

ANNUAL REPORT

1983-84



PAKISTAN SCIENCE
FOUNDATION



Pakistan Science Foundation

ANNUAL REPORT 1983 - 84

PAKISTAN SCIENCE FOUNDATION
Almarkaz F7/2
Islamabad

LETTER OF TRANSMITTAL

Islamabad

Dear Mr. Secretary,

I have the honour to enclose herewith the Annual Report of the Pakistan Science Foundation for the Fiscal year 1983-84, 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 & Technology,
Government of Pakistan,
Islamabad.

PAKISTAN SCIENCE FOUNDATION

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- (16) Dr. A.Q. Ansari, Vice Chancellor, Sind Agriculture University, Tandojam.
- (17) Dr. Ishfaq Ahmed, Member (Technical), Pakistan Atomic Energy Commission, Islamabad.
- (18) Mr. Abdul Raziq, Secretary (Irrigation), Government of Baluchistan, Quetta.
- (19) Dr. Tahir Hussain, Whole-time Member, University Grants Commission, Islamabad.

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LIST OF ABBREVIATIONS

Province

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 Univeristy/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 Sciences
BIO	Biological Sciences

ENG Engineering Sciences
MED Medical Sciences
PHY Physcial 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 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 detailed in the ensuing chapters.

CHAPTER - I

ACTIVITIES AND PROGRAMMES

The progress of work done by the Pakistan Science Foundation during the year, 1983-84 under the various functions entrusted to it is summarised below:-

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

i) CONSTRUCTION OF PASTIC PERMANENT BUILDING

The civil works in connection with the construction of PASTIC permanent building was completed. This included the installation of a transformer and commissioning of regular electricity connection. Air conditioning of the library section is in progress. The development project of PASTIC 1978/79-1982/83 was completed.

ii) DOCUMENT PROCUREMENT AND SUPPLY SERVICE

Four thousand one hundred and seventy five (4,175) scientific and technical documents were procured against the 4,332 document requests from the National/International Information supplying sources and catered to the research Scientists, Engineers and Technologists in the country during the year under report.

iii) TRANSLATION SERVICE

Eleven technical and scientific papers in modern European and Slavonic languages were translated into English which consisted of 53,800 words and were provided to the requesters from various S&T institutions in the country.

iv) BIBLIOGRAPHIES

Eleven bibliographies were prepared on specialized topics which contain 370 references in total. The selective bibliographies were provided to customers working on different research problems.

v) REPROGRAPHY

Regular reprographic services including photocopying and printing were rendered to scientists and technologists in the country at the approved subsidized rates. About 26,504 impressions

were printed by the Reprography Division of the Centre, in addition to 66,205 pages of photocopies catered to the clientele.

vi) NATIONAL TECHNICAL INFORMATION SERVICE USA

Dissemination of potential and technical information to different clients in the country was arranged through NTIS of U.S.A. One hundred and forty four (144) NTIS reports on the specific subjects relating to solar energy, fuel technology, petroleum transportation, energy recovery from solid wastes, electric power plants, wind energy, oils, pollution control, nuclear power reactors, plastics, laser beams and laser fusion, foamed plastics etc., were delivered to the customers on their demand.

vii) PATENT INFORMATION SERVICE

Reprints of 158 patents were supplied. Patent indexes and reprints covering a number of fields of Science and Technology were provided to the technologists, scientists, and technocrats in the country. Twelve new patent lists were published out and supplied to the R&D organizations in the country.

viii) PAKISTAN SCIENCE ABSTRACTS

Vol. 19,1-4 and Vol.20, 1-4 were completed containing 671 abstracts and were sent for printing.

ix) PASTIC NATIONAL SERVICE REFERENCE LIBRARY

One hundred and sixty two (162) books, 350 issues of 38 titles of periodicals were received in the library during the period under report.

x) INFORMATION NETWORK

PASTIC has established an information network with the participation of six centres of excellence attached to the country's Universities. These centres were subvented by PASTIC/PSF with a view to strengthening their libraries in scientific research publications.

Ninety seven books were acquired by centres of excellence from subventions. PASTIC made an inventory of these.

xi) UNION CATALOGUE

Data from 25 libraries comprising of 3200 records were indexed to be included in the Union Catalogue.

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 THE COUNTRY.

The Foundation carried out its statutory responsibility for the support of research through the programmes namely:(a) grant of research projects submitted by individuals or groups of scientists in the Universities and other research institutions: (b) Institutional Support: provision of equipment, literature, staff training facilities etc., to build institutional capability for conducting research, (c) organization of integrated research projects, (d) support for participation in regional and international research programmes.

A. GRANT OF RESEARCH PROJECTS SUBMITTED BY INDIVIDUAL RESEARCH WORKERS OR GROUP OF SCIENTIFIC WORKERS.

One of the major functions of the Foundation is to promote and finance basic and fundamental research having relevance to the socio-economic needs of the country. The progress made under this head is as under :-

Forty eight (48) projects requesting for funds costing Rs.22.276 million were received by the Foundation during the report period. Thirty-four (34) project proposals at various stages of their processing were brought forward from the previous year. Thus, in all eighty-two (82) project proposals remained under active consideration of the Foundation during 1983-84. Out of these only 14 projects could however, be sanctioned at an estimated cost of Rs.3.871 million.

The criteria for research grants are: (a) scientific merit of the proposed research,(b) availability of the scientific technical staff competent to undertake the proposed task. (c) institutional capability in terms of physical facilities such as equipment, laboratory and library facilities and support from scientific colleagues, and (d) likelihood of completion of the project within the stipulated time.

Each proposal after the initial review was placed before the relevant Technical & Finance Committees prior to the final sanction by the Executive Committee of the Foundation.

Discipline-wise distribution of research grants so far sanctioned by the Foundation is shown in Table-I.

Research Projects

Summaries of the research proposals sanctioned during the year 1983-84 are given below:-

S-AU/AGR (80)

1. AGRICULTURAL SCIENCES

Title: Quality Improvement of Vegetables

Vegetables are vital source of food and energy to the mankind. However, little work has been done on the improvement of their quality and yield in Pakistan with the result that quality of vegetables has gone down considerably and supply of inferior quality is very common in our markets.

This project aims at studying the agronomic factors such as application of fertilizer, judicious use of irrigation water and other specific techniques involved in the upraising of the quality of vegetables.

The study will help in improving the quality and yield of vegetables and availability of better and nutritious food to people.

P-VC/AGR (85)

Title: Study on the Epidemiology of Salmonellae of Human and Animal origin in Punjab

Salmonellaesis is one of the important Zoonotic problems in the developed as well as developing countries. Human get infection through consumption of contaminated feed of animal origin.

The project aims to study the status of different species of Salmonellae and their serotypes producing typhoid and other enteric fever, septicaemias, food poisoning, abortion and other maladies in man and animals in Punjab.

The results will be helpful in the prevention and control of Salmonellae infection.

TABLE - I

**SCIENTIFIC RESEARCH PROJECTS SANCTIONED DISCIPLINE
WISE DURING JULY 1973 TO JUNE, 1984**

DISCIPLINE	1973-80		1980-81		1981-82		1982-83		1983-84		Total Amount Sanctioned	
	No. of Sch- eme	Amount Sanct- ioned	No. of Sch- eme	Amount Sanct- ioned	No. of Sch- eme	Amount Sanct- ioned	No. of Sch- eme	Amount Sanct- ioned	No. of Sch- eme	Amount Sanct- ioned		
AGRICULTURAL Sciences	22	4.095	1	0.024	1	0.244	2	0.368	2	0.645	28	5.730
Biological Sciences	49	6.044	1	0.147	4	0.891	5	0.869	3	0.580	62	8.531
Chemical Sciences	57	7.106	7	0.631	6	0.681	8	1.173	3	0.618	81	10.209
Earth Sciences	12	1.212	-	-	-	-	1	0.186	-	-	13	1.398
Engineering Sciences	4	0.389	1	0.071	-	-	2	0.620	-	-	7	1.080
Environment- al Sciences	13	1.454	-	-	1	0.100	-	-	2	0.383	16	1.937
Mathematical Sciences	3	0.214	1	0.020	1	0.016	-	-	-	-	5	0.250
Medical Sciences	20	1.187	9	1.096	10	1.794	-	-	3	0.824	42	4.901
Oceanography	3	0.456	-	-	-	-	-	-	1	0.820	4	1.285
Physical Sciences	17	3.055	-	-	1	0.096	2	0.503	-	-	20	3.654
Total	200	25.221	20	1.989	24	3.822	20	3.719	14	3.871	278	38.975

2. BIOLOGICAL SCIENCES

P-PU/BIO (121)

Title: Effects of Heavy Metals, with special reference to Cadmium and Lead, on Common Edible Fish of Pakistan

Due to increasing industrialization the various industrial effluents containing heavy metals are causing great problems for the aquatic ecosystem. Metals like lead and cadmium are the major cause of concern, because it is feared that these metals may effect human health indirectly through edible fish, which is one of the most important source of protein in our country.

Although scattered reports on the effect of cadmium and lead are known for a few species of the fish, no systematic study has ever been undertaken to evaluate heavy metal toxicity on the various systems of the same species. The present work involves the studies on biochemical and histopathological changes induced by lead and cadmium toxicity on a common edible fish of Pakistan, namely. *Cirrhina mrigala*.

The results of these project may help in adopting suitable practices for avoiding contamination of fish with heavy metals.

C-QU/BIO (125)

Title: Study of Epididymal function in the Rhesus Monkey (*Macaca mulatta*): Androgen dependent proteins, their characterization and regional distribution.

Androgen dependent proteins have been characterized in a few mammalian species like mouse, rat, sheep, rabbit and hamster. Available evidence suggests that an alternation in the surface charge of the sperm takes place during its passage through the epididymis, which has been attributed to an acquisition of glycoprotein on the sperm plasma membrane. It has also been demonstrated that this acidic epididymal glycoprotein (AEG) is secreted by principal cells in the epididymis where functional maturation is known to occur.

The present project aims at investigating the characterization of Androgen dependent epididymal proteins in Rhesus Monkeys and its regional distribution in various segments along the epididymal duct. For this purpose tests shall be conducted on intact adult monkeys, castrated monkeys, treated/un-treated with testosterone and unilaterally castrated monkeys.

The results of these investigations will be of significant importance in the development of new methods for fertility regulation in males.

Title: Preparation of Book on Medicinal Plants of Pakistan

The basic structure of most synthetic pharmaceuticals raw materials have been derived from the structures of chemicals which after being suitably amended and improved are presented in the market as new pharmaceuticals. Thus the knowledge and their use in various diseases needs to be propagated not only for common people but also for researchers about medicinal plants.

The project aims at preparing a book on medicinal plants of Pakistan which can be translated later into urdu for use as a text in Unani medicine schools and as reference hand book for researchers, apothecaries and pharmacists.

3. CHEMICAL SCIENCES

S-KU/CHEM (142)

Title: Chemical, Spectroscopic and Microbial Studies of Transition Metal Complexes containing Mixed Ligands

Ligands differ in their chemical properties and in the position of nitrogen atoms present in the molecules. Thus the complexes synthesized have different stoichiometry regarding the structure and number of ligands attached to the metal atoms.

The investigations under this project are planned to (i) synthesize transition metal complexes containing mixed ligands; (ii) spectroscopic evidence of their formation and (iii) microbial studies.

The result of these studies may be helpful in preparing a few drug metal complexes and study of their bio-availability in body and their bacterial action.

S-CSIR/CHEM (143)

Title: Development of new inorganic materials (Inorganic Plastics of the Future) based on Portland Cement.

Portland Cement has been extensively used for over a century in construction work and civil Engineering to bind together aggregates such as sand and crushed stone. It is however, brittle with low tensile strength and can be used in load carrying structures only after reinforcement with fibres or steel, which of course, renders the structures very expensive.

The present study aims at developing new inorganic materials of general utility, based on portland cement, which are referred to as inorganic plastic of the future.

F-PU/CHEM (153)

Title: A thermodynamic study of the Supermolecular Order (SMO) in Aqueous solutions of polyvinyl alcohol.

In recent years, there has been growing interest in the solution properties of polyvinyl alcohol (PVA) because of their agricultural and industrial importance. These properties are known to act as aggregating agents for stabilization of soils. Furthermore aqueous PVA solutions are used in formation of adhesives, paper treatment and textile sizing.

The present project aims at conducting a thermodynamic study of the supermolecular order (SMO) in aqueous solutions of polyvinyl alcohols through spectroscopic and other techniques.

The results of these investigations may enable the researchers to determine various parameters required for the understanding of factors that influence the molecular association of SMO formation at ambient conditions.

4. ENVIRONMENTAL SCIENCES

S-KU/ENVR (24)

Title: Hazardous effects of industrial pollution and environment due to refineries at spills.

Due to phenomenal increase in population and industrialization pollution has caused hazardous effect in major cities of Pakistan. Karachi being heavily populated and major industrial city of Pakistan is also facing problem due to water, air industrial and marine pollutions causing damage to the environment.

The project is aimed at surveying the refineries and some industries such as Tanneries, cement, paints and plastics, chemicals Asbestos ad pipe factory of Karachi. In addition to this the Malir and Liari river will also be surveyed, with a view to analyse the raw material/chemicals used by the industries, the process involved and waste disposals.

This study will provide scientific and technical data to suggest ways and mean to impose restriction on industries to take suitable steps to clear the rivers and the atmosphere from toxic and hazardous pollutions and adopt remedial measures for the same.

S-KIJ/ENVR (26)

Title: Resource Recovery from poultry waste & its utilization

Technological achievements, urbanization and industrialization together with a rapid growth of world population have contributed to creating serious environmental problems. Even the disposal of poultry waste has become a major problem because of the size and density of today's larger layer and broiler operation. Traditionally, poultry waste was spread on the land for its fertilizer value. However, since many of large layer and broiler operations lack the land to effectively dispose of waste, the manure is often stockpiled which results into environmental pollution and hazards effects on health.

The project aims at (i) developing technology for protein recovery from poultry wastes (ii) studying the value of recovered protein as a low-cost poultry feed ingredient and (iii) reducing environmental pollution, through appropriate waste disposal.

The results of these investigation may provide to poultry industry by making available cheap poultry feed.

5. MEDICAL SCIENCES

P-PMI/MED (90)

Title: Effect of fasting on serum and Urinary Biochemical Profile of Normal Males.

It has generally been accepted that high fluid intake is essential for reducing stone forming. However, there is some evidence that stone constituents are reduced during fasting. Any scientific studies to confirm these are lacking. The project aims at studying the biochemical profile of normal young males during fasting to determine any change in serum or urine which may promote stone formation and to conclude whether 12 to 18 hours fast is advisable in stone formers.

C-GP/MED (92)

Title: Incidence of Infertility in Islamabad and its management

Reproduction is one of the main characteristics for living things and to be deprived of this capability can have far reaching effects on social life and psychosomatic health of an individual. Accurate statistics of infertility are not available in Pakistan. Furthermore, prior to the present era of ovulation inducing drugs and prolactin inhibiting drugs, oestrogen and progestogen

have been used for induction of follicle maturation or ovulation. There is lack of proof that these steroids substitutions therapy has consistent beneficial effects on follicle maturation or ovulation.

The project envisages at (i) collection of statistical data from Islamabad on primary and secondary infertility, their incidence and causes both in female and male patients, (ii) management of patients which require investigation of both partners and (iii) treatment of infertility through modern techniques.

In Pakistan no such organized study has so far been done. Therefore it is going to be very fruitful and will tell us the exact etiology responsible for infertility in our country. The results of this study will be very encouraging and will give a pregnancy rate of atleast 40%.

P-KEM/MED (95)

Title: Study of Rubella Antibodies in General Population with Special Reference to Pregnant Women.

Hospital statistics indicate that a number of congenitally deformed infants are born in Pakistan. It is suspected that rubella virus may be responsible for this deformation in new born babies as it does in other countries. However, no work has been performed on the isolation of rubella virus in Pakistan.

The present project aims at studying the incidence of rubella antibodies in general population with special reference to pregnant women. The data collected shall be used to develop a policy for the introduction of rubella immunisation programmes.

The study will help in lowering the birth rate of congenitally deformed babies.

6. OCEANOGRAPHY

S-NIO/OCEAN (9)

Title: Feasibility Studies for Extraction of Energy from Currents and Heliohydrogravity.

In advance countries, extensive research is going on to extract energy from oceans as power can be produced by a flow of water through the turbines from high levels to lower levels. Pakistan being a developing country has substantial shortage of energy. Therefore a lot of research is needed to exploit

resources other than conventional energy.

The study is aimed at preparing a feasibility study of extracting power from currents of creek system in the coastal areas Karachi. Detail studies will be undertaken to explore the inheart oceanography resources and power potential in this area .

The investigations will help in preparing a pilot plant project for power generation from Ocean Currents.

B. 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 organizations. But of these, only seven institutions were given grants totalling to Rs.0.761 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.

Item IV: SCIENCE CENTRE

THE ESTABLISHMENT OF SCIENCE CENTRES, CLUBS, MJSEUM, HERBARIA AND PLANETARIA

Science popularisation requires creation of necessary infrastructure such as Science Centre, Clubs, Museum, Herbaria Planetaria and organization of Science Fairs/Exhibitions etc.

The Foundation has initiated a number of activities independently as well as with the assistance of educational institution in the country for the achievement of this objective. A brief account of these activities is given below:-

I. ESTABLISHMENT OF PAKISTAN MUSEUM OF NATURAL HISTORY

The Pakistan Museum of Natural History (Phase I) was initiated by the Pakistan Science Foundation in May 1979 under a Government approved project. The PC-1 of the second phase of the Museum which include the construction of permanent museum building has been approved by the CDWP during the report period.

The Museum in addition to display halls, has three scientific Divisions, namely Botanical, Zoological and Earth Sciences Division and one Design Section. The Scientific Divisions are the mainstream for development of reference collection researches, and allied activities. The Design Section is responsible for the designing and display of the exhibits, dioramas, etc. The ideas for various natural history exhibits/dioramas are developed collectively by the Scientists of the three Divisions and relevant staff of the Design Section; the later, however, ensures the realization of these ideas in term.

The Scientific staff of the Museum undertakes such projects which provide raw material for further laboratory researches as well as strengthening the reference collections. As a consequence, the reference collections increase every year in terms of number and quality of specimens.

The progress made by various Division/Section of the Pakistan Museum of Natural History in the achievements of its approved objectives is given below:-

A. BOTANICAL SCIENCE DIVISION

REFERENCE COLLECTION

Collection of Flora: Field work was carried out in the Muree and Galiat areas, Kaghan valley and some areas of Swat District. A total of 1730 plant specimens belonging to various groups were collected. Ecological data of these plants were also collected.

RESEARCH: Taxonomic studies were carried out for the identification of the plants collections. About 2100 specimens were identified, dried, disinfected, labelled and mounted for permanent record in the Herbarium.

Following ecological and systematic studies were also completed:

- i) Phytosociological studies of North-facing slopes of Cherat Hills.

- ii) Trials to improve salt tolerance in tomatoes using choline chloride.
- iii) Effect of Choline Chloride pregermination soaking treatment upon two varieties of tomatoes.
- iv) Taxonomic and Physiological studies of some fungi from Pakistan.
- v) Effect of advancing tomato seeds in various NaCl concentration upon the rate of germination.
- vi) Lemnaceae of Islamabad area.
- vii) Hydrocharitaceae of Rawalpindi District.

DISPLAY OF SPECIMENS: Specimens alongwith explanatory notes for individual exhibits and dioramas were prepared in consultation with the Design Section. These include exhibits such as the Fiborous plants, the Oil-producing Plants and the Poisonous Plants of Pakistan.

SERVICES RENDERED TO OTHER ORGANIZATION: More than 600 plants specimens were identified for Federal Government College, (Women F-7/2, and Federal Government Collge (Boys) H/9, Islamabad, National Institute of Health Laboratories, Islamabad and the Government College, Haripur.

B. EARTH SCIENCES DIVISION

REFERENCE COLLECTION:

Collection of Rocks, Minerals and Fossils: Field work was carried out in Khewra, Chinji and Riwat in the Punjab Province, Aliabad, Hab Chowki and the Manchar Lake in the Sind Province, and Nowshera area in the N.W.F.P. As a result of these field excursions 65 rock samples, 840 invertebrate fossils and 90 plant fossils specimens were collected.

RESEARCH: Petrographic studies of a selected rock samples collected from Khewra and Nowshera areas were undertaken. This has been made possible because of the rock-cutting and thin-sectioning facilities established in the ESE Laboratories. Further studies on these samples such as X-ray diffraction and geochemical analyses were done in other Laboratories.

DISPLAY OF SPECIMENS: Representative specimens of Vertebrate and Invertebrate fossils, minerals and rocks are selected for the Earth Sciences Exhibits. Short introductory notes have also been prepared.

PUBLIC AWARENESS PROGRAMME:

Exhibits and Dioramas: In collaboration with the Design Section initial preparations are made on the Salt Range Diorama. Pamphlets, Brochures: Manuscript on the Igneous Rocks and the Metamorphic Rocks are in preparation.

SERVICE RENDERED TO OTHER ORGANIZATIONS:

8 lectures on the petroleum geology and X-ray diffraction techniques were delivered in the Geology Department of the Quaid-i-Azam University (Islamabad) and the University of Azad Jammu and Kashmir (Muzaffarabad). Also rock samples were provided to three Post-graduate students of the Chemistry Department of the Quaid-i-Azam University, Islamabad.

C. ZOOLOGICAL SCIENCE DIVISION:

REFERENCE COLLECTION:

Collection of Fauna: A field trip was made to collect marine animals of the Karachi Coastal areas. Also 192 insect specimens belonging to 17 families were also collected from Karachi and neighbouring areas. Also a number of short field trips to the Galiat, Kohata, and Islamabad areas were undertaken for fauna collection. 201 animal specimen belonging to 8 invertebrate orders, 63 butterfly specimens and aquatic bags of 4 families were collected during these trips.

RESEARCH:

- i) Morphological studies on Bugs of 3 Pentatomid genera and the Marine Molluses were carried out for the identification of specimens collected during field works. As a result thereof, 63 species, including 5 new records and 5 new species, were identified.
- ii) The following research projects were also completed.
 - a) Checklist and key to species of Planarians of Pakistan.
 - b) Comparative studies on petrothoracic sclerites of some aquatic bugs (Hemiptera; Heteroptera) of Pakistan.
 - c) Notes on the Arachnids.
 - d) Taxonomic studies of four new species of genus *Dolycoris* and computer programming for selected techniques of numerical taxonomy.
 - e) Data on 25 stands for the studies of phytophagous insects of the cultivated forests of Islamabad were analysed.

- f) A check-list and key to the genera of Heteroptera: Pentatomomorpha of Islamabad includes 63 species of which 40 are new records from this region and five are new species.
- iii) Research on the following projects is in progress.
 - a) Revision of genus *Mormidella*.
 - b) Effect of environmental factors on pheromone
 - c) Nymphal systematics of *Odonata* of Pakistan.

DISPLAY OF SPECIMENS:

Several stuffed animal specimens and a few replicas of marine animals were provided for various exhibits/dioramas on the fauna of Pakistan. Explanatory notes on some of these specimens were also prepared.

SERVICE RENDERED TO OTHER ORGANIZATIONS:

Technical guidance was provided to 9 M.Phil students of the Department of Biological Sciences, Quaid-i-Azam University, Islamabad.

TRAINING

- i) Two short term training courses regarding Taxidermy of small mammals and birds were organized by the Museum.
- ii) One Associate Curator obtained one month training in "Systematic studies of Heteroptera" at the Department of Zoology, University of Karachi, Karachi.
- iii) A Research Associate attended the Post-graduate training course on "Nuclear and other Advance Techniques in Agriculture and Biological Research" at the Nuclear Institute for Agriculture Biology, Faisalabad.

D. DESIGN SECTION

PREPARATION OF EXHIBITS/DIORAMA:

Exhibits/Dioramas etc. In close collaboration with the scientists of the three Sciences Divisions for the supply of specimens and relevant technical information, the exhibits and dioramas on the following topics were designed for display:

- i) Life cycle of lower and higher plants.
- ii) Vegetation Diorama.
- iii) Fiber and toxic plants.
- iv) Plant tissue culture.

- v) Minidioramas in Children Discovery Room.
- vi) Marine Diorama.
- vii) Animals and their Homes
- viii) Animal Diorama.
- ix) Display of Economic Insects.
- x) Anatomy of Dog and fish.
- xi) Installation of Whale skull
- xii) Tiger Diorama.
- xiii) Migration of Birds.
- xiv) Salt Range Diorama
- xv) Transparency boxes were prepared for the following display:-
 - Insectivorous plants.
 - Paper production
 - Timber wood.

ARTWORK FOR PAMPHLETS, BROCHURES:

Art work of book cover of "Cultivated Trees and Shrubs of Pakistan," visual and art work for the booklet, "Igneous Rock" and calligraphical work of the booklet "Metamorphic Rock"

SOUVENIER SHOP:

Textile materials were collected from Karachi and Pottery procured from Gujrat and Peshawar for the setting-up of the Museum Souvenir shop. Stickers, Jigsaw Puzzles and models were also designed to be sold at the Souvenir Shop.

SERVICES RENDERED TO OTHER ORGANIZATIONS:

- Exhibition Scheme of Pakistan Pavilion for Expo'85, Japan, prepared for the Ministry of Science and Technology.
- Visual designs and artwork were prepared for the following:
 - i) Monogram of PASTIC.
 - ii) Book cover of "Pakistan Science Abstract" for PASTIC
 - iii) Title cover of "Charter and Bye-Laws" for Pakistan Academy of Sciences.
 - iv) Diploma/Certificates and Handbook for Foreign Service Training Institute.
 - v) Request Cards for the Centre of Excellence in Geology, Baluchistan University, Quetta.
 - vi) News Letter, Library Bulletin, Monthly Bulletin and Quarterly Journal for Documentation Service of Irrigation, Drainage & Flood Control Department.
- Interior decoration and designing of PASTIC Reception Room.

2. SCIENCE FAIRS/EXHIBITIONS:

The Foundation provided technical as well as financial assistance to various educational institutions for organizing science fairs and exhibitions. Details of these events is given as under :-

<u>Purpose</u>	<u>Institution</u>	<u>Amount</u>
Electronics Exhibition	University of Engineering & Technology, Lahore.	Rs.30,000/-
Science Fair 1983	Board of Intermediate & Secondary Education, Lahore	Rs.60,000/-
Science Fair 1984	Board of Intermediate & Secondary Education, Lahore	Rs.75,000/-
2nd Science Exhibition	University of Baluchistan Quetta	Rs.40,000/-
Promotion of Science Activities.	PASTIC Sub-Centre, Quetta	Rs.25,000/-
Promotion of Science Activities	Science Forum, Govt. College, Hyderabad.	Rs.12,000/-
Establishment of Science Club	University of Peshawar Peshawar	Rs.40,000/-

3. POPULAR LECTURES:

The Foundation arranged a number of popular talks and lectures by local and foreign scientists/experts at the Auditorium of the Foundation. Topics of such lectures are given below:-

<u>Topic</u>	<u>Speaker</u>
Origin of Life.	Dr.R.R.F. Kinghorn Imperial College of Science & Technology, London.
The World Environment day Celebrations	Dr. Z.A. Hashmi Senior Scientist Dr. M.D. Shami Chairman, PSF. Dr. Ch. M. Anwar Khan P.A.R.C. Mr. S.M. Asim DESTO

Talented students of Pakistan apprised about "Frontiers of Science open to students."

Dr. M.D. Shami
Chairman, PSF.

Oceanography

Dr. Taufiq A. Siddiqi
East West Centre, Hawaii.

Latest Development in S&T specially in oceanography

Dr. M.H. Haq
Dr. Bilal-ul-Haq
Woodshole
Oceanography Institute,
U.S.A.

4. SCIENCE FILMS:

The Foundation also arranged Film shows of the Science documentaries and Wild Life, Environment, Solar System etc. with the assistance of American Centre in Islamabad.

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 & scientific societies and endeavouring to provide all possible assistance to the new ones. Annual grants amounting to Rs.0.480 million were released during the current year to various Non-Government Organizations/Scientific Societies for the achievement of approved objectives (Annexure-IV).

Special grants totalling Rs.0.268 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.

During the report period, grants totalling Rs.0.165 million were given to various organizations, R&D institutions and scientific societies for holding seminars, symposia & conferences. A brief account of some of the seminars/symposia is given below:-

1. A workshop on Plant Nematology was organised by the National Nematological Research Centre, University of Karachi, Karachi from 20th Nov. to 2nd Dec., 1984. An amount of Rs.10,000/- was given for the purpose. The workshop was attended by renowned scientists from various Universities.
2. 1st International Seminar on High Altitude Biomedical Research was organised by the Postgraduate Medical Institute, Lahore on 16th Dec., 1984. The objectives of seminar were :-
 - To review the current knowledge on Biomedical Research at High Altitude.
 - Assess medical and social problems of high altitude population in Pakistan.
 - Future course of research.

The seminar was attended by eminent scientists and Doctors.

3. The 4th International Workshop on Bacteriophage Mu & transposable Genetic elements was organized by the Centre for Advanced Molecular Biology, University of the Punjab, Lahore from 4th - 7th Dec., 1983. The workshop was attended by eminent foreign scientists who expressed their views on the topic.
4. 1st International Seminar on the Chemistry of Natural Products was organised by the HEJ Research Institute of Chemistry, University of Karachi, Karachi from 5th to 9th Feb., 1984. A large number of renowned scientist in organic & Biochemistry from abroad and some 150 local delegates from various universities and research organisations attended the seminar
5. The 3rd Summer School in Science for Talented Students of Intermediate Classes was organised by the Board of Intermediate & Secondary Education, Lahore from 19th July to 2nd August, 1983 at Khanspur, Ayubia. The aim of this Summer School was to orient & train talented students in research in pure and applied sciences and also to spot the talent.

Item VII. EXCHANGE OF VISITS:

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

A major weakness of Pakistani Scientists is their isolation. Due to lack of contact with the Scientists in advanced societies and the absence of intellectual interaction, many of our scientific workers become obsolescent & lose enthusiasm freshness and spontaneity. There is an urgent need to end the isolation from world science of Pakistan Science and Scientists. Our scientific workers must be able to meet their counter-parts in the advanced societies and visit international and regional research centres and universities of repute.

Grants totalling Rs.0.227 million were sanctioned to 15 Scientists (Annexure-VII) to attend International Conferences/Symposia and to meet their counterparts in institutions of higher learning in advanced countries.

Item VIII: AWARDS AND FELLOWSHIPS

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

The Foundation continued the fellowship of Dr. Zafar Javeed @ Rs.900/-p.m. for his M.Phil studies at Postgraduate Medical Institute, Lahore. An amount of Rs.10,800/- was released to the Institute on account of his fellowship for the 2nd year.

An amount of Rs.5,000/- was released to the Pakistan Museum of Natural History, Islamabad for arranging a training course on Taxidermy.

Item IX: SURVEYS AND STATISTICS:

A project entitled "Impact of non-dietry factors on the International Status of people of Pakistan," was sanctioned in 1981-82 for a period of eighteen months at a total cost of Rs.67,400/-.

The project aimed to study the evaluation of nutritional situation since independence, the major factors affecting the nutrition status, trends and fluctuations in the national food production, food availability, income distribution, forecasting the institutional demand and supply possibilities for major food commodities by the year 2000; and changes with which national food production and income distribution is converted into improvement in the international status of the population.

The research has been completed and final report submitted. The achievements made therein are summarized below:-

In spite of marked improvement in food supply situation of Pakistan, malnutrition continues to be a serious problem, especially among infants, preschool children, pregnant and lactating mothers. This statement is based upon the findings of this study and various nutrition surveys which have been carried out during the last 3 decades in the country. The extent of the nutrition problem and its adverse consequences for the development of the country, at present and in the future, necessitates not only short term but also systematic long term measures to alleviate malnutrition. From the data available, a national picture of the current nutritional status of the population is as follows:-

- Infant mortality	100/1000 live births	
- Mortality in Pre-schoolers (1-4 years).	100/1000 live births	
- Maternal mortality	6-8/1000 live births	
- 3rd degree malnutrition	7%	
- 2nd degree malnutrition	9.5% (0-5 year age)	
- 1st degree malnutrition	43%	
- Crude birth rate	40/1000	
- Goitre All Pakistan:3.1%	Rural: 1.9%	
	Urban: 3.50%	
Goitrogenic areas(AK&NA)	upto 70%	
- <u>Anaemia</u>	<u>Urban</u>	<u>Rural</u>
All groups	50%	36%
Children	30%	16%
P&L mothers	95%	76%

The principal factors determining the country's nutritional status are the production and availability of food and income distribution. Per capita food intake increases as income rises both in the urban and the rural population. The share of animal protein in total protein of the lowest income groups is 4 to 6 grams as against 22 to 30 grams in the higher income groups. Wheat is the principal source of protein and calories for much of the poor population.

The nutritional demand for food has been projected on the basis of assumptions made on the growth of population and

per capita income, since the population is growing at a fast rate and increase in income is generally a major objective of our development plans and programmes. The population of Pakistan is estimated to increase to about 140 million by the year 2000. The supply of food for the ever growing population will pose tremendous problems in future years. Even to maintain the present level of inadequate nutritional intake, food production has to be stepped up significantly as worked out under demand projection.

In view of the declining pulses acreage and rising pulses prices, agricultural policies favouring increased pulses production should be encouraged. In addition to traditional pulses and oilseeds, soyabean production merits careful consideration and production in Punjab and Sind Provinces to increase the availability of protein and oils. Adequate production of food grain and animal foods (milk, meat and animal products) are necessary for improving the diet and nutrition. In addition to increased agricultural inputs, both technological change and land reforms have also been considered as viable strategies for increased food availability and favourable income distribution change. Considerable improvements in the nutritional status can be achieved by allowing a large proportion of income growth to be obtained by nutritionally deficient income groups. This is, of course quite feasible because the food intake of a large proportion of population is significantly above the nutritional requirements. Therefore the most effective approach appears to be the simultaneous increases in the purchasing power of lower income groups and food supply.

Item X: RESEARCH EVALUATION:

The Foundation evaluated the following technical-fiscal reports received during the report period as per PSF procedure laid down:

i) Semi Annual Reports

As many as twenty one semi-annual research and fiscal reports received after the initiation of each project/after submission of annual reports were scrutinized by the Science Wing of PSF to assess the interim progress of these projects.

ii) First & Second Annual Reports

Eight first annual and four 2nd annual reports submitted by the Principal Investigators, after initial scrutiny by the Science Wing were sent for detailed evaluation to active scientific workers in the relevant field 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

Fourteen final reports in respect of the completed projects received during the report period, were also sent to the subject experts for review and evaluation. On receipt back, they were submitted to the relevant Technical Committees for adoption.

Item XI: SCIENTISTS' POOL

Two scientists who had returned from abroad after completing higher education and were looking for job suited to their qualifications were placed on the scientist pool and assigned to the following Institutions:-

1. Pakistan Museum of Natural History, Islamabad.
2. Department of Chemical Engineering, University of Engineering & Technology, Lahore.

In addition, bio-data of five Pakistani Scientists living abroad and interested in returning to Pakistan were circulated among various Universities and Research Institutions in order to assist them in finding appropriate employment in Pakistan.

Item XII: INTERNATIONAL LIAISON:

Liaison with International Agencies and Scientific establishments in different countries serve as a means to solve scientific problems by sharing knowledge and exchange of ideas. The Foundation is maintaining close liaison with such organizations. Some of the activities performed by the Foundation are as under:-

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

As per provision of the above memorandum, Dr. Fateh Mohammad Nazar, Associate Professor Centre of Excellence, Solid State Physics, University of Punjab, Lahore visited U.K. for four weeks from 23rd May to 22nd June, 1984 and had meetings with scientists of the following Institutions:-

- Physics Departments of Chelsea College, Birkbeck College and Imperial College, London.
 - Departments of Material Sciences, Solid State Physics and Applied Physics and Thames Polytechnic & Universities of Brunel, Southampton, Bristol, Cambridge, Oxford, New Castle Upon Tyne and Durham.
- b) Memorandum of Understanding between the US National Science Foundation and the Ministry of Science and Technology.

Collaborative Research Programme: Pakistan Science Foundation is acting as a focal point for US-NSF collaborative research projects submitted by Scientists from various Universities. The Foundation has sponsored the following 4-major research projects from various Universities of Pakistan under the Memorandum of Understanding signed between the Ministry of Science and Technology, Pakistan and US National Science Foundation.

<u>Project Title</u>	<u>Amount Sanctioned</u>	<u>Name of Sponsoring Institute</u>
Study of Bisbenzyl Isoquinoline Alkaloids from Medical Plants of Pakistan. PSF/Res/NSF (26)	1.033 m	University of Karachi, Karachi.
Study of Tissue Culture of Plants of Alkaloid and Aromatica from Pakistan PSF/Res/NSF (27)	0.859 m	University of Peshawar, Peshawar.
Study of Age and Tectonic History of Kara Korum Hindu Kush Rangeland-Intermountain Basins of Northern Pakistan. PSF/Res/NSF (28)	4.237 m	Centre for Excellence in Geology, University of Peshawar, Peshawar
Study of Restriction Enzymes PSF/Res/NSF (32)	1.999 m	Centre for Advanced Studies in Molecular Biology, University of Punjab, Lahore.

The following projects duly approved by the Government of Pakistan have been sent to US-NSF for their approval.

- Nodulation Status of Legumes of Pakistan (PSF/C-Res/NSF (36)
- Stochastic Modelling in Arid Region (PSF/C-Res/NSF (31)
- Chromosomes number of Vascular Plants of Pakistan.

c) APSENA Seminar:

In pursuance of President's directive, the Foundation in collaboration with expatriate Scientists and Engineers of North America had arranged a conference on "Science and Technology" in December, 1983 at Islamabad. The purpose behind this meeting was to provide a regular forum where expatriate scientists could meet their local counterparts; exchange latest information/progress in various fields of Science and Technology; identify major problems of mutual concern; fix research directions which are likely to provide necessary solution and to recommend guidelines for future research in high technologies.

d) VISIT OF CHINESE DELEGATION:

A five membered Chinese delegation visited Pakistan from 23rd Nov ., 1983 to 9th Dec., 1983 under item 5-205 of protocol signed between Pakistan and China. The purpose of visit was to study the popularization of scientific knowledge, extension of Appropriate Technology and aims and objectives of the R&D organizations in Pakistan. The local hospitality to the delegation was provided by the Foundation.

e) EXCHANGE OF VISITS UNDER THE BRITISH TECHNICAL ASSISTANCE PROGRAMME

- Two British Experts were invited under British Council Technical assistance programme to provide expert and advisory services to the Pakistan Museum of Natural History for a period of 2 weeks for the designing of the exhibit galleries and display of various specimen of fauna, flora and fossil. The local hospitality to the two experts was provided by the Foundation.
- Dr. A.R. Shakoori, Department of Zoology, University of the Punjab, Lahore attended a course on 'Biotechnology' held in U.K. An amount of Rs.14,990/- was released on account of return air-fare.
- Dr. G.T. Young, Tutor in Organic Chemistry and Fellow, Oxford University, U.K. paid a visit to

the Pakistan Science Foundation on 11th March, 1984, and held discussions on matter of mutual interest. A meeting with local Organic Chemists was also arranged in the Foundation and later Dr. Young visited the Department of Chemistry, Quaid-i-Azam University, Islamabad.

CHAPTER - 2

PROGRESS OF PSF SUPPORTED PROJECTS

An account of the progress reports of PSF supported projects, received during the year 1983-84, is given below:-

A. FINAL REPORTS

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

Project No:	S-KU/Bio (14/1)
Project Title:	Investigation on Wood Anatomy of Conifers & Polysaccharide Components of Eucalyptus, Poplar and Conifers of Pakistan.
Name of Investigator:	Dr. Mahmood Ahmed
Project Particulars:	
- Duration	Two Years
- Date of commencement	1.5.1981
- Date of completion	31.5.1983
- Implementing Agency	University of Karachi, Karachi.
- Total Expenditure:	Rs.1,46,932/-
Main Objectives:	To make a detailed study of the wood structure & microscopic examination of cell walls of coniferous species of Pakistan & to study the Chemistry of Eucalyptus & poplar with reference to polysaccharide contents.

SUMMARY OF THE WORK DONE

Anatomical structure of wood of fifteen coniferous species viz., *Abies pindrow*, *Cedrus deodara*, *Cupressus arizonica*, *C. funebris*, *C. sempervirens*, *C. torulosa*, *Picea smithiana*, *Pinus gerardiana*, *P. halepensis*, *P. roxburghii*, *P. wallichiana*, *Thuja orientalis*, *Taxus baccata*, *Juniperus polycarpus* and *Araucaria cookii* was studied. Anatomical characteristics and general features of wood were described in each case. Total thickness of cell

wall and thickness of individual cell wall layers of the first twelve conifers mentioned above were also estimated.

Cell wall polysaccharides namely holocellulose, alphacellulose, hemicellulose, lignin and pectin were estimated from the wood of trunks as well as from branches of conifers and some fast growing angiosperms (*Eucalyptus* and *Populus* species). Wood from the trunks and branches of 13 conifers were analyzed for holocellulose, alphacellulose and lignin contents. Hemicellulose and pectin contents of wood from the trunks of 13 and branches of 10 conifers were estimated. Woods from the trunks of 15 and branches of 11 fast growing angiosperms were analyzed for holocellulose, alphacellulose and lignin contents.

In coniferous wood obtained from trunks the amounts of holocellulose, alphacellulose, hemicellulose, lignin and pectin ranged between 61.87-75.06% (*Cupressus sempervirens*-*C. torulosa*), 31.53-49.33% (*C. arizonica*-*Pinus roxburghii*), 5.85-26.42% (*C. torulosa*-*Taxus baccata*), 23.52-41.33% *Pinus wallichiana*-*Cedrus deodaera*) and 1.73-4.39% (*P. roxburghii*-*Cupressus arizonica*) respectively. On the other hand, values for these components in branchwood ranged between 60.07-77.23% (*Cupressus torulosa*-*Pinus geradiana*), 32.86-50.30% (*C. arizonica*-*F. gerardiana*), 10.67-23.22% (*Thuja orientalis*-*C. arizonica*) 31.40-40.93% (*Juniperus polycarpos*, *P. roxburghii*) and 1.53-7.19% (*Codrus deodara*-*Cupressus arizonica*) respectively.

In angiosperms holocellulose, alphacellulose and lignin contents of trunk wood ranged between 67.80-78.52% (*Eucalyptus microtheca* *Populus nigra*), 37.68-48.15% (*E. glaberrima*-*P. nigra*) and 22.01-32.28% (*E. maculata*-*E. microtheca*) respectively, whereas in branchwood the amount of these polysaccharides varied between 67.22-78.63% (*E. tereticornis*-*P. deltoides*), 36.25-50.53% (*E. citriodora*-*P. ciliata*) and 20.96-32.77% (*P. deltoides*-*E. tereticornis*) respectively. Results showed that hardwoods, on the average, contained more holocellulose and alphacellulose than softwoods and the reverse was true for lignin content. Amounts of these polysaccharides in trunkwood and branchwood did not show much variation in the same species.

Publications:	Four research publications have been published as a result of research done under this project.
Project No.	P-PU/Bio (40/1)
Project Title:	Control of Some Avian and Mammalian Pests.
Name of Investigator:	Dr. Mirza Azhar Beg
Project Particulars:	

- Duration Two-Years
- Date of commencement 1.9.1980
- Date of completion 31.8.1982
- Implementing Agency University of Agriculture.
Faisalabad.

Main Objectives: To develop a programme for rodent control which could be used by ordinary farmers with substantial economic benefit and study the ecology & biology of House Sparrow & the rose ringed parakeet in relation to crop damage.

SUMMARY OF THE WORK DONE

1. Biology and control of rats and mice:

Studies on reproduction, infestation and damage patterns of the rodent pests, response of these pest populations to poison baiting and the ecological niche of the pests in the agro-ecosystem, permitted the development of a strategy for inhibiting their populations in central Punjab. The salient features of this strategy are:-

- a. For sustained baiting chronic poisons such as fumarin, racumin etc. should be used. The various crops should be treated with this poison according to this schedule; sugarcane from September to November, leguminous fodder crops (lucerne, shaftal and berseem) and minor crops (pulses, vegetables etc.) in April and May.
- b. For baiting the rodent burrows zinc posphide may be used. Rodent burrows of nearby alkaline and sandy tracts should be treated in October, of the cane fields soon after the crop is harvested, and of the wheat fields once during the tillering-booting stage and again during the flowering stage.
- c. Control measures should cover large areas. The larger the protected area, the more permanent shall be the effect of control efforts. Preferably, the area to be protected should be bounded by such physical barriers as irrigation canals, highways, railroads, alkaline tracts etc.

2. Biology and control of the house sparrow:

Studies conducted on the roosting habits of sparrows in different seasons, on typical locations of their nests, average clutch and brood sizes, and on their feeding habits and preferred foods, permitted the outlining of a number of control procedures.

3. Ecology and control of the Rose-ringed parakeet:

A study aimed at knowing the roosting habits, nesting niche, breeding habits, food, and general behaviour of the Rose-ringed Parakeet (*Pisittacula krameri*), in the cultivations of the central Punjab, was carried out to determine its ecological niche and weak links in its life so that the same could be exploited to inhibit its populations. A number of measures were suggested for inhibiting the parakeet populations.

Project No:	S-KU/Bio (99)
Project Title:	Catalogue/Records of the Karachi University, Zoological Museum.
Name of Investigator:	Dr. Hamid Mahmood
Project Particulars:	
- Duration	Three-Years
- Date of completion	1.10.1980
- Date of completion	30.9.1983
- Implementing Agency	University of Karachi, Karachi.
- Total Expenditure	Rs.95,580/-
Main Objectives:	To under take scientific study of the holdings of the Zoological Museum of Karachi University & to incorporate these in a series of publications to highlight important information of the holdings of the Museum.

SUMMARY OF THE WORK DONE

Various localities of different districts of Sind Province were visited regularly in order to study the reptilian fauna of Sind, its ecology, distribution and status, Coastal beds at Hawksbay, Sandspit, Manora, Cape Monze, Fish Harbour, Korangi Creek, Gizri and Patiani Creeks were also repeatedly visited for observat-

ion/collection of Marine Turtles and Sea Snakes. A total of 1225 specimens comprising 84 taxa belonging to 19 families were collected/recorded from the above districts. A number of the species collected have not been reported from these areas before.

The habitats of the reptiles were thoroughly studied in all the districts and thus distribution of the reptilian fauna and status of individual species was noted. Status of a particular species is based on its relative abundance and, in some cases on population estimates in the peak seasons. On the basis of this survey, the reptilian fauna was divided into 5 categories, viz., Common, Less Common, Rare, Very Rare and Abundant.

Reptiles rated as rare and very rare were much more abundant a few decades ago. It was noted in the study that rarity of the reptilian fauna is the result of the destruction and shrinkage of the natural wild environment, exploitation of the fauna on large scale for industry, large scale killing of the so called fearful species, and taking over of their habitats for settlement by human race. The majority of snakes are non-poisonous, but they are killed whenever encountered.

Project No:	S-KU/Chem (10/1)
Project Title:	Structural & Synthetic Studies on Some B Carboline bases
Name of Investigator:	Dr. Salimuzzaman Siddiqi
Project Particulars:	
- Duration	Three-Years
- Date of commencement	1.5.1979
- Date of completion	30.4.1982
- Implementing Agency	University of Karachi, Karachi
- Total Expenditure	Rs.2,39,042/-
Main Objectives:	In this extension proposal it has been proposed to further prepare nitro and other derivatives of B-carboline in order to

obtain new pharmacologically important substances which could find use in medicine. Work on the alkaloids from *Peganum harmala* seeds would continue to obtain new B-carboline derivatives for harmaline & harmine. Investigations on commercially feasible procedures for the extraction of oil from kernels of *Peganum harmala* seed would also be continued with a view to developing a process for ultimate large scale isolation of edible oil.

SUMMARY OF THE WORK DONE:

In the context of studies in correlation of structure and activity of B-carboline bases, a large number of new derivatives were synthesized and characterized through physical and spectral data. The possible utilization of the alkaloidal derivatives of abundantly available indigenous medicinal plants in the development of important therapeutic agents was particularly investigated.

The work was mainly concerned with:

1. Structure and activity relationships in *Peganum harmala* alkaloids: harmine, harmidine and tetrahydroharmine.
2. Comparative study of cyano derivatives of B-carbolines and some steroidal and simpler bases.
3. Structure and activity correlation in the Sandwicine series of *Rauwolfia* alkaloids.
4. Conversion of *harmala* alkaloids into other types of alkaloidal bases of potential therapeutic importance.
5. Nitration studies in yohimbine

Pharmacological studies on various derivatives were pursued with particular reference to their psychotomimetic and anti-leukemic action. One of the derivatives, namely sulfonamide of tetrahydroharmine, was found to have analgesic property without any undesirable side effects.

Publication:

Nineteen publications have been made as a result of research done under this project.

Project No:	C-QU/Chem (56)
Project Title:	Chemical Investigation of the Plants known to have significant pharmacological activities.
Name of Investigator:	Dr. Mashooda Hasan
Project Particulars:	
- Duration	Two-Year & Six-Months
- Date of commencement	16.8.1976
- Date of completion	31.1.1979
- Implementing Agency	Quaid-i-Azam University, Islamabad
- Total Expenditure	Rs.1,76,134.42
Main Objectives:	To study the chemistry of <i>Perovskia abrotanoides</i> which are used by locals for reducing fever. Significant medicinal properties will be studied using chemical & physical methods of analysis & testing the isolated compounds for their pharmacological activities.

SUMMARY OF THE WORK DONE:

The hygienic conditions in Pakistan not being adequate, diabetes, kidney ailments, and typhoid are widespread. Indigenous medicinal plants known to have therapeutic constituents have proved to be effective in preventing or curing these diseases. Investigations were carried out on the following plants:

1. *Perovskia abrotanoides*
2. Zea mays silk
3. *Eriobotryajaponica* leaves

As a result of this work on *Perovskia abrotanoides*, several components of the essential oils were reported and identified. Furthermore, pharmacological investigations of the essential oils of *Perovskia abrotanoides*, as carried out in National Health Laboratories, Islamabad, established marked anti-typhoid activity.

Publication: One research paper entitled- "Anti bacterial activity of the essential oils of *Perostrea abrotanoides*" has been published in the Islamabad Journal of Science. 5, 22-25 (1978).

Degree awarded: One researcher has been awarded M.Phil degree as a result of research carried out for this project.

Project No: P-PU/Chem (83)

Project Title: Isolation, purification & structural determination of alkaloids from the flowers of *Sphaeranthus indicus*.

Name of Investigator: Dr. M.I.D. Chughtai

Project Particulars:

- Duration One-Year
- Date of commencement 3.1.1980
- Date of completion 2.1.1981
- Implementing Agency University of Punjab, Lahore.
- Total Expenditure Rs.25,202.65

Main Objectives: To study plants belonging to the genus *Rhamnaceae* which is rich in various types of alkaloids of Pharmaceutical value.

SUMMARY OF THE WORK DONE:

Earlier studies showed the presence of one alkaloid in the flowers of *Sphaeranthus indicus*. The present investigations on the flowers of this plant indicate the presence of more alkaloids. Nine fractions were isolated from the methanolic extract of flowers. Fraction 5 having given the highest yield was further fractionated and two pure compounds were obtained. Their physical constants were determined, including UV, IR and Mass spectra.

On the basis of these studies, two alkaloids have been assigned tentative structures. They belong to the cyclopeptide class alkaloids.

Project No:	S-KU/Chem (89/1)
Project Title:	Primary metabolites of Fungus <i>Candida</i> & their Biological activity.
Name of Investigator:	Dr. Zafar H. Zaidi
Project Particulars:	
- Duration	One Year
- Date of commencement	1.7.1980
- Date of completion	30.6.1981
- Implementing Agency	University of Karachi, Karachi
- Total Expenditure	Rs.27,199.94
Main Objectives:	To identify & characterize metabolites from <i>Candida albicans</i> & <i>C. tropicalis</i> and study biological activity of these compounds in particular anti-influenza and anti carcinogenic.

SUMMARY OF THE WORK DONE:

This is the first study on the characterisation of proteins and peptides in the cell free broth of *Candida tropicalis*. The presence of a highly specific proteolytic enzyme cleaving at valine has been reported. This has been confirmed by digesting B-lactoglobulin and a number of synthetic peptides. The enzyme has a carbohydrate moiety and a molecular weight of $40,000 \pm 7,000$ as determined on SD S-polyacrylamide gel electrophoresis. Its optimum activity occurs at 37°C at a pH between 8-9. It has been named Valinease because of its selective cleavage.

The peptides separated on Dowex 50 have been tested against a number of pathogenic and non-pathogenic bacteria. At least four of the peptides have been found to be active against most of the bacterial strains. The aminoacid composition and N-terminal residues of these peptides have been determined.

Project No:	S-CSIR/Chem (105)
Project Title:	New Medicinal Derivatives from Santonium.

Name of Investigator: Dr. Yousuf Ahmed

Project Particulars:

- Duration One-Year and 3-Months
- Date of commencement 24.3.1981
- Date of completion 30.6.1982
- Implementing Agency PCSIR Laboratories, Karachi.
- Total Expenditure Rs.53,079.52

Main Objectives: To isolate Santonium and other compounds from Artemisia plants & to explore possibilities of preparing some derivatives of Santonium on large laboratory scale.

SUMMARY OF THE WORK DONE:

Pakistan used to be the largest supplier in the world of the anthelmintic drug, santonin, which is extracted from *Artemisia maritima*, a herb occurring in Kurram Valley near Para-chinar, Gilgit and Skardu. However, the drug has now been almost completely replaced by synthetic anthelmintics because of its toxicity, and Pakistan has lost a means of valuable foreign exchange. This investigation was conducted to isolate santonin and other compounds from the *Artemisia* plant and to explore possibilities of preparing some derivatives of santonin on large laboratory scale.

About thirty species of *Artemisia* occur in Pakistan, none of which have been studied in detail.

In the present investigation a simple procedure was developed for estimation of santonin in *Artemisia* herb and this process was used for estimation of santonin content of *Artemisia maritima* collected from Parachinar area. In halogenation studies on santonin, adducts of santonin with bromine and iodine were obtained, though structure of the adducts was not elucidated. Synthesis of 1,2-dibromosantonin, as reported in the literature, seems doubtful and other synthetic routes need to be explored.

While santonin did not react with aziridine at room temperature, a mixture of products containing at least four different compounds was formed on refluxing solution of santonin in aziridine. One of these products appeared to be an aziridine salt of santon-

inic acid. Further, 2-chlorosantonin formed a polymer with aziridine at room temperature.

A species of Artemisia, *Artemisia elegantissima*, occurs in the Islamabad area. This herb afforded a compound which was identified as 6,7-dimethoxy-coumarin. Both the herb and the isolated compound were found to possess interesting pharmacological properties. They are potent hypotensive and are also useful in the treatment of jaundice.

Artemisia is a sweet smelling herb and its essential oil, obtained as a by-product in the manufacture of santonin, has a potential for use in perfumery industry. This oil may well prove to be as good a foreign exchange earner as santonin which has lost world market as an anthelmintic.

Publications: Three research papers have been published as a result of research under this project.

Project No: P-PU/Chem (108)

Project Title: Synthetic and Catalytic aspects of new transition metal Alkyls and Aryls.

Name of Investigator: Dr. M. Zafar Iqbal

Project Particulars:

- Duration Three-Years
- Date of commencement 2.12.1980
- Date of completion 1.12.1983
- Implementing Agency University of the Punjab, Lahore
- Total Expenditure Rs.96,946/-

Main Objectives: To develop the chemistry of transition metal Alkyls and Aryls exhibiting unusual structures and chemical reactivities.

SUMMARY OF THE WORK DONE

Triphenylphosphine derivatives of Palladium (II), Platinum (IV), Copper (II), Silver (I), and Gold (III); and dipyridyl derivatives of Palladium (II) and Copper (II) were synthesized. These derivat-

ives were further treated with methyl Grignard reagent and methyl derivatives of metals containing trophenylphosphine and dipyriddy were isolated. Studies of catalytic aspects of these complexes revealed that the methyl trophenylphosphine Platinum (IV) Chloride produced a liquid with solid flakes when treated with acrylamide. Aniline was oxidised to nitrosobenzene in presence of methyl triphenylphosphine Copper (II) Chloride.

The compounds have been studied by Infrared spectroscopy and likely formulas are discussed.

Benzylideneaniline and N, N-dimethylbenzylamine derivatives of I(b) metals were prepared. Based on the analytical results, general characteristics and spectroscopic data, the structural formulae are proposed. The compounds were well defined solids fairly stable and ploynuclear. Fusion with Lewis bases resulted in bridge cleavage reactions.

The oxidation of aromatic primary amines was studied in natural, acidic and basic media in presence of Copper (II) and Gold (III). Various aromatic amines were oxidised to coresponding azo-derivatives. Electron withdrawing substituents were found to slow down the reaction and strong substituents did not allow the reaction to proceed. The presence of electron donating substituents suc as $-CH_3$ on aromatic amines enhanced the rate of reaction. Toluidines (o-and p-) reacted in presence of Copper (II) and Gold (III) to give fuchsin dye alongwith the axo-derivatives.

Publications: Three papers have been published as a result of research under this project.

Degree awarded: One Research Officer has been awarded Ph.D. degree as a result of research carried out under this project.

Project No: P-PU/Chem (130)

Project Title: Investigation of reactivity of Phosphate esters.

Name of Investigator: Dr. Mohammad Younas

Project Particulars:

- Duration One Year

- Date of commencement 13.1.1983

- Date of completion 12.1.1984
- Implementing Agency University of Punjab, Lahore.
- Total Expenditure Rs.83,558.22

Main Objectives: To (i) prepare series of diphenyl-aryl phosphate esters & study their hydrolysis at various PWs (catalysed and un-catalysed) (ii) establish correlation between structure and reactivity & (iii) study the mechanism of these reactions.

SUMMARY OF THE WORK DONE

It is well recognised fact that phosphate esters play a vital role in living systems. There is hardly anything going on in the living cell that does not involve phosphate esters in one form or the other. To understand the chemistry of life it is necessary to understand the behaviour of simple phosphate esters, acting as model compounds for naturally occurring substances, particularly towards hydrolysis. Although phosphate mono- and diesters have been thoroughly investigated, only scattered information is available about phosphate triesters.

In the present investigation, three phosphate triesters belonging to the series diphenyl substituted-aryl phosphates have been prepared and the rates of their hydrolysis to diphenyl phosphate with the release of a phenolate anion, have been measured under different conditions. As a result of these investigations, a general pattern of their behaviour towards hydrolysis has become clear and an extended study leading to the possible mechanistic interpretations of the biological reactions, can now conveniently be made.

It has also been observed that the alkaline hydrolysis of the diphenyl p-nitrophenyl phosphate is catalysed by B-cyclodextrin, suggesting that cyclodextrin might be a suitable species for catalysing the hydrolysis reactions of a wide variety of organic phosphate esters.

Publications: Two papers have been published as a result of research carried out under this project.

Project No: P-PU/Math (13)

Project Title: Existence and properties of generalised free products of certain group amalgams.

Name of Investigators: Dr. M. Abdul Majeed

Project Particulars:

- Duration One-Year
- Date of commencement 1.7.1982
- Date of completion 30.6.1983
- Implementing Agency University of Punjab, Lahore.
- Total Expenditure Rs.19,750/-

Main Objectives: To encourage young Pakistani students to engage themselves in research and prepare them for Ph.D programme at the University. It shall also generate research activity in field of group theory in the Department.

By a theorem of Hanna Neumann, an amalgam of an arbitrary collection of groups is embeddable if and only if the reduced amalgam of such groups is embeddable. So, in order to discuss the embeddability of an amalgam of the reduced amalgam in a finite group we first consider the embeddability of the reduced amalgam in a finite group. The general problem has evaded solution for the last thirty years. In this project the embeddability of an amalgam of three finite dihedral group in a finite group has been investigated. The groups are given in the forms:-

$$A = (a, b = a^2 = b^2 = (ab) = 1)$$

$$B = (b, c = b^2 = c^2 (bc)^m = 1)$$

$$C = (c, a = c^2 = a^2 = (ca)^n = 1)$$

The amalgam A formed by these groups is their reduced amalgam. If any two of the 1,m,n, say 1, m are equal to 2 then

$$G = C \times (. b : b^2 = 1)$$

embeds the amalgam and is finite. Here the problem is examined in more generality. rheumatoid

Project No: S-DMC/Med (67)

Project Title: To study the prevalence clinical prevention and Management of Juvenile Rheumatoid Arthritis (J.R.A.)

Name of Investigator: Prof. Dr.Saleh Memon

Project Particulars:

- Duration Two-Years
- Date of commencement 26.6.1981
- Date of completion 30.6.1983
- Implementing Agency Dow Medical College, Karachi.
- Total Expenditure Rs.2,26,135/-

Main Objectives:

- i) Estimation of prevalence of J.R.A.
- ii) Study of its Clinical presentation & diagnostic criteria
- iii) Response of anti inflammatory drugs
- iv) Avoidance of end stage crippling

SUMMARY OF THE WORK DONE:

Although seldom fatal, rheumatoid arthritis (R.A.) is a major cause of pain and physical disability, particularly when it starts in childhood (J.R.A.). Indeed J.R.A. can be the most crippling of all forms of arthritis. The main objectives of this project were:

1. To study the epidemiology of J.R.A.
2. To compare it with adult R.A.
3. To investigate the response to anti-inflammatroy drugs, and
4. To investigate ways to avoid end stage crippling.

The following conclusions were drawn from the 2-years study:

1. J.R.A. is not a rare disease in our part of the world, though less common than adult R.A.

2. It is quite different from the adult variety in its course, serology, response to treatment.
3. It mostly affects males. out of 75 cases,66% were males and 34% were females.
4. 80% of cases were seronegative, as compared to the adult variety where 70-80% are seropositive i.e. positive Rheumatoid factor.
5. Mean age of on set is 7 1/2 years.
6. All 3 varieties of J.R.A. occur in our part of the world:
 - Polyarticular
 - Systemic onset (Still's disease)
 - Pauciarticular variety
7. Systemtic onset variety is the most severe form of the disease.
8. Response to non steroid anti-inflammatory durgs is adequate if treatment is started early in the disease, when joint deformities can be prevented.
9. Growth retardation and physical handicaps are most important complications which have been seen in the research work where treatment is not started early.

Project No: P-PMI/Med (73)

Project Title: (i) High Allitude Mountain Explorative and evaluative study
(ii) Rheumatic Fever Disease-comparative and presenting study.

Name of Investigator: Dr. Farrukh A. Khan

Project Particulars:

- Duration Four-Months
- Date of commencement 1.6.1982

- Date of completion 30.10.1982
- Implementing Agency Post-graduate Medical Institute, Lahore.
- Total Expenditure Rs.37,400/-

Main Objectives: To study the mechanism of mountain sickness with its various manifestations with a view to find out whether specific measures employed are useful or not and have a scientific basis in relation to the response of the Cardiovascular system at high altitudes. The prevalence of Rheumatic fever-heart disease will also be studied to prevent it with its special circumstances of people living at high altitudes

Ten healthy male volunteers, 18-40 years old, were rapidly inducted by road to an altitude, 3780 m. Observations first recorded in Rawalpindi (3,000 m) included pulse, weight, blood pressure, electrocardiography and plethysmography, and were repeated daily for 4 days in the Altitude Lab.

Mean weight of the group decreased from 65.45 kg to 62.25 kg. The mean pulse rate increased significantly from 74.6/min. to 88.5/min. after 24 hours of stay at 3,780 m, (P 0.01). Mean systolic blood pressure increased from 106 mm. Hg to 126.3 mm. Hg and mean diastolic blood pressure increased from 77.2 mm. Hg to 87.2 mm. Hg (P 0.01).

Pulse wave height (PTG) decreased significantly in 8 (80%) subjects (P 0.01). Mean left ventricular ejection time (ETc) decreased significantly (P 0.01) from 312.2±18.4 msec. to 280.9±22.8 msec. indicating latent cardiac insufficiency. Anacrotic waves were recorded in 2 (20%) subjects. (All these parameters returned to normal on return to Rawalpindi.

Project No: S-KU/Phys (24)

Project Title: Electrical Conductivity of Some Solids at and below room temperatures.

Name of Investigator:	Dr.S.M.A. Tirmizi
Project Particulars:	
- Duration	Two-Years
- Date of commencement	11.7.1981
- Date of completion	10.7.1983
- Implementing Agency	University of Karachi, Karachi.
- Total Expenditure	Rs.1,59,412/-
Main Objectives:	To measure the electrical conductivity of some solids and their alloys at and below room temperatures. The solids to be studied will mainly consist of these which are extensively used in metal industry.

SUMMARY OF WORK DONE

Gray iron samples alloyed with tin in small proportions have been studied for their electrical resistivity properties. The tin content was varied in steps of 0.05% within a total range of 0.00-0.35% tin. Three independent sets of samples were prepared. Measurements were made on each set of samples in the temperature range from 85-1173 K. In general, each sample shows positive value of dp/dT for the different samples of the same series of alloy, however, differ substantially. A graphical plot of dp/dT against % of tin shows a significant inflexion at about 0.1% tin for each of the three sets of samples. This is suggestive of some ordering effect in the composition range of 0.1-0.15% tin. Interestingly, the British Cast and Iron Research Association has also reported a definite magnetic transition in similar alloys at a composition of about 0.1% tin. For an understanding of the physics of this transition, a good deal of further investigations would be required. Magneto-resistance measurements of these materials were also undertaken at room temperature. These are very preliminary measurements, and are only significant in so far as that they do indicate significant magneto-resistance effects.

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>Project No:</u>	<u>Title of the Project</u>
P-PU/Bio (83)	Morphological and Metabolic Hazards of Chlorinated Insecticides on small Mammals in Pakistan.
S-KU/Bio (109)	A Qualitative Survey of Nodulating Ability of Legumes of Pakistan.
P-PU/Chem (112)	A study of removal of Industrial pollution gases by absorption.
P-PU/Phys (31)	Electromagnetic Properties of Rocks Building Materials and Ceramics.

C) Ist Annual Reports

The Ist Annual Reports of the following projects were received and processed by the Foundation during the period under report:-

<u>Project No.</u>	<u>Title of the Project</u>
P-PU/Bio (102)	Studies on vertebrate fossils of Pakistan.
S-KU/Bio (109)	A Qualitative Survey of Nodulating Ability of Legumes of Pakistan.
S-KU/Chem (107/1)	Pilot Plant Production of Butanol ol. by Fermentation.
P-PU/Chem (112)	A study of removal of Industrial pollution gases by absorption.
P-UET/Chem (118)	Study on the Food Potential of indigenous Algae.
S-CSIR/Chem (129)	Study of Plants of Medicinal nutritional value.
P-AEMC/Med (58)	Neonatal Screening for Hypothyroidism and its relationship to mental retardation.
P-FJMC/Med (87)	Comparative Study of Aspiration Cytology & Tru-Cut Needle Biopsy in the diagnostic evaluation of breast masses.

CHAPTER - 3

ORGANIZATION AND ADMINISTRATION

The organizational Structure of the Foundation, Pakistan Scientific & Technological Information Centre, (PASTIC) and Pakistan Museum of Natural History (PMNH), are given on page 51,52 and 53.

The staff in position in respect of Foundation, PASTIC and PMNH is as under :-

PAKISTAN SCIENCE FOUNDATION

S.No.	Designation	Number
1.	Chairman	1
2.	Member Science	1 (Vacant)
3.	Director/Member Finance	1
4.	Secretary	1
5.	Principal Scientific Officer	2
6.	Senior Scientific Officer	2
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.	Superintendent	1
18.	Supporting Staff	<u>46</u>
	Total:	<u>67</u>

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

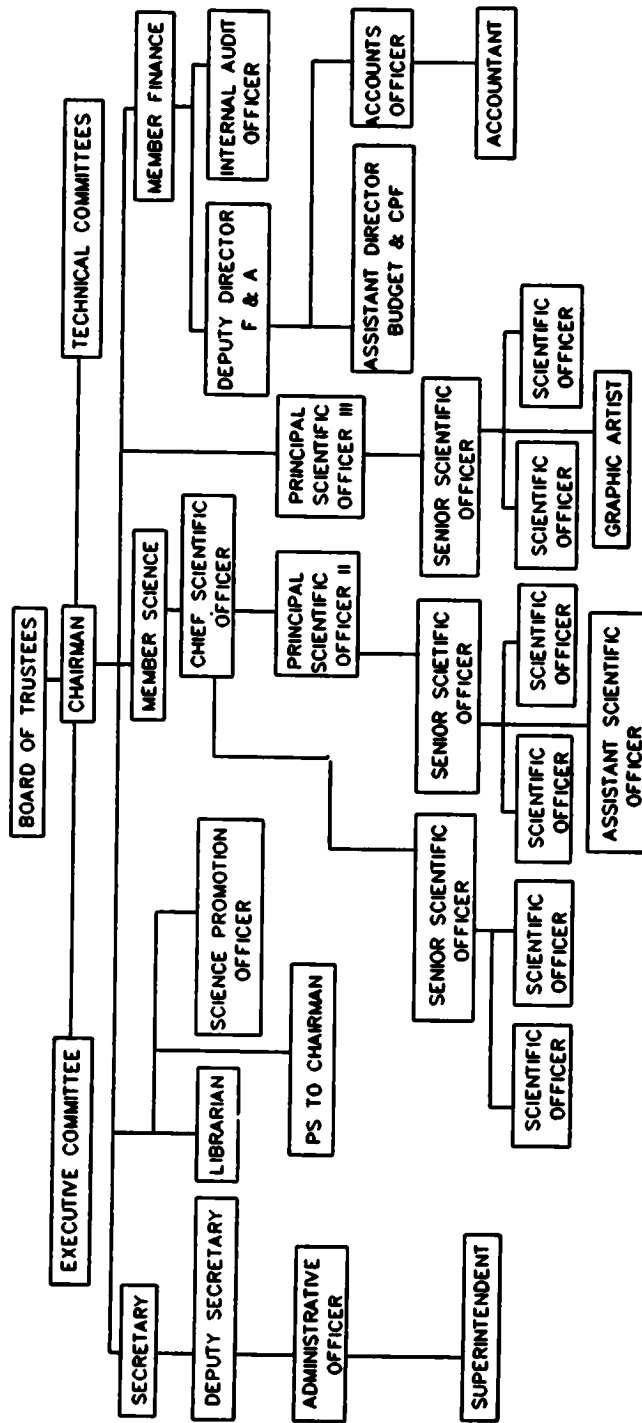
**PAKISTAN SCIENTIFIC & TECHNOLOGICAL INFORMATION
CENTRE (PASTIC) ISLAMABAD**

S.No.	Designation	Number
1.	Director	1
2.	Principal Documentation Officer	1
3.	Chief Editor	1
4.	Senior Librarian	1
5.	Manager Reprographic Unit	1
6.	Senior Information Officer	1
7.	Chief Liaison Officer	1
8.	Senior Translating Officer	1
9.	Senior Bibliographic Officer	1
10.	Administrative Officer	1
11.	Liaison Officer (Quetta)	1
12.	Liaison Officer (Peshawar)	1
13.	Photographic Officer	3
14.	Printing Officer	1
15.	Accounts Officer	1
16.	Superintendent Documentation	1
17.	Supporting Staff	<u>73</u>
	Total:	<u>91</u>

**PAKISTAN MUSEUM OF NATURAL HISTORY
P M N H**

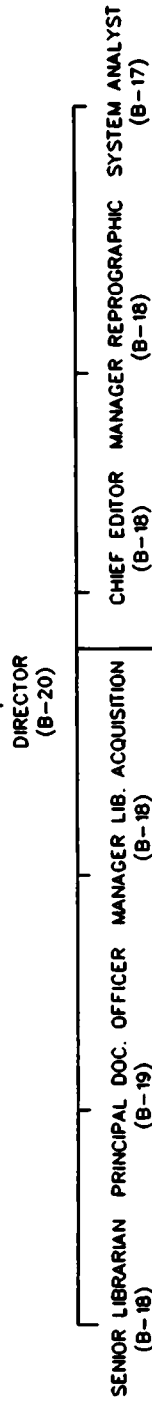
S.No.	Designation	Number
1.	Director General	1
2.	Directors	2
3.	Curators	2
4.	Associate Curators	5
5.	Research Associates	12
6.	Taxidermist	1
7.	Artist	1
8.	Modeller	1
9.	Administrative Officer	1
10.	Accounts Officer	1
11.	Supporting Staff	58
	Total:	85

PAKISTAN SCIENCE FOUNDATION ORGANIZATIONAL CHART

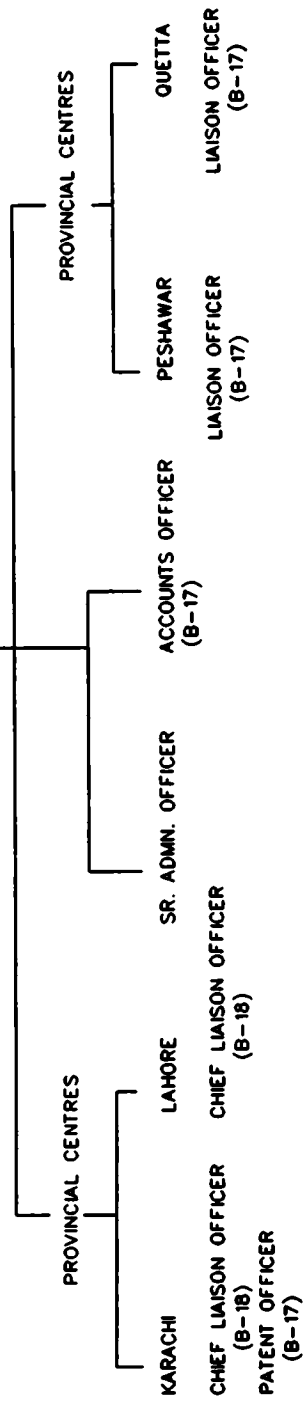


ORGANIZATION CHART

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

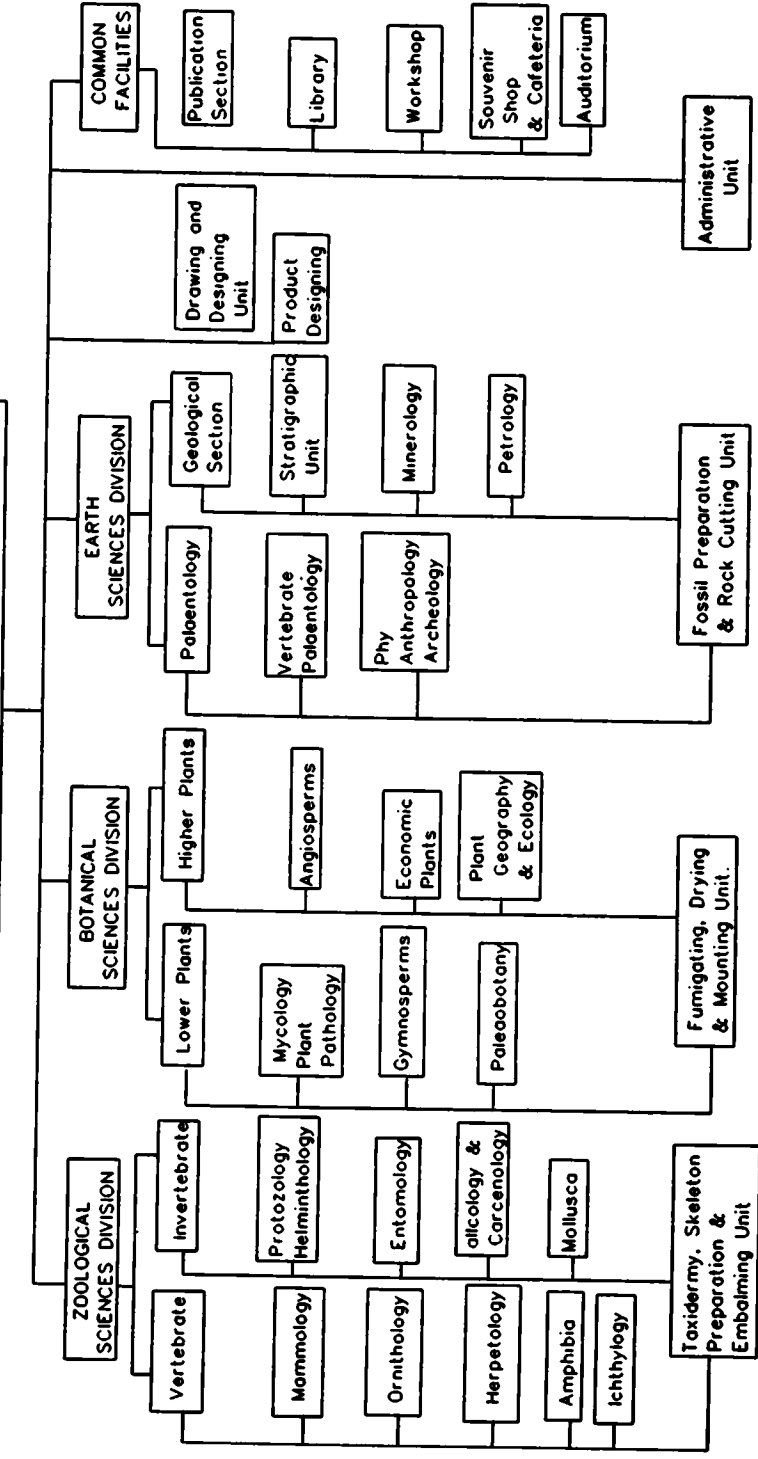


ADMINISTRATION & BUDGET/ACCOUNTS UNIT



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 (PASTIC)	Akbar & Company Chartered Accountants Amin Building Shahrah-e-Quaid-i-Azam <u>Lahore</u>
Pakistan Museum of Natural History (PMNH)	Ilyas Saleem & Co., Chartered Accountants 18-D, 6th Road, Satellite Town, <u>Rawalpindi</u>

Phones: 6 5 7 9 3
6 8 3 0 4
5 6 5 6 0

NAZIR CHAUDHRI & CO.
Chartered Accountants
2-GardeeTrust Building, Napier Road,
Lahore-7

AUDITORS' REPORT

We have examined the annexed Balance Sheet of Pakistan Science Foundation as at 30th June, 1984 and the annexed income and Expenditure Account for the year ended 30th June, 1984 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, 1984, comprise of grants received from the Federal Government. We are satisfied that the grants so received has been utilized 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, 1984. However, refunds amounting to Rs.2,91,886/- received during the year as also the accumulated balance thereof (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 CHAUDHIR & CO.
Chartered Accountants.

LAHORE,
DATED:- 6, August, 1985.

PAKISTAN SCIENCE FOUNDATION ISLAMABAD

INCOME AND EXPENDITURE ACCOUNT FOR THE YEAR ENDED 30TH JUNE, 1984

<u>EXPENDITURE</u>	<u>NOTE</u>	<u>1988</u>	<u>1983</u>
Grants	11	34,73,951	50,03,404
Development Grant	12	5,22,000	-
Travel Grant for Scientific Survey, Science Conference & Seminars	13	3,84,957	83,677
Scientists Pool	14	2,400	3,000
Other Functions	15	3,52,840	2,49,459
Administrative Expenses	16	29,23,243 <u>76,59,391</u>	22,38,634 <u>75,78,174</u>
		=====	=====
<u>INCOME</u>			
Miscellaneous Income	17	4,576	41,181
Net Expenditure for the year Transferred to General Fund.		<u>76,54,815</u>	<u>75,36,993</u>

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

CHAIRMAN

TRUSTEE

TRUSTEE

Sd/-

NAZIR CHAUDHRI & CO
CHARTERED ACCOUNTANTS

6 August, 1985.

NAZIR CHAUDHRI & CO.
CHARTERED ACCOUNTANTS

PAKISTAN SCIENCE FOUNDATION ISLAMABAD

SCHEDULE OF FIXED ASSETS AS AT 30TH JUNE, 1984

PARTICULARS	C O S T			D E P R E C I A T I O N					Written Down value as at 30.6.84	
	As at 1.7.83	Additions during the year	Sale & Adjustment	As at 30.6.84	Rate %	To 30.6.83	Trans- fert/Ad- justment	Provided for the year		To 30.6.84
LAND LEASEHOLD	30,13,919	-	-	30,13,919	-	-	-	-	-	30,13,919
FURNITURE & FIXTURES	3,44,553	56,386	-	4,00,939	6	90,938	-	18,600	1,09,538	2,91,401
OFFICE EQUIPMENT	3,66,271	107,421	-	4,73,629	15	1,46,218	-	49,121	1,95,339	2,78,353
AIR CONDITIONERS	1,18,364	-	-	1,18,364	15	65,943	-	7,863	73,806	44,558
MOTOR VEHICLES	6,15,064	-	(6,236)	6,08,828	20	2,58,360	(5,399)	71,173	3,24,134	2,84,694
BYCYCLES	680	-	-	680	20	401	-	56	457	223
LIBRARY BOOKS	41,181	2,336	-	43,517	5	5,109	-	1,920	7,029	36,488
Rupees-	45,00,032	1,66,143	(6,236)	46,59,939		5,66,969	(5,399)	1,48,733	7,10,303	39,49,636
1983-	37,28,904	7,71,128	-	45,00,032		-	-	1,55,415	5,66,969	39,33,063

NAZIR CHAUDHRI & CO.
CHARTERED ACCOUNTANTS

PAKISTAN SCIENCE FOUNDATION, ISLAMABAD

NOTES ON ACCOUNTS 30TH JUNE, 1984

ACCOUNTING POLICIES

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

GRANT RECEIVED

- 1.1 Grants from the Government of Pakistan have been accounted for on receipt basis.

RESEARCH SUPPORT GRANTS

Research Support Grants 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 has been charged on reducing balance method.

GENERAL FUND

2. This is made up of	<u>1984</u>	<u>1983</u>
Balance as at July 1, 1983	45,26,815	39,53,451
Add Grant Sanctioned and received during the year as under.		
Grant received from Govt. of Pakistan	75,30,000	
Development grant received from the Govt. of Pakistan	<u>5,22,000</u>	<u>80,52,000</u>
	1,25,78,815	1,21,27,251
Less Expenditure during the year	<u>76,54,815</u>	<u>75,36,993</u>
	49,24,000	45,90,258

NAZIR CHAUDHRI & CO
CHARTERED ACCOUNTANTS

Less Refund of un-utilized grants disbursed during the year shown under grant refundable to the Government (Note '6')	49,24,000	45,90,258
	<u>37,375</u>	<u>63,443</u>
	<u>48,86,625</u>	<u>45,26,815</u>

3. RESEARCH SUPPORT GRANTS

a) In accordance with the Principal outlined in the charter grants aggregating Rs.22,32,673 have been paid by the Foundation during the year for the conducting of various approved Scientific research projects as detailed here under :-

Physical Sciences	49,986
Chemical Sciences	4,13,731
Biological Sciences	5,08,957
Earth Sciences	11,005
Environment Sciences	40,007
Agricultural Sciences	1,52,078
Engineering Sciences	1,50,133
Medical Sciences	2,88,496
Institutional Support	6,11,880
Honoraria	6,400
	<u>22,32,673</u>
	=====

b) The balance is arrived at as follows:-

Balance as at 1st July, 1983	3,35,51,078
Disbursement during the year	<u>22,32,673</u>
Balance as on 30th June, 1984	<u>3,57,83,751</u>

4. In accordance with the provision of the agreement, the grantee has undertaken to incur the grant for the performance and execution of the research project 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

These are made up of

Laibilities for Expenses	65,500	62,500
Audit Fee and Expenses	-	26,165
Travel Grants	4,599	10,150
Salaries & other Benefits	41,808	18,410
other Administrative Expenses	<u>1,11,907</u>	<u>1,17,225</u>
	=====	=====

NAZIR CHAUDHRI & CO
CHARTERED ACCOUNTANTS

6.	GRANTS REFUNDABLE TO GOVERNMENT	
	Balance brought forward	8,86,196 1,68,824
	Amount refunded during the year related to grants disbursed	
	During the year	37,375 63,443
	In prior years	<u>2,54,511</u> <u>6,53,929</u>
		<u>2,91,886</u> <u>7,17,372</u>
	Rupees:-	11,78,082 8,86,196
		=====
7.	RESEARCH PROJECTS IN PROGRESS	
	This represents the expenditure incurred on various research projects which appears per contra on the Liabilities side under the head "Research Support Grant."	
8.	ACCOUNT RECEIVABLE	
	These consist of	
	UNESCO COUPONS	50,000 1,58,000
	PASTIC	1,62,000 72,000
	PMNH	5,000 -
		<u>2,17,000</u> <u>2,30,000</u>
		=====
9.	ADVANCES, DEPOSITS & PREPAYMENTS	
	These are made up of	
	Advance to staff	76,795 74,003
	Deposit	5,500 4,600
	Prepayments	4,91,436 4,24,744
	L/C Margin	<u>1,65,000</u> -
		<u>7,38,731</u> <u>5,03,347</u>
		=====
10.	CASH & BANK BALANCES	
	In hand	14,192 14,793
	With Bank (A/C No.052)	10,99,055 8,49,033
	UNESCO COUPONS	<u>1,58,000</u> -
		<u>12,71,247</u> <u>8,63,826</u>
		=====
11.	GRANTS	
	Research Support	22,32,673 36,69,572
	Scientific Societies & Professional Bodies	6,93,000 7,90,000
	Science Conferences & Seminars	<u>5,48,278</u> <u>5,43,832</u>
		<u>34,73,951</u> <u>50,03,404</u>

NAZIR CHAUDHRI & CO.
CHARTERED ACCOUNTANTS

12. DEVELOPMENT GRANTS

The sum of Rs.5,22,000 represents the grant sanctioned by the Government of Pakistan from Aid of National Science Foundation United State of America for project PL-480 which has been received by the Foundation and paid as under:-

VC University of Karachi	1,74,000	
VC University of Peshawar	<u>3,48,000</u>	
	5,22,000	
	=====	

13. TRAVEL GRANT FOR SCIENTIFIC SURVEY, SCIENCE CONFERENCES AND SEMINARS.

Local	92,085	-
Foreign	<u>2,92,872</u>	<u>83,677</u>
	3,84,957	83,677
	=====	=====

14. SCIENTISTS POOL

Salaries	1,500	3,000
Honoraria & Travelling	<u>900</u>	<u>-</u>
	2,400	3,000
	=====	=====

15. OTHERS

Science Centres & Herbaria	2,92,000	-
Information & Documentation	20,480	2,28,709
Awards, Prizes & Fellowship	<u>40,360</u>	<u>20,750</u>
	3,52,840	2,49,459
	=====	=====

16. ADMINISTRATIVE EXPENSES
These Comprise of :-

Salaries & other Benefits	18,33,369	12,13,004
Travelling Expenses Local	69,311	164,649
Office Rent	3,03,600	2,13,600
Water,Electricity & Gas	42,065	31,270
Postage,Telegrams & Telephones	1,52,716	1,74,229
Printing & Stationery	79,557	44,292
Vehicles Running & Maintenance	1,66,438	1,43,504
News Papers & Periodicals	11,424	12,258
Liveries & Uniforms	2,580	1,760
Entertainment	40,408	16,657
Repair & Maintenance	24,564	22,966
Miscellaneous Expenses	22,791	23,664
Depreciation	<u>1,48,733</u>	<u>1,55,415</u>
	28,97,556	22,17,268

NAZIR CHAUDHRI & CO.
CHARTERED ACCOUNTANTS

OTHER EXPENDITURE

Audit Fee	13,000	17,000
Advertisement	-	4,366
Bank charges	1,387	-
Import Licence Fee	3,300	-
Oil Painting charges	8,000	-
	<u>29,23,243</u>	<u>22,38,634</u>
	=====	=====

17. MISCELLANEOUS RECEIPTS

This is made up as under :-

Interest on Advance	2,013
Profit on sale of Motor cycle	<u>2,563</u>
	4,576
	=====

18. FIGURES

- a) In these accounts have been rounded off to the nearest rupee.
- b) of the previous year have been re-arranged wherever necessary for the purpose of comparison.

A K B A R & C O M P A N Y
CHARTERED ACCOUNTANTS

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

Our Ref: IT/P-04/86

Dated August 31, 1986

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, 1984.

Dear Sir,

We have completed the audit of Receipts and Payments Accounts of Pakistan Scientific & Technological Information Centre at Islamabad with sub-centres at Lahore, Karachi, Quetta and Peshawar for the year ended June 30, 1984 and report that:-

Opening Balances as on July 1, 1984, differ with the closing balances of audited Balance sheet as on June 30, 1984, the adjustment/verification of these will be taken up at the time of audit of books of accounts for the year ended June 30, 1985.

Subject to above, we report that:-

1. GRANTS:

This represents the amount received by the Islamabad Centre from Pakistan Science Foundation alongwith the year under audit. The amount allocated and remitted to Sub-Centres is as under :-

<u>Name of Centre</u>		<u>Funds Allocation</u>	<u>Funds utilized/ Remitted</u>
PASTIC	Islamabad Centre	16,20,600	18,80,580
Lahore	Sub-Centre	2,18,900	2,10,346
Karachi	Sub-Centre	9,37,500	7,59,865
Quetta	Sub-Centre	1,41,250	1,46,027
Peshawar	Sub-Centre	1,11,750	33,182
		<u>30,30,000</u>	<u>30,30,000</u>

From the above table it is clear that Rs.2,59,980 have been utilized in excess by the PASTIC Islamabad by remitting the less amount to sub-centres whereas centre is not authorised to incur the expenses under any head of account over and above the Budget Allocation. If any reappropriation is required, it must be approved by the finance and Accounts Wing of PSF. The approval of the same was not provided to us.

2. SALARIES:

(i) SUB-CENTRE, LAHORE:

(a) Rs.49.45 were paid excess to the following staff members in the month of January, 1984 and should be recovered:-

1) Mr. Amjad Ali	Rs.24.00
2) Mr. Allah Ditta	Rs. 4.65
3) Mr. Babu	<u>Rs.21.30</u>
	<u>Rs.49.95</u>

(b) Rs.130.00 were paid to the following staff members on February 2, 1984, but Rs.133.00 were recorded in books of accounts and balance of Rs.3.00 was misappropriated:-

1) Mr. Mohammad Aslam	Rs.45.00
2) Mr. Amjad Ali	Rs.40.00
3) Mr. Taj Mohammad	Rs.23.00
4) Mr. Allah Ditta	Rs.12.00
5) Mr. Babu	<u>Rs.10.00</u>
	<u>Rs.130.00</u>

(c) As per salary sheet, amount of Rs.5,443.20 was passed for payment by the Officer-in-Charge but in cash book payment of Rs.5,460.00 has ben recorded. It resulted an excess payment of Rs.16.80.

(ii) SUB-CENTRE QUETTA

(a) Following amounts were paid as daily wages to the following staff but approval of the same was not available for our verification:-

1) Mr. Nazir Ahmed (Machine Operator)	Rs.400.00
2) Mr. Tariq Masih (Sweeper)	<u>Rs.300.00</u>
	<u>Rs.700.00</u>

(iii) We have noted that income-tax deducted at source u/s 50 (I) of the Income Tax Ordanice 1979, from the salaries of the employees of Sub-Centres Lahore,

Karachi, Quetta Peshawar during the year has not been deposited with the treasury within one week as required by the law.

2. TRAVELLING AND DAILY ALLOWANCE:

(i) SUB CENTRE LAHORE

Travelling expenses were paid to the following members but proper sanction of the same was not available:-

1) Mr. Munir Ahmed Siddique	Rs.2,020.00
2) Major General M.I. Burney	Rs. 670.00
3) Mr.Sarwar T. Zuberi	Rs.2,000.00
4) Chinese Delegation Expenses	Rs.13,535.00
	<u>Rs.18,225.00</u>

(ii) SUB CENTRE KARACHI

(a) Advances against travelling and daily allowances were paid to the following members but actual bills have not been submitted till the date of audit:-

<u>Date</u>	<u>Particulars</u>	<u>Amount</u>
6.11.83	Mr. S. Zafar-ul-Hasan	Rs.2,000.00
4.10.83	Mrs. Farida Anees	Rs.3,000.00
		<u>Rs.5,000.00</u>

(b) Rs.6,775.00 were paid as travelling and daily allowances on September 29, 1983, to Mr. Ayub, Superintendent on account of his transfer from Islamabad to Sub-Centre Karachi but approval of the same was not available.

(iii) SUB CENTRE QUETTA

Advance against T.A. and D.A. were paid to the following members but actual bills were not submitted till the date of audit:-

<u>Date</u>	<u>Particulars</u>	<u>Amount</u>
1.10.83	Mr. Ayat-ul-Allah Durrani	Rs.2,500.00
2.11.83	Mrs. Khalida Usmani	Rs.1,750.00
20.12.83	Mr. Ayat-ul-Allah Durrani	Rs.6,720.00
		<u>Rs.10,970.00</u>

(iv) SUB CENTRE PESHAWAR

Advance against T.A. and D.A. was paid to Mr. S.M. Anwar to attend meeting at Islamabad but bill of the same was not submitted for adjustment of the same.

4. MEDICAL EXPENSES:

Actual medical bills are being paid to staff members of Sub-Centres - Lahore and Karachi while as per letter No.PSF/Admn/5(2)/73-Vol.2, dated September 24, 1983. Rs.100.00 as medical allowance per month has been permitted. Following staff members of Sub-Centre Lahore utilized medical facilities on production of actual bills. In absence of proper rules and regulations, it is not possible to control these expenses:-

1. Mr. Humayun
2. Mr. Amjad Ali
3. Mr. Mohammad Ramzan
4. Mr. Allah Ditta

5. C.P.FUND CONTRIBUTION:

SUB CENTRE QUETTA

C.P. contribution fund has been deducted @ 10% upto December 31, 1984, while as per C.P. contribution rules it should be 12.50%.

6. RECREATION ALLOWANCE:

SUB CENTRE KARACHI

Recreation allowance amounting to Rs.2,500.00 paid to staff was not got approved from Senior Administrative Officer, PASTIC, Islamabad except Rs.500.00 paid to Mr. Zaheer -ud-Din Qureshi.

7. GRATUITY:

ISLAMABAD CENTRE

Gratuity of Rs.80,000 has been deposited with the Pakistan Science Foundation for the year under audit. The amount is not in accordance with the service rule No.19. The amount transferred is an estimated figure.

8. PRINTING AND STATIONARY:

SUB CENTRE KARACHI

Rs.760.00 paid on August 22, 1983 for purchase of stationary but no approval was produced for our verification.

9. POSTAGE, TELEGRAM AND TELEPHONE:

(i) SUB CENTRE KARACHI

Heavy telephone expenses were incurred and it was explained to us that no ceiling had been fixed for Sub-Centre, Karachi.

(ii) SUB CENTRE QUETTA

We have observed that telephone expenses have been incurred excess than the limit of Rs.750/- per month in following months:-

<u>Particulars</u>	<u>Amount</u>
April, 1983 (paid after 30th June,1983)	Rs.2,124,25
May, 1983 (paid after 30th June,1983)	Rs.1,338.75
	<u>Rs.3,462.79</u>

10. REPAIR AND MAINTENANCE:

SUB CENTRE QUETTA

Expenses incurred for repair to furniture exceed limit of Officer-in-Charge and required approval of the Chairman which was not produced for our verification.

11. TRANSLATION COST:

SUB CENTRE LAHORE:

(a) A Cheque No.998649 dated: September 21, 1983 for Rs.2,240.00 was received from the WAPDA in response to their bill No.6148/83 dated August 30, 1983 and was deposited in the bank on October 5, 1983 but the collecting bank refused to send it for collection for the reason that branch name-stamp on cheque was not affixed. Cheque was returned and therefore, no action seems to have been taken for the collection of the outstanding bill.

(b) Rs.18.50 were collected against bill No.6083/83, dated July 3, 1983 but only Rs.8.50 were deposited in bank and balance of Rs.10.00 remain un-explained.

12. SEMINAR EXPENSES:

SUB CENTRE QUETTA: Rs.58,200.00

These expenses were incurred for celebrating the seminar in Baluchistan and a general letter for allocation of seminar of Rs.120,000 at various centres was available but proper sanction of the expenses was not available.

13. UNFORSEEN EXPENSES:

ISLAMABAD CENTRE:

During the year Rs.5,500 has been incurred as legal expenses and Rs.12,565.00 on account of shifting of office equipment from Karachi which were not provided in the budget estimates. The sanction of the above expenses by the Chairman is contravention of Regulation No.3-(A)vii(C).

14. SERVICE CHARGES:

This amount refers to the service rendered to certain clients and the amounts collected against the bills submitted and are credited to the account No.276, maintained with National Bank of Pakistan, P.E.C.H.S. Branch, Karachi. The said bank account and account No.81760, maintained with National Bank of Pakistan University Branch, Peshawar remained unverified in absence of availability of record.

15. HOTEL CHARGES: Rs.5,782.25

SUB CENTRE PESHAWAR

These expenses were incurred regarding the visit of Chinese delegation but approval of the same was not available for our verification.

16. OFFICE EQUIPMENT

SUB CENTRE QUETTA

Rs.2,500 were spent for purchase of one air cooler but sanction was not available.

17. CASH WITH BANK:

(i) ISLAMABAD CENTRE

Bank reconciliation statement provided verified by us and it was observed that following cheques are outstanding since more than six months, hence should be reversed:-

<u>Date</u>	<u>Cheque No.</u>	<u>Amount</u>
15.09.1983	06593/597622	Rs.24,498.00
28.11.1983	06665/604802	Rs.23,136.00
17.12.1983	06665/604834	Rs.14,998.00

(ii) SUB CENTRE LAHORE

The following cheques are outstanding since more than six months and hence should be reversed:-

<u>Date</u>	<u>Cheque No.</u>	<u>Amount</u>
26.06.1981	249149	Rs. 404.00
9.10.1982	269711	Rs. 55.00
19.10.1982	269715	Rs. 166.00
20.09.1983	485752	Rs. 803.00
19.01.1984	697730	Rs. 602.51
		<u>Rs.2030.51</u>

There is a difference of Rs.70 in opening balance of bank account as on July 1st, 1982.

(iii) SUB CENTRE QUETTA

We have prepared the bank reconciliation statement and found that one cheque No.724830 for R.5,121.60 was issued on June 3, 1984 but the payment of the same has been recorded in bank as Rs.5,721.60 Excess debit of Rs.600 should be got rectified from the Branch Manager.

18. GENERAL:

- (i) Only cash book is being maintained at Sub-Centre. It is suggested that ledger of the same should be maintained.
- (ii) Postage Register is not being maintained at Sub-Centres. We suggest the early introduction of the same.

In the end we thank for the staff for cooperation extended during course of audit.

Your's faithfully,

Sd/-

AKBAR & COMPANY
CHARTERED ACCOUNTANTS

	ISLAMABAD	LAHORE	KARACHI	QUETTA	PESHAWAR	TOTAL
Printing & Stationery	17,497.25	2,316.25	747.50	1,100.00	950.00	22,611.00
Postage, Telegrams & Telephones	175,828.70	8,871.78	41,918.85	2,490.75	883.30	229,993.38
Repair & Maintenance	46,631.76	865.00	30,000.00	11,725.00	257.00	89,478.76
Newspapers, Advertisement and Publications	11,436.50	538.50	1,079.75	13,700.00	592.75	27,347.50
Translation charges	-	5,916.00	-	-	-	5,916.00
Chemical/Solvent	-	6,200.00	88.00	-	-	6,288.00
Freight & Cargo	404.25	-	-	-	-	404.25
Entertainment	4,108.20	82.10	15.00	-	-	4,205.30
Petrol oil & lubricants	33,494.17	462.00	19,347.62	-	-	53,303.79
Law charges	5,500.00	-	-	-	-	5,500.00
Bank charges	78.90	33.70	115.95	57.00	40.60	326.15
Gardening	2,120.00	-	-	-	-	2,120.00
Foreign Delegation expenses	-	-	26,000.00	-	-	26,000.00
Sweeping charges	-	-	-	-	550.00	550.00
Uniform & Driving dress	-	-	-	-	585.00	585.00
Seminar expenses	9,804.00	-	-	58,200.00	-	68,004.00
Consumable stores	-	-	10,784.50	-	-	10,784.50
Photostat machine purchased	-	-	-	-	-	-
Remittance to Sub-Centres	1,149,418.95	-	-	-	-	1,149,418.95
Subvention to Cooperative libraries	140,000.00	-	-	-	-	140,000.00
Shifting of office equipment	12,565.00	-	-	-	-	12,565.00
Purchase of Unesco Coupons	51,975.00	-	-	-	-	51,975.00
Operating of UBIX	5,000.00	-	-	-	-	5,000.00
Cycle Advance	5,600.00	-	-	-	-	5,600.00
Security deposit- Telephones	1,350.00	-	-	-	-	1,350.00
Miscellaneous Expenses	172.00	1,095.85	222.00	24,260.40	326.75	26,077.00
C.P.F. und paid	-	-	-	-	407.00	407.00
TOTAL:-	3,030,000.00	242,213.91	891,142.63	228,353.62	94,310.98	4,486,021.14
Less Remittance to Sub-Centre	-	-	891,142.63	-	-	1,149,418.95
	3,030,000.00	242,213.91	891,142.63	228,353.62	94,310.98	3,336,602.19
Closing Balance:						
Cash in hand		955.60	1,543.15	-	-	2,498.75
Cash with Bank		48,935.27	33,024.53	929.92	53,911.51	136,801.23
Total		<u>49,890.87</u>	<u>34,567.68</u>	<u>929.92</u>	<u>53,911.51</u>	<u>139,299.98</u>
	3,030,000.00	292,104.78	925,710.31	229,283.54	148,222.49	3,475,902.17

Sd/-
AKBAR & COMPANY
CHARTERED ACCOUNTANTS

LAHORE: 65-SHAHRAH-E-QUAID-E-AZAM
DATE: 31 AUG 1986

AKBAR & COMPANY
CHARTERED ACCOUNTANTS

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

No.IT/P-04/III/89

Dated: July 31, 1988.

The Deputy Director (F&A),
Pakistan Science Foundation,
Post Box No. 1121,
Islamabad.

Subject:- Audit of Books of Accounts of Pakistan Scientific
and Technological Information Centre, Islamabad.
for the year ended June 30, 1984.

Dear Sir,

With reference to our discussions with you on 28th and 30th instant, we submit that the difference of opening balances of cash in hand for the year ended June 30, 1984 was discussed in detail. We suggest that these be adjusted on our visit to take up the audit of the subsequent year and be verified by our staff members.

We will be pleased to take up the audit of the next year at the earliest on your intimation and our charges for the next year will be 25% shall be higher than the previous year due to inflationary effects.

We also take this opportunity to remind you that our bill for professional charges of Rs.10000/- for the year ending June 30, 1984, is also pending since April 1985. Please expedite the payment of same.

Thanking you,

Yours faithfully,

Sd/-
AKBAR AND COMPANY
CHARTERED ACCOUNTANTS

ILYAS SALEEM & CO
Chartered Accountants

Internationally Midsnell

18-D, 6th Road,
P.O. Box No.1731
Rawalpindi
Tele:845318
Telex:54028
Cable:MIDSNELL
Rawalpindi

Partners:
MOHAMMAD ILYAS
M.A., M.Com. LLB., FCA
MOHAMMAD SALEEM
B.Sc., FCA
SAGHIR AHMAD
B.Com. ACA

The Chairman,
Board of Trustees
Pakistan Science Foundation
Islamabad.

Dear Sir,

PAKISTAN MUSEUM OF NATURAL HISTORY RECEIPTS
AND PAYMENTS ACCOUNT FOR THE YEAR ENDED
JUNE 30, 1984.

We are enclosing five copies of the Receipt and payment Account together with our report thereon, duly initialled by us for identification purposes. We shall be pleased to sign our report after these accounts have been considered and approved by the Board of Trustees and signed by at least two members of the Board authorised in this behalf. Our observations arising out of our audit together with suggestions for improvement are as under:-

1. RECEIPTS

These comprises of

Grant in Aid from Government	Rs.3,050,000
Institutional grant by PSF	Rs. 200,000
Refund of price quoted/accepted of Built-in-Showcases from Punjab Small Industries Corporation	Rs. 63,500
	<u>Rs.3,313,500</u>

2. PAYMENTS

2.1 We were unable to verify the following payments due to lack of supporting documents.

Salaries of staff	8,678
TA/DA	<u>2,360</u>
	<u>11,038</u>

- 2.2 Quotations for purchase of projection lamp and copying stand with lamp's was not on record. It was difficult to ascertain whether this purchase was made on competitive rates.
- 2.3 In some cases acknowledgement in respect of rent payment for office building was not on record.
- 2.4 Repair of Vehicles was carried without preparation of proper indent.
- 2.5 In presence of Museum own photo stat machine photo copies were made from outside but no one had certified that machine was out of order on a specific date.
- 2.6 Deduction of C.P. Fund of Mr. I.U. Cheema had not been promptly deposited with comptroller Quetta. We suggest that such deductions should be deposited regularly as it may result in penal consequences.
- 2.7 We were unable to ascertain the amount of advances recoverable from the employees and others due to:
- i) Improper book keeping which did not show the personal accounts
 - ii) The temporary record maintained did not depict all of the transactions of advances.
- 2.8 No record was maintained in respect of unpaid salaries. Also the amount left unpaid were not deposited back.
- 2.9 According to rule 50 of the Income Tax Rules 1982 tax deduction from salaries of employees must be deposited within 24 hours with the Govt. Treasury or any representative thereon. We have noticed that requirements of Income Tax Ordinance have not been complied with. In addition to the above we have also observed that workings in respect of tax deductions were not on record thus making it difficult to ascertain the accuracy of such deductions. We recommend that tax deductions from employees salary should be based on proper computation duly checked for accuracy by Museum staff and that all such deductions should be deposited with the Govt. Treasury within the prescribed period to avoid penal consequences.

3. CASH AND BANK BALANCES:

Cash was not physically verified by the auditors at the terminal date.

4. GENERAL

- 4.1 Fixed assets register was not properly maintained.
- 4.2 No detailed inventory of stores and stocks was provided to us.
- 4.3 We observed that furniture, fixture and fittings of office and Museum have not been insured. Additionally, fidelity insurance policy have not been secured for cash handling. This matter requires the most immediate attention of the management.

We are thankful for the coordination provided to us by the staff.

Very Truly Yours

Sd/-

(MOHAMMAD SALEEM)
For ILYAS SALEEM & CO.

PAKISTAN MUSEUM OF NATURAL HISTORY

RECEIPTS AND PAYMENTS ACCOUNT FOR THE YEAR ENDED
JUNE 30, 1984

<u>BALANCE AS AT JULY 1, 1983</u>	<u>NOTE</u>	<u>1984</u>
Cash at Banks		16,679.13
Cash in Hand		772.37

<u>RECEIPTS</u>		<u>3,313,500.00</u>
	Rupees	<u>3,330,951.50</u>

PAYMENTS

Salaries & Allowances	1,955,418.30
Office Rent	302,852.00
Rent, Residential Accomodation	131,064.50
Travelling Expenses	90,940.68
Entertainment	5,000.20
Telephone Charges	91,723.07
Gas, Water & Electricity	27,506.49
P.O.L.	106,375.04
Newspaper & Magazines	3,828.75
Advertisement	4,049.18
Repair & Maintenance	24,703.75
Consumable Store	315,864.81
Books	43,568.02
Vehicle	84,954.00
Furniture & Fixture	65,547.54
Office Equipment	15,495.00
Miscellaneous Expenses	44,240.59
Bank Charges	16,694.34
	<u>3,329,826.26</u>

BALANCE AS AT JUNE 30, 1984

Cash at Banks	404.72
Cash in Hand	720.52
	<u>3,330,951.00</u>
	=====

Sd/-

TRUSTEE

TRUSTEE

ILYAS SALEEM & CO
(CHARTERED ACCOUNTANT)

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 Pakistan Science Foundation
 - (c) 'Foundation' means the Pakistan Science Foundation established under this Act.
3. ESTABLISHMENT OF THE FOUNDATION -(1) As soon as 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 use and be used.

(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 centres.
- 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 particulars;
- vi) the organisation 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. TERM 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 decisions 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 scrutinize applications for financial assistance for carrying out scientific research submitted to the Foundation by the universities or other institutions or by individual scientific workers or groups of scientific workers and to review and evaluate to 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 Governments;
- 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 expenditure 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 in consultation with the Federal Governemnt.

(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, conform 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 alongwith the audited accounts of the Foundation.

(2) The annual report alongwith 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.

LIST OF SANCTIONED RESEARCH GRANTS 1983-84

<u>No.</u>	<u>List of schemes</u>	<u>Amount Sanctioned</u>	<u>Name of the Principal Investigator and Organization Supported</u>
1.	<u>Agricultural Sciences</u>		
i)	Quality Improvement of Vegetables. S-AU/Agr (80)	1,96,840/-	Prof. Karamullah H. Agha, Dean Faculty of Agriculture, Sind Agriculture University, Tandojam.
ii)	Study on the Epidemiology of Salmonellae of Human & Animal origin in Punjab	3,97,410/-	Prof. Dr. Muhammad Ajmal, Principal & Professor of Microbiology, College of Veterinary Sciences, Lahore.
2.	<u>Biological Sciences</u>		
i)	Effects of Heavy Metals with Special reference to Cadmium and Lead, on common Edible Fish of Pakistan P-PU/Bio (121)	3,61,000/-	Dr. Abdul Rauf Shakoori, Department of Zoology, University of the Punjab, New Campus, Lahore.
ii)	Study of epididymal Function in the Rhesus Monkey (Macaca mulatta): Androgen dependent proteins, their characterization and regional distribution. C-QU/Bio (125)	86,250/-	Dr. Azra Khanum, Department of Biological Sciences, Quaid-i-Azam University Islamabad.
iii)	Proposal for preparation of book on medicinal plants of Pakistan P-AU/Bio (126)	1,32,902/-	Dr. Abdul Hamid Khan, Rt. Director, Advance Studies Research University of Agriculture, Faisalabad.

<u>No.</u>	<u>List of Schemes</u>	<u>Amount Sanctioned</u>	<u>Name of the Principal Investigator and Organization Supported</u>
3.	<u>Chemical Sciences</u>		
i)	Chemical, spectroscopic & Microbial Studies of Transition Metal Complexes Containing Mixed Ligands. S-KU/Chem (142)	25,000/-	Dr. Najma Sultana, Assistant Professor, Department of Pharmaceutical Chemistry, Faculty of Pharmacy, University of Karachi Karachi.
ii)	Development of new Inorganic materials (Inorganic plastics of the future) based on Portland Cement. S-CSIR/Chem (143)	329,484/-	Mr. Mohammad Aslam Ex. Chairman, PCSIR Laboratories, Karachi.
iii)	A thermodynamic study of the Supermolecular order in Aqueous solutions of Polyvinyl alcohol. F-PJ/Chem (153)	263,600/-	Dr. Noor Ahmad, Professor, Centre of Excellence in Physical Chemistry, University of Peshawar, Peshawar.
4.	<u>Environmental Sciences</u>		
i)	Hazardous Effect of Industrial Pollution & Environment. S-KU/Envr (24)	2,45,800/-	Dr. Akhlaq Ahmed, Department of Applied Chemistry, University of Karachi, Karachi.
ii)	Resource Recovery from Poultry Waste and Its Utilization S-KU/Envr (26)	1,37,390/-	Dr. Altaf Khan, Associate Professor, University of Karachi, Karachi.
5.	<u>Medical Sciences</u>		
i)	Effect of Fasting on Serum and Urinary Bio-chemical Profile of Normal Males. P-PMI/Med (90)	48,265/-	Dr. Farakh A. Khan, Professor of Urology, Postgraduate Medical Institute, Lahore.

<u>No.</u>	<u>List of Schemes</u>	<u>Amount Sanctioned</u>	<u>Name of the Principal Investigator and Organization Supported</u>
	ii) Incidence of Infertility in Islamabad and its Management. C-CP/Med (92)	2,35,023/-	Dr. Samia Janjua, Consultant Obstetrician/ Gynecologist, Central Govt. Polyclinic, Islamabad.
	iii) Study of Rubella antibodies in general population with special reference to pregnant Women. P-KEM/Med (95)	56,402/-	Dr. Shamim Raza Bukhari, Professor of Pathology, King Edward Medical College Lahore.
6.	<u>Oceanography</u>		
	i) Feasibility study for Extraction of Energy from Current and Heliohydrogravity. S-NIO/Ocean (9)	820,610/-	Dr. G.S. Quraishiee, Director, National Institute of Oceanography, Karachi.

PSF GRANTS GIVEN AS INSTITUTIONAL SUPPORT

<u>S.No.</u>	<u>Institution</u>	<u>Grant in Rupees</u>
1.	Department of Physics, Baluchistan University, Quetta.	1,50,000/-
2.	Department of Botany, University of Peshawar, Peshawar	25,000/-
3.	Bahauddin Zakariya University, Multan	2,00,000/-
4.	Veterinary Science College, Lahore.	15,000/-
5.	University College, Kotli	56,880/-
6.	Pakistan Museum of Natural History, Islamabad.	2,00,000/-
7.	Mehran University of Engg. & Technology, Jamshoro.	1,00,000/-
8.	Army Medical College Rawalpindi	15,000/-

**GRANTS SANCTIONED FOR SCIENTIFIC SOCIETIES AND
LEARNED BODIES FOR ACHIEVEMENT OF THEIR OBJECTIVES**

<u>S.No.</u>	<u>A g e n c y</u>	<u>Grant in Rupees</u>
1.	Pakistan Academy of Sciences	50,000/-
2.	Pakistan Association for the Advancement of Science .	50,000/-
3.	Pakistan Association of Scientists & Scientific Professions.	50,000/-
4.	Scientific Society of Pakistan	50,000/-
5.	Pakistan Engineering Congress	30,000/-
6.	Pakistan Medical Association	20,000/-
7.	Biological Society of Pakistan	20,000/-
8.	Pakistan Society of Biochemists	10,000/-
9.	Chemical Society of Pakistan	10,000/-
10.	Sind Science Society of Pakistan	30,000/-
11.	Pakistan Forest Institute, Peshawar	15,000/-
12.	Pakistan Veterinary Journal	10,000/-
13.	Pakistan Institute of Electrical Engineers	25,000/-
14.	Pakistan Institute of Chemical Engineers	20,000/-
15.	Institute of Engineers of Pakistan	40,000/-
16.	Pakistan Institute of Metallurgical Engineers	10,000/-
17.	Institute of Engineers	10,000/-
18.	Solar Energy Society	10,000/-
19.	Pakistan Society of Nematologists	20,000/-

GRANTS SANCTIONED FOR PUBLICATION PROGRAMME

<u>S.No.</u>	<u>Agency</u>	<u>Publication</u>	<u>Grant in Rupees</u>
1.	Pakistan Academy of Sciences	Monographs	10,000/-
2.	Pakistan Association for the Advancement of Science	i) Pakistan Journal of Science ii) Pakistan Journal of Scientific & Industrial Research	40,000/-
3.	Scientific Society of Pakistan	i) Science Bachoon Keliay ii) Science Magazine	30,000/-
4.	Biological Society of Pakistan	Biologia	20,000/-
5.	Pakistan Society of Biochemists	Pakistan Journal of Biochemistry	15,000/-
6.	Chemical Society of Pakistan	Journal of Chemical Society of Pakistan	20,000/-
7.	Pakistan Institute of Chemical Engineers	Journal of the Pakistan Institute of Chemical Engineers	15,000/-
8.	Mehran University of Engineering & Technology, Jamshoro	Journal of Engineering & Technology.	15,000/-
9.	Faculty of Veterinary Sciences, University of Agriculture, Faisalabad.	Pakistan Veterinary Journal	10,000/-
10.	Pakistan Forest Institute, Peshawar	Publication of Pakistan Journal of Forest.	15,000/-
11.	University of Peshawar	Bulletin of Zoology	20,000/-
12.	Department of Pharmacy, University of Karachi Karachi.	Journal of Pharmacy	30,000/-
13.	Federal Government Urdu Science College, Karachi	'Urdu' Journal 'Tahqeeq'	12,000/-
14.	Government College, Lahore	Journal of Natural Sciences & Mathematics	6,000/-
15.	Khyber Medical College, Peshawar	Pakistan Oral & Dental Journal	10,000/-

**GRANTS SANCTIONED FOR ORGANIZING SCIENCE
CONFERENCES/SYMPOSIA/SEMINAR**

<u>S.No.</u>	<u>Agency</u>	<u>Object</u>	<u>Amount Sanctioned</u>
1.	Centre of Excellence in Water Resources Engineering, Lahore.	International Seminar on Water Resources Management	25,000/-
2.	University of Karachi	Workshop on Training programme in various fields of Microbiology.	20,000/-
3.	Board of Intermediate & Secondary Education. Lahore	Summer School for talented students.	25,000/-
4.	University of Karachi	Seminar on Natural Product Chemistry.	20,000/-
5.	Centre for Advanced Studies of Molecular Biology, University of Punjab, Lahore	International Workshop on Bactario phage and transposable genetic elements.	20,000/-
6.	University Grants Commission, Islamabad	A meeting of young Scientists.	10,000/-
7.	Pakistan Academy of Sciences, Islamabad.	A Symposium of Plan-power development.	20,000/-
8.	Pakistan Institute of Chemical Engineers.	Workshop cum refresher Course Pakistan Institute of Engineers.	5,000/-
9.	Post-graduate Medical Institute, Lahore	1st International Symposium on high altitude Bio-medical Research.	10,000/-
10.	National Nematological Research Centre, Karachi	Workshop on Plant Nematology.	10,000/-

TRAVE GRANTS FOR PARTICIPATION IN SCIENCE CONFERENCE

<u>S.No.</u>	<u>Name and Address</u>	<u>Conference/Seminar</u>	<u>Amount Sanctioned</u>
1.	Prof. Atta-ur-Rehman, HEJ Research Institute of Chemistry, University of Karachi. Karachi.	9th International Con- gress of Heterocyclic Chemistry, held at Tokyo, Japan.	27,278/-
2.	Dr. Ijaz-ul-Hassan, Dean, Post-graduate Medical Institute, Lahore.	8th Asian Pacific Con- gress on Diseases of Chest held at Japan.	26,165/-
3.	Dr. Abdul Ghaffar, Professor, Department of Botany, University of Karachi, Karachi.	4th International Con- gress of Plant Pathology, Melbourne, Australia.	30,063/-
4.	Dr. Sheikh Ijaz Rasool, Department of Micro- biology, University of Karachi, Karachi.	15th International Con- gress of Genetics at New Delhi, India.	4,620/-
5.	Prof. S.H. Iqbal, Associate Professor, University of Punjab, Lahore.	3rd International Mycologi- cal Conference held at Tokyo, Japan.	32,023/-
6.	Dr. Naseem Akhtar, Professor, Govt. College of Science, Lahore.	1st International Con- ference on Chemistry & Technology of Lanthanides & Actinides held in Italy.	22,594/-
7.	Dr. M. Aslam Khan, Assistant Professor, Department of Geography, University of Peshawar Peshawar.	12th International Training Seminar on Rural Develop- ment Planning held at Nagoya, Japan.	16,350/-
8.	Dr. M. Shahid Anzari, Assistant Professor, Department of Chemistry, Quaid-i-Azam University, Islamabad.	29th All Pakistan Science Conference in Karachi.	2,950/-

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| 9. | Dr. Zahuor Ahmad,
Department of Chemistry,
Quaid-i-Azam University,
Islamabad. | 29th All Pakistan Science
Conference in Karachi. | 2,950/- |
| 10. | Dr. M.D. Shami,
Chairman,
Pakistan Science
Foundation, Islamabad. | International Conference
on Cooperation in Science &
Technology for Developing
Countries. | 4,640/- |
| 11. | Mr. Irfan Ullah Khan,
Research Officer,
University of Baluchistan at Karachi.,
Quetta. | 1st International Sympos-
ium on Natural Products held | 1,550/- |
| 12. | Prof. Nasir-ud-Din,
Department of
Chemistry, University of
Baluchistan, Quetta. | 1st International Symposium
on Natural Products held at
Karachi. | 1,550/- |
| 13. | Dr. A.R. Shakoori,
Co-Director,
Centre of Microbiology,
University of the Punjab,
Lahore. | Course on Biotechnology
in U.K. | 14,990/- |
| 14. | Dr. Manzoor Ahmad,
Department of
Epidemiology, College of
Community, Medicine,
Lahore. | 431st Course on Epidem-
iological Methods held at
Southampton, U.K. | 22,210/- |
| 15. | Dr I.H. Shah,
Director Research,
University of Engineering
& Technology,
Peshawar. | A short course of study
in Rural Energy Planning
held in Netherland | 18,021/- |

