u>2,00,230</u>	<u>2,00,230</u>
	<u>12,98,220</u>	<u>11,83,952</u>
	=====	=====
10. <u>CASH &amp; BANK BALANCES</u>		
In hand	15,742	15,760
UNESCO COUPONS	<u>2,08,000</u>	<u>2,08,000</u>
	<u>2,23,742</u>	<u>2,23,760</u>
	=====	=====

11. GRANTS

Research Support	51,07,097	59,08,975
Scientific Societies & Prof. Bodies.	9,15,000	10,40,000
Science Conferences Meetings & Seminars	5,89,311	3,55,787
	<u>66,11,408</u>	<u>73,04,762</u>
	=====	=====

12. DEVELOPMENT GRANTS

	35,49,000	16,75,000
	=====	=====

This represent the grant received through Govt. of Pakistan from Aid of National Science Foundation of America for project PL-480 and have been paid to the following.

University of Peshawar	27,75,000	9,10,000
Punjab University Lahore	5,05,000	3,00,000
University of Karachi	<u>5,69,000</u>	<u>4,65,000</u>
	<u>35,49,000</u>	<u>16,75,000</u>
	=====	=====

13. TRAVEL GRANT FOR SCIENTIFIC SURVEYS SCIENCE CONFERENCES & SEMINARS

Local	-	4,671
Foreign	<u>5,28,427</u>	<u>3,79,801</u>
	<u>5,28,427</u>	<u>3,84,472</u>
	=====	=====

14. SCIENTIFIC POOL

Salary	11,667	5,516
Honorarium Travelling	<u>500</u>	<u>270</u>
	<u>12,167</u>	<u>5,786</u>
	=====	=====

15. OTHERS

Science Centres & Hebaria	3,17,847	1,09,718
Information & Documentation	-	18,560
Awards Prizes & Fellowships	52,852	21,085
International Liasions	2,54,996	-
Collection of Statistics	1,11,718	-
Utilization of Research Results.	<u>1,000</u>	<u>-</u>
	<u>7,38,413</u>	<u>1,49,363</u>
	=====	=====

16. ADMINISTRATIVE EXPENSES

These comprise of

Salary & other benefits	23,66,822	20,82,844
Travelling expenses(local)	98,384	86,641
Office Rent	4,74,433	4,20,433
Electricity, Gas and Water	50,140	40,066
Postage Telegram & Telephone	2,20,534	2,26,282
Printing & Stationery	63,499	42,193
Vehicle Running & Maint.	2,10,669	2,07,278
Newspaper & Periodicals	11,379	13,563
Liveries & Uniforms	784	4,008
Entertainment	30,915	50,386
Repair & Maintenance	39,575	21,298
Misc.	10,221	18,858
Audit charges (C.P.F.)	-	2,100
Depreciation	<u>2,97,582</u>	<u>1,76,832</u>
	<u>38,74,937</u>	<u>33,92,782</u>
	=====	=====

OTHER EXPENDITURE

Audit Fee	15,000	15,000
Advertisement	8,015	16,791
Bank charges	3,863	4,079
Subscriptions	-	572
Experts & Consultants	1,00,763	14,074
	<u>1,27,641</u>	<u>50,516</u>
	<u>40,02,578</u>	<u>34,43,298</u>
	=====	=====

17. MISCELLANEOUS INCOME

This is made up as under

Interest on advances	4,630	-
Profit on sale of vehicle	-	3,532
Sale of useless store	-	<u>3,000</u>
	<u>4,630</u>	<u>6,532</u>

18. FIGURES

- In these accounts have been rounded off to the nearest rupees.
- Of the previous year have been re-arranged where ever necessary for the purpose of comparison

**AKBAR & COMPANY**  
CHARTERED ACCOUNTANTS

MUHAMMAD AKBAR  
B.Com.(Hons.) F.C.A.

The Chairman,  
Pakistan Science Foundation,  
P-13, Al-Markaz, F-7/2,  
Islamabad.

Subject:- AUDIT OF BOOKS OF ACCOUNTS OF PAKISTAN  
SCIENTIFIC & TECHNOLOGICAL INFORMATION  
CENTRE FOR THE YEAR ENDED JUNE 30,1986.

Sir,

We are pleased to report that we have completed the audit of Receipts and Payments accounts of Pakistan Scientific & Technological Information Centre, Islamabad with Sub-Centres at Lahore, Karachi, Quetta and Peshawar for the year ended June 30, 1986 and report that:-

I. ISLAMABAD

1. GRANTS

This represents the amount received by Centres from Accountant General Pakistan Revenues (AGPR) during the year under audit. The amount allocated and remitted to sub-centres are as under:-

Name of Centre	Funds allocated	Funds utilized/ remitted.
Islamabad	3,416,400	3,480,194.19
Lahore	279,400	211,950.00
Karachi	478,100	509,395.81
Quetta	199,300	200,100.00
Peshawar	128,800	100,360.00
	<u>4,502,000</u>	<u>4,502,000.00</u>

It is evident from the above Table that fund of Rs.63,794.19 have been utilized in excess by the PASTIC Islamabad than the approved budget, while the Centre is not authorised to incur the expenses under any head of account over and above the budget allocation. If any re-appropriation is required, it must be approved by the Finance & Accounts Wing of PSF. The approval of re-appropriation of expenses was not provided to us.



2. BENEVOLENT FUND AND GROUP INSURANCE:

Benevolent Fund and Group Insurance paid on June 6, 1986 amounting to Rs.4,983.38 and Rs.3,242.01 respectively but remain unverified in absence of receipts from respective institutions.

3. REPROGRAPHY EXPENSES:

Purchase of ink of Rs.1170 on June 12, 1986 and binding of Rs.1010 on June 24, 1986 remain unverified in absence of cash memo/bills.

4. REPAIR AND MAINTENANCE - VEHICLE:

Repair and maintenance expenses of Rs.155.40 incurred on June 24, 1986 is supported by cash memo/bill of Rs.145.40 which resulted accounting for expenses excess by Rs.10.

5. Following vouchers are without supporting cash memo/bills.

<u>Date</u>	<u>Particulars</u>	<u>Amount</u>
25.6.1986	Repair and maintenance	Rs.490.00
"	Printing and Stationery	Rs.3290.00
30.6.1986	Photocopy	Rs. 187.00
"	Miscellaneous expenses	Rs. 73.00
"	Entertainment	Rs.296.07

6. C.P.FUND:

During the course of audit we observed short deduction of C.P. Fund from the following employees. This practice remained continued from December 1985 to June 30, 1986.

<u>Name of Employee</u>	<u>C.P.Fund should be</u>	<u>C.P.Fund Deducted.</u>
Mohammad Anees	214	206
Masood Ali	227	220
Syed Shaukat Ali	149	142
Saeed Khan	199	192
Irshad Ahmad	112	107
M.A. Baseer	189	184
Zafar Khan	125	122
Z.U. Farooqi	122	199
Irfan Ali	102	99
Zia Ahmad	81	79
Abdul Hakeem	81	79
Aslam Siddiqui	87	84
Mohammad Sikandar	82	80
Amir Sultan	77	76

Manzoor Hussain	76	66
Shah Pasand	72	71
Baz Khan	72	71

7. CASH WITH BAKS: Rs. 24,054.13

- i) Name of banks with whom balances are held were not available nor they have been confirmed with balance confirmation/bank statements.
- ii) National Bank of Pakistan balance, as per cash book, is Rs.366.60 which as per bank statements Rs.21,683.09 No reconciliation of the same was available for our verification.

8. UNESCO COUPONS: \$ 271.41

Unesco Coupons were not physically verified by us as on June 30, 1986 however, we have relied upon certificate of its physical existence by management.

9. REPROGRAPHY RECEIPTS:

Expenses amounting to Rs.126,054.50 were incurred out of reprography receipts without prior approval from Chairman, PSF, as required under law.

ii) SUB CENTRE LAHORE

1. TRAVELLING AND CONVEYANCE:

Advance for T.A. & D.A. of Rs.1000 paid to Mr. Mohammad Akram D.D.O. on October 22, 1985 to attend the meeting at Islamabad on October 23, 1985 was adjusted on June 30, 1986 against Rs.540 and balance was refunded. We suggest that bills against advances should be adjusted at earliest possible and balance be refunded.

2. CASH WITH BANK:

Bank balance as per bank statement is short by Rs.70 with the cash book balance and the said difference is being brought forward since July 1, 1982.

3. CASH IN HAND:

Cash in hand remain Rs.500 in each day and amount is drawn from the Bank equal to daily expenses. We suggest that first of all Rs.500 should be utilized.

iii) SUB CENTRE KARACHI:

1. C.P.FUND DEDUCTION:

Monthly deductions are not correct and which continued from July to November 1985 and our observations are as under:-

S.No.	Name of Employee	C.P.Fund deducted	C.P.Fund should be
1.	Anwar Zia	60	62
2.	Mohammad Ramzan	150	145
3.	Mohammad Shafique	69	67
4.	Mohammad Younus	74	75

From November 1985 to June, 86 the practice was as under:-

1.	Anwar Zia	70	69
2.	Mohammad Ramzan	150	145

2. MEDICAL CHARGES:

i) As per voucher No.14 dated August 1, 1985 medical expenses are Rs.933.90 while sum total of supporting evidence is Rs.878.65 and difference of Rs.55.25 excess paid remains unexplained.

ii) Rs.993.00 were paid as medical expenses to Dr. Kalimud-Din for the month of November and December vide Voucher No.107 dated January 28,1986 but no supporting evidence was attached.

3. TELEPHONE EXPENSES:

Telephone expenses of Rs.3697 for telephone No.433151 for July, October, November, December and January remain unverified as telephone bills paid were not available.

4. ADVERTISEMENT AND PUBLICITY:

Vide voucher No.163 dated April 28, 1986, advertisement expenses of Rs.375 were incurred which remain unverified in absence of cash memo/bill.

5. PAKISTAN SCIENCE FOUNDATION EXPENSES:

Expenses of Rs.348,127.20 were incurred by P.S.F. Employees at Karachi out of remittance by PSF, but expenses remain unverified in absence of supporting evidence either in original or in photocopies.

6. Details of BLD coupons received were not produced.

iv) SUB CENTRE QUETTA:

1. All Seminar expenses above Rs.500 are sanctioned by D.D.O. It is violation of authority.

2. TRAVELLING AND CONVEYANCE:

2.1 Advance of Rs.3000 and Rs.7020 was paid to Mr. Ayatullah Durrani on October 21, 1985 and on March 1, 1986 have directly been charged to expenses. No bill of actual expenses incurred to adjust the advance was available for our verification. Rs.5980 incurred by Mr. Shams-ul-Haq also remain unverified in absence of proper bill. Further sanction limit of Rs.500 was also violated in disbursement of these expenses.

2.2 Expenses Rs.13,200 were incurred out of P.S.F. remittance remain unconfirmed in absence of supporting evidence.

3. STATIONARY STOCK:

Purchased stationery during the year not entered in stock register.

vi). SUB CENTRE PESHAWAR:

1. TRAVELLING AND CONVEYANCE:

i) Taxi charges of Rs.179 were paid to Mr. Javed, LDC on various dates while he is entitled only wagon fare.

ii) Advance for TA and DA of Rs.800 paid to Mr. Anwar Ahmad D.D.O. on February 26, 1985 was adjusted on February 26, 1986 against Rs.608 balance was refunded. We suggest that bills against advances should be adjusted at earliest possible and balance be refunded.

GENERAL:

1. Documentation receipts:

Documentation receipts could not be verified by us due to non-availability of record;

2. Ledgers are not being maintained by any Centre. It is suggested for the maintenance of the same.

3. Cash in hand for all the Centres as on June 30, 1986 was not physically verified by us. However, we have relied

upon the certificates of its physical existence provided by the managements.

In the end we want to place on record thanks to the management and staff for the corporation extended to us during the course of audit.

Thanks,

Yours faithfully,

Sd/-

AKBAR AND COMPANY  
CHARTERED ACCOUNTANT

LAHORE: 65-SHAHRAH-E-QUAID-E-AZAM

DATED: 15 APRIL 1989

PAKISTAN SCIENTIFIC AND TECHNOLOGICAL INFORMATION CENTRE  
RECEIPT AND PAYMENT ACCOUNTS FOR THE YEAR ENDED JUNE 30, 1986

	<u>R E C E I P T S</u>					<u>TOTAL</u>
	<u>ISLAMABAD</u>	<u>LAHORE</u>	<u>KARACHI</u>	<u>QUETTA</u>	<u>PESHAWAR</u>	
<u>OPENING BALANCE:</u>						
Cash in hand	1,500.00	500.00	1420.10	-	500.00	3,929.10
Cash with bank	24,054.13	28,856.10	9,249.48	323.80	90,850.46	153,333.97
UNESCO Coupons	47,173.17					47,173.17
	<u>72,727.30</u>	<u>29,356.10</u>	<u>10,678.58</u>	<u>323.80</u>	<u>91,350.46</u>	<u>204,436.24</u>
<u>GRANTS:</u>						
From AGPR	4,502,000.00					4,502,000.00
From Science Foundation	-	33,723.00	348,127.20	13,200.00	-	395,050.20
Other receipts	-	6,744.52	21,842.50	10,000.00	352.00	38,939.02
From PASTIC Islamabad	-	211,950.00	509,395.81	200,100.00	100,360.00	-
<u>TOTAL:</u>	<u>4,574,727.30</u>	<u>281,773.62</u>	<u>890,044.09</u>	<u>223,623.80</u>	<u>192,062.46</u>	<u>5,140,425.46</u>
	<u>P A Y M E N T S</u>					
Remittance to Sub-Centres	1,021,805.81	89,388.63	311,513.75	114,535.45	73,888.45	2,565,476.45
Salaries & allowances	1,976,150.17	-	4,390.00	-	-	4,390.00
Printing, Stationary and consumable stores	192,612.82	8,629.85	10,116.00	7,523.00	801.00	219,682.67
Postage, telegrams & telephones	46,416.12	5,044.40	7,915.10	4,090.00	400.00	63,865.62
Newspaper, advertisement & Publ.	16,929.45	-	1,596.00			18,525.45
Translation charges	1850.00	4,775.00				5,825.00
Freight & cargo	461.00	-	1,406.00			1,867.00
Entertainment	663.63	12.00				675.63
Vehicle running expenses	53,772.69					53,772.69
Local rates & taxes	33,082.00	-	1,118.75			34,200.75
Bank charges	2,763.31	214.50	178.20	40.00	50.00	3,246.01
Gardening	1,732.00	-	255.00			1,987.00
Insurance Premium	-	642.00				642.00
Uniform and Driving Dress	1,120.00					1,120.00
Seminar expenses	-	-	-	44,260.00		44,260.00
Furniture & Fixture	9,100.00					9,100.00
PSF expenses	-		348,127.20			348,127.20
Travelling & Conveyance allowance	-	1,291.50	4,652.80	29,200.00	-	35,144.30
Operational expenses of computer unit	10,250.00					10,250.00
Documentation Section	198.60					198.60
Purchase of UNESCO Coupons	126,000.00					126,000.00
Advances	4,848.00	20,361.00	19,888.00	-	2,100.00	47,197.00

	<u>ISLAMABAD</u>	<u>LAHORE</u>	<u>KARACHI</u>	<u>QUETTA</u>	<u>PESHAWAR</u>	<u>TOTAL</u>
Unforeseen expenses	588.80	-	5,186.55	-	-	6,405.35
Electricity, Water & Gas charges	133,214.00	2,783.50	14,658.10	-	400.00	151,055.60
Miscellaneous	-	604.10	-	1,700.00	6,794.20	9,098.30
Reprography expenses	56,114.00	-	-	-	-	56,114.00
Refund to P.S.F.	-	15,120.00	-	7,420.00	1,039.80	22,540.00
Medical charges	-	16,642.97	60,840.23	150.00	-	78,673.00
House Rent	-	-	-	11,700.00	-	11,700.00
Hot and Cold charges	-	210.00	-	-	-	210.00
Repair & maintenance of vehicles	-	158.00	-	-	-	158.00
Repair & maintenance of equipment	19,399.30	-	1,780.00	-	-	21,179.30
Repair & maintenance of building	55,212.25	1,121.00	5,885.60	-	5,275.00	67,493.85
Purchase of vehicles	332,000.00	-	-	-	-	332,000.00
Purchase of equipment	401,105.00	-	-	-	-	401,105.00
Purchase of Books	5,044.45	830.50	-	-	-	5,874.95
Welfare fund	-	-	895.99	-	-	895.99
Staff building rent	-	-	13,800.00	-	-	13,800.00
	<u>4,501,633.40</u>	<u>167,828.95</u>	<u>814,833.27</u>	<u>220,618.45</u>	<u>90,748.45</u>	<u>4,773,856.71</u>
<u>CLOSING BALANCE:</u>						
Cash in hand	1,500.00	500.00	1,282.00	-	500.00	3,782.00
Cash with Bank	24,420.73	113,444.67	73,928.82	3,005.35	100,814.01	315,613.58
UNESCO Coupons	47,173.17	-	-	-	-	47,173.17
	<u>73,093.90</u>	<u>113,944.67</u>	<u>75,210.82</u>	<u>3,005.35</u>	<u>101,314.01</u>	<u>366,568.75</u>
TOTAL:	<u>4,574,727.30</u>	<u>281,773.62</u>	<u>890,044.09</u>	<u>223,623.80</u>	<u>192,062.46</u>	<u>5,140,425.46</u>

Sd/- AKBAR & COMPANY  
CHARTERED ACCOUNTANTS

LAHORE: 65-SHAHRAH-E-QUAID-E-AZAM  
DATE: 15 APR 1989

**AKBAR & COMPANY**  
CHARTERED ACCOUNTANTS

PAKISTAN SCIENTIFIC AND TECHNOLOGICAL INFORMATION CENTRE  
GOVERNMENT RECEIPT AND PAYMENTS ACCOUNTS FOR THE YEAR ENDED JUNE 30, 1986

	<u>ISLAMABAD</u>	<u>LAHORE</u>	<u>KARACHI</u>	<u>QUETTA</u>	<u>PESHAWAR</u>	<u>TOTAL</u>			
<u>CLOSING BALANCE</u>									
Cash in hand	9.90					9.90			
Cash in Bank	285,698.95	2,164.50	19.74		8.00	<u>287,891.19</u>			
						287,901.09			
<u>RECEIPTS</u>									
Documentation Receipts	18,102.01	23,473.00	12,935.60		4,340.00	58,850.61			
Reprography Receipts	<u>72,371.85</u>					<u>72,371.85</u>			
	376,182.71	<u>25,637.50</u>	<u>12,955.34</u>		<u>4,348.00</u>	419,123.55			
	=====	=====	=====		=====	=====			
		P	A	Y	M	E	N	T	S
Reprography expenses	126,054.50								126,054.50
Bank charges	-	83.00							83.00
Transfer in Govt.	-	21,200.00	12,900.00					4,260.00	38,360.00
Treasury A/c									
<u>CLOSING BALANCE:</u>									
Cash in hand	9.90								9.90
Cash with bank	<u>250,118.31</u>	<u>4,354.50</u>	<u>55.34</u>			<u>88.00</u>			<u>254,616.15</u>
	250,128.21	<u>4,354.50</u>	<u>55.34</u>			<u>88.00</u>			<u>254,626.05</u>
	376,182.71	<u>25,637.50</u>	<u>12,955.34</u>			<u>4,348.00</u>			419,123.55
	=====	=====	=====			=====			=====

Sd/- AKBAR & COMPANY  
CHARTERED ACCOUNTANTS

LAHORE: 65-SHAHRAH-E-QUAID-E-AZAM

DATE: 15 APR 1989



**AKBAR & COMPANY**  
CHARTERED ACCOUNTANTS

MUHAMMAD AKBAR  
B.Com. (Hons.) F.C.A.

The Chairman,  
Pakistan Science Foundation,  
P-13, Al-Markaz, F-7/2,  
Islamabad.

Subject:- AUDIT OF BOOKS OF ACCOUNTS OF PAKISTAN  
SCIENTIFIC & TECHNOLOGICAL INFORMATION  
CENTRE FOR THE YEAR ENDED JUNE 30, 1986

Sir,

Reference to our meeting with Deputy Director Finance and Accounts, Pakistan Science Foundation from February 9, 1991 to February 11, 1991, regarding short comings/observations pointed out in the previous report and we detail that the following information/short comings in our report have been clarified as under:-

i) ISLAMABAD CENTRE:

1) GRANTS:

This represent the amount received by Centres from Accountant General Pakistan Revenues (AGPR) during the year under audit. The amounts allocated and remitted to Sub-Centres are as under:-

<u>Name of Centre</u>	<u>Fund Allocated</u>	<u>Funds utilized/ remitted</u>
Islamabad	3,416,400	3,480,194.19
Karachi	279,400	211,950.00
Lahore	478,100	509,395.81
Quetta	199,300	200,100.00
Peshawar	128,800	100,360.00
	<u>4,502,000</u>	<u>4,502,000.00</u>

It is evident from the above that fund of Rs.63,794.19 has been utilized in excess by the PASTIC Islamabad than the approved budget, while the centre is not authorised to incur the expenses under any head of account over and above the budget allocation. Expenses exceeding the budget were approved by the Board of Trustee in its 15th meeting held on 27th June, 1985 vide letter No.PSF/Accounts/4(1)/85-86 Pastic 1836, dated October 13, 1985.

2) BENEVOLENT FUND AND GROUP INSURANCE:

Benevolent fund and group insurance were paid on June 6, 1986 amounting to Rs.4,983.38 and Rs.3,242.01 respectively through demand drafts.

9. REPROGRAPHY RECEIPT:

Expenses amounting to Rs.126,054.50 were incurred out of Reprography receipts without prior approval from Chairman, PSF as required by law. However, these expenses were approved by the Director General , PASTIC Islamabad, and were deposited in Treasury on October 20, 1986.

iii) SUB CENTRE KARACHI:

3. TELEPHONE EXPENSES:

Telephone expenses of Rs.3,657 for telephone No.433151 for July, October, November, December and January were verified by us.

4. ADVERTISEMENT AND PUBLICITY:

Voucher No.163 dated April 26, 1986 advertisement expenses of Rs.375 were incurred whose supporting bill/cash memo was provided to us for verification.

iv) SUB CENTRE PESHAWAR:

1. TRAVELLING AND CONVEYANCE:

Taxi charges of Rs.179 were paid to Mr. Javed L.D.C. on various dates while he is entitled only wagon fare. Rs.136 have been recovered from Mr. Javed on June 8, 1989.

2. DOCUMENTATION RECEIPTS:

Documentation receipts were verified by us. However, bank statement for the month of January 1986 was not made available to us.

Yours faithfully,

Sd/-

AKBAR AND COMPANY  
CHARTERED ACCOUNTANTS

LAHORE-65-SHARAH-E-QUAID-E-AZAM  
DATED 4 SEPT. 1990

**AKBAR & COMPANY**  
CHARTERED ACCOUNTANTS

MUHAMMAD AKBAR  
B.Com. (Hons.) F.C.A.

The Chairman,  
Pakistan Science Foundation,  
P-13, Al-Markaz, F-7/2,  
Islamabad

Subject:- AUDIT OF BOOKS OF ACCOUNTS OF PAKISTAN  
SCIENTIFIC AND TECHNOLOGICAL INFORMATION  
CENTRE FOR THE YEAR ENDED JUNE 30, 1986.

Sir,

As per telephonic conversation by the Director Miss Azra Sultana, we deputed our staff to verify the short comings/observations pointed out in the previous report and we detail that the following information/short comings in our report have been clarified as under:-

3. REPROGRAPHY EXPENSES:

Cash memo/bills of purchase of ink of Rs.170 on June 12, 1986 and binding of Rs.1,010 on June 24, 1986 was provided to us dated June 15 1986 and June 26, 1986 respectively.

4. REPAIR AND MAINTENANCE - VEHICEL:

Repair and maintenance expenses of Rs.155.40 incurred on June 24, 1986 whose supporting cash memo/bill was provided for our verification.

5. PETTY CASH VOUCHERS:

Supporting evidence of all the vouchers mentioned in the previous report was provided to us. Cash memo/bills of Rs.296.07 regarding Entertainment expenses on June 30, 1986 was of the date July 3, 1986 and accounted for in cash book with lead pencil.

6. C.P.FUND:

During the course of audit we observed short deduction of C.P. Fund from the employees. This practice remained continued from December 1985 to June 30, 1986 and explained that necessary corrections have been made and it was for staff existing after June 30, 1989.

7. CASH WITH BANKS:

Rs.24,054.13

The balance remains unconfirmed in absence of balance confirmation certificate. Name of the Banks were not available on books but were got verified from file. It is suggested that cash book should indicate the name of the Banks and instructions should be issued in this regard.

ii) KARACHI CENTER:

5) PAKISTAN SCIENCE FOUNDATION: by PSF Employees

Expenses of Rs.348,127.20 were incurred by PSF Employees at Karachi out of remittance by PSF. It has been explained that those expenses are of PSF and has been accounted for in PSF books of accounts.

Yours faithfully,

Sd/-

AKBAR AND COMPANY  
CHARTERED ACCOUNTANTS

LAHORE: 65-SHAHRAH-E-QUAID-E-AZAM:

DATE: FEBRUARY 11, 1991

The Chairman,  
Board of Trustees,  
Pakistan Museum of Natural History,  
Islamabad.

ILYAS SALEEM & CO.

Dear Sir,

Re: Audit Report of Accounts June 30, 1986

We have completed the audit of Accounts for the year ended June 30, 1986. Our observations arising out of our audit are given below:-

1. Some of the recurring expenses were met out of Development Grant. Refer Annexure-I for detail.
2. Expenditure incurred against Development Grant does not confirm with PC-I. The detail is attached at Annexure-II.
3. An amount of Rs.1,79,266 was advanced to CDA for the construction of Museum Building. We are unable to satisfy ourselves regarding the terms and conditions of this advance, however, reportedly there exist no agreement for the same.
4. Tax deducted at source has not been correctly calculated.
5. Quotations were not regularly obtained for purchases.
6. We are unable to ascertain the amount of advances recoverable from the employees and others due to the following reasons:-
  - i) Improper book keeping which does not show the personal accounts.
  - ii) The temporary record maintained not depicts all the transactions.
7. Physical verification of fixed assets was not carried out and fixed assets register was not properly maintained.
8. No detailed inventory of stores and stocks was provided to us.
9. Cash in hand was not physically verified by us on the terminal date.

Very truly yours,

Sd/-

(MUHAMMAD SALEEM)  
For ILYAS SALEEM & CO.

## Annexure-I

<u>Recurring Expenditure</u>	<u>Rs.</u>
Wages.	6,300.00
P.O.L.	8,900.00
Insurance Vehicle	5,653.00
Consumable Stores	70,830.50
Repair & Maintenance of Equipment	4,500.00
Repair and Maintenance of Motor Vehicle	1,031.00

.....

## Annexure-II

<u>Expenditure as per PC-I</u>		<u>Expenditure actually incurred</u>
Books	Rs.200,000	Rs.327,119
Transport	Rs.110,000	Rs.240,000

ILYAS SALEEM & CO.

PAKISTAN MUSEUM OF NATURAL HISTORY

RECEIPTS AND PAYMENTS ACCOUNT OF DEVELOPMENT  
PROJECT FOR THE YEAR ENDED JUNE 30, 1986

1986 (Rs.)

RECEIPTS

Development Grant 3,198,500.00

PAYMENTS

Purchase of vehicle	240,700.00
Purchase of Generator	8,990.00
Laboratory Equipment	895,110.00
Books	327,119.30
Advance to CDA for construction of Building	1,179,266.00
Advance to PEPAC	450,000.00
Wages	6,300.00
P.O.L.	8,900.00
Insurance vehicle	5,653.00
Consumable Stores	70,830.50
Repair and Maintenance of Equipment	4,500.00
Repair and Maintenance of Motor Vehicle	1,031.00
Bank charges	<u>100.20</u>
	<u>3,198,500.00</u>

Sd/-

ILYAS SALEEM & CO.  
CHARTERED ACCOUNTANTS

RAWALPINDI \_\_\_\_\_ 1987

PAKISTAN MUSEUM OF NATURAL HISTORY ISLAMABAD

RECEIPT AND PAYMENT ACCOUNT (RECURRING ACCOUNT)  
FOR THE YEAR ENDED JUNE 30, 1986

<u>RECEIPTS</u>	<u>1986 (Rs.)</u>
Opening	
Cash in hand	2,386.78
Cash at bank	<u>26,567.01</u>
	28,953.79
Grants	4,400,000.00
Pakistan Science Foundation	37,257.00
Insurance claim	<u>36,300.00</u>
	<u>4,502,510.79</u>
<u>PAYMENTS</u>	
Salaries & allowances	2,441,596.20
Rent office buildings	661,480.00
Rent residential buildings	374,400.00
Entertainment	8,272.43
Newspapers and Magazines	4,041.52
Telephones	88,268.00
Electricity, Gas and Water charges	86,585.65
Advertisement	27,747.90
Postage and telegams	388.10
Medical charges	85,791.12
Security deposits electricity	845.00
Audit fee	11,140.00
T.A./D.A.	61,906.50
Consumable stores	195,337.25
Welfare Fund	5,748.00
P.O.L/Repair and Maintenance of vehicles	180,075.92
Repair and Maintenance of office	12,071.77
Printing & stationery	47,433.80
Overtime	6,445.00
C.P.Fund Final Payments	18,292.00
Bank charges	10.00
Advances against expenses	320.71
Repair and Maintenance of office equipment	20,844.00
Office equipment	86,071.00
Furniture & fixture	9,310.00
C.P.Fund advance	17,685.00
Loan to P.I.	5,000.00
Miscellaneous expenditure	<u>12,857.32</u>
	<u>4,469,964.19</u>
Closing balance	
Cash in hand	13,500.00
Cash at Bank	<u>19,046.00</u>
	32,546.60
	4,502,510.79

Sd/-

Rawalpindi, 1987

ILYAS SALEEM & CO.,  
CHARTERED ACCOUNTANTS



PAKISTAN SCIENCE FOUNDATION ACT 1973

National Assembly of Pakistan  
Islamabad, the 2nd February, 1973

The following Acts of the National Assembly received the assent of the President on the 31st January, 1973 and hereby published for general information:

Act No. III of 1973

An Act to provide for the establishment of the Pakistan Science Foundation.

Whereas it is expedient to provide for the establishment of the Pakistan Science Foundation and for matters ancillary thereto.

It is hereby enacted as follows:-

1. SHORT TITLE, EXTENT AND COMMENCEMENT -(1)  
This Act may be called the Pakistan Science Foundation, Act, 1973

2. It extends to the whole of Pakistan

3. It shall come into force at once.

2. DEFINITIONS - In this Act, unless there is anything repugnant in the subject or context.

a) 'Board' means the Board of Trustees of the Foundation;

b) 'Chairman' means the Chairman of the Foundation; and

c) 'Foundation' means the Pakistan Science Foundation established under this Act.

3. ESTABLISHMENT OF THE FOUNDATION - (1) As soon as may be after the commencement of this Act, the Federal Government may, by notification in the official Gazette, establish a Pakistan Science Foundation to promote and finance scientific activities having a bearing on the socio-economic needs of the country.

(2) The Foundation shall be a body corporate by the name of the Pakistan Science Foundation, having perpetual succession and a common seal, with power, subject to the provisions of this Act, to acquire, hold and dispose of property, both movable and immovable, and shall by the said name sue and be sued.

(3) The head office of the Foundation shall be at Islamabad.

4. FUNCTIONS OF THE FOUNDATION -(1) The Foundation shall function as a financing agency for:

- i) The establishment of comprehensive scientific and technological information and dissemination centre.
- ii) the promotion of basic and fundamental research in the universities and other institutions on scientific problems relevant to the socio-economic development of the country;
- iii) the utilization of the results of scientific and technological research including pilot plant studies to prove the technical and economic feasibility of processes found to be promising on a laboratory scale;
- iv) the establishment of science centres, clubs, museum, herbaria and planetaria;
- v) the promotion of scientific societies, associations and academies engaged in spreading the cause of scientific knowledge in general or in the pursuit of a specific scientific discipline or technology in particular;
- vi) the organization of periodical science conferences, symposia and seminars;
- vii) the exchange of visits of scientists and technologists with other countries;
- viii) the grant of awards, prizes and fellowships to individuals engaged in developing processes, products and inventions of consequence to the economy of the country; and
- ix) special scientific surveys not undertaken by any other organization and collection of scientific statistics related to the scientific effort of the country.

2. The Foundation shall also:-

- i) review the progress of scientific research sponsored by it and evaluate the results of such research;
- ii) maintain a National Register of highly qualified and talented scientists of Pakistan, including engineers and doctors, in or outside the country and to assist them, in collaboration with the concerned agencies in finding appropriate employment.

iii) establish liaison with similar bodies in other countries.

(3) In the performance of its functions, the Foundation shall be guided on questions of policy by the instructions if any, given to it by the Federal Government which shall be the sole judge as to whether a question is a question of policy.

5. BOARD OF TRUSTEES -(1) The general direction, conduct and management of the affairs of the Foundation, including administration of its funds, shall vest in a Board of Trustees consisting of the following members namely:-

Whole-time members

- i) the Chairman;
- ii) one eminent scientist;
- iii) the Director of Finance;

to be appointed by the President;

Part-time members

- iv) the Chairman of the National Science Council;
- v) four scientists to be nominated by the National Science Council; and
- vi) eleven eminent scientists to be nominated by the President.

(2) The remuneration and other terms and conditions of service of the Chairman and the two other whole-time members of the Board shall be such as may be determined by the President.

6. CHAIRMAN OF THE BOARD: The Chairman of the Board shall be the Chairman of the Foundation and shall be appointed for a term of three years from amongst the eminent scientists of the country having experience of research and scientific administration.

7. TERMS OF MEMBERS OF THE BOARD: The members of the Board, other than the ex-officio member, shall hold office for a term of three years and shall be eligible for re-appointment or re-nomination, as the case may be.

8. MEETING OF THE BOARD: (1) The meeting of the Board shall be held at least twice a year and shall be presided over by the Chairman or, in his absence, by its whole-time scientist member.

(2) All decision at a meeting of the Board shall be taken by a majority of the votes of the members present and voting.

9. QUORUM AT THE MEETING OF THE BOARD: To constitute a quorum at a meeting of the Board not less than nine members shall be present.

10. EXECUTIVE COMMITTEE: There shall be an Executive Committee consisting of the Chairman and the two whole-time members of the Board.

11. DELEGATION OF POWERS: The Board may, from time to time, delegate to the Chairman or the Executive Committee such of its powers and functions as it may consider necessary.

12. ADHOC COMMITTEE: The Foundation may set up adhoc committees consisting of university professors and other leading scientists and experts to serutinize applications for financial assistance for carrying out scientific research submitted to the Foundation by the universities or other institutions or by invididual scientific workers or groups of scientific workers and to review and evaluate the results of research sponsored by the Foundation.

13. FUNDS: The funds of the Foundation shall consist of:-

- a) grants made by the Federal Government and the Provincial Government;
- b) donations and endowments; and
- c) income from other sources.

14. BUDGET: The Foundation shall cause to be prepared and approve a statement of its receipts and expenditures for each financial year.

15. ACCOUNTS AND AUDIT: (1) The funds of the Foundation shall be kept in a personal ledger account of the Foundation with the State Bank of Pakistan or with any Branch of the National Bank of Pakistan acting as an agent of the State Bank.

(2) The accounts of the Foundation shall be maintained in such form and manner as to the Auditor-General of Pakistan may determine consultation with the Federal Government.

(3) The accounts of the Foundation shall be audited by one or more auditors who are chartered accountants within the meaning of the Chartered Accountants Ordinance, 1961

(X of 1961), and are appointed by the Foundation in consultation with the Auditor-General of Pakistan.

16. APPOINTMENT OF OFFICERS AND SERVANTS:

(1) The Foundation may appoint such officers and servants, and engage such consultants or experts, as it may consider necessary for the efficient performance of its functions, on such terms and conditions as it may deem fit.

(2) In fixing the terms and conditions of service of its officers and servants, the Foundation shall, as nearly as may be, confirm to the scales of pay allowances and conditions of service applicable to the corresponding class of employees of the Federal Government.

(17) ANNUAL REPORT: (1) The annual report of the Foundation, which shall, among other things, clearly bring out the benefits accruing to the nation as a result of the activities sponsored by the Foundation, shall be prepared by the Chairman and submitted, through the Board, to the Federal Government along with the audited accounts of the Foundation.

(2) The annual report along with the audited accounts of the Foundation shall be laid before the National Assembly.

18. REGULATIONS: The Foundation may make Regulations for the efficient conduct of its affairs.

19. REPEAL: The Pakistan Science Foundation Ordinance, 1972 (LII of 1972), is hereby repealed.

Annexure-II

LIST OF SANCTIONED PROJECTS DURING THE YEAR 1985-86

<u>Title of schem</u>	<u>Amount sanctioned</u>	<u>Name of Principal Investigator &amp; Organization supported</u>
<b>BIOLOGICAL SCIENCES</b>		
i) Studies on the siwalik Artiodactyla(Souidea, Anthracotheroidea & Cervidae (P-PU/Bio (141)	3,70,200/-	Dr. Abu-Baker, Zoology Department, Punjab University, New Campus, <u>Lahore</u>
ii) Effect of phytohormones applications in the Amelioration of water and salt stress in legumes. C-QU/Bio (144)	54,200/-	Dr. Asghari Bano, Lecturer, Department of Biological Sciences, Quaid-i-Azam University, <u>Islamabad</u>
iii) Collection and record of Reptilian fauna of Tableland Potwar, Punjab, Pakistan P-TICR/Bio (149)	2,09,300/-	Mr. M. Sharaif Khan Department of Zoology, Govt.T.I. College <u>Rabwah.</u>
iv) Hormonal Influences on skeletal Muscle Grafts. P-PU/Bio (149)	2,35,700/-	Dr. Shahzad A. Mufti, University of Punjab, <u>Lahore.</u>
<b>CHEMICAL SCIENCES</b>		
i) "Mechanism of Iron release from biological iron transport Compounds." S-KU/Chem (164)	3,03,400/-	Syed Arif Kazmi, University of Karachi, University Road, <u>Karachi-32</u>
ii) "Isolation and structural Studies on the Chemical constituents of Ervatamia coronaria." S-KU/Chem (165)	3,93,500/-	Prof. Atta-ur-Rehman, Co-Director, H.E.J., Research Institute of Chemistry, University of Karachi, <u>Karachi.</u>
iii) Studies of Heterocyclic compounds. P-IU/Chem (166)	2,48,800/-	Dr. Misbahul-Ain Khan, Islamia University, <u>Bahawalpur</u>
iv) Development of procedure for extraction and	1,14,400/-	Dr. Mohammad Ali Khan, Prof. Nuclear Chemistry,

- |   |            |   |
|---|------------|---|
| refining of Beryllium from Beryl ores of Pakistan<br>P-PU/Chem (169)                            |            | University of Punjab,<br><u>Lahore.</u>   |
| v) Studies on the Chemical constituents of capparidaceous Plants of Pakistan<br>P-PU/Chem (170) | 3,03,400/- | Prof. Viqar-Uddin Ahmad,<br>H.E.J. Research Institute,<br>Chem. University of<br>Karachi, <u>Karachi.</u> |

#### ENVIRONMENTAL SCIENCES

- |   |            |  |
|---|------------|--|
| CR-39 Mica Nuclear Track Filter System: Developments and other applications in Biology & Environment Sciences.<br>P-PCSIR/Envr (28) | 5,47,200/- | Dr. Naeem Ahmad Khan,<br>Pakistan Council of<br>Scientific & Industrial<br>Research, <u>Islamabad.</u> |
|---|------------|--|

#### MEDICAL SCIENCES

- |  |            |  |
|--|------------|--|
| i) Biochemical Studies on Trauma<br>S-JPMC/Med (85)  | 2,05,220/- | Prof. M. Ata-ur-Rehman,<br>Deptt. of Biochemistry<br>JPMC <u>Karachi.</u>  |
| ii) Incidence of Hyperuricemia in General population of different status in Multan Division and its relationship to risk factors of coronary heart disease<br>PNMC/Med (100) | 4,78,600/- | Dr. M. Hayat Zafar,<br>Prof. of Medicine,<br>Nishter Medical College,<br>Multan                                      |
| iii) Studies on Protein changes in Senile cataract.<br>KU/Med (108)  | 2,31,600/- | Dr. Zafar H. Zaidi,<br>Prof. HEJ Research<br>Institute of Chemistry,<br>University of Karachi,<br><u>Karachi-32.</u> |
| iv) Mother infant transmission of hepatitis B-Virus in Pakistan.<br>C-NIH/Med (110)  | 5,28,650/- | Dr. Abdul Ghufoor,<br>Chief, Public Health Division,<br>National Institute<br>of Health, <u>Islamabad.</u>           |

#### PHYSICAL SCIENCES

- |   |            |   |
|---|------------|---|
| v) Coherence Properties of Radiation in Non-linear optics and lasers<br>C-QU/Phy (49)   | 1,97,950/- | Dr. M. Sohail Zubairy,<br>Department of Physics,<br>Quaid-i-Azam University,<br><u>Islamabad</u>    |
| vi) Computer Simulation of Laser Fusion/some aspects of plasma Physics<br>C-QU/Phy (50) | 5,87,800/- | Dr. G. Murtaza,<br>Prof. Department of<br>Physics, Quaid-i-Azam<br>University,<br><u>Islamabad.</u> |

ANNEXURE-III

**INSTITUTIONAL SUPPORT**

<u>Sr. No.</u>	<u>Name of Institution</u>	<u>Grant Released</u>
1.	University of Karachi, Karachi	46,000/-
2.	Sind Agriculture University, Tandojam	4,35,000/-
3.	Govt. Degree College for Boys, Jhang	1,50,000/-
4.	Bahauddin Zakaria University, Multan	2,00,000/-
		<u>8,31,000/-</u>



## ANNEXURE-IV

PSF GRANTS SANCTIONED TO SCIENTIFIC SOCIETIES AND LEARNED BODIES FOR THEIR APPROVED OBJECTIVES FOR THE YEAR 1985-86.

<u>No.</u>	<u>Name of Society</u>	<u>Amount</u>
1.	Pakistan Academy of Sciences	50,000/-
2.	Scientific Society of Pakistan	50,000/-
3.	Pakistan Association of Scientists & Scientific Professions.	60,000/-
4.	Pakistan Association for Advancement of Science.	50,000/-
5.,	Pakistan Society of Nematologists	10,000/-
6.	Zoological Society of Pakistan	20,000/-
7.	Pakistan Botanical Society.	20,000/-
8.	Society for Advancement of Agricultural Sciences Pakistan	10,000/-
9.	Biological Society of Pakistan	10,000/-
10.	Pakistan Society of Public Health Engineers.	15,000/-
11.	Pakistan Society of Biochemists	10,000/-
12.	Chemical Society of Pakistan	20,000/-
13.	Institute of Engineers Pakistan	50,000/-
14.	Institute of Electrical Engineers of Pakistan	50,000/-
15.	Pakistan Engineering Congress	30,000/-
		<u>4,55,000/-</u>

ANNEXURE-V

GRANTS SANCTIONED FOR PUBLICATION PROGRAMME

S.No.	A g e n c y	Publication	Grant in Rs.
1.	Pakistan Academy of Sciences	Monographs etc.	50,000/-
2.	Scientific Society of Pakistan	Science Bachoon-ke-Liay	50,000/-
3.	Pakistan Association for the Advancement of Science.	Pakistan Journal of Science	50,000/-
4.	Pakistan Society of Nematologists.	Journal of Nematology	10,000/-
5.	Zoological Society of Pakistan	Pakistan Journal of Zoology.	30,000/-
6.	Pakistan Botanical Society	Journal of Botany	30,000/-
7.	Society for the Advancement of Agricultural Sciences of Pakistan	Pakistan Journal of Agricultural Sciences	10,000/-
8.	Biological Society of Pakistan.	Biologia	20,000/-
9.	University of Karachi Karachi	Pakistan Journal of Pharmacology.	10,000/-
10.	Pakistan Society of Biochemists	Pakistan Journal of Biochemistry	20,000/-
11.	Chemical Society of Pakistan	Journal of Chemical Society of Pakistan	30,000/-
12.	Pakistan Council of Science & Technology	Journal of Science Technology and Development.	50,000/-
13.	Pakistan Forest Institute Peshawar	Journal of Forestry	15,000/-
14.	Mehran University of Engg. & Tech. Jamshoro	Journal of Engineering & Technology	20,000/-

15. University of Karachi	Journal of Pharmacy	20,000/-
16. Society for the Promotion of Engineering Education	Journal of Engineering Education	10,000/-
17. Khyber Medical College Peshawar	Pakistan Oral & Dental Journal	15,000/-
18. University of Agriculture Faisalabad.	Pakistan Veterinary Journal	10,000/-
19. Govt. College, Lahore	Journal of Natural Sciences & Mathematics	10,000/-
20. Federal Urdu Science College, Karachi	Tehqiq	15,000/-
21. University of Punjab, Lahore.	Journal of Mathematics	<u>20,000/-</u>
	Total	<u>4,95,000/-</u>

## ANNEXURE-VI

GRANTS SANCTIONED FOR ORGANIZING SCIENCE  
CONFERENCES/SYMPOSIA/SEMINARS

<u>S.No.</u>	<u>A g e n y</u>	<u>Object</u>	<u>Amount</u>
1.	Ministry of Science & Technology, Islamabad	1st National Seminar on Technology Transfer	30,000/-
2.	Soil Science Society of Pakistan	1st National Congress of Soil Science.	20,000/-
3.	University Grants Commission, Islamabad	National Workshop on Industry & University Interaction in Chemistry	15,000/-
4.	Quaid-e-Azam University Islamabad	All Pakistan Mathematical Conference.	10,000/-
5.	Department of Botany, University of Peshawar, N.W.F.P.	2nd National Meeting on plant tissue culture.	10,000/-
6.	Board of Intermediate & Secondary Education, Lahore.	Summer School in Science for talented students of Intermediate classes at Khanspur.	30,000/-
7.	Institute of Engineers, Pakistan, Lahore Centre.	International Colloquium on Concrete in developing countries and Workshop, Lahore.	20,000/-
8.	H.E.J. Research Institute of Chemistry, University of Karachi.	2nd International Symposium Pak. U.S. Binational Workshop on Natural Product Chemistry	50,000/-
9.	University of the Punjab, Lahore.	23rd All Pakistan Urdu Science Conference	50,000/-
10.	Quaid-e-Azam University, Islamabad.	Symposium on "Frontiers in Physics."	25,000/-
11.	Society for the Promotion of Engineering Education & Research, Lahore	National Seminar on Engineering Education and Research.	5,000/-
12.	Institute of Marine Sciences, University of Karachi	International Conference on Marine Sciences for Arabian Sea.	20,000/-

13. The Institute of Engineers, Pakistan (Rawalpindi/Islamabad Centre).	National Conference on Telecommunication.	20,000/-
14. National Institute of Silicon Technology, Islamabad.	SAARC Workshop on Renewable Energy Sources.	20,000/-
15. Faculty of Engineering and Technology, University of Punjab, Lahore.	Powder Metallurgy Technology Symposium	20,000/-
16. National Academy of Higher Education, University Grants Commission, Islamabad.	Regional School on Short range order metallic solid solution.	20,000/-
17. Pakistan Association of Scientists and Scientific Professions, Karachi	Seminar on Quran and Science.	25,000/-
18. Karachi University, Karachi	US-Pakistan Binational Workshop on Biosaline Research.	25,000/-
		<u>4,15,000</u>

ANNEXURE-VII

TRAVEL GRANTS FOR VISITS ABROAD

<u>S.No.</u>	<u>Name &amp; Address</u>	<u>Purpose of visit</u>	<u>Amount</u>
1.	Miss Narmeen Altaf, 23-Golf Avenue, Mughal Pura, <u>Lahore.</u>	1985 student pugwash International Conference on 'Science, Technology & Industrial Responsibility, at Princeton, New Jersey, USA, 23-29 June, 1985	16,750/-
2.	Dr. Afzal Ahmad Professor in Mechanical Engineering Department, NED University of Engineering & Technology, <u>Karachi</u>	8th International Con- ference of Production Research held at the University of Stuttgart, West Germany from 20-22 August, 1985	26,650/-
3.	Dr. Khawaja Azam Ali, Assistant Professor, Department of Earth Sciences, Quaid-e-Azam University <u>Islamabad</u>	2nd Annual mid-year meeting of the society of Economic Paleontologists & Minerologists at Coloradi, USA, from 11-14 Augst,1985	9,408/-
4.	Dr. Chaudhry Muhammad Hussain, Associate Professor, Department of Mathematics, Quaid-e-Azam University, <u>Islamabad.</u>	International Group theory Conference Groups St. Andrews 1985 at Univer- sity of St. Andrews, Scotland 20th July to 10th August, 1985.	9,632/-
5.	Dr. S.U. Sheikh Department of Chemistry, Quaid-e-Azam Univeristy, <u>Islamabad.</u>	8th International Con- ference on thermal analysis held at Bratislavia, Chech- osalavakia from 9-23rd August, 1985.	6,720/-
6.	Dr. M. Suleman Sheikh, Assistant Professor, Jinnah Post-graduate Medical Centre, <u>Karachi.</u>	10th World Congress of Natural Medicines held at Malaga, from 25-27th April, 1986	19,360/-
7.	Dr. Muhammad Saleem, Department of Chemistry Quaid-e-Azam University, <u>Islamabad.</u>	Post-Doctoral Research at Edinburg University, U.K.	14,510/-

8. Dr. Muhammad Shahid Ansari, Sponsored fellowship 18,670/-  
Assistant Professor, programme Austria/UNESCO  
Department of Chemistry,  
Quaid-e-Azam University,  
Islamabad.
9. Dr. Gul Hassan Kazi, 7th Miami International 28,385/-  
Director, Conference on Alternative  
National Centre of Energy Sources at Miami,  
Excellence in Analytical Florida, 9-11th December,  
Chemistry, 1985  
University of Sind,  
Jamshoro.
10. Dr. Manzoor Ahmad, 5th Biannual Scientific 25,440/-  
Deputy Commandant & Meeting of Asian Pacific  
Chief, Armed Forces Association of study of  
Institute of Pathology, liver diseases at Singapore  
Rawalpindi from 8th January, 1986.
11. Dr. Alla Bakhsh Thaheem, 5th International Symposium 30,096/-  
Assistant Professor, on Approximate theory, at  
Department of Mathematics, Texas, USA, from 13-17th  
Quaid-e-Azam University, January, 1986.  
Islamabad
12. Prof. Dr. Muhammad Zafar 9th Annual Conference of 7,210/-  
Iqbal, the Bangladesh Chemical  
Institute of Chemistry, Society at Dhaka in  
University of Punjab, January, 1986.  
Lahore.
13. Dr. M. A. Maqbool, Society of Nematologist 42,476/-  
National Nematological & International Congress of  
Research Centre, Nematology held in Florida,  
University of Karachi, USA from 22nd March, 1986.  
Karachi.
14. Dr. Khalida Usmani, 11th UICC Training Course 36,480/-  
Prof. of Surgery, in Cancer Research held  
Fatima Jinnah Medical in Mexico from 13-15th  
College, Lahore. December, 1986.
15. Dr. Mrs. Shagufta post-doctoral Research 16,040/-  
Zulfiqar, Fellowship at the  
Assistant Professor, University of Glosgow,  
Department of Chemistry, U.K.  
Quaid-e-Azam University,  
Islamabad.

16. Dr. Rehana Rashid, Assistant Professor, Department of Chemistry University of Baluchistan, <u>Quetta.</u>	Post-doctoral Research Fellowship at the Max-plank Institute for Radiation Chemistry, Mulheim, Government of Federal Republic of Germany from 1st May, 1986.	23,800/-
17. Dr. Bashir Ahmad Sheikh, Professor and Dean, Faculty of Animal Husbandry and Veterinary Sciences, Sind Agriculture Univer- sity, <u>Tandojam.</u>	IVth International Sympos- ium on Veterinary and Laboratory Diagnostics Amsterdam from 2nd to 6th June, 1986.	31,844/-
18. Dr. Qamar Iqbal, Department of Chemistry University of Engineering & Technology, <u>Lahore.</u>	International Seminar on Effective Teaching in Higher Education at Edinburgh, U.K. from 8th to 20th June, 1986.	20,150/-
19. Dr. Asghar Qadir, Assistant Professor, Chairman, Department of Math. Quaid-e-Azam University, <u>Islamabad.</u>	11th Conference on General Relativity and Gravitation held in Stockholm Sweden from 6th to 11th July, 1986.	33,590/-
20. Dr. Nusrat Habib Rana, Consultant Psychiatrist, Government Mental Hospital, <u>Lahore.</u>	10th World Congress of Natural Medicine Malaga, Spain 25th to 29th April, 1986.	31,600/-
Total:-		4,48,811/-